

NUCLEAR REGULATORY COMMISSION ISSUANCES

OPINIONS AND DECISIONS OF THE NUCLEAR REGULATORY COMMISSION WITH SELECTED ORDERS

September 1, 1984 - December 31, 1984

**Volume 20
Book II of II
Pages 799 - 1706**



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PREFACE

This is Book II of the twentieth volume of issuances (799 - 1706) of the Nuclear Regulatory Commission and its Atomic Safety and Licensing Appeal Boards, Atomic Safety and Licensing Boards, and Administrative Law Judge. It covers the period from September 1, 1984 to December 31, 1984.

Atomic Safety and Licensing Boards are authorized by Section 191 of the Atomic Energy Act of 1954. These Boards, comprised of three members conduct adjudicatory hearings on applications to construct and operate nuclear power plants and related facilities and issue initial decisions which, subject to internal review and appellate procedures, become the final Commission action with respect to those applications. Boards are drawn from the Atomic Safety and Licensing Board Panel, comprised of lawyers, nuclear physicists and engineers, environmentalists, chemists, and economists. The Atomic Energy Commission first established Licensing Boards in 1962 and the Panel in 1967.

Beginning in 1969, the Atomic Energy Commission authorized Atomic Safety and Licensing Appeal Boards to exercise the authority and perform the review functions which would otherwise have been exercised and performed by the Commission in facility licensing proceedings. In 1972, that Commission created an Appeal Panel, from which are drawn the Appeal Boards assigned to each licensing proceeding. The functions performed by both Appeal Boards and Licensing Boards were transferred to the Nuclear Regulatory Commission by the Energy Reorganization Act of 1974. Appeal Boards represent the final level in the administrative adjudicatory process to which parties may appeal. Parties, however, are permitted to seek discretionary Commission review of certain board rulings. The Commission also may decide to review, on its own motion, various decisions or actions of Appeal Boards.

The Commission also has an Administrative Law Judge appointed pursuant to the Administrative Procedure Act, who presides over proceedings as directed by the Commission.

The hardbound edition of the Nuclear Regulatory Commission Issuances is a final compilation of the monthly issuances. It includes all of the legal precedents for the agency within a six-month period. Any opinions, decisions, denials, memoranda and orders of the Commission inadvertently omitted from the monthly softbounds and any corrections submitted by the NRC legal staff to the printed softbound issuances are contained in the hardbound edition. Cross references in the text and indexes are to the NRCI page numbers which are the same as the page numbers in this publication.

Issuances are referred to as follows: Commission--CLI, Atomic Safety and Licensing Appeal Boards--ALAB, Atomic Safety and Licensing Boards--LBP, Administrative Law Judge--ALJ, Directors' Decisions--DD, and Denial of Petitions for Rulemaking--DPRM.

The summaries and headnotes preceding the opinions reported herein are not to be deemed a part of those opinions or to have any independent legal significance.

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Thomas M. Roberts
James K. Asselstine
Frederick M. Bernthal
Lando W. Zech, Jr.

In the Matter of

Docket No. 50-322-OL-4
(Low Power)

**LONG ISLAND LIGHTING
COMPANY**
(Shoreham Nuclear Power
Station, Unit 1)

September 7, 1984

The Commission calls for the views of the parties concerning a September 5, 1984 Licensing Board Order (LBP-84-35A, 20 NRC 920) in this operating license proceeding.

ORDER

On September 5, 1984, the Atomic Safety and Licensing Board issued an "Order Reconsidering Summary Disposition of Phase I and Phase II Low-Power Testing" (LBP-84-35A, 20 NRC 920). The effect of the September 5 Order is to resolve certain offsite emergency power issues in favor of permitting the Long Island Lighting Company (LILCO) to conduct fuel loading and low-power testing as proposed in Phases I and II of its low-power testing program. However, in the present posture of the case, no such fuel loading and low-power testing can be undertaken without action by the Commission itself.

Any party's written views on whether the Licensing Board's September 5, 1984 Order may serve as the basis for issuance of a license for Phase I and Phase II of LILCO's low-power testing program should be received by the Secretary of the Commission no later than c.o.b. Friday, September 14, 1984. Such written views should include discussion of the factors specified in 10 C.F.R. § 2.788(e).

It is so ORDERED.

For the Commission*

SAMUEL J. CHILK
Secretary of the Commission

Dated at Washington, D.C.,
this 7th day of September 1984.

*Chairman Palladino has chosen not to participate in matters related to Shoreham pending disposition of the County's and State's "Request for Recusal and, Alternatively, Motion for Disqualification of Chairman Palladino."

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Nunzio J. Palladino, Chairman
Thomas M. Roberts
James K. Asselstine
Frederick M. Bernthal
Lando W. Zech, Jr.

In the Matter of

Docket No. 50-289-SP
(Restart)

METROPOLITAN EDISON COMPANY,
et al.

(Three Mile Island Nuclear
Station, Unit 1)

September 11, 1984

The Commission denies a request by the Licensee to stay the re-opened management hearings in the Three Mile Island, Unit 1, restart proceeding based upon its determination that the stay criteria are not satisfied and it grants an intervenor's motion to lift the stay of the re-opened hearings on certain other allegations.

RULES OF PRACTICE: STAY REQUESTS

The four factors to be considered in deciding whether to grant a stay request, as set forth in 10 C.F.R. § 2.788(e), are: (1) Whether the moving party has made a strong showing that it is likely to prevail on the merits; (2) Whether the party will be irreparably injured unless a stay is granted; (3) Whether the granting of a stay would harm other parties; and (4) Where the public interest lies.

RULES OF PRACTICE: STAY REQUESTS (IRREPARABLE INJURY)

The most significant factor in deciding whether to grant a stay request is "whether the party requesting a stay has shown that it will be irreparably injured unless a stay is granted." *Westinghouse Electric Corp.* (Export to the Philippines), CLI-80-14, 11 NRC 631, 662 (1980).

RULES OF PRACTICE: STAY REQUESTS (IRREPARABLE INJURY)

Mere litigation expense, even substantial and unrecoverable cost, does not constitute irreparable injury. *Consumers Power Co.* (Midland Plant, Units 1 and 2), ALAB-395, 5 NRC 772, 779 (1977), quoting *Renegotiation Board v. Bannerkraft Co.*, 415 U.S. 1, 24 (1974).

ORDER

This Order addresses Licensee's June 13, 1984 request that the Commission stay the reopened management hearings in the Three Mile Island, Unit 1 (TMI-1) restart proceeding (ALAB-772, 19 NRC 1193 (1984)), and Three Mile Island Alert's (TMIA) June 25, 1984 request that the Commission lift the stay of the reopened hearings on the so-called Hartman allegations (ALAB-738, 18 NRC 177 (1983)).¹ As explained below, the Commission has decided to deny Licensee's request and grant TMIA's request.

I. LICENSEE'S REQUEST TO STAY ALAB-772

On May 25, 1984, the Appeal Board issued its decision on the management issues in the TMI-1 restart proceeding. The Appeal Board in that decision remanded three issues to the Licensing Board for further hearings. Those issues involved (1) the adequacy of Licensee's training program, (2) the May 9, 1979 mailgram from Herman Dieckamp to Congressman Udall concerning the "pressure spike" during the TMI-2 accident, and (3) pre-accident leak rate practices at TMI-1.

¹ By separate Order issued today, the Commission has taken review of three issues in ALAB-772 and of several related matters, in order to decide whether or not further hearings are required in this restart proceeding and, if so, what their scope should be. CLI-84-18, 20 NRC 808 (1984).

On June 13, 1984, Licensee requested the Commission to stay the remanded hearings pending action on the petition for review it intended to file.² Licensee addressed the four factors to be considered in deciding whether to grant a stay as follows.³ Licensee argued first that it is likely to prevail on the merits on all three remanded issues. Licensee stated the difference in judgments between the Boards on training are likely "to be resolved in favor of the Licensing Board's decision," that it would be "fruitless and inconsistent" to devote additional resources to the mailgram issue, and that the evidence does not justify reopening on leak rate testing practices at TMI-1. Licensee then argued that it will be irreparably injured if a decision on restart must await completion of further hearings, and that it will suffer irreparable injury from the effort and expense of preparing for and conducting further hearings if the Commission should eventually reverse the Appeal Board. Finally, Licensee stated no other party will be harmed by a stay, and the public interest will best be served by avoiding a commitment of resources to the reopened hearings prior to a Commission decision on whether those hearings are necessary.

The NRC Staff, the Union of Concerned Scientists (UCS), and Three Mile Island Alert (TMIA) responded to Licensee's motion.

The NRC Staff supported Licensee's request. Staff argued that Licensee had failed to show that it was likely to prevail on the merits and did not make a particularly strong showing of irreparable injury. However, Staff agreed with the Licensee that no other party would be harmed by a stay and that the public interest would best be served by avoiding any commitment of resources to a hearing which may not be necessary. Staff, balancing these four factors, concluded that they weighed "slightly in favor" of granting Licensee's request "until the Commission has acted on Licensee's petition for review of ALAB-772."

UCS opposed Licensee's request. UCS first argued that the application for a stay is inconsistent with the procedures adopted by the Commission in the restart proceeding. UCS, noting that the Commission removed stay authority from the Appeal Board in this special proceeding, argued

² Licensee requested prompt Commission action on its motion because the Licensing Board had scheduled a prehearing conference on the remanded issues for June 28, 1984. The Commission issued an Order on June 26, 1984 (unpublished) stating that it would not act on Licensee's motion prior to June 28.

³ The four factors to be considered in deciding whether to grant a stay request are set forth in 10 C.F.R. § 2.788(e):

1. Whether the moving party has made a strong showing that it is likely to prevail on the merits;
2. Whether the party will be irreparably injured unless a stay is granted;
3. Whether the granting of a stay would harm other parties; and
4. Where the public interest lies.

that there is no reason for a stay because the question of restart is independent of the merits process.

UCS next argued that Licensee's request does not meet the standards required for the granting of a stay. UCS stated that Licensee has not established that it will suffer irreparable injury because the grant or denial of a stay would have no effect whatever on restart, and because the effort and expense of conducting hearings do not constitute irreparable harm. UCS argued that Licensee's pleading on its face was insufficient to show that it is likely to prevail on the merits. UCS maintained that the other parties would be harmed by a stay because it would again delay the time when intervenors can participate in an on-the-record adjudication of Licensee's competence and integrity. Finally, UCS argued that the public interest favors denying the stay because the questions here go to the heart of management and operator competence and hence should be resolved now.

TMIA opposed Licensee's request for the reasons outlined in the UCS opposition.

The most significant factor in deciding whether to grant a stay request is "whether the party requesting a stay has shown that it will be irreparably injured unless a stay is granted."⁴ *Westinghouse Electric Corp.* (Export to the Philippines), CLI-80-14, 11 NRC 631, 662 (1980). The only injury in the present case would be the commitment of resources to a hearing before the Commission has decided whether that hearing should be held. "Mere litigation expense, even substantial and unrecoverable cost, does not constitute irreparable injury." *Consumers Power Co.* (Midland Plant, Units 1 and 2), ALAB-395, 5 NRC 772, 779 (1977), quoting *Renegotiation Board v. Bannerkraft Co.*, 415 U.S. 1, 24 (1974).⁵

With regard to the second factor, establishing a strong likelihood of prevailing on the merits, Licensee has not made a convincing argument. On the first issue, training, Licensee offers only a conclusionary argument that the Commission is likely to resolve the differences in judgment between the boards in favor of the Licensing Board. This argument

⁴ The Commission disagrees with the UCS argument that a stay is necessarily improper in this special proceeding. The Commission removed stay authority from the Appeal Board because the Commission intended to make the decision on restart. That does not mean that a stay by the Commission in the present circumstances would be improper.

⁵ Licensee's argument that it will be irreparably injured through a delay in restart is irrelevant to the present question. The issue of restart is separate from the issue of whether the reopened hearings should be stayed until the Commission decides whether to review ALAB-772.

is insufficient for purposes of its stay motion to establish a strong likelihood of prevailing on the merits.⁶

Concerning the third factor, the Commission finds that the other parties would not be harmed by a stay. The only harm alleged by UCS and TMIA is a delay in the hearings and some unspecified relationship between that delay and a restart decision. The Commission will not authorize restart unless the concerns which led to making the 1979 shutdown order immediately effective are satisfied. A short delay in any hearings while the Commission determines whether those hearings should be held would not affect the Commission's decision.

The Commission finds that the fourth factor, the public interest, is neutral here. While there is some public interest in not pursuing those hearings before the Commission has considered if they are necessary, there is also a public interest in avoiding delay in hearings.

The Commission after considering these four factors has decided to deny Licensee's motion. The necessity of participating in a hearing does not constitute sufficient harm to justify a stay, and Licensee has failed to demonstrate that any of the other factors are significant enough in the present case to warrant a stay.

II. TMIA'S REQUEST TO LIFT STAY OF ALAB-738

The Appeal Board in ALAB-738 directed the Licensing Board to reopen the TMI-1 restart record to examine allegations made by Harold Hartman, a former TMI-2 operator, that leak rate data at TMI-2 had been falsified. On October 7, 1983, the Commission took review of whether the hearings should be deferred until after the Commission's Office of Investigations (OI) had completed an investigation it had instituted on the Hartman allegations. To preserve the *status quo*, the Commission stayed the Licensing Board hearings until it had received and considered the parties' views.

Shortly after issuance of the October 7 Order, the Department of Justice requested the Commission to stay further administrative proceedings related to the operation of TMI-2 until the then-pending criminal trial, *United States v. Metropolitan Edison Co.*, had been completed. The Commission agreed to cooperate with the Department of Justice and suspended the OI investigation of the Hartman allegations.

⁶ The Commission notes that in view of Licensee's failure to make the requisite showing on the training issue it is unnecessary to address the other two issues. Even if Licensee made the requisite showing on the other issues, the prospect of some reopened hearings would remain real.

TMIA in response to Licensee's request for a stay of ALAB-772 moved the Commission to lift the stay of the reopened hearings on the Hartman allegations. TMIA argued that there was no longer any basis for staying that decision. TMIA maintained that OI had substantially completed its investigation, that the company had already commissioned a new investigation, and that it was grossly unfair to deny the parties to the proceeding any opportunity to pursue this matter.

The Staff opposed TMIA's motion. Staff argued that the stay should continue until OI has completed its investigation of the Hartman allegations and issued its resulting report, especially in view of the previous Commission decision that the Hartman allegations do not have to be resolved before restart. Staff also argued that the stay should continue until the Commission decides whether further hearings are required under ALAB-772.

Licensee also opposed the TMIA motion. Licensee argued there was no urgency to pursuing the matter and the original basis for the stay remained valid. Licensee also noted that the Commission could still take review of whether further hearings were required.

The Commission has decided to grant TMIA's motion and lift the stay of the hearings ordered by the Appeal Board in ALAB-738. The Commission has not yet decided whether a full investigation of the Hartman allegations is still warranted, and, accordingly, the Commission has determined that its original concerns about conserving agency resources and avoiding duplication of effort are not now sufficient to warrant a stay. The Commission also notes in this regard that the Licensing Board in the prehearing conference on the issues remanded by ALAB-772 deferred proceeding on the TMI-1 leak rate matter pending further guidance by the Appeal Board or Commission because the Appeal Board expected the TMI-1 leak rate matter to be considered in conjunction with the Hartman remand. For purposes of a stay of hearings, the Commission sees no reason to treat the leak rate practices issues differently from the other remanded issues.

In sum, the Commission finds no reason to stay the remanded hearings. Licensee's motion to stay the remand directed in ALAB-772 is therefore denied, and TMIA's motion to lift the stay of the remand

directed in ALAB-738 is granted. The Commission in this decision is expressing no view on the merits of either Appeal Board decision.

It is so ORDERED.

For the Commission

SAMUEL J. CHILK
Secretary of the Commission

Dated at Washington, D.C.,
this 11th day of September 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Nunzio J. Palladino, Chairman
Thomas M. Roberts
James K. Asselstine
Frederick M. Bernthal
Lando W. Zech, Jr.

In the Matter of

Docket No. 50-289-SP
(Restart)

METROPOLITAN EDISON COMPANY,
et al.

(Three Mile Island Nuclear
Station, Unit 1)

September 11, 1984

In order to determine whether further hearings are required in this special restart proceeding for Unit 1 of the Three Mile Island (TMI) nuclear power plant and the scope of any such hearings, the Commission (1) decides to review certain portions of the Appeal Board decisions in ALAB-772, 19 NRC 1193 (1984), and ALAB-738, 18 NRC 177 (1983), and (2) requests the views of the parties regarding additional hearings. The Commission also announces its intention to determine whether the plant must remain shut down pending more hearings, should it find such hearings are required.

ORDER

On May 24, 1984, the Appeal Board issued its decision on the management issues in the Three Mile Island, Unit 1 (TMI-1) restart proceeding, ALAB-772, 19 NRC 1193. The Appeal Board found in three areas

"that the record does not support the Licensing Board's favorable findings concerning licensee's management of TMI-1." *Id.* at 1279. Those areas involve the adequacy of Licensee's training program, the May 9, 1979 mailgram from Herman Dieckamp to Congressman Udall regarding the "pressure spike," and leak rate practices at TMI-1.

As explained below, the Commission has decided to review the Appeal Board's decision on these three issues to determine whether further hearings are warranted. The Commission has also decided to review whether the Appeal Board in this proceeding had the legal authority to remove Mr. Charles Husted from supervisory duties, insofar as the training of nonlicensed personnel is concerned, without providing Mr. Husted with notice and an opportunity to request a hearing.

In addition, as explained below, the Commission has decided to take review of whether in view of changed circumstances further hearings are required on the Hartman allegations, as directed by the Appeal Board in ALAB-738, 18 NRC 177 (1983).¹ Finally, the Commission has decided to review whether any of the information discussed in Staff's latest evaluation of management integrity, NUREG-0680, Supplement No. 5, requires further hearings.

The Commission in this manner will decide whether any further hearings are required in this proceeding, and, if so, what their scope should be. The Commission in making its determination whether new information requires reopening of the record will use the traditional standards for reopening, and, accordingly, the parties should apply those standards in their comments. *See, e.g., Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-598, 11 NRC 876 (1980). The parties in addressing the scope of further hearings, if any, as requested throughout this Order, shall designate the specific disputed issues of fact material to a restart decision by the Commission on which further evidence must be produced and shall provide their most substantial factual and technical bases for their position on each such issue.

The Commission has decided not to rule on whether to lift the immediate effectiveness of the 1979 shutdown orders until after it has decided on what further evidentiary hearings, if any, are required in the restart proceeding. If the Commission decides that further hearings are required, it will decide whether the public health, safety and interest require completion of those hearings prior to a decision on lifting effectiveness.

¹ Licensee's request that the remanded hearings directed by the Appeal Board in ALAB-772 be stayed and TMIA's request that the stay of ALAB-738 be immediately lifted are being addressed in a separate Order that is being issued today (CLI-84-17, 20 NRC 801).

I. REVIEW OF ALAB-772

Licensee, General Public Utilities Nuclear Corporation (GPU Nuclear), on June 22, 1984, requested the Commission to review ALAB-772 insofar as it reopens the record on the management phase of this proceeding. Licensee argued that the Licensing Board's decision, which found in favor of restart, was adequate, and that the perfection in the record sought by the Appeal Board was unnecessary. The NRC Staff had no objection to Commission review of ALAB-772.

Licensee's petition was opposed by Three Mile Island Alert (TMIA) and the Union of Concerned Scientists (UCS). Both argued that the Appeal Board was correct on the three remanded issues, and that Licensee had failed to demonstrate that these issues met the standards for Commission review set forth in 10 C.F.R. § 2.786.

The proceeding to determine whether TMI-1 should be restarted was initiated by Commission Order in August 1979. CLI-79-8, 10 NRC 141. The Commission at that time had no conception that this proceeding would last for 5 or more years. The proceeding has become one of the most complex in Commission history, requiring a high degree of Commission involvement.

The Commission has decided that, due to the unique nature of this enforcement proceeding, it will make the decision on whether further hearings are required, and if so, what the specific issues in those hearings should be. See, e.g., *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-77-8, 5 NRC 503, 516 (1977); *United States Energy Research and Development Administration* (Clinch River Breeder Reactor Plant), CLI-76-13, 4 NRC 67, 75-76 (1976). Accordingly, the Commission has decided to take review of ALAB-772 insofar as it remands three issues to the Licensing Board for further hearings. The parties in their comments should address both the need for further hearings and what the scope of such further hearings, if any, should be. The Commission in this regard is particularly interested in the parties' analyses and conclusions regarding the significance of information developed since the close of the hearing record relating to the adequacy of Licensee's training program. The Commission by taking review is expressing no view on the merits of the Appeal Board's decision. Nor does the Commission intend this Order to affect the ongoing hearings before the Licensing Board.

In addition, the Commission has decided to take review of the Appeal Board's requirement as a condition of restart that Mr. Charles Husted "have no supervisory responsibilities insofar as the training of non-licensed personnel is concerned." ALAB-772, *supra*, 19 NRC at 1224.

The Commission is not concerned with the underlying justification for the Appeal Board's act, but rather with whether an adjudicatory board in an ongoing hearing has the legal authority to impose a condition on a licensee which in effect operates as a sanction against an individual, where that individual is not a party to the proceeding and has had no notice of a possible sanction or opportunity to request a hearing. The parties should accordingly limit their comments to the legal issue involved. The Commission if it determines that the Appeal Board erred will then decide whether to take enforcement action against Mr. Husted separate from the restart proceeding.

II. REVIEW OF ALAB-738

On October 7, 1983, the Commission issued an Order (unpublished) taking review of whether the hearing on the Hartman allegations ordered by the Appeal Board in ALAB-738 should be stayed until the Commission's Office of Investigations (OI) had completed an investigation it had started on the Hartman allegations. To preserve the status quo, the Commission stayed the Appeal Board decision pending receipt and consideration of the parties' comments.

At the time that it issued its Order the Commission was concerned that concurrent efforts by OI and the Licensing Board on the Hartman allegations would involve a duplication of effort and constitute a possible source of complaint of harassment of witnesses. Another concern was that the NRC had already issued subpoenas to forty-seven witnesses requesting them to appear to answer questions posed by OI. A motion to quash the subpoenas had been denied by the Commission, and the government was preparing a motion asking the Federal District Court to enforce the subpoenas. There was no reason to believe that the Licensing Board would have had an easier time than OI in securing witness cooperation. Accordingly, the Commission perceived that there was little chance that Licensing Board hearings could meaningfully proceed.

After the Commission stayed the hearing, the Department of Justice on December 14, 1983, asked the Commission to stay further agency activity related to the Hartman allegations until the then-pending criminal trial, *United States v. Metropolitan Edison Co.*, Criminal No. 83-00188 (M.D. Pa.), had been completed. The Commission agreed to cooperate with the Department of Justice and suspended the OI investigation of the Hartman allegations.

Metropolitan Edison entered into a plea agreement on February 29, 1984, with the United States which ended the criminal prosecution. Metropolitan Edison pleaded guilty to one count of the indictment charging it with failure to establish, implement and maintain an accurate and meaningful reactor coolant system water inventory balance procedure to demonstrate that unidentified leakage was within allowable limits. It also pleaded no-contest to six other counts of the indictment, including those which charged the company with improper manipulation of TMI-2 leak rate tests to generate results that would fulfill the company's license requirements.

The Commission has been considering how best to proceed in this matter since completion of the criminal trial. The Commission felt that decision would depend in part on whether the Commission could obtain access to the record of the Grand Jury proceeding which led to the indictment of Metropolitan Edison. On June 25, 1984, the District Court for the Middle District of Pennsylvania denied the Commission's request for the Grand Jury record.

The Commission has also been considering the future extent of OI's investigation into this matter, and the effect of changes in personnel at TMI on the relevance of that investigation to operation of TMI-1. For instance, Herman Dieckamp has been relieved of his duties as Chairman and Chief Executive Officer of GPU Nuclear, although he continues to serve on the Board of Directors of GPU Nuclear, and Robert Arnold, who had been President of GPU Nuclear, has been reassigned to non-nuclear work with the GPU organization. Philip Clark, formerly Executive Vice President of GPU Nuclear, has replaced Arnold as President of GPU Nuclear, while E.E. Kintner, formerly Vice President, has become Executive Vice President. GPU Nuclear has also added to its Board of Directors three outside directors who will comprise a Nuclear Safety and Compliance Committee of the GPU Nuclear Board. That Committee has hired a staff to monitor the operation and maintenance of the GPU Nuclear units. The Committee's findings will be detailed in periodic public reports. These new individuals in charge — Messrs. Clark, Kintner, and the new members of the Board — had no connection to or responsibility for the actions taken in 1978 and 1979 that led to the criminal convictions.² Nor are any of the individuals who may have been

² The Commission notes in this regard the statement by the United States Attorney at the sentencing hearing that the evidence does not indicate that any of the Directors and Officers of GPU Nuclear from its organization in 1982 to the date of the indictment, or the Directors of Metropolitan Edison Company during the period covered by the indictment, "participated in, directed, condoned or was aware of the acts or omissions that are the subject of the indictment."

directly responsible for the falsifications currently employed in operational positions at TMI-1.³

In light of these developments, the Commission has determined that it should now decide whether the restart hearing should be reopened, and, if not, whether there should be a hearing on the Hartman allegations separate from the restart proceeding in order to allow the matter to be fully aired. Accordingly, the Commission is inviting the parties to submit their views on whether a hearing on the Hartman allegations is warranted and, if so, what the scope of the hearing should be.

III. REVIEW OF NUREG-0680, SUPPLEMENT NO. 5

The NRC Staff in NUREG-0680, Supp. No. 5, reviewed nine investigations by OI and other materials that appeared to be relevant and material to evaluating Licensee's management integrity. Staff in its evaluation indicated that significant facts unknown to the Staff during the hearings demonstrated a "pattern of activity on the part of the Met-Ed [that], had it been known at the time, would likely have resulted in a conclusion by the Staff that the Licensee had not met the standard of reasonable assurance of no undue risk to public health and safety." *Id.* at 13-5. However, with regard to the current Licensee, GPU Nuclear, Staff concluded after balancing the past improper activities against the subsequent record of remedial actions and performance, as well as the record of current senior management, that present GPU Nuclear management was acceptable. Staff in making this determination relied in part on information outside the formal adjudicatory record.

Considering the amount of extra-record material relied on by Staff in Supp. No. 5 and Staff's conclusions regarding Metropolitan Edison, the

³ The Commission believes that, in the absence of any contrary information, OI's report on leak rate practices at TMI-1 leaves no significant doubt that Michael Ross had no involvement in falsifications at Unit 2. Mr. Ross is the only person currently in an operational position at TMI-2 who was licensed to operate TMI-2 prior to the accident. OI's investigation shows that Mr. Ross primarily worked at TMI-1, and that he had no involvement with leak rate falsifications at TMI-2.

The Commission recognizes that a limited number of individuals who were in operational positions at TMI-2 prior to the accident are now in nonoperational positions at TMI-1 and it is possible that the Commission may order the temporary separation of some or all of these individuals as a condition of restart. The Commission also recognizes that Licensee, until the open issues (including the Hartman allegations) are resolved, has temporarily reassigned personnel in such a manner that those functions which provide an overview assessment, analysis, or audit of plant activities, contain only personnel who, prior to the accident, had not been in a management, supervisory, or professional position at TMI-1 or -2. The parties in their comments should address whether or not further evidentiary hearings are required to determine the final disposition of the status of these individuals and whether any such hearings can be separated from the restart proceeding. Licensee in this connection should provide a list of the individuals who have been temporarily reassigned and whom Licensee may wish to return to TMI-1 at any time in the future.

Commission wishes the parties to address whether any of the information addressed in Supp. No. 5 requires further reopening of the record. The parties should not address matters where motions to reopen have already been granted or denied on the same information cited by Staff, but rather should specify what, if any, new information which has not yet been passed on by a Board warrants reopening of the record.⁴

If the Staff's position is that the evidentiary record in the restart proceeding needs to be reopened on Supp. No. 5 issues, the Staff shall designate the specific disputed issues of fact on which further evidence must be produced and shall provide in its response its supplemental testimony on each such issue in the form of affidavits. Staff shall also explain how this supplemental testimony alters the testimony it provided to the Licensing Board.

If the Staff's position is that the evidentiary record in the restart proceeding does not need to be reopened on Supp. No. 5 issues, the Staff shall explain how it reached this conclusion in view of its statement in Supp. No. 5 that

[t]his pattern of activity on the part of Met-Ed, had it been known at the time, would likely have resulted in a conclusion by the staff that the licensee had not met the standard of reasonable assurance of no undue risk to public health and safety. However, these matters, or the significant facts concerning these matters, were not known to the NRC staff during the ASLB's proceeding on TMI-1 restart.

Supp. No. 5, at 13-5.⁵ Staff in this regard should specify what testimony it gave before the Licensing Board that it would now change, and why that change in testimony does not require reopening.

The parties have 20 days from service of this Order to submit their views on the above issues, and 15 days thereafter to submit any reply comments. The Commission will then decide the overall question of whether further hearings are required, and, if so, what their scope should be.

⁴ Because the Commission will decide whether or not the information contained in Supp. No. 5 requires reopening of the record, the parties should not file separate motions to reopen the record on matters addressed in Supp. No. 5 with the Licensing Board or Appeal Board.

⁵ Regardless of its position on reopening, Staff shall set forth exactly what new information led it to the above-quoted conclusion on Metropolitan Edison Co. The Commission notes in this regard that the certification of Floyd and post-accident cheating were litigated before the Licensing Board, the Appeal Board in ALAB-774, 19 NRC 1350 (1984), denied a motion to reopen on pre-accident training irregularities, and the Staff was aware of the Hartman allegations in 1979.

Staff in addressing whether further hearings are required should also explain why it believes current GPUN management is acceptable in light of its assertions that management may not have been adequate until 1982. We note that from 1980 to 1982 key GPUN personnel such as Messrs. Philip Clark and Henry Hukill held senior management positions, and some of the organizational elements that were in place prior to 1982 closely paralleled current GPUN structures.

Commissioner Asselstine disapproved this Order. His separate views are attached. The separate views of Commissioner Roberts and the additional views of Chairman Palladino are also attached.

It is so ORDERED.

For the Commission

SAMUEL J. CHILK
Secretary of the Commission

Dated at Washington, D.C.,
this 11th day of September 1984.

DISSENTING VIEWS OF COMMISSIONER ASSELSTINE

I cannot agree with the Commission's Order taking review of ALAB-772 and other miscellaneous TMI Restart issues. The Appeal Board decision should be allowed to stand, and the Commission should merely remand the other issues it has decided to review to the Licensing Board. The Licensing Board can then determine whether new information warrants holding a hearing.

The Appeal Board decision on management issues (ALAB-772) is a particularly thoughtful and well-done review of the Licensing Board's decision. The Commission has not and indeed cannot point to anything in the Appeal Board decision which is either clearly erroneous or an abuse of discretion, neither is there any important question of law or policy involved. These are the proper triggers for Commission review. 10 C.F.R. § 2.786. Instead, the Commission, without finding that the Appeal Board erred, is requiring parties who have already prevailed before the Appeal Board to again meet the heavy burden of showing why the record should be reopened.

Further, the Commission has required the parties, in effect, to set out contentions they want to put forth at a hearing and the evidentiary bases for those contentions. The Commission intends not only to rule on whether the record should be reopened and remanded to the Licensing Board, but it also intends to rule on what specific contentions the Licensing Board may hear, if any. As I have said in the past, this is the kind of ruling best left in the hands of licensing boards which are perfectly capa-

ble of, and in fact were specifically set up for, handling such fact-specific adjudicatory rulings.

The Commission has also decided to solicit comments on whether the record should be reopened on the Hartman issues (ALAB-738) and based upon the Staff's latest evaluation of Licensee management — NUREG-0680, Supp. No. 5. There has been so much new information on the management issue since the close of the Licensing Board record that the Licensing Board record clearly is stale. The following statement of the Staff, standing alone, demonstrates the staleness of the Licensing Board record:

The pattern of activity by Met-Ed, had it been known by the staff at the time the staff formulated its positions on management in the restart proceeding would likely have resulted in a conclusion by the staff that Met-Ed had not met the standard of reasonable assurance of no undue risk to the public health and safety.

NUREG-0680, Supp. No. 5, p. 2-2. The Commission ought simply to acknowledge the obvious, reopen the record, and remand the case to the Licensing Board for a determination on whether further hearings on these issues would be useful. The parties to this proceeding have been asked repeatedly to comment on all this new information, and have repeatedly expressed opinions about the need to, or lack of a need to, reopen the record for a hearing. Obtaining further comments on this issue is nothing more than procedural window dressing and is a waste of time and energy for all concerned.

The Commission ought to decide finally whether the TMI-1 Restart decision is to be based on a formal adjudicatory record or on an informal record. If the Commission really thinks a formal record is necessary, as it said it did 5 years ago, it ought to stop playing procedural games, reopen the record and get these hearings moving. If the Commission instead intends to make its decision based partially on the informal record developed since the close of the Licensing Board record and not wait for the results of any hearings, the Commission ought to just make that decision and move on. Today's Order accomplishes nothing but delay in either case.

**SEPARATE VIEWS OF COMMISSIONER ROBERTS ON
ALAB-772 AND OTHER MATTERS
(September 10, 1984)**

My dissenting colleague asserts that the majority has improperly taken review of ALAB-772 and other matters decided by the Appeal Board. I must disagree with that characterization of our decision.

I view our taking of review as exercising our supervisory authority and responsibility to chart the course of the remainder of this proceeding. At this stage of the proceeding, the procedures used by a Licensing Board to screen contentions at the initial stages of a proceeding do not apply. We are not "playing procedural games." We are trying to assure that any further hearings that may be necessary to produce factual information material to our decision on restart are focused on issues which are genuinely in dispute. Until we receive from the parties their responses to this Order, we cannot decide whether further hearings are necessary, or, if they are, what their scope should be.

In light of the course of this proceeding over the past 5 years, I believe that, had we not taken review, we would have been shirking our duty.

ADDITIONAL VIEWS OF CHAIRMAN PALLADINO

I agree with the Commission's decision and with Commissioner Roberts' comments in response to the dissenting opinion of Commissioner Asselstine. I would add that I cannot agree with Commissioner Asselstine that our decision "accomplishes nothing but delay." I believe that the restart proceeding can benefit from Commission guidance at this time on what specific disputed issues warrant further hearings as they may affect the Commission's pending restart decision. I would not conclude that the Commission's decision can only engender delay, particularly in light of the decision to permit hearings to proceed in the interim. The course that fosters delay, it seems to me, is for the Commission to do nothing as Commissioner Asselstine appears to prefer, thus leaving the entire matter in the Licensing Board's lap.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Thomas S. Moore, Chairman
Dr. John H. Buck
Dr. W. Reed Johnson

In the Matter of

Docket Nos. 50-275-OL
50-323-OL

PACIFIC GAS AND ELECTRIC
COMPANY
(Diablo Canyon Nuclear Power
Plant, Units 1 and 2)

September 6, 1984

Upon the appeals of intervenors and the Governor of California, the Appeal Board affirms (with respect to Unit 1) the initial decision of the Licensing Board authorizing the issuance of a full power license for the Diablo Canyon nuclear facility. Consideration of Unit 2 by the Appeal Board is postponed, pending the Board's completion of findings of fact for that unit.

RULES OF PRACTICE: BRIEFS

Exceptions to an initial decision that are not briefed on appeal are deemed waived. *See Public Service Electric and Gas Co.* (Salem Nuclear Generating Station, Unit 1), ALAB-650, 14 NRC 43, 49 (1981), *aff'd sub nom., Township of Lower Alloways Creek v. Public Service Electric & Gas Co.*, 687 F.2d 732 (1982); *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-461, 7 NRC 313, 315 (1978).

EMERGENCY PLANNING: EARTHQUAKE IMPACTS

NRC regulations do not require specific consideration of the impacts of earthquakes on emergency planning. *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), CLI-81-33, 14 NRC 1091 (1981). *See also Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-728, 17 NRC 777, 793 (1983); CLI-84-12, 20 NRC 249, 250 (1984).

POLICY STATEMENT: ENVIRONMENTAL IMPACT OF "CLASS 9" ACCIDENTS

The Commission's June 13, 1980 policy statement entitled "Nuclear Power Plant Accident Considerations Under the National Environmental Policy Act of 1969," 45 Fed. Reg. 40,101, does not mandate that the agency consider Class 9 accident sequences for plants, like Diablo Canyon, where the final Environmental Impact Statement has already been issued, unless there is a showing of special circumstances. In this instance, location of a nuclear power plant in a region of known seismicity is not a "special circumstance" under the policy statement.

EMERGENCY PLANNING: FEMA FINDINGS (NEED FOR FINAL FINDINGS)

The Commission's emergency response regulations, 10 C.F.R. 50.47(a)(2), do not require "final" Federal Emergency Management Agency (FEMA) findings on the adequacy of offsite emergency response plans before a license may be authorized. *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-776, 19 NRC 1373 (1984).

EMERGENCY PLANNING: EMERGENCY PLANNING ZONES

Central to the development of offsite emergency response plans under the Commission's regulations is the concept of emergency planning zones (EPZs), i.e., those areas around a plant for which planning is needed so that timely and effective actions can be taken to protect the public in the event of a radiological emergency. *See* 10 C.F.R. 50.47(c)(2); 10 C.F.R. Part 50, Appendix E; "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," NUREG-0654/FEMA-REP-1, Rev. 1 (November 1980) at 10. The Commission's regulatory

scheme contemplates the establishment of two such zones: the plume exposure pathway that "shall consist of an area about 10 miles (16 km) in radius" and the ingestion pathway that "shall consist of an area about 50 miles (80 km) in radius." 10 C.F.R. 50.47(c)(2).

EMERGENCY PLANNING: REQUIREMENTS

The Commission's regulations require that emergency response planning within the emergency planning zones meet the requirements set forth in 10 C.F.R. 50.47(b). Section 50.47(c)(2) further provides that "[t]he exact size and configuration of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries."

EMERGENCY PLANNING: EMERGENCY PLANNING ZONES (SIZE)

Although the regulations provide that the exact size and configuration of a particular EPZ is to be determined with reference to site-specific factors, the wholesale enlargement of the Commission-prescribed EPZs by a state cannot preclude a licensing decision based upon the requirements of the NRC regulations. *See Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), LBP-82-39, 15 NRC 1163, 1181 (1982), *aff'd*, ALAB-717, 17 NRC 346 (1983) (The Commission's regulations "clearly allow leeway for a mile or two in either direction, based on local factors. But it . . . clearly precludes a plume EPZ radius of, say, 20 or more miles.").

EMERGENCY PLANNING: EXCEPTIONS TO REGULATIONS

A party seeking to impose a radical departure from the Commission's prescribed EPZs should seek an exception to the rule pursuant to 10 C.F.R. 2.758.

APPEAL BOARDS: STANDARD OF REVIEW

The standard applicable to appeal board review of a licensing board's factual findings is whether an appeal board's examination of the evidence convinces it that the record compels a different result. *See Northern States Power Co.* (Monticello Nuclear Generating Plant, Unit 1),

ALAB-611, 12 NRC 301, 304 (1980); *Niagara Mohawk Power Corp.* (Nine Mile Point Nuclear Station, Unit 2), ALAB-264, 1 NRC 347, 357 (1975).

EMERGENCY PLANNING: PREDICTIVE FINDINGS

The Commission's emergency response regulations contemplate, in appropriate circumstances, predictive findings on emergency response planning so that operation of a facility need not be delayed unnecessarily by the hearing process. *See San Onofre, supra*, 17 NRC at 380 n.57. *See generally Detroit Edison Co.* (Enrico Fermi Atomic Power Plant, Unit 2), ALAB-730, 17 NRC 1057, 1067 (1983).

LICENSING BOARDS: RESOLUTION OF ISSUES

A Licensing Board must adequately confront the conflicting viewpoints of expert witnesses and resolve each issue before it. *See generally Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-442, 6 NRC 33, 41 (1977).

APPEARANCES

Joel R. Reynolds and John R. Phillips, Los Angeles, California, and **David S. Fleischaker**, Oklahoma City, Oklahoma, for the San Luis Obispo Mothers for Peace, *et al.*, joint intervenors.

Byron S. Georgiou, Sacramento, California, and **Herbert H. Brown and Lawrence Coe Lanpher**, Washington, D.C., for Edmund G. Brown, Jr., (former) Governor of the State of California.*

Malcolm H. Furbush, Robert Ohlbach, Philip A. Crane, Jr., and Richard F. Locke, San Francisco, California, and **Arthur C. Gehr and Bruce Norton**, Phoenix, Arizona, for Pacific Gas and Electric Company, applicant.

*Since the briefing of the issues decided in this opinion, George Deukmejian has assumed the office of Governor. Pursuant to Governor Deukmejian's request, he has been substituted for Governor Brown as the representative of the State of California. The Attorney General of the State of California is now representing Governor Deukmejian.

Lawrence J. Chandler, Donald F. Hassell and Sherwin E. Turk for the Nuclear Regulatory Commission staff.

DECISION

All parties appealed the Licensing Board's August 31, 1982 initial decision, LBP-82-70, 16 NRC 756 (1982), authorizing a full power license for Pacific Gas and Electric Company's Diablo Canyon Nuclear Power Plant, Units 1 and 2. In this decision, we address the appeals of the joint intervenors and the Governor of California from that decision. Previously, in ALAB-776, 19 NRC 1373 (1984), we decided the appeals of the applicant and the NRC staff. The present appeals challenge the adequacy of emergency planning at Diablo Canyon. In addition, the joint intervenors dispute the sufficiency of the NRC's environmental review of the Diablo Canyon project.¹

I.

In its initial decision, the Licensing Board made detailed factual findings on the numerous facets of the onsite and offsite emergency response planning for Diablo Canyon.² The Board then concluded that emergency planning for the facility complies with the Commission's

¹ The adjudicatory history of the Diablo Canyon project extends over a period exceeding a decade and can be traced through numerous agency decisions. *See, e.g.*, ALAB-334, 3 NRC 809 (1976) (authorization of Part 70 license to store new fuel); LBP-78-19, 7 NRC 989 (1978) (partial initial decision on environmental and some safety issues); LBP-79-26, 10 NRC 453 (1979) (partial initial decision on non-TMI issues, e.g., risk from aircraft, seismic and security); ALAB-598, 11 NRC 876 (1980) (reopening of record for seismic issues); ALAB-644, 13 NRC 903 (1981) (seismic findings on reopened record); LBP-81-21, 14 NRC 107 (1981) (partial initial decision authorizing fuel loading and low power testing); ALAB-653, 14 NRC 629 (1981) (security findings based on reopened record; expurgated findings attached to CLI-82-19, 16 NRC 53 (1982)); CLI-81-22, 14 NRC 598 (1981) (immediate effectiveness review); CLI-81-30, 14 NRC 950 (1981) (suspension of low power license); ALAB-728, 17 NRC 777 (1983) (low power authorization affirmed); CLI-83-27, 18 NRC 1146 (1983) (fuel loading and pre-criticality testing authorized); CLI-84-2, 19 NRC 3 (1984) (hot system testing authorized); ALAB-763, 19 NRC 571 (1984) (findings on adequacy of Unit 1 design following reopening of record); CLI-84-5, 19 NRC 953 (1984) (lifting suspension of low power license); CLI-84-13, 20 NRC 267 (1984) (immediate effectiveness review).

² LBP-82-70, *supra*, 16 NRC at 763-92, 799-849. What we stated in ALAB-776, *supra*, 19 NRC at 1375 n.4, concerning the format of the Licensing Board's initial decision warrants repeating:

The Board's initial decision consists of essentially two parts. The first is a lengthy "opinion" discussing the issues, the evidence, and the Board's resolution of the issues. LBP-82-70, *supra*, 16 NRC at 759-98. The second is an equally lengthy listing of "findings of fact" and "conclusions of law" largely repetitious of what the Board already stated in the first part of its decision. *Id.* at 798-855. Besides being exceedingly time-consuming for both the writers and the readers, this format holds the potential for creating . . . inconsistencies within the four corners of the decision.

emergency response regulations and provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.³ On appeal, the joint intervenors and the Governor challenge these conclusions on several grounds.⁴

A. They assert that the Board erred in making these determinations without first considering the effects upon emergency planning of a major earthquake which causes, or occurs during, a radiological emergency at the facility.⁵ In a prehearing conference order the Licensing Board rejected the attempt to inject this issue into the proceeding,⁶ relying upon the Commission's then-recent decision in *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), CLI-81-33, 14 NRC 1091 (1981). That decision held the agency's regulations do not require specific consideration of the impacts of earthquakes on emergency planning.

The joint intervenors and the Governor raised this same issue in their earlier appeals⁷ from the Licensing Board's partial initial decision authorizing fuel loading and low power testing at Diablo Canyon.⁸ In ALAB-728, we resolved this issue against them, holding that the Commission's *San Onofre* decision "could not be more emphatic or clear: the possible complicating effects of an earthquake on emergency planning should not be considered in individual licensing proceedings."⁹ Normally, our resolution of this issue in ALAB-728 would be the law of the case and preclude any further consideration of the same issue on appeals from the Licensing Board's initial decision. In this instance, however, the Commission has, in effect, directed certification of the

³ LBP-82-70, *supra*, 16 NRC at 761, 797-98.

⁴ Pursuant to 10 C.F.R. 2.762 (1982), the joint intervenors filed 198 exceptions to the Licensing Board's initial decision and other related rulings while the Governor filed 83 exceptions. See Joint Intervenor's Exceptions to the Licensing Board's August 31, 1982 Initial Decision (September 16, 1982); Exceptions of Governor [of California] to Licensing Board Initial Decision of August 31, 1982 (September 16, 1982). Only those issues briefed by the joint intervenors or the Governor are treated in this opinion. The remaining exceptions are deemed waived for failure to brief them on appeal. See *Public Service Electric and Gas Co.* (Salem Nuclear Generating Station, Unit 1), ALAB-650, 14 NRC 43, 49 (1981), *aff'd sub nom., Township of Lower Alloways Creek v. Public Service Electric & Gas Co.*, 687 F.2d 732 (1982); *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-461, 7 NRC 313, 315 (1978).

⁵ See Joint Intervenor's Brief in Support of Exceptions (November 8, 1982) [hereinafter Joint Intervenor's Brief] at 21-30; Brief of Governor [of California] in Support of Exceptions (November 8, 1982) [hereinafter Brief of Governor] at 2-8.

⁶ See Memorandum and Order of December 23, 1981 (unpublished) at 1-2.

⁷ See Joint Intervenor's Brief in Support of Exceptions (September 2, 1981) at 53-55; Brief of Governor [of California] on Appeal of the Licensing Board Partial Initial Decision of July 17, 1981 (September 2, 1981) at 35-40.

⁸ See LBP-81-21, 14 NRC 107 (1981).

⁹ 17 NRC 777, 793 (1983).

issue on its own motion.¹⁰ After declining to review ALAB-728,¹¹ the Commission, on April 3, 1984, announced that it would decide whether the effects of earthquakes on emergency planning at Diablo Canyon should be considered.¹² In a decision issued August 10, the Commission "determined that the information before it does not warrant departure from the decision in *San Onofre* that the NRC's regulations 'do not require consideration of the impacts on emergency planning of earthquakes which cause or occur during an accidental radiological release.'"¹³ In these circumstances, the issue appealed by the joint intervenors and the Governor is no longer before us.

B. The joint intervenors also argue that the Licensing Board erred in authorizing a license for Diablo Canyon without first addressing the consequences of a Class 9 accident at the facility.¹⁴ Like their argument concerning the complicating effects of earthquakes on emergency planning, the joint intervenors raised this issue on their appeal from the Licensing Board's partial initial decision authorizing fuel loading and low power testing. Once again this issue was resolved against them in ALAB-728.

In a Memorandum and Order dated June 19, 1981, the Licensing Board denied the joint intervenors' motion to reopen the record to consider the environmental consequences of a Class 9 accident at Diablo Canyon.¹⁵ On appeal of the decision authorizing low power testing, the joint intervenors argued that the Board's denial of their earlier motion was error. They asserted that the Commission's June 13, 1980 policy statement entitled "Nuclear Power Plant Accident Considerations Under the National Environmental Policy Act of 1969," 45 Fed. Reg. 40,101, mandated that the agency consider Class 9 accident sequences for Diablo Canyon in its Environmental Impact Statement (EIS).¹⁶ In ALAB-728, we fully rehearsed the evolution of the agency's treatment of so-called Class 9 accidents from the time such postulated events received no consideration through the issuance of the Commission's 1980 policy statement, which announced that future agency environmental impact statements should include their consideration. Contrary to the joint intervenors' argument that pending cases required consideration of Class 9 accidents, we held that the policy statement, by its terms, was

¹⁰ See 10 C.F.R. 2.718(i).

¹¹ See CLI-83-32, 18 NRC 1309 (1983).

¹² See CLI-84-4, 19 NRC 937 (1984).

¹³ CLI-84-12, 20 NRC 249, 250 (1984).

¹⁴ See Joint Intervenors' Brief at 47-53.

¹⁵ LBP-81-17, 13 NRC 1122 (1981).

¹⁶ See Joint Intervenors' Brief in Support of Exceptions (September 2, 1981) at 56-57. See also ALAB-728, *supra*, 17 NRC at 795.

limited to proceedings where the agency had not yet issued a final EIS.¹⁷ In the case of Diablo Canyon where the final EIS had already been issued, supplemented, litigated and found adequate, we held that the “change in policy announced in 1980 was not intended by the Commission to apply.”¹⁸ We went on to note, however, that the Commission’s policy statement did not completely foreclose consideration of Class 9 accidents in proceedings like Diablo Canyon if certain “special circumstances” were shown. But we found that

in their brief, joint intervenors make no argument that “special circumstances” exist at Diablo Canyon so as to require expanding the already completed EIS for the facility. Therefore, we need not consider that question. We note, however, that in denying the joint intervenors’ motion to reopen the record, the Licensing Board concluded that no such special circumstances existed with respect to Diablo Canyon.¹⁹

The joint intervenors now seek to argue on this appeal that the Licensing Board’s conclusion that no special circumstances exist at Diablo Canyon was erroneous. Their argument comes too late. Nothing barred the joint intervenors from raising this additional argument on their previous appeal. Indeed, they were required to put forth all their arguments on this issue at that time. To allow a second appeal of the same issue would lead to endless litigation.

In any event, the joint intervenors’ argument that special circumstances exist at Diablo Canyon is without merit. As noted in ALAB-728, the Commission’s policy statement set forth the “unique circumstances” in cases that had in the past warranted consideration of Class 9 accidents.²⁰ The Commission cited the novel design of the proposed Clinch River Breeder Reactor, the high population density surrounding the proposed Perryman site, and the potentially serious radiological exposures associated with water pathways from Offshore Power Systems’ floating nuclear power plants. It then indicated that final environmental statements should be expanded to include Class 9 accident analyses only in “similar special circumstances.”²¹ The joint intervenors do not contend that Diablo Canyon presents circumstances similar to those listed in the Commission’s policy statement. Rather, they argue there is a fourth category — proximity to a natural hazard — that demands consid-

¹⁷ ALAB-728, *supra*, 17 NRC at 795-96.

¹⁸ *Id.* at 796.

¹⁹ *Id.*

²⁰ ALAB-728, *supra*, 17 NRC at 796; 45 Fed. Reg. 40,101, 40,102 (1980).

²¹ 45 Fed. Reg., *supra*, at 40,103.

eration of Class 9 accidents because Diablo Canyon is located in the vicinity of the Hosgri Fault and in a region of known seismicity.

The "natural hazard" category relied upon by joint intervenors originated with the Commission's opinion in *Public Service Co. of Oklahoma* (Black Fox Station, Units 1 and 2), CLI-80-8, 11 NRC 433, 434 (1980). There the Commission reversed our order requiring the staff to inform the Commission whether Class 9 accidents should be considered for that reactor.²² *Black Fox* preceded the Commission's policy statement and was an evolutionary step toward the policy's development. In that decision, the Commission listed the same three categories of special cases that subsequently appeared in the policy statement. It also noted a fourth category, i.e., "proximity to man-made or natural hazard," that represented the "type of *exceptional* case that *might* warrant additional consideration."²³ Because the natural hazards category was not subsequently repeated in the policy statement, that category's continuing validity is suspect. Nor is the natural hazards category "similar" to the other categories in the policy statement.²⁴ Putting these distinctions to one side, the natural hazards category still does not advance the joint intervenors' position.

Contrary to joint intervenors' argument, the fact that Diablo Canyon is located in the vicinity of the Hosgri Fault and in a region of known seismicity does not make the Diablo Canyon situation "unique" or "exceptional" as required by the policy statement and *Black Fox*. Pursuant to General Design Criterion 2 (GDC 2) of 10 C.F.R. Part 50, Appendix A, nuclear power plants are required to be designed to withstand earthquakes and certain other natural hazards. Specifically, it directs that they

shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without loss of capability to perform their safety functions. The design bases for these structures, systems, and components shall reflect: (1) Appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated, (2) appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena and (3) the importance of the safety functions to be performed.²⁵

²² See ALAB-573, 10 NRC 775, 790-92 (1979).

²³ CLI-80-8, *supra*, 11 NRC at 434 (emphasis in the original).

²⁴ See *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), ALAB-705, 16 NRC 1733, 1742 n.24 (1982).

²⁵ 10 C.F.R. Part 50, Appendix A, Criterion 2.

Diablo Canyon, like other licensed facilities, has been found to meet this standard.²⁶ In other words, the effects of the hazards listed in GDC 2 are typical of those that all commercial reactors must be designed to meet. They are not the "unique" and "exceptional" circumstances that under the Commission's precedents and policy statement require consideration of Class 9 accidents.²⁷ Accordingly, the Licensing Board was correct in concluding that no special circumstances exist at Diablo Canyon that require consideration of Class 9 accidents.²⁸

C. Next, the joint intervenors and the Governor argue that the Licensing Board erred in authorizing the issuance of a full power license before the Federal Emergency Management Agency (FEMA) issued "final" findings on the adequacy of the state and local offsite emergency response plans for Diablo Canyon. They argue that such "final" FEMA findings, and their right to rebut them, are mandated by the Commission's emergency response regulations, 10 C.F.R. 50.47(a)(2).²⁹ This issue was decided in ALAB-776 in resolving the appeals of the applicant and the staff from the Licensing Board's initial decision. In opposing those appeals, the joint intervenors and the Governor made the identical argument and proffered the same interpretation of the Commission's regulations.³⁰ We held that the Commission's emergency response regulations did not require "final" FEMA findings on the adequacy of offsite emergency response plans, and that interim FEMA findings and the testimony of FEMA witnesses with respect to the adequacy of such plans was all that was needed to comply with the regulations. Further, with respect to the state plan and preparedness, we found that the hearing record fully supported the Licensing Board's conclusion that there was

²⁶ At the time the joint intervenors moved to reopen the record for consideration of Class 9 accidents at Diablo Canyon, the Licensing Board had already conducted exhaustive hearings on the effects of seismic forces on the facility. Subsequently, the Board found the seismic design adequate. See LBP-79-26, 10 NRC 453 (1979). Thereafter, we reopened the record to hear new evidence that was not available to the Board below and, after further hearings, affirmed the Licensing Board's decision. See ALAB-644, 13 NRC 903 (1981).

²⁷ We note that the Director of Nuclear Reactor Regulation has also denied two petitions filed pursuant to 10 C.F.R. 2.206 seeking to have the agency consider the effects of Class 9 accidents at Diablo Canyon. See DD-80-22, 11 NRC 919 (1980); DD-81-3, 13 NRC 349 (1981). The second petition was filed by the joint intervenors. In denying both petitions, the Director found that there were no special circumstances at Diablo Canyon warranting the consideration of Class 9 accidents.

²⁸ The joint intervenors also argue that the Licensing Board's failure to consider the consequences of Class 9 accidents violates the National Environmental Policy Act, 42 U.S.C. §§ 4321 *et seq.*, and the regulations of the Council on Environmental Quality, 40 C.F.R. 1502.9(c). The explicit purpose of the Commission's June 13, 1980 policy statement, however, was to ensure compliance with NEPA. We are, therefore, bound by the policy statement. See ALAB-705, *supra*, 16 NRC at 1738 n.13.

²⁹ See Joint Intervenors' Brief at 12-20, 37-38; Brief of Governor at 12-14.

³⁰ See Joint Intervenors' Response to Pacific Gas and Electric Company and NRC Staff Briefs in Support of Exceptions to August 31, 1982 Initial Decision (December 20, 1982) at 4-11; Brief of Governor [of California] in Reply to PG&E and NRC Staff Briefs in Support of Exceptions (December 20, 1982) at 1-6.

reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.³¹

D. Central to the development of offsite emergency response plans under the Commission's regulations is the concept of emergency planning zones (EPZs), i.e., those areas around a plant for which planning is needed so that timely and effective actions can be taken to protect the public in the event of a radiological emergency.³² The Commission's regulatory scheme contemplates the establishment of two such zones: the plume exposure pathway that "shall consist of an area about 10 miles (16 km) in radius" and the ingestion pathway that "shall consist of an area about 50 miles (80 km) in radius."³³ As we stated in reviewing this regulatory scheme in *Cincinnati Gas & Electric Co. (Wm. H. Zimmer Nuclear Power Station, Unit No. 1)*, ALAB-727, 17 NRC 760, 765 (1983),

[t]he plume EPZ is concerned principally with the avoidance in the event of a nuclear facility accident of possible (1) whole body external exposure to gamma radiation from the plume and from deposited materials and (2) inhalation exposure from the passing radioactive plume. The duration of those exposures could vary in length from hours to days. The ingestion EPZ is established primarily for the purpose of avoiding exposures traceable to contaminated water or foods (such as milk or fresh vegetables), a potential exposure source that could vary in duration from hours to months.

The Commission's regulations then require that emergency response planning within these two zones meet the requirements set forth in 10 C.F.R. 50.47(b).

In its emergency response planning for Diablo Canyon, the State of California established substantially larger EPZs around the plant than those specified in 10 C.F.R. 50.47(c)(2). Although recognizing the Commission-prescribed EPZs, the State established three zones that more than encompassed the federal zones: the California Basic EPZ (plume); the California Extended EPZ (plume); and the California Ingestion Pathway EPZ.³⁴ The Basic EPZ, for instance, has an average radius of about 15 miles but extends 18 miles beyond the plant to the

³¹ ALAB-776, *supra*, 19 NRC at 1380.

³² See 10 C.F.R. 50.47(c)(2); 10 C.F.R. Part 50, Appendix E; "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," NUREG-0654/FEMA-REP-1, Rev. 1 (November 1980) at 10.

³³ 10 C.F.R. 50.47(c)(2). The Commission's emergency response regulations further provide that "[t]he exact size and configuration of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries." *Id.*

³⁴ See Applicant's Ex. 73, Appendix C at 7, 12, and Figs. 2, 6.

north and 20 miles to the southeast.³⁵ Following the example of the State, San Luis Obispo County (the jurisdiction in which the plant is located) adopted the same state zones in its emergency response plan.³⁶

In its initial decision, the Licensing Board noted the five EPZs (i.e., three state and two federal) applicable to Diablo Canyon and held that

the Federal requirements are minimum standards for planning and not inflexible targets which must not be exceeded. This Board, however, has no authority to enforce State standards which exceed those required by Federal regulations. That is for the State to do.³⁷

Because the county emergency plan incorporating the California Basic EPZ would be implemented in the event of a radiological emergency at Diablo Canyon, the Board inquired into the status of planning in the state zones beyond the areas set forth in 10 C.F.R. 50.47(c)(2) only to assure that all levels of emergency response would be integrated. The Board then generally found that offsite planning within the federal EPZs was adequate and met the Commission's emergency response requirements of 10 C.F.R. 50.47(b). Additionally, it found that beyond the federal zones there was reasonable assurance that planning would be sufficient to permit appropriate integration prior to full power operation.³⁸

On appeal, the joint intervenors and the Governor assert that the Licensing Board erred in failing to give effect to the state-designated zones. They argue that the Board's conclusion, which largely ignores the state zones beyond the areas specified in the Commission's regulations, contravenes established principles of federal-state comity — principles that are specifically recognized by section 274 of the Atomic Energy Act, 42 U.S.C. § 2021.³⁹ The applicant and the staff, on the other hand, support the Licensing Board's treatment of the state zones, arguing that the Board properly declined to require compliance with the Commission's emergency planning requirements throughout the entire state-designated zones.

Contrary to the argument of the joint intervenors and the Governor, the Licensing Board's focus on emergency planning within the EPZs set forth in 10 C.F.R. 50.47(c)(2) was correct. That regulation evidences the Commission's considered expert judgment as to the necessary size of the plume exposure pathway EPZ and the ingestion pathway EPZ for

³⁵ *Id.* at Fig. 2.

³⁶ See Applicant's Ex. 80 at I.5(2) and Fig. I.5-6.

³⁷ LBP-82-70, *supra*, 16 NRC at 764. See also *id.* at 801-02.

³⁸ See *id.* at 765, 768, 802.

³⁹ See Joint Intervenors' Brief at 31-36; Brief of Governor at 8-12.

light water commercial nuclear power plants.⁴⁰ Although the regulations provide that the exact size and configuration of a particular EPZ is to be determined with reference to site-specific factors,⁴¹ the wholesale enlargement of the Commission-prescribed EPZs by the State cannot preclude a licensing decision based upon the requirements of the NRC regulations. As the Licensing Board concluded in considering the same type of expanded state EPZs in *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), LBP-82-39, 15 NRC 1163, 1181 (1982), *aff'd*, ALAB-717, 17 NRC 346 (1983), the Commission's regulations "clearly allow leeway for a mile or two in either direction, based on local factors. But it . . . clearly precludes a plume EPZ radius of, say, 20 or more miles." The same Board then correctly determined that a party seeking to impose such a radical departure from the Commission's prescribed EPZs should seek an exception to the rule pursuant to 10 C.F.R. 2.758.⁴²

Before the Licensing Board neither the joint intervenors nor the Governor sought an exception or waiver (pursuant to 10 C.F.R. 2.758) of the Commission's 10- and 50-mile emergency planning zones. Nor did they present evidence that the plume exposure pathway EPZ and the ingestion pathway EPZ established pursuant to the Commission's regulations should be altered to accommodate particular local conditions.⁴³ Rather, they now argue that as a matter of federal-state comity the Licensing Board should have deferred to the state zones. This argument, however, simply misses the point. Although section 274 of the Atomic Energy Act provides a framework for cooperation with, and transfers of authority to, the states for the regulation of certain byproduct, source, and special nuclear materials, that section also requires the Commission

⁴⁰ See Statement of Considerations accompanying promulgation of Final Emergency Planning Regulations, 45 Fed. Reg. 55,402, 55,406 (1980); NRC Policy Statement, "Planning Basis for Emergency Responses to Nuclear Power Reactor Accidents," 44 Fed. Reg. 61,123 (1979). See also "Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants," NUREG-0396/EPA 520/1-78-016 (December 1978) at 15-17, I-6 to I-7, and I-20.

⁴¹ See note 33, *supra*.

⁴² See LBP-82-39, *supra*, 15 NRC at 1181 n.14.

⁴³ In their briefs, both the joint intervenors and the Governor cite Governor's Exhibit 8 and suggest that it provides the most appropriate basis for determining the size of the EPZs for Diablo Canyon. See Joint Intervenors' Brief at 34; Brief of Governor at 8. This exhibit, published by the California Office of Emergency Services and entitled "Emergency Planning Zones for Serious Nuclear Power Plant Accidents" (November 1980), delineates enlarged EPZs for all nuclear power plants in the state. In the hearing below, the Licensing Board admitted this exhibit into evidence for the sole purpose of identifying the boundaries of the three state EPZs. It was specifically not admitted to provide the basis for, or to justify, the state EPZs. See Tr. 12,522-23, 12,545-48. Neither the joint intervenors nor the Governor has appealed the Licensing Board's evidentiary ruling on this exhibit. Moreover, because the exhibit was offered by the Governor without any sponsoring expert witnesses, the Board's ruling was manifestly correct. See *San Onofre*, *supra*, 17 NRC at 366-68; *Duke Power Co.* (William B. McGuire Nuclear Station, Units 1 and 2), ALAB-669, 15 NRC 453, 477 (1982).

to retain all authority and responsibility for the regulation of nuclear power plants and prohibits any delegation of that authority.⁴⁴ It should hardly need be stated that the Commission's emergency response requirements are an integral part of the agency's regulation of nuclear power plants, and compliance with those rules determines whether an applicant receives an operating license, not obedience to additional requirements that may have been adopted by state or local authorities. Even though offsite emergency planning depends upon state and local resources, the applicant cannot be denied an operating license, if, as in this case, planning within the NRC-prescribed EPZs complies with the Commission's emergency response requirements. Accordingly, the Licensing Board did not err in refusing to adopt the enlarged state EPZs and, correspondingly, in refusing to require compliance with the Commission's emergency response requirements in the areas outside the federal EPZs.

E. Additionally, the joint intervenors argue that the Licensing Board abused its discretion in authorizing a full power license for Diablo Canyon even though at the time of the hearing on emergency planning several defects in the county's response plans existed.⁴⁵ Principally, they complain, with little elaboration, that the county's planning is inadequate because its public information program had not been implemented and its communications system had uncorrected deficiencies. Further, the joint intervenors, joined by the Governor, claim that the county's emergency response planning is generally deficient because sociological and psychological profiles of the population in the evacuation zone have not been conducted to gauge the public response to a radiological emergency at Diablo Canyon.⁴⁶

1. In addressing emergency response information programs for Diablo Canyon,⁴⁷ the Licensing Board concluded that the applicant had

⁴⁴ See 42 U.S.C. § 2021(c).

⁴⁵ The joint intervenors also claim that, at the time of the hearing, state emergency planning was inadequate because evacuation plans for special state jurisdictions within San Luis Obispo County (i.e., California Men's Colony and California Polytechnic Institute) were incomplete. See Joint Intervenors' Brief at 38. In ALAB-776, *supra*, 19 NRC at 1380, we reviewed the evidence underlying the Licensing Board's conclusion that state planning was adequate and upheld that finding. Moreover, as found by the Licensing Board, both of the joint intervenors' examples of inadequacies in state preparedness are in areas that lie outside the federally prescribed plume exposure pathway where evacuation would be needed. See LBP-82-70, *supra*, 16 NRC at 766 n.8.

⁴⁶ See Joint Intervenors' Brief at 40-47; Brief of Governor at 15-17.

⁴⁷ The Commission's planning standard on public information, 10 C.F.R. 50.47(b)(7), provides that: Information is [to be] made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are [to be] established in advance, and procedures for coordinated dissemination of information to the public are [to be] established.

developed an adequate program. That program included a page of appropriate information in the San Luis Obispo County telephone directory and the periodic dissemination of newsletters to the residents within the California Basic EPZ informing them about the plant, general nuclear issues, emergency planning and instructions on how residents will be notified and what they should do in the event of a radiological emergency. The Board found that the applicant had prepared various sites for the news media in the event of a radiological emergency and had established procedures for the coordinated release of information to the general public and the media.⁴⁸ With respect to the county program, the Board indicated that the county planned to publish and distribute throughout the California Basic EPZ an information booklet containing emergency response instructions but, at the time of the hearing, the document was only in draft form. The Licensing Board, like FEMA in its review of the county plan and preparedness, found that the county publication was a necessary element of the public information program. It therefore placed a condition upon its license authorization that the county information booklet be published and distributed to the public well in advance of full power operation of Diablo Canyon.⁴⁹

The Licensing Board also fully canvassed the question of the adequacy of the onsite and offsite communications systems necessary to respond to a radiological emergency.⁵⁰ The Board concluded that there were no serious deficiencies with the applicant's onsite emergency communications systems but, with respect to offsite communications, it identified several defects in essential components of the county system. The Licensing Board found, however, that such defects were temporary in nature because the applicant had committed to replace or add necessary equipment to the county system thereby eliminating the cited difficulties.⁵¹ Thus, the Board concluded "that the critical requirements of the communication system for offsite communications in San Luis Obispo County are or will be met" and the county system met the requirements of 10 C.F.R. 50.47(b)(6).⁵²

The Board's findings on the adequacy of the county's public information program and emergency communications system fully discuss each issue and thoroughly and accurately detail the record evidence. No

⁴⁸ See LBP-82-70, *supra*, 16 NRC at 777, 820-22.

⁴⁹ *Id.* at 778, 823.

⁵⁰ The Commission's emergency communications planning standard, 10 C.F.R. 50.47(b)(6), provides that: "Provisions [must] exist for prompt communications among principal response organizations to emergency personnel and to the public."

⁵¹ LBP-82-70, *supra*, 16 NRC at 775-77, 816-20.

⁵² *Id.* at 776.

useful purpose would be served by repeating all of those particulars here. Suffice it to say that the Board's findings are supported by the record and our examination of the evidence does not convince us that the record compels a different result — the standard applicable to our review of the Licensing Board's factual findings.⁵³ Moreover, the joint intervenors' complaints stem from the predictive nature of the Board's findings (i.e., that actions taken in the future will rectify deficiencies) and the condition placed by the Board on its authorization to ensure certain actions are taken. The gist of the joint intervenors' position is that all corrective actions must be taken before the adjudicatory hearing, not after it, with the result that all licensing details must await the hearing process.

The Commission's emergency response regulations, however, contemplate, in appropriate circumstances, predictive findings on emergency response planning so that operation of a facility need not be delayed unnecessarily by the hearing process.⁵⁴ Emergency planning need not be complete at the time of the hearing as long as the evidence permits the Licensing Board to find that "there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency."⁵⁵ Indeed, prior to 1982, the agency's regulations required a finding that "the state of onsite and offsite emergency preparedness provides reasonable assurance that adequate protective measures can and will be taken."⁵⁶ In 1982, the Commission deleted the reference to the "state" of emergency preparedness "to clarify that the findings on emergency planning required prior to license issuance are predictive in nature and need not reflect the actual state of preparedness at the time the finding is made."⁵⁷ Thus, as here, the Licensing Board's findings can

⁵³ See *Northern States Power Co.* (Monticello Nuclear Generating Plant, Unit 1), ALAB-611, 12 NRC 301, 304 (1980); *Niagara Mohawk Power Corp.* (Nine Mile Point Nuclear Station, Unit 2), ALAB-264, 1 NRC 347, 357 (1975).

We note that in the staff response to our April 10, 1984 order inquiring whether the appeals of the applicant and the staff from the Licensing Board's initial decision were moot, the staff attached an April 2, 1984 FEMA memorandum on the current status of offsite emergency planning at Diablo Canyon. The FEMA memorandum indicates that the county emergency response information booklet has been published and distributed and that a second distribution is already planned. The memorandum also states that the deficient items in the county communications system (i.e., those identified by FEMA as critical for emergency planning) have been corrected and that the reliability of the county's microwave and VHF systems has been very good during the last year. See Memorandum for Edward L. Jordan, NRC, from Richard W. Krimm, FEMA (April 2, 1984), attached to NRC Staff Response to the Appeal Board's Order of April 10, 1984 (April 18, 1984) [hereinafter FEMA memorandum].

⁵⁴ See *San Onofre*, *supra*, 17 NRC at 380 n.57. See generally *Detroit Edison Co.* (Enrico Fermi Atomic Power Plant, Unit 2), ALAB-730, 17 NRC 1057, 1067 (1983).

⁵⁵ 10 C.F.R. 50.47(a)(1).

⁵⁶ 10 C.F.R. 50.47(a)(1) (1982).

⁵⁷ 47 Fed. Reg. 30,232 (1982). At the same time the Commission removed the reference in 10 C.F.R. 50.47(a)(1) to the "state" of emergency preparedness, it also added a last sentence to the section

(Continued)

properly be predictive in nature.⁵⁸ Similarly, the Board's licensing authorization may be appropriately conditioned on the completion of items found deficient at the time of the hearing.⁵⁹

2. The joint intervenors and the Governor also assert that, contrary to 10 C.F.R. 50.47(a)(1), there is no assurance that the emergency plans for Diablo Canyon can be implemented because sociological and psychological profiles of the affected populations in the evacuation zone have not been conducted to assess the public response to a radiological emergency at Diablo Canyon. In rejecting the need for local surveys, the Licensing Board found that such studies are not required by the agency's regulations and would not improve public information planning.⁶⁰ It concluded that "[h]owever interesting such data might be, it is irrelevant to the task of informing the public about the necessity to travel a limited distance from Diablo Canyon in an emergency."⁶¹

In addressing the testimony of the joint intervenors' expert witnesses (i.e., that surveys were necessary because people behave differently in radiological emergencies than in other disasters and either overreact by doing more than is required, or underreact by becoming immobilized), the Board found that

providing that emergency preparedness exercises need not be held before any initial licensing decision. See 47 Fed. Reg. 30,232, 30,236 (1982). This new provision was invalidated in *Union of Concerned Scientists v. NRC*, 735 F.2d 1437 (D.C. Cir. 1984) on the ground that it denied the right to a hearing on a material licensing factor required by 10 C.F.R. Part 50, Appendix E, in contravention of section 189(a)(1) of the Atomic Energy Act, 42 U.S.C. § 2239(a)(1). That holding is inapposite to the type of predictive findings and conditions involved here.

⁵⁸ No unfairness results from such a system for just as one party can demonstrate that a planned course of action will resolve an identified deficiency, an opposing party can establish that the deficiency cannot be resolved by that planned action. Supervision of a party's compliance with a commitment or a licensing board condition is left to the staff. If one party is dissatisfied with the way another party has fulfilled a commitment or met a condition, the matter may, in appropriate circumstances, be brought back to the licensing board or become the subject of a petition under 10 C.F.R. 2.206.

⁵⁹ The joint intervenors also claim that, at the time of the hearing, county preparedness was deficient because not all of the standard operating procedures (SOPs) for implementing the county plan had been finished, approved and adopted, and that no letters of agreement between the county and other private and public organizations for supporting services had been secured. See Joint Intervenors' Brief at 39-40. The Licensing Board found that all the SOPs for actions within the federally prescribed plume exposure pathway were complete, and that no difficulties stood in the way of completing the remainder. See LBP-82-70, *supra*, 16 NRC at 764-65, 803. The Board also found that the critical elements for implementing the county plan were contained in SOPs and that letters of agreement were used only for non-critical elements of emergency support. Moreover, the Board found that no obstacles stood in the way of the county obtaining such letters of agreement. See *id.* at 767, 804. The Board's findings accurately reflect the hearing evidence and are fully supported by the record. We are not convinced the evidence compels any different result. Further, we note that the FEMA memorandum on the current status of off-site emergency planning at Diablo Canyon (see note 53, *supra*) indicates that the county SOPs for the areas outside the federally prescribed plume exposure pathway EPZ are substantially complete and that the county has obtained substantially all the letters of agreement.

⁶⁰ LBP-82-70, *supra*, 16 NRC at 778-80, 823-25.

⁶¹ *Id.* at 780.

there is no apparent hazard to public health and safety if overreaction occurs. Assuming overreaction was likely, we have no remedy beyond that which is already planned, which is to broadcast accurate, consistent information.

... Some people require repeated warnings and repeated information bulletins in order to become convinced that a hazard is real and that they should react. We see little value in a social survey in counteracting this phenomenon, however. The phenomenon of underreaction is already known. The remedy is repeated consistent warnings and information bulletins. The public will receive these through the emergency broadcast system.⁶²

The Board also found the testimony of the applicant's expert, who indicated that studies of human behavior in other types of disasters provide a sufficient basis to establish workable emergency plans, "more credible as regards the public information program."⁶³

Contrary to the suggestion of the joint intervenors and the Governor, the Licensing Board adequately confronted the conflicting viewpoints of the expert witnesses and resolved each issue before it.⁶⁴ Its findings are amply supported and our examination of the evidence does not convince us that the record compels a different result.⁶⁵

II.

Finally, the joint intervenors challenge the Licensing Board's finding that the power-operated relief valves (PORVs) at Diablo Canyon have been adequately designed, constructed and tested.⁶⁶ They do not contest the Board's findings on the basis of the underlying hearing record. Rather, the joint intervenors argue that information revealed by the applicant subsequent to the hearing on the PORV issue removes the evidentiary support for the Board's findings. They point out that the Licensing Board received notification from the applicant after the evidentiary hearing, but before the issuance of the initial decision, that the initial

⁶² *Id.* at 779.

⁶³ *Id.* at 780.

⁶⁴ See generally *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-442, 6 NRC 33, 41 (1977).

⁶⁵ In his brief (at 16), the Governor also argues that the Licensing Board erred in refusing to order a survey to assess the magnitude of role conflict among emergency workers who might evacuate with their families in an emergency instead of reporting for duty. The Licensing Board found that role conflict would not cause professionally trained emergency workers, including plant operators, to abandon their duties. LBP-82-70, *supra*, 16 NRC at 770, 807-08. Further, it found there was no "dichotomy between operators performing their duties and seeing to their family's safety. Reasonable individuals would do both." *Id.* at 770. These findings are also fully supported by the record and we are not convinced that the evidence demands a different result.

⁶⁶ See LBP-82-70, *supra*, 16 NRC at 761, 795-97, 850-54.

pipng design reviews conducted as part of the Commission-ordered independent design verification program (IDVP) revealed that some piping analyses potentially affecting the PORVs may not have been conservative.⁶⁷ Subsequent events, however, have made joint intervenors' argument academic.

While the joint intervenors' appeal of the initial decision was pending, they filed a motion with us to reopen the record on the issue of the adequacy of the applicant's design quality assurance program. We granted that motion, along with a similar one filed by the Governor. The reopened proceeding focused on the adequacy of the independent design verification program and the joint intervenors had the opportunity to litigate the same matter they claim on appeal undermines the Licensing Board's findings. The joint intervenors chose not to contest the adequacy of the PORVs although the issue was fairly encompassed by one of the Governor's issues concerning the verification of Westinghouse-supplied equipment. In ALAB-763, 19 NRC 571, 586, 609 n.193 (1984), we found verification of the design of that equipment adequate.

For the foregoing reasons, the initial decision of the Licensing Board authorizing the issuance of a full power license for Diablo Canyon, Unit 1, is affirmed. As we explained in ALAB-763,⁶⁸ however, the Board's license authorization for Unit 2 shall not be effective until we have made our findings with respect to the adequacy of the applicant's design verification program for that unit.

It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the
Appeal Board

⁶⁷ See Joint Intervenors' Brief at 53-56 and Exhibit B.

⁶⁸ 19 NRC at 582.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Thomas S. Moore, Chairman
Dr. John H. Buck
Dr. W. Reed Johnson

In the Matter of

Docket Nos. 50-275-OL
50-323-OL

**PACIFIC GAS AND ELECTRIC
COMPANY**
**(Diablo Canyon Nuclear Power
Plant, Units 1 and 2)**

September 6, 1984

The Appeal Board dismisses the joint intervenors' motion to reopen the Diablo Canyon proceeding on seismic issues, finding that it lacks jurisdiction to consider the matter.

RULES OF PRACTICE: SHOW-CAUSE PROCEEDINGS

Under the terms of 10 C.F.R. 2.206, a party may request the Director of Nuclear Reactor Regulation to institute a show-cause proceeding seeking to amend or revoke a nuclear power plant operating license.

APPEAL BOARDS: JURISDICTION

When a discrete issue has been decided by an appeal board and the Commission declines to review that decision, agency action is final with respect to the issue and appeal board jurisdiction is terminated. *Metro-politan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1),

ALAB-766, 19 NRC 981, 983 (1984); *Virginia Electric and Power Co.* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-551, 9 NRC 704, 708-09 (1979); *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-513, 8 NRC 694, 695 (1978).

APPEAL BOARDS: JURISDICTION

Where finality has attached to some but not all issues, appeal board jurisdiction to entertain new matters is dependent upon the existence of a "reasonable nexus" between those matters and the issues remaining before the board. *See Virginia Electric and Power Co.* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-551, 9 NRC 704, 707 (1979).

APPEARANCES

Joel R. Reynolds, Ethan P. Schulman, Eric Havian and John R. Phillips, Los Angeles, California, and **David S. Fleischaker**, Oklahoma City, Oklahoma, for the San Luis Obispo Mothers for Peace, *et al.*, joint intervenors.

Robert Ohlback, Philip A. Crane, Jr., Richard F. Locke and Dan G. Lubbock, San Francisco, California, and **Arthur C. Gehr, Bruce Norton and Thomas A. Scarduzio, Jr.**, Phoenix, Arizona, for Pacific Gas and Electric Company, applicant.

Lawrence J. Chandler for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

Opinion for the Board by Dr. Buck and Dr. Johnson:

On July 16, 1984, the joint intervenors filed with us a motion to reopen the Diablo Canyon proceeding on seismic issues.¹ The motion, accompanied by the affidavit of Dr. James N. Brune,² is founded upon

¹ Joint Intervenors' Motion to Reopen the Record on Seismic Issues.

² Dr. Brune is Professor of Geophysics, Scripps Institution of Oceanography, University of California at San Diego. He has appeared in these proceedings previously as a witness for the joint intervenors and for Governor Brown of California. *See* ALAB-644, 13 NRC 903, 1013 (1981).

seismological information characterized by intervenors as newly acquired and of such significance as to put into question the seismic design of the Diablo Canyon plant. In short, our attention is directed to data obtained from the April 24, 1984 Morgan Hill (California) earthquake, the results of a research paper by J.K. Crouch, S.B. Bachman and J.T. Shay (1984) related to the nature of the Hosgri Fault, and a series of recent earthquakes along the Central California coast that, assertedly, cast doubt upon the seismicity previously assigned in NRC proceedings to the Diablo Canyon region.³

The applicant and NRC staff oppose the motion to reopen.⁴ Both parties first question whether this Board has jurisdiction to entertain such a motion, arguing that our earlier decision on seismic design matters, ALAB-644, 13 NRC 903 (1981), which the Commission declined to review, represents final agency action on the subject. Alternatively, these parties treat the joint intervenors' motion on its merits and again conclude it should be denied. Because the joint intervenors had not addressed the jurisdiction question, we asked for their views on this matter. In an August 9, 1984 reply, joint intervenors take the position, *inter alia*, that agency action on this issue is not final, and that this Board does have jurisdiction to decide their motion.

As we discuss below, review of the parties' arguments, the procedural history of this case and our earlier decisions convinces us that we do not have jurisdiction to consider the intervenors' motion to reopen the record on seismic issues. The motion is therefore dismissed. This does not mean, however, that joint intervenors are without an avenue to pursue their concerns on the seismic design issue within this agency. Under the terms of 10 C.F.R. 2.206, they may request the Director of Nuclear Reactor Regulation to institute a show-cause proceeding seeking to amend or revoke the Diablo Canyon operating license.⁵

Following hearings on the seismic redesign of Diablo Canyon to account for the earthquake potential of the Hosgri Fault, the Licensing Board found the plant to be adequately designed to withstand any earthquake that could reasonably be expected. LBP-79-26, 10 NRC 453 (1979). While joint intervenors' appeal of that decision was before us,

³ Joint Intervenors' Motion to Reopen the Record on Seismic Issues (July 16, 1984) at 3-17, Attachment V.

⁴ Answer of Pacific Gas and Electric Company in Opposition to Joint Intervenors' Motion to Reopen the Record on Seismic Issues (July 27, 1984); NRC Staff's Answer to Joint Intervenors' Motion to Reopen the Record on Seismic Issues (August 1, 1984).

⁵ We note that, at the request of the joint intervenors, the United States Court of Appeals for the District of Columbia Circuit, on August 17, 1984, stayed the Commission's August 10, 1984 order authorizing issuance of a full power license for Diablo Canyon. The stay will remain in effect pending court review. *San Luis Obispo Mothers for Peace v. NRC*, No. 84-1410 (D.C. Cir. Aug. 17, 1984).

we granted their motion to reopen the record to receive evidence derived from the 1979 Imperial Valley earthquake. Following a six-day hearing to consider this evidence, we issued a decision, ALAB-644, that covered matters raised both on the appeal of the Licensing Board's decision and in the reopened hearing. We found that the seismic design of the facility was adequate and affirmed the Licensing Board's decision.⁶ The Commission declined to review ALAB-644, rendering it final on March 18, 1982.⁷

Our earlier decisions make it abundantly clear that when a discrete issue has been decided by an appeal board and the Commission declines to review that decision, agency action is final with respect to the issue and our jurisdiction is terminated. This is the case even when other issues may still be before us. Our most recent determination of this jurisdictional question appeared earlier this year:

Under settled principles of finality of adjudicatory action, once we have finally determined discrete issues in a proceeding, our jurisdiction is terminated with respect to those issues, absent a remand order by the Commission or a court issued during the course of its review of our decision. *Virginia Electric and Power Co.* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-551, 9 NRC 704, 708-09 (1979); *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-513, 8 NRC 694, 695 (1978). . . . It is clear that where, as here, the Commission declines to review our decision, a final agency determination has been made resulting in the termination of our jurisdiction.

To be sure, [unrelated] issues . . . are still before us. That we may yet be considering some issues in a proceeding, however, does not preserve our jurisdiction over issues previously determined.⁸

Intervenors point out that we still have before us on appeal matters related to earthquakes. They argue that because there is a sufficient relationship (i.e., a reasonable nexus) between these issues and those forming the basis of the instant motion to reopen, we do indeed still have jurisdiction to consider the motion.⁹ We do not agree. The issues before

⁶ ALAB-644, *supra*, 13 NRC at 996.

⁷ See letters from S.J. Chilk, NRC, to parties, dated March 18, 1982.

⁸ *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), ALAB-766, 19 NRC 981, 983 (1984) (footnotes omitted). The joint intervenors rely on the cited *Seabrook* decision, ALAB-513, for the proposition that if an issue has not as yet received court review, there has been no final agency action with respect to it. But it is clear that the reference to court review in *Seabrook* (8 NRC at 695) was to provide the reader with information as to the ultimate resolution of the question there. *Seabrook* should not be read to suggest that court review constitutes an element of agency action on an issue. See also *Louisiana Power & Light Co.* (Waterford Steam Electric Station, Unit 3), ALAB-753, 18 NRC 1321, 1329-30 (1983).

⁹ See *Virginia Electric and Power Co.* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-551, 9 NRC 704, 707 (1979) (where finality has attached to some but not all issues, appeal board jurisdiction to entertain new matters is dependent upon the existence of a "reasonable nexus" between those matters and the issues remaining before the board).

us in the full power appeal are not related to the seismic design of the facility and are independent of the nature of a particular earthquake.¹⁰ The motion, on the other hand, would have us explore again the detailed nature of the seismic design bases for the plant, and involves totally different considerations than the questions on appeal. It is clear that, with our decision on seismic design issues in ALAB-644 and the Commission's determination not to review that decision, the adjudication of that matter is final and we no longer have jurisdiction.

The motion to reopen the record on seismic issues is *dismissed*.

It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the
Appeal Board

Because Dr. Buck's full retirement from the Appeal Panel becomes effective September 7, 1984, the majority opinion is being issued today without the separate opinion of Mr. Moore. That opinion will issue subsequently.

¹⁰ In ALAB-781, 20 NRC 819, we have today decided exceptions raised by the joint intervenors and Governor Brown to the Licensing Board's final initial decision authorizing full power operation of Diablo Canyon (LBP-82-70, 16 NRC 756 (1982)). Two matters considered in those appeals pertain peripherally to the effects of earthquakes: the Board's failure to consider (1) earthquakes in emergency planning, and (2) the special circumstances of earthquake potential at Diablo Canyon as a basis for analyzing the environmental effects of Class 9 accidents. Clearly we considered these issues to be still before us in our analysis of the jurisdiction question.

Dissenting Opinion of Mr. Moore:

My colleagues dismiss the joint intervenors' motion to reopen the record in this operating license proceeding finding that we lack jurisdiction to entertain it. They hold that our earlier resolution of the seismic design issue in ALAB-644¹ became final agency action on this question when the Commission declined to review that decision, thereby ousting us of jurisdiction. In the words of the majority, "when a discrete issue has been decided by an appeal board and the Commission declines to review that decision, agency action is final with respect to the issue and our jurisdiction is terminated."² Because the majority's holding is premised on an erroneous notion of jurisdiction and final agency action, and is in the teeth of the agency's regulations, I dissent. We clearly have jurisdiction to consider the joint intervenors' motion. I would determine, therefore, whether the reopening motion meets the established tripartite test for such motions.³

I.

A. Contrary to the majority's holding, when the Commission declined to review ALAB-644 that decision did not become final agency action that deprived us of *jurisdiction* over the reopening motion on seismic issues. Our earlier decision was rendered upon an appeal from one of the Licensing Board's many *partial* initial decisions⁴ and, after it was issued, numerous contested issues remained to be resolved in the still ongoing operating license proceeding. In the words of the Administrative Procedure Act, ALAB-644 was simply "preliminary . . . or intermediate agency action,"⁵ not final agency action. Under the Commission's regulations, only an *initial* decision authorizing an operating license or denying a license can lead to *final* agency action which terminates our jurisdiction over the operating license proceeding.⁶

When the joint intervenors filed their reopening motion, we had pending their appeal from the Licensing Board's initial decision authorizing a full power operating license for the Diablo Canyon facility. As a consequence of that appeal challenging the license authorization, jurisdiction

¹ 13 NRC 903 (1981).

² 20 NRC at 841.

³ See, e.g., *Kansas Gas and Electric Co.* (Wolf Creek Generating Station, Unit No. 1), ALAB-462, 7 NRC 320, 338 (1978).

⁴ See LBP-79-26, 10 NRC 453 (1979).

⁵ 5 U.S.C. § 704.

⁶ See 10 C.F.R. 2.717(a), 2.760(a).

over the entire proceeding passed from the Licensing Board to us at the time the appeal was filed. Because we already had jurisdiction over the proceeding when the motion was filed, it was properly filed with us and we therefore necessarily have jurisdiction (i.e., the power or authorization to act in the operating license proceeding) to entertain a reopening motion on any issue — including one decided on a previous appeal.

It is elementary that a prior appeal from a ruling at an earlier stage of the same proceeding has no bearing on the jurisdiction of the appellate tribunal in a subsequent appeal. The prior adjudication, whether from an interlocutory or final order, only establishes the law of the case for that appellate body and any inferior tribunal. That doctrine, however, is not jurisdictional; it is not a limitation on the power of the appellate body.⁷ As the Supreme Court long ago stated in *Messinger v. Anderson*, 225 U.S. 436, 444 (1912) (Holmes, J.), the law of the case doctrine “as applied to the effect of previous orders on the later action of the court rendering them in the same case, merely expresses the practice of courts generally to refuse to reopen what has been decided, not a limit to their power.”⁸ Such well-established judicial precedents underlie our conclusion in *Marble Hill*, ALAB-493,⁹ that the rule of the law of the case was fully applicable to NRC adjudicatory proceedings and that the doctrine was not jurisdictional.¹⁰ In circumstances that mirror those presented here, the *Marble Hill* Board concluded, on an appeal from an initial decision authorizing a construction permit, that we have jurisdiction to reconsider (in order to take into account new matter) the identical issue we resolved on a prior appeal of a partial initial decision.¹¹ The *Marble Hill* Board explicitly held, contrary to my colleagues’ assertion here, that the Commission’s refusal to review our earlier decision did not “cut off our right to reconsider a question in an appeal which is still pending before us.”¹² The Board then distinguished the circumstances it faced

⁷ See 9 Moore’s Federal Practice ¶ 110.25[2] at 274-75 (2d ed. 1982).

⁸ See also *Signal Oil & Gas Co. v. Barge W-701*, 654 F.2d 1164, 1169 (5th Cir.), cert. denied, 455 U.S. 944 (1981); *Handi Investment Co. v. Mobil Oil Corp.*, 653 F.2d 391, 392 (9th Cir. 1981).

⁹ *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-493, 8 NRC 253, 260 & n.25 (1978).

¹⁰ ALAB-493, *supra*, 8 NRC at 258-60.

¹¹ *Id.* at 260.

¹² *Id.*

The circumstances that lead to our *Marble Hill* holding are somewhat involved. At issue was the geographical boundary between Kentucky and Indiana that are separated by the Ohio River at the plant site. Section 401 of the Federal Water Pollution Control Act, 33 U.S.C. § 1341(a), requires that those making discharges into navigable waters first obtain certification from the state in which the discharge originates. The applicant sought and obtained such certification from Indiana. In a partial initial decision authorizing a limited work authorization (LWA) for Marble Hill, the Licensing Board held that the applicant’s certification satisfied the Water Act because the facility would be located in Indiana. LBP-77-

(Continued)

from those where an initial decision had become the final agency decision which would terminate its jurisdiction in the licensing proceeding.¹³

Indeed, that latter situation arose in *Marble Hill* some six months after we affirmed (in ALAB-493) the Licensing Board's initial decision authorizing the construction permit and the Commission then declined to review our decision. When one of the intervenors sought to reopen the proceeding the *Marble Hill* Board specifically applied our prior ruling in ALAB-493 that under the Commission's regulations only an initial decision authorizing or denying a license can become a final agency decision and only a final decision terminates an adjudicatory board's jurisdiction over the licensing proceeding.¹⁴ Thus, in a second decision, ALAB-530, the *Marble Hill* Board denied the intervenor's reopening motion holding that, upon the Commission's refusal to review ALAB-493, the initial decision authorizing the license became final agency action that terminated our jurisdiction.¹⁵ The majority in the case at hand do not even acknowledge our prior authoritative decisions and similarly ignore the well-established judicial precedents.¹⁶ It misap-

52, 6 NRC 294, 337 (1977). On appeal, the *Marble Hill* Board set aside part of the lower Board's conclusion and held that the Water Act required certification from the state into whose waters the effluent would be discharged. At the same time, we rejected Kentucky's argument seeking a ruling that certification must come from it because any discharge from the facility necessarily would be into Kentucky waters which extend to the present low water mark of the Ohio River on the Indiana shore. Rather, we held controlling Supreme Court precedents placed the boundary at the low water mark on the Indiana shore at the time Kentucky was admitted to the Union in 1792. The proceeding was remanded for a determination of the 1792 boundary. ALAB-459, 7 NRC 179, 189-96 (1978). The Commission then declined to review that decision. ALAB-493, *supra*, 8 NRC at 255 n.1. In due course and after the Licensing Board issued another partial initial decision granting a second LWA (LBP-77-67, 6 NRC 1101 (1977)), which we then affirmed (ALAB-461, 7 NRC 313 (1978)), the lower Board issued its initial decision authorizing a construction permit and finding, *inter alia*, that the applicant's Indiana water certification was valid. LBP-78-12, 7 NRC 573 (1978). On appeal of the initial decision, Kentucky requested that we reconsider our prior ruling that the 1792 boundary was controlling in order to take into account a 1943 interstate compact that it claimed settled its boundary at the present low water mark of the Ohio River on the Indiana shore. Among other arguments, both the NRC staff and the applicant asserted that our prior resolution of that issue in ALAB-459 was the law of the case but they argued, in effect, that that doctrine, as well as the Commission's refusal to review ALAB-493, were jurisdictional bars to our reconsideration of the issue. As indicated, the *Marble Hill* Board rejected these arguments. ALAB-493, *supra*, 8 NRC at 259-60.

¹³ ALAB-493, *supra*, 8 NRC at 260 n.27.

¹⁴ *Public Service Co. of Indiana* (*Marble Hill Nuclear Generating Station, Units 1 and 2*), ALAB-530, 9 NRC 261, 262 (1979).

¹⁵ *Id.* In a footnote, the *Marble Hill* Board then indicated that, after the affirmance of the initial decision, our only jurisdiction was over a matter where we expressly reserved jurisdiction and suggested that we would have authority to consider a reopening motion related to such a matter. *Id.* at 262 n.2.

¹⁶ The majority's position is also at odds with our holding in ALAB-781, 20 NRC 819 (1984), where we affirmed the Licensing Board's initial decision authorizing a full power operating license for Diablo Canyon, Unit 1. In their appeal of that initial decision, the joint intervenors argued, *inter alia*, that the Licensing Board erred in failing to consider the environmental consequences of a so-called Class 9 accident at Diablo Canyon. We unanimously held that our prior resolution of that issue in ALAB-728, 17 NRC 777, 795-96, *review denied*, CLI-83-32, 18 NRC 1309 (1983), which was rendered on an appeal of the Licensing Board's partial initial decision (LBP-81-21, 14 NRC 107 (1981)), was the law of the case

(Continued)

prehends the fundamental concept of jurisdiction and then compounds the error with an equally erroneous notion of final agency action.

B. The scheme of the Commission's Rules of Practice for operating license proceedings calls for challenges to an operating license application to be settled in a single adjudicatory proceeding before a licensing board that, after all appeals or the expiration of the period for such appeals, ultimately culminates in a final agency decision authorizing or denying a license.¹⁷ Accordingly, the regulations provide that after all appropriate hearings on the contested issues, the licensing board "will render an *initial decision*"¹⁸ that, *inter alia*, "will be based on the *whole* record."¹⁹ The rules then state that the

initial decision . . . will constitute the *final action* of the Commission forty-five (45) days after its date when it authorizes the issuance . . . of a license . . . or thirty (30) days after its date in any other case, unless an appeal is taken in accordance with § 2.762 or the Commission directs that the record be certified to it for *final decision*.²⁰

The regulations are then explicit that the adjudicatory boards' "*jurisdiction* in each *proceeding* will terminate upon the expiration of the period

and that we would not consider the issue again. ALAB-781, *supra*, 20 NRC at 825-26. As already noted, that doctrine is not a limit on authority; it is simply a rule of practice that a decision on an issue made at one stage of a proceeding, absent compelling reasons to reconsider the issue later, generally becomes binding precedent in successive stages of the same litigation. We invoked that doctrine in ALAB-781 precisely because at that point we had jurisdiction to revisit the Class 9 issue if appropriate grounds for doing so had been present. My colleagues, however, did not find in ALAB-781 that we were barred by a lack of jurisdiction from reconsidering the issue — the only conclusion that would be consistent with their holding here that "when a discrete issue has been decided by an appeal board and the Commission declines to review that decision, agency action is final with respect to the issue and our jurisdiction is terminated." 20 NRC at 841.

¹⁷ See 10 C.F.R. 2.700-2.790.

¹⁸ 10 C.F.R. 2.760(a) (emphasis supplied).

¹⁹ 10 C.F.R. 2.760(c) (emphasis supplied).

The licensing boards, like federal district courts, have broad authority to address cases in stages to aid in the logical and orderly disposition of entire proceedings. For example, pursuant to Rule 42(b) of the Federal Rules of Civil Procedure, courts may order individual trials on "any separate issue" for the sake of expedition and economy. Similarly, licensing boards may segregate issues for separate hearing under their authority to "[r]egulate the course of the hearing." 10 C.F.R. 2.718(e). Because of the number and complexity of issues involved in operating license proceedings, licensing boards regularly hold separate hearings on individual issues and then issue partial initial decisions based on that segment of the record compiled on the individually tried issues. The partial initial decisions then are incorporated into the licensing board's initial decision authorizing or denying a license. *Cf.* 10 C.F.R. 2.606(b)(2) n.3. Only the initial decision, however, is based on the *whole* record as required by 10 C.F.R. 2.760(c). Thus, on an appeal from an initial decision, jurisdiction over the whole record of the proceeding passes from the licensing board to the appeal board. In contrast, on an appeal from a partial initial decision, jurisdiction over only that portion of the record encompassing the issues appealed passes from the licensing board to the appeal board at the time of the appeal. It should be noted that the appeal of a partial initial decision is a classically interlocutory one (see 10 C.F.R. Part 2, Appendix A, § 1(e) n.2) and that interlocutory appeals are proscribed by 10 C.F.R. 2.730(f). Such appeals are permitted, however, by our indulging the fiction that partial initial decisions that decide "a major segment of the case" are sufficiently "final" for purposes of 10 C.F.R. 2.762 to permit them to be appealed. *Toledo Edison Co.* (Davis-Besse Nuclear Power Station), ALAB-300, 2 NRC 752, 758 (1975).

²⁰ 10 C.F.R. 2.760(a) (emphasis supplied).

within which the Commission may direct that the record be certified to it for *final decision*, or when the Commission renders a *final decision* . . . whichever is earliest.”²¹ Of course, in the event of an appeal from the Licensing Board’s initial decision, the time period in which the initial decision would otherwise become a final decision is tolled until after Appeal Board review. Thus, pursuant to these express provisions, only an initial decision authorizing or denying a license that has become a final decision (either by the expiration of the time for Commission review or by the Commission undertaking review) can terminate an adjudicatory board’s jurisdiction over a licensing proceeding. As previously noted, we had the appeal from the initial decision authorizing a full power license pending at the time the joint intervenors filed the reopening motion. Accordingly, there simply was no final agency decision capable of ousting us of jurisdiction as the majority claims.

Our decision in ALAB-644 is not “final” agency action in any sense of the word. That decision was rendered on appeal from one of the Licensing Board’s partial initial decisions, not an initial decision authorizing the Diablo Canyon operating license. As already shown, after the Commission declined to review ALAB-644, the issue decided in our opinion was not immune from further agency adjudicatory consideration as would be the case of a final decision.²² Additionally, although not decisive, it should be noted that neither the joint intervenors nor any other party could petition any court of appeals pursuant to 28 U.S.C. 2342(4) for review of ALAB-644 as a “final” order of the agency.²³ Only the grant or denial of licensing authorization represents such a final agency order.²⁴ Indeed, in the Diablo Canyon operating license proceeding, like numerous similar situations, the Commission parried judicial

²¹ 10 C.F.R. 2.717(a) (emphasis supplied). See also 10 C.F.R. 2.770.

²² See ALAB-493, *supra*, 8 NRC at 258-60; ALAB-530, *supra*, 9 NRC at 262.

That ALAB-644 was not final agency action that precluded further agency adjudicatory consideration of seismic issues is illustrated by parallel circumstances in this very proceeding. In ALAB-728, *supra*, 17 NRC at 792-93, 812, like ALAB-644, we affirmed one of the Licensing Board’s partial initial decisions. In that decision, we held, *inter alia*, that the possible complicating effects of earthquakes on emergency planning should not be considered in individual licensing proceedings. Some months after declining to review ALAB-728, the Commission on its own motion again considered that identical issue in the operating license proceeding. See CLI-84-4, 19 NRC 937 (1984); CLI-84-12, 20 NRC 249 (1984). It could properly do this precisely because ALAB-728 did not represent final agency action on that issue in the operating license proceeding. As is obvious, the majority’s view cannot be squared with the Commission’s own actions in this proceeding.

²³ See also 42 U.S.C. § 2239(b).

²⁴ See, e.g., *Natural Resources Defense Council, Inc. v. NRC*, 680 F.2d 810 (D.C. Cir. 1982); *Honicker v. NRC*, 590 F.2d 1207 (D.C. Cir. 1978), *cert. denied*, 441 U.S. 906 (1979); *Ecology Action v. AEC*, 492 F.2d 998 (2d Cir. 1974); *Citizens for a Safe Environment v. AEC*, 489 F.2d 1018 (3rd Cir. 1973).

review of ALAB-644 because that decision did not represent final agency action and therefore the matter was not ripe for review.²⁵

II.

The majority purports to rest its conclusion that we lack jurisdiction to entertain the joint intervenors' reopening motion on the recent decision in *Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit No. 1)*, ALAB-766, 19 NRC 981 (1984). In ALAB-766 — one of many appellate decisions in the special TMI restart proceeding²⁶ — another Board dismissed an intervenor's motion for "reconsideration" for want of jurisdiction. The motion was aimed at an issue it resolved in an earlier decision, ALAB-697,²⁷ affirming one of the Licensing Board's partial initial decisions²⁸ in the restart proceeding. The motion was filed while the concluding portion of the Licensing Board's initial decision²⁹ authorizing restart was still pending on appeal. Contrary to the holdings in *Marble Hill*, ALAB-493 and ALAB-530, and without mentioning those precedents, the *TMI* Board concluded that "once we have finally determined discrete issues in a proceeding, our jurisdiction is terminated with respect to those issues . . .".³⁰ It then found that "where, as here, the Commission declines to review our decision, a final agency determination has been made resulting in the termination of our jurisdiction."³¹ Simply stated, the rationale of ALAB-766 is fallacious for the same reasons the majority here erred. As spelled out in *Marble Hill*,³² the *TMI* Board's earlier decision, which it erroneously labeled final in ALAB-766, was not final agency action that deprived it of jurisdiction over the reconsideration motion. The prior decision was rendered on appeal from a partial initial decision and only established the law of the case. To repeat, that doctrine does not bear on whether the board has jurisdiction but only whether it should exercise that jurisdiction. Absent compelling reasons,

²⁵ See *Brown v. NRC*, No. 82-1549 (D.C. Cir. July 6, 1982) (order granting respondent's motion to hold in abeyance). See also Respondent Nuclear Regulatory Commission's Motion to Hold in Abeyance, *Brown v. NRC*, No. 82-1549 (D.C. Cir.) (June 23, 1982).

²⁶ Although the TMI restart proceeding is a unique discretionary one, the Commission ordered that it be conducted in accordance with the Rules of Practice. See *Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit 1)*, CLI-79-8, 10 NRC 141, 147 (1979). See also *id.*, ALAB-685, 16 NRC 449, 451 (1982).

²⁷ 16 NRC 1265 (1982).

²⁸ LBP-81-59, 14 NRC 1211 (1981).

²⁹ LBP-82-56, 16 NRC 281 (1982).

³⁰ ALAB-766, *supra*, 19 NRC at 983.

³¹ *Id.*

³² ALAB-493, *supra*, 8 NRC at 258-60; ALAB-530, *supra*, 9 NRC at 262.

the law of the case doctrine counsels that such prior decisions should not be reconsidered as a matter of sound judicial practice, but a rule of practice is a far cry from the jurisdictional bar erroneously erected by ALAB-766. Accordingly, the reasoning of ALAB-766, like that of the majority here, is fatally flawed.

Even putting to one side its erroneous rationale, ALAB-766 loses its standing as viable precedent for a more fundamental reason. Under settled principles of *stare decisis* the application of known principles and previously disclosed courses of reasoning in one case are to be followed in subsequent decisions in order to promote agency stability and equal treatment of litigants. Although an agency does not owe slavish adherence to precedent, the doctrine of *stare decisis* takes on an added dimension in administrative adjudication. This is because “[i]t is an elementary tenet of administrative law that an agency must either conform to its own precedents or explain its departure from them.”³³ Thus, “‘when an agency decides to reverse its course, it must provide an opinion or analysis indicating that the standard is being changed and not ignored, and assuring that it is faithful and not indifferent to the rule of law.’”³⁴ Indeed, an agency’s “[f]ailure to explain the reversal of directly controlling precedent is unlawful.”³⁵ Therefore, the TMI Board was not free to ignore our *Marble Hill* holdings and reach a contrary result.³⁶ Its failure in ALAB-766 even to mention the *Marble Hill* decisions was arbitrary and capricious and robs that decision of any precedential value.³⁷ The

³³ *International Union (UAW) v. NLRB*, 459 F.2d 1329, 1341 (D.C. Cir. 1972).

³⁴ *Greyhound Corp. v. ICC*, 551 F.2d 414, 416 (D.C. Cir. 1977), quoting *Columbia Broadcasting System v. FCC*, 454 F.2d 1018, 1026 (D.C. Cir. 1971).

³⁵ *RKO General v. FCC*, 670 F.2d 215, 223 (D.C. Cir. 1981), cert. denied, 456 U.S. 927 (1982). Accord, *McHenry v. Bond*, 668 F.2d 1185, 1192 (11th Cir. 1982); *Niedert Motor Service v. United States*, 583 F.2d 954, 962 (7th Cir. 1978); *NLRB v. Silver Bay Local Union*, 498 F.2d 26, 29 (9th Cir. 1974).

³⁶ It should be noted that one appeal board does not have the unbridled authority to overrule a prior board precedent. Because the Commission’s Rules of Practice do not contain procedures for en banc review by the Appeal Panel, the settled internal practice of the Panel obligates every board to adhere to our controlling precedents. In the event a board disagrees with a prior ruling, the entire Panel must be informally polled and a majority must favor overruling the precedent. If this internal procedure is not followed, the board must apply the precedent and its only course is to entreat the Commission to review its decision in order to settle the question. Cf. *O. Hommel Co. v. Ferro Corp.*, 659 F.2d 340, 354 (3rd Cir. 1981), cert. denied, 455 U.S. 1017 (1982).

³⁷ In concluding that it lacked jurisdiction, the TMI Board purported to rely on our decisions in *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-513, 8 NRC 694 (1978) and *Virginia Electric and Power Co.* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-551, 9 NRC 704 (1979). The TMI Board, however, failed to provide any analysis of the circumstances present in each of those decisions and those cases do not support the TMI Board’s holding. Nor are *Seabrook* and *North Anna* inconsistent with our *Marble Hill* decisions, ALAB-493 and ALAB-530. Indeed, *Seabrook* was decided in the short interval between the two *Marble Hill* decisions and it was relied upon in the second *Marble Hill* decision. ALAB-530, *supra*, 9 NRC at 262 & n.2.

In *Seabrook*, at the time the intervenor filed its reopening motion, the Licensing Board’s initial decision authorizing a construction permit had been appealed and become final agency action and the

(Continued)

holding of the majority, therefore, lacks a proper footing on which to rest.

If the majority's holding is permitted to stand, our jurisdiction in circumstances like those presented here will depend solely on the happenstance of when we review partial initial decisions. Such a result is contrary to the Commission's Rules of Practice and has little to commend it. This result also encourages the erroneous use of the label "jurisdiction" as an expedient to avoid the more time-consuming task of determining whether motions to reopen meet the established tripartite test for such filings. The public interest is better served by our consideration of such motions on the merits.

For the foregoing reasons, we clearly have jurisdiction to consider the joint intervenors' motion to reopen the proceeding and I would decide it on the merits. Because I am in minority on this question, my determination of whether the record should be reopened would be merely an academic exercise. Accordingly, I shall not undertake that task.

Separate Statement of Dr. Johnson (March 7, 1985):

Mr. Moore's dissent prompts three brief observations. First, his view of the Commission's regulations and our governing precedent is novel, to say the least. He takes issue with the majority's holding that "when a

license already had issued. Because the Commission then explicitly instructed it to conduct a further exploration of the alternative site question, the *Seabrook* Board concluded that the Commission's directive did not return jurisdiction over the entire proceedings to it and that it lacked jurisdiction to entertain the reopening motion. ALAB-513, *supra*, 8 NRC at 695-96. See *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-471, 7 NRC 477, 480 n.2 (1978). After *Seabrook*, the second *Marble Hill* decision was handed down. See note 15 and accompanying text. Thereafter, in *North Anna*, we faced the question whether we had jurisdiction to consider a new safety issue raised by a Board Notification where the Licensing Board had issued an initial decision authorizing a license and no appeal had been filed. Under the Commission's Rules of Practice, the initial decision ordinarily would have become final agency action and the adjudicatory board's jurisdiction would have terminated after the time for appeal expired. See 10 C.F.R. 2.717(a), 2.760(a), 2.762(a). The question arose, however, because of the Appeal Board's customary *sua sponte* review practice — a practice not provided for in the regulations. On *sua sponte* review, the *North Anna* Board affirmed the initial decision authorizing a license but it retained jurisdiction over several matters discovered on that review. *Virginia Electric and Power Co.* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-491, 8 NRC 245 (1978). It then received a Board Notification on yet another safety question. Not surprisingly, the *North Anna* Board concluded that it had jurisdiction to consider such an issue only if the new matter had a reasonable nexus to those matters over which it had retained jurisdiction. ALAB-551, *supra*, 9 NRC at 707. Thus, in both *Seabrook* and *North Anna* an initial decision authorizing a license had become a final agency action at the time the question of our jurisdiction arose. As previously shown, the Commission's regulations make this factor determinative. Both *Seabrook* and *North Anna* are consistent with our *Marble Hill* decisions and the *TMI* Board was not free to ignore the holdings of ALAB-493 and ALAB-530.

discrete issue has been decided by an appeal board and the Commission declines to review that decision, agency action is final with respect to the issue and our jurisdiction is terminated.” Mr. Moore argues that this reflects an erroneous notion of jurisdiction and final agency action, and is contrary to both Commission precedent and regulations.

The majority’s holding in ALAB-782 is fully consistent with a long line of agency cases. While I would not presume to engage in a complex legal argument on what appears to be a rather fine point, I must say that I cannot find in the *Marble Hill* opinions relied on by the dissent any express articulation of the principle for which Mr. Moore now claims they stand. Indeed, ALAB-530 seems entirely consistent with the approach adopted by the majority here, and the most that can be said for ALAB-493 is that it is limited by the unique circumstances there present. See 8 NRC at 260. Nor does he point to any support for the reading of the regulations on which he relies. Various appeal boards before and since ALAB-782 have considered this issue and none has expressed any difficulty with the “jurisdictional” approach followed by the majority.¹

Second, during my tenure with the Appeal Panel, since 1974, I have never been aware of the internal procedure for overruling prior decisions described in the dissent at note 36. For about the past three years, however, we have consistently followed a practice under which drafts of opinions to be published are circulated to all Panel members and our professional staff in advance of their issuance. The purpose of this practice is to avoid potential inconsistencies between or among our decisions. The chairman of the Board that issued ALAB-766 in the *Three Mile Island Restart* case (on which the majority here relied and which Mr. Moore criticizes) advises me that no one interposed any substantive objection to that Board’s disposition of the motion involved there. Similarly, apart from Mr. Moore, no Panel or staff member suggested that our approach in ALAB-782 was wrong. I must assume that the other Panel members considered our decision (i.e., ALAB-782), as well as ALAB-766, to be consistent with governing precedent.

Third, it is not clear to me what problem Mr. Moore’s dissent seeks to correct. Over the years there has evolved what appears to be a sensible and practical distribution of responsibility for reviewing matters raised

¹ See, e.g., *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-513, 8 NRC 694, 695-96 (1978); *Louisiana Power & Light Co.* (Waterford Steam Electric Station, Unit 3), ALAB-753, 18 NRC 1321, 1329-30 (1983); *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), ALAB-766, 19 NRC 981, 983 (1984); *Louisiana Power & Light Co.* (Waterford Steam Electric Station, Unit 3), ALAB-792, 20 NRC 1585, 1588-89 (1984), *clarified*, ALAB-797, 21 NRC 6 (1985).

anew.² Common sense and the realities of the NRC's unique administrative litigation structure (including the division of authority among the adjudicatory boards, the Commission and the NRC staff) — more than the strict principles of jurisdiction that apply to the federal courts — have governed our actions.³ The Commission has not seen fit to alter that approach. Mr. Moore would now have the adjudicatory boards retain authority to pass on such matters until the ink has dried on the final adjudicatory decision in each proceeding. He offers no persuasive explanation why this new approach is necessary or desirable.

² Because many months have passed since ALAB-782 was issued (i.e., on September 6, 1984), it is useful to review some of the events that preceded it. On July 27, 1984, in an unpublished order we unanimously referred to the Commission a request by Joint Intervenors to stay authorization of the full power operation of the plant. That request relied upon, among other things, the geological information included in Joint Intervenors' motion to reopen the record. Then on August 10, 1984, the Commission authorized a full power license for Diablo Canyon. CLI-84-13, 20 NRC 267 (1984). That order denied Joint Intervenors' stay request and addressed explicitly the same new geological information presented in the motion to reopen. In rejecting Joint Intervenors' arguments, the Commission relied to a great extent upon our earlier geological findings in ALAB-644. 20 NRC at 275-78.

Thus here, rather than the usual situation in which the Commission simply declines to review an Appeal Board decision, we have the case in which the Commission has affirmatively adopted the Appeal Board's findings. In these circumstances, it would appear to be disruptive in the extreme for the Board to announce its authority to relitigate these same issues.

³ See, e.g., *Philadelphia Electric Co.* (Limerick Generating Station, Units 1 and 2), ALAB-726, 17 NRC 755 (1983). Cf. *Union Electric Co.* (Callaway Plant, Unit 1), ALAB-750A, 18 NRC 1218, 1219-20 (1983).

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL PANEL

Alan S. Rosenthal, Chairman

In the Matter of

**Docket Nos. STN 50-518
STN 50-520**

**TENNESSEE VALLEY AUTHORITY
(Hartsville Nuclear Plant,
Units 1A and 2A)**

In the Matter of

**Docket Nos. STN 50-566
STN 50-567**

**TENNESSEE VALLEY AUTHORITY
(Yellow Creek Nuclear Plant,
Units 1 and 2)**

September 11, 1984

Based upon the cancellation of Units 1A and 2A of the proposed Hartsville Nuclear Plant and the proposed two-unit Yellow Creek Nuclear Plant, the Appeal Board terminates the limited jurisdiction it previously retained over the construction permit proceedings involving these facilities.

APPEARANCES

Herbert S. Sanger, Jr., Lewis E. Wallace and W. Walter LaRoche,
Knoxville, Tennessee, for the applicant, Tennessee Valley
Authority.

MEMORANDUM AND ORDER

On August 29, 1984, the Board of Directors of the Tennessee Valley Authority (TVA) decided to cancel (1) Units 1A and 2A of the proposed Hartsville Nuclear Plant; and (2) the proposed two-unit Yellow Creek Nuclear Plant.¹ In light of this development, TVA seeks the termination of the limited appellate jurisdiction previously retained over the construction permit proceedings involving these facilities.² Its motions to that effect are *granted* on the authority of ALAB-760, *supra* note 1, and the decisions there cited.

It is so ORDERED.

FOR THE APPEAL PANEL
CHAIRMAN

C. Jean Shoemaker
Secretary to the Appeal Panel

This action was taken by the Appeal Panel Chairman under the authority of 10 C.F.R. 2.787(b).

¹ TVA had previously cancelled Units 1B and 2B of the Hartsville facility. See ALAB-760, 19 NRC 26 (1984).

² The retained jurisdiction in both proceedings was with regard to a single generic issue as to which an ultimate Commission determination has not as yet been reached: the environmental effects associated with the release of radioactive radon gas (radon-222) to the atmosphere as a result of the mining and milling of uranium for reactor fuel. See ALAB-554, 10 NRC 15, 16 n.2 (1979) (*Hartsville*); ALAB-558, 10 NRC 158, 159 (1979) (*Hartsville*); ALAB-515, 8 NRC 702, 715 (1978) (*Yellow Creek*).

ALAB-554 and ALAB-558 applied to all four Hartsville units. The jurisdiction over the radon issue retained in those decisions with regard to Units 1B and 2B was terminated in ALAB-760, *supra* note 1.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Alan S. Rosenthal, Chairman
Thomas S. Moore
Dr. Reginald L. Gotchy

In the Matter of

Docket No. 50-482-OL

**KANSAS GAS AND ELECTRIC
COMPANY, et al.**
**(Wolf Creek Generating Station,
Unit 1)**

September 13, 1984

The Appeal Board affirms an earlier order of the Licensing Board that dismissed an intervenor as a party to this operating license proceeding based upon the Licensing Board's determination that the intervenor's single contention concerned the financial qualifications of an applicant and, under the Commission's rules, such issues are not litigable in such proceedings. The Appeal Board's action is predicated upon the Commission's promulgation of a new rule that, like its predecessor, removed consideration of an applicant's financial qualifications from operating license proceedings.

ADJUDICATORY BOARDS: AUTHORITY

Neither appeal boards nor licensing boards are empowered to entertain challenges to the legality of a Commission regulation. *See* 10 C.F.R. 2.758(a); *see also Potomac Electric Power Co.* (Douglas Point Nuclear Generating Station, Units 1 and 2), ALAB-218, 8 AEC 79, 89-90 (1974).

APPEARANCES

John M. Simpson, Shawnee Mission, Kansas, for the appellant, Kansans for Sensible Energy.

Jay E. Silberg and **Delissa A. Ridgway**, Washington, D.C., for the applicants, Kansas Gas and Electric Company, *et al.*

Myron Karman for the Nuclear Regulatory Commission staff.

DECISION

In an unpublished June 9, 1982 order, the Licensing Board dismissed intervenor Kansans for Sensible Energy (KASE) as a party to this operating license proceeding. That action rested upon two factors: (1) KASE's single contention concerned the financial qualifications of one of the applicants; and (2) effective March 31, 1982, the Commission had amended its regulations to remove financial qualifications issues from, *inter alia*, proceedings such as this one.¹

KASE filed a timely appeal from the June 9 order, contending that the elimination of consideration of financial qualifications issues in reactor licensing proceedings contravened the Atomic Energy Act. On June 28, 1982, we entered an order in which we pointed out that neither appeal boards nor licensing boards are empowered to entertain challenges to the legality of a Commission regulation.² The order went on, however, to advise the parties that we were nevertheless deferring final action on the appeal. This was because it had come to our attention that KASE and certain other organizations had filed a petition for review of the amended financial qualifications rule in the United States Court of Appeals for the District of Columbia Circuit. In the circumstances, it seemed advisable to await the court's disposition of the petition.³

On February 7, 1984, the District of Columbia Circuit issued its decision on the petition for review. The court held that the amended financial qualifications rule was not supported by its accompanying statement of basis and purpose, as required by the Administrative Procedure Act.

¹ 47 Fed. Reg. 13,750 (1982).

² See 10 C.F.R. 2.758(a); see also *Potomac Electric Power Co.* (Douglas Point Nuclear Generating Station, Units 1 and 2), ALAB-218, 8 AEC 79, 89-90 (1974).

³ June 28, 1982 order (unpublished) at 3.

Accordingly, the court remanded the rule to the Commission for further proceedings consistent with its opinion.⁴

In response to the remand, the Commission has now promulgated a new rule, which will take effect on October 12, 1984. By its terms, financial qualifications issues may be raised in *construction permit* proceedings. But, as under the replaced 1982 rule, such issues are not to be litigated in *operating license* proceedings.⁵

In light of this development, we now *affirm* the result reached by the Licensing Board in its June 9, 1982 order.⁶

It is so ORDERED.⁷

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the
Appeal Board

⁴ *New England Coalition on Nuclear Pollution v. NRC*, 727 F.2d 1127 (D.C. Cir. 1984).

⁵ 49 Fed. Reg. 35,747, as corrected, 49 Fed. Reg. 36,631 (1984). That the new rule is not as yet effective is of no present moment. In a statement of policy issued on June 7, 1984, the Commission determined that "the March 31, 1982 rule will continue in effect until finalization of the Commission's response to the Court's remand." The appeal and licensing boards were directed "to proceed accordingly." 49 Fed. Reg. 24,111 (1984).

⁶ As noted, this appeal has been on our docket for an extended period. We see no compelling reason to hold it in abeyance still further to await the outcome of any petition for judicial review of the new rule that might be filed. In the event such a petition is filed and proves successful, an appropriate remedy presumably will be available to KASE.

⁷ On July 2, 1984, the Licensing Board rendered its initial decision in this proceeding, in which it authorized, subject to certain conditions, the issuance of an operating license for the Wolf Creek nuclear facility. LBP-84-26, 20 NRC 53. In the absence of any appeal from that decision, we have undertaken to review it on our own initiative. See our August 3, 1984 order (unpublished). Upon completion of our review, we will announce the results in a separate decision.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Christine N. Kohl, Chairman
Gary J. Edles
Dr. Reginald L. Gotchy

In the Matter of

Docket Nos. 50-352
50-353

PHILADELPHIA ELECTRIC COMPANY
(Limerick Generating Station,
Units 1 and 2)

September 26, 1984

The Appeal Board affirms, in part, the Licensing Board's decisions in this operating license proceeding concerning the environmental impacts of the Limerick supplementary cooling water system, and remands two issues to the Licensing Board to afford the intervenor the opportunity to resubmit its contentions on those issues. Additionally, the Appeal Board denies the intervenor's motions to set aside the Licensing Board's decisions on the basis of new evidence.

**DELAWARE RIVER BASIN COMPACT: EFFECT ON
FEDERAL ACTIONS**

Federal agencies are precluded from taking action that "substantially conflict[s]" with a comprehensive plan for the development and use of the water resources of the Delaware River Basin (DRB) when it has been adopted by the Delaware River Basin Commission (DRBC) with the concurrence of the Commission's federal representative. *See* DRB

Compact, Pub. L. No. 87-328, § 15.1(s)1, 1961 U.S. Code Cong. & Ad. News (75 Stat. 688) 775, 807-08.

ADJUDICATION: ENVIRONMENTAL IMPACT STATEMENTS

In the usual case, environmental hearings await the preparation and circulation of the staff's final environmental statement. *See, e.g., Potomac Electric Power Co.* (Douglas Point Nuclear Generating Station, Units 1 and 2), ALAB-277, 1 NRC 539, 546 (1975).

ADJUDICATORY BOARDS: CONDUCT OF PROCEEDINGS

Although an agency must ordinarily adhere to its own rules and established practices, it is always within the discretion of an administrative agency to relax or modify its procedural rules adopted for the orderly transaction of business before it when in a given case the ends of justice require it. *See American Farm Lines v. Black Ball Freight Service*, 397 U.S. 532, 539 (1970), *quoting NLRB v. Monsanto Chemical Co.*, 205 F.2d 763, 764 (8th Cir. 1953).

ADJUDICATORY BOARD: AUTHORITY OVER STAFF ACTION

A licensing board may direct the staff to publish its environmental documents by specific dates if, after affording the parties — including the staff — opportunity to be heard on the matter, it finds no further delay is justified. *Offshore Power Systems* (Floating Nuclear Power Plants), ALAB-489, 8 NRC 194, 208 (1978). *See also* 49 Fed. Reg. 9352, 9361 & n.14, 9383-84 (1984) (the latter to be codified at 10 C.F.R. § 51.15).

NEPA: ENVIRONMENTAL IMPACT STATEMENTS (TIMING)

NEPA does not address the timing of an environmental statement, as long as it is available by the time of the agency's recommendation or report on the proposed federal action. *New England Coalition on Nuclear Pollution v. NRC*, 582 F.2d 87, 93-94 (1st Cir. 1978).

DELAWARE RIVER BASIN COMPACT: EFFECT ON FEDERAL ACTIONS

The NRC could neither authorize a utility to withdraw water from the Delaware River in amounts that exceed that allocated by the DRBC, nor require the DRBC to make any particular allocation decision among the competing interests for the Delaware River. But the NRC is not precluded from examining the effects of the amount withdrawn for a nuclear power plant and acting to lessen the impact of a plant on the Delaware River.

NEPA: NRC RESPONSIBILITIES

The Commission has an independent responsibility to fulfill the purposes of NEPA to the fullest extent possible. 42 U.S.C. § 4332. *See Tennessee Valley Authority* (Phipps Bend Nuclear Plant, Units 1 and 2), ALAB-506, 8 NRC 533, 544-49 (1978). *But see Bucks County Board of Commissioners v. Interstate Energy Co.*, 403 F. Supp. 805, 808 (E.D. Pa. 1975) (DRBC is "the federal agency designated to implement NEPA for all projects affecting the Delaware River Basin"). In carrying out its NEPA duties, the NRC need not perform a wholly independent analysis from scratch, but may rely, if it wishes, on scientific data and inferences drawn by other agencies.

ADJUDICATORY BOARDS: JURISDICTION

To the extent that an application for an operating license reflects some actual changes in connection with the facility as it was contemplated at the time of issuance of the construction permit, such changes are within the scope of the operating license proceeding. On the other hand, if activity already authorized by the construction permit results in impacts not previously expected, that is a matter for resolution by the Director of Nuclear Reactor Regulation pursuant to 10 C.F.R. §§ 2.202, 2.206. *See Consumers Power Co.* (Midland Plant, Units 1 & 2), ALAB-674, 15 NRC 1101 (1982).

NEPA: NRC RESPONSIBILITIES

NEPA does not require the NRC to consider those environmental impacts of a water diversion project solely attributable to a separate entity otherwise unassociated with the nuclear plant, when the total impacts have already been evaluated by another agency with oversight of the

entire project. *See Henry v. FPC*, 513 F.2d 395 (D.C. Cir. 1975). *See also Kleppe v. Sierra Club*, 427 U.S. 390, 410 (1976).

NATIONAL HISTORIC PRESERVATION ACT: REQUIREMENTS

Section 106 of the National Historic Preservation Act (NHPA) requires the head of any federal agency having authority to license any undertaking, prior to the issuance of any license, to take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such federal agency also must afford the Advisory Council on Historic Preservation a reasonable opportunity to comment with regard to such undertaking. 16 U.S.C. § 470f.

NATIONAL HISTORIC PRESERVATION ACT: REQUIREMENTS

Section 110(f) of NHPA requires agencies to undertake in advance all possible planning and actions necessary to minimize any direct and adverse harm to a National Historic Landmark as a consequence of any federal approval. 16 U.S.C. § 470h-2(f).

FISH AND WILDLIFE COORDINATION ACT: REQUIREMENTS (CONSULTATION)

The requirement of the Fish and Wildlife Coordination Act, 16 U.S.C. § 662(a) — that an agency “first shall consult” with the U.S. Fish and Wildlife Service whenever any waters are proposed or authorized to be diverted pursuant to a federal license — does not prescribe exactly when and how this consultation is to occur, so long as it precedes any definitive agency action.

NEPA: REQUIREMENTS

Section 102 of NEPA, 42 U.S.C. § 4332(2)(C), requires consideration of alternatives only for major federal actions “significantly affecting the quality of the human environment.”

ENDANGERED SPECIES ACT: REQUIREMENTS

Section 7 of the Endangered Species Act (ESA), as amended in 1979, 16 U.S.C. § 1536(a)(2), provides that each federal agency must, in consultation with and with the assistance of the Secretary of the Interior or Commerce, insure that any agency action is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of the habitat of such species. In fulfilling this requirement, each agency must use the best scientific and commercial data available.

ENDANGERED SPECIES ACT: REQUIREMENTS

Section 7 of ESA does not require acquiescence to National Marine Fisheries Service views, just consultation. *Sierra Club v. Froehlke*, 534 F.2d 1289, 1303-04 (8th Cir. 1976). *Cf. Lake Erie Alliance for the Protection of the Coastal Corridor v. Army Corps of Engineers*, 526 F. Supp. 1063, 1081 (W.D. Pa. 1981), *aff'd*, 707 F.2d 1392 (3d Cir.), *cert. denied*, ___ U.S. ___, 104 S. Ct. 277 (1983).

ENDANGERED SPECIES ACT: REQUIREMENTS

Congress did not design ESA to protect individual members of an endangered species, only the species as a whole. The smallest units afforded protection are "subspecies" and "any distinct population segment . . . which interbreeds when mature." 16 U.S.C. § 1532(16).

RULES OF PRACTICE: EX PARTE COMMUNICATIONS

The Commission's ex parte rules prohibit communications between the parties to contested proceedings, on the one hand, and, on the other, those with decisionmaking responsibilities — i.e., Commissioners, their staffs and advisers, members of adjudicatory boards, and their staffs and advisers. 10 C.F.R. § 2.780. *See* Administrative Procedure Act, 5 U.S.C. § 557(d). The "NRC staff" does not advise the Commission or the boards. Rather, it is a distinct and separate entity that is a party to a proceeding and may confer with other parties. *See* 10 C.F.R. § 2.102(a).

ADJUDICATORY BOARDS: SCOPE OF AUTHORITY

Adjudicatory boards can act only on applications before them and cannot dictate changes in such applications that are a matter of management prerogative.

RULES OF PRACTICE: RESPONSIBILITIES OF PARTIES

An applicant is obliged to notify the board and the parties promptly of any significant changes in its application. *Tennessee Valley Authority* (Browns Ferry Nuclear Plant, Units 1, 2 and 3), ALAB-677, 15 NRC 1387, 1391-94 (1982).

ADJUDICATORY HEARINGS: NEW INFORMATION

Parties to an adjudicatory proceeding must be afforded an opportunity to challenge any newly amended, significant portion of an application under consideration. *See Philadelphia Electric Co.* (Limerick Generating Station, Units 1 and 2), ALAB-778, 20 NRC 42, 48 (1984).

ADJUDICATORY BOARDS: EFFECT OF OTHER PROCEEDINGS

In making its determinations, an adjudicatory board must decide only the federal questions before it, without being unduly influenced by the decisions of others with differing concerns and responsibilities. *See Kerr-McGee Corp.* (West Chicago Rare Earths Facility), CLI-82-2, 15 NRC 232, 269 (1982), *aff'd sub nom. City of West Chicago v. NRC*, 701 F.2d 632 (7th Cir. 1983), and cases cited. *See also Cross-Sound Ferry Services, Inc. v. United States*, 573 F.2d 725, 732-33 (2d Cir. 1978).

APPEARANCES

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DECISION

I. INTRODUCTION AND SUMMARY

This case concerns an application by Philadelphia Electric Company (the applicant or PECO) for an operating license for its Limerick Station, Units 1 and 2. All issues in this appeal involve the applicant's effort to use the Delaware River to provide supplementary cooling water for the

plant.¹ The appellant is Del-Aware Unlimited, Inc. (Del-Aware), an organization with members who live near the area of the Delaware River at issue here. Although it litigated several contentions concerning the environmental impact of using the Delaware River to provide supplementary cooling water, other similar issues it sought to raise were excluded. Following a hearing on the admitted contentions, the Licensing Board concluded that there would be no adverse environmental impact from the use of Delaware River water for the Limerick plant.²

Del-Aware's challenges on appeal from the Board's disposition of its various contentions can be divided into four broad categories. First, Del-Aware attacks the Board's decision to hold hearings on its contentions before the NRC staff issued its environmental impact statement. Second, it disputes the Board's determination to exclude certain contentions from consideration at the hearing. Third, it objects to the Board's disposition of those issues actually considered. Fourth, it claims that various recent developments warrant remand to the Board for consideration of alternatives to the use of Delaware River water. PECO and the NRC staff oppose the appeal.

We affirm the Board's decision on all but two issues. As explained in more detail below, Del-Aware must be given an opportunity to formulate, promptly and in accordance with 10 C.F.R. § 2.714, certain new contentions. They are to be based on the staff's now issued final environmental statement (FES), and should concern (1) the impact of the supplementary cooling water system on the salinity of the Delaware River, and (2) the system's impacts on the Point Pleasant Historic District.

II. BACKGROUND

Like most electricity generating plants, Limerick will require a substantial amount of water for operation. As the project stands now, PECO intends to draw cooling water primarily from either the adjacent Schuylkill River or the nearby Perkiomen Creek. When water from these sources is inadequate, PECO intends to supplement it by drawing cooling water from the Delaware River and transporting it to the plant through a series of pipelines and pumping stations. This has been termed the "river-follower" method of supplementary cooling. The withdrawal of water from the Delaware River for use at Limerick is part of an overall

¹ Various issues unrelated to the supplementary cooling water system were recently decided by the Licensing Board in LBP-84-31, 20 NRC 446 (1984). Still other issues remain pending.

² LBP-83-11, 17 NRC 413 (1983).

venture known as the Point Pleasant Diversion (PPD) project, which is to provide water for the Neshaminy Water Resources Authority (NWRA) (serving Bucks and Montgomery Counties, Pennsylvania), as well as for PECO's use.³

The lengthy history of this project is set forth in several earlier NRC decisions.⁴ We will not rehearse here the genesis of the river-follower method, except as necessary for the discussion of the issues now before us on appeal. A brief chronology of events pertinent to this proceeding, however, is useful.

A. AEC/NRC and DRBC Reviews

The allocation of Delaware River water among conflicting potential uses, such as the Point Pleasant Diversion project, is determined by the Delaware River Basin Commission (DRBC). This is a regional entity created by an intergovernmental compact and ratified by joint resolution of Congress.⁵ The Commission is comprised of the governors of Delaware, Pennsylvania, New York, and New Jersey, plus a federal representative. The Compact requires the DRBC to prepare, and from time to time to revise, a comprehensive plan for the development and use of the water resources of the Delaware River Basin. Federal agencies are precluded from taking action that "substantially conflict[s]" with such comprehensive plan when adopted by the DRBC with the concurrence of the federal representative.⁶

The pumping station at Point Pleasant was originally approved by the DRBC and added to the comprehensive plan in 1966. PECO, which filed its application to construct Limerick in 1970, and NWRA requested DRBC approval for inclusion in the comprehensive plan that same year (1970). In 1973, the DRBC issued a final environmental impact statement on the proposal and tentatively granted approval to PECO to withdraw water from the Delaware River, subject to certain flow restrictions. The DRBC also indicated that the river-follower method was one of

³ The project gets its name because the intake from the Delaware River is located near Point Pleasant, Pennsylvania. Water is to be drawn from the Delaware River and pumped through a transmission main to the Bradshaw Reservoir. Beyond the reservoir the flow will be divided. A portion of the water will flow to the Neshaminy Creek watershed where it is to be used as part of the municipal water supply for NWRA and for low flow augmentation for water quality control. The rest of the water will be used at Limerick. It will flow via pipeline to the East Branch of the Perkiomen Creek. From the East Branch the water will travel into the main stream of the Perkiomen. A final pumping station will transmit the water via a line from an intake on the Perkiomen to the Limerick plant. See map in Appendix A.

⁴ See, e.g., LBP-74-44, 7 AEC 1098 (1974); ALAB-262, 1 NRC 163 (1975).

⁵ See DRB Compact, Pub. L. No. 87-328, 1961 U.S. Code Cong. & Ad. News (75 Stat. 688) 775.

⁶ *Id.*, § 15.1(s)1, 1961 U.S. Code Cong. & Ad. News at 807-08.

three available options for effecting the withdrawal and that it would reach a final decision on the matter at a later time.

A licensing board authorized the issuance of a construction permit to PECO in 1974, but excluded the river-follower method as a bona fide alternative for providing supplementary cooling water.⁷ Although the Atomic Energy Commission's staff (predecessor to the NRC) had prepared a final environmental impact statement for Limerick's construction permit application, the Board found that the environmental impacts of the river-follower method had not been adequately considered. On appeal, we disagreed and concluded that the consideration of this alternative was adequate, noting that it would add no environmental "costs" but might only reduce the "benefits" for economic reasons.⁸ The U.S. Court of Appeals for the Third Circuit affirmed our decision.⁹

In 1979, PECO and NWRA filed applications with the DRBC to obtain final approval for construction of their respective portions of the Point Pleasant Diversion pumping stations and transmission mains. These applications reflected a downscaled version of the project, as tentatively approved earlier by the DRBC.¹⁰ The DRBC once again performed an environmental review and in August 1980 prepared an "environmental assessment" with a "negative declaration." In other words, the DRBC found no significant environmental impacts from the project and thus no need for another environmental impact statement. It granted final approval to PECO's and NWRA's applications in 1981. Under a condition imposed by the DRBC, however, PECO may not withdraw cooling water from the Delaware River when the flow at Trenton, New Jersey, is less than 3,000 cubic feet per second (cfs), unless PECO releases from off-stream storage an amount of water equal to that it withdraws. The DRBC's decision was challenged in federal court and upheld.¹¹

PECO filed its operating license application with the NRC in 1981. The Commission published a notice of opportunity for hearing, and the Licensing Board held a special prehearing conference to consider petitions for intervention. In an order following the conference, the Board,

⁷ LBP-74-44, *supra*, 7 AEC at 1128.

⁸ ALAB-262, *supra*, 1 NRC at 189-97, 199-205.

⁹ *Environmental Coalition on Nuclear Power v. NRC*, 524 F.2d 1403 (3d Cir. 1975).

¹⁰ The original plans called for a maximum total withdrawal of 150 million gallons of water per day (mgd). The new plan sought withdrawal of only 95 mgd — 46 mgd for Limerick and 49 for NWRA.

¹¹ *Delaware Water Emergency Group v. Hansler*, 536 F. Supp. 26 (E.D. Pa. 1981), *aff'd*, 681 F.2d 805 (3d Cir. 1982) (hereafter "*Hansler*"). The district court noted the several environmental impact statements that had already been prepared in connection with this project, including that of the DRBC in 1973, the AEC in 1973, and the Soil Conservation Service of the U.S. Department of Agriculture in 1976. *Id.* at 33-34.

inter alia, admitted Del-Aware as a party to the case and accepted several of its contentions for litigation.¹²

The Licensing Board also made a number of other determinations pertinent to this appeal. First, it concluded that, absent a showing of sufficiently changed circumstances since the construction permit was issued, it would not relitigate environmental matters that were considered in the construction permit proceeding.¹³ On a related point, the Board also concluded that it lacked jurisdiction to consider "changes in impacts of construction resulting from changed circumstances."¹⁴ In doing so, the Board stressed that the Notice of Opportunity for Hearing in this proceeding limited its authority to consideration of only matters relating to the proposed *operation* of the plant.¹⁵ The Board thus distinguished *construction* impacts from "*operational* impacts of construction changes."¹⁶ Second, the Board ruled that it would consider the total environmental impacts of the portions of the project to be used jointly by PECO and NWRA — i.e., the Point Pleasant intake and pumping station, the transmission main to the Bradshaw Reservoir, and the reservoir itself.¹⁷ It would not consider, however, those portions of the water supply system to be used exclusively by NWRA — i.e., the transmission main from the Bradshaw Reservoir to the North Branch of the Neshaminy Creek, the North Branch Water Treatment Plant, and the transmission mains from the treatment plant.¹⁸

Third, the Board determined that section 15.1(s)1 of the DRB Compact precluded it from reevaluating the DRBC decision allocating water to Limerick via the river-follower mode.¹⁹ This provision bars federal

¹² LBP-82-43A, 15 NRC 1423, 1440-41, 1479 (1982). As pertinent here, those contentions are:

Contention V-15 and V-16a (in part) — The intake will be relocated such that it will have significant adverse impact on American shad and short-nosed [sic] sturgeon. The relocation will adversely affect a major fish resource and boating and recreation area due to draw-down of the pool.

Contention V-16a — Noise effects and constant dredging maintenance connected with operations of the intake and its associated pump station will adversely affect the peace and tranquility of the Point Pleasant proposed historic district.

¹³ *Id.* at 1458-64. The Board based this conclusion on its understanding of the scope of review required by the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321, at the operating license stage. *Id.* at 1461.

¹⁴ *Id.* at 1476.

¹⁵ *Id.* at 1477.

¹⁶ *Id.* at 1476 (emphasis added). Among the changes alleged by Del-Aware and noted by the Board were a change in the location of the intake structure at Point Pleasant (from the shoreline to farther out into the river); the reported discovery of shortnose sturgeon, an endangered species, in the river since the conclusion of the construction permit proceeding; and the recent eligibility of the Point Pleasant Historic District for listing in the National Register of Historic Places. *Id.* at 1461, 1476.

¹⁷ *Id.* at 1472.

¹⁸ *Id.* at 1473.

¹⁹ *Id.* at 1469. The Board noted, however, that the Compact did not bar consideration of all environmental issues arising due to the Diversion project — just those relating to water allocation. *Ibid.*

action that substantially conflicts with the DRBC's comprehensive plan, of which water allocation is a principal part. Del-Aware's proposed contention V-16 concerned the Diversion's assertedly adverse effect on water quality in the Delaware River — specifically an increase in salinity. Because salinity is a function of total water withdrawal and thus allocation, the Board reasoned, this was a matter committed to the DRBC's discretion. The Board therefore refused to admit the contention.²⁰ It noted, however, that even in the absence of the statutory bar, Del-Aware would have a "heavy burden" in showing why any NRC reliance on the DRBC's salinity analysis was improper or unjustified.²¹

Finally, because NWRA and PECO were soon to begin construction of the Point Pleasant Diversion, the Board decided to review the environmental impacts of its operation on an expedited basis — even before the staff completed its draft environmental statement. The Board believed that its consideration of Del-Aware's contentions, particularly the need for mitigation of potential adverse operating impacts resulting from or exacerbated by the changes, might be compromised if undertaken after the start of construction.²² As a result, hearings on Del-Aware's contentions were held in October 1982, some eight months before the issuance of the staff's draft environmental impact statement.²³

The Board issued its partial initial decision in March 1983. It summarized its conclusions as follows:

On the basis of the record before it, the Board finds ~~contrary~~ to the contention of the intervenor, that there would be no significant adverse impact on the populations of American shad and shortnose sturgeon in the Delaware River as a result of operation of the presently proposed Point Pleasant intake. The Board also finds that there is no evidence that the proposed intake would have an adverse impact on recreational activities in the Delaware River.

The Board finds that noise from operation of the intake as it is presently proposed could have a significantly adverse impact on the Point Pleasant proposed historic district. The Board, in its order, is imposing a condition which requires that a determination be made, if the intake is built, as to whether there are such significant noise impacts and, if so, requires that such impact be minimized. The Board concludes that after any necessary noise mitigation measures have been undertaken,

²⁰ *Id.* at 1484-85; Licensing Board Memorandum and Order of July 14, 1982 (unpublished), at 18-19; LBP-82-72, 16 NRC 968 (1982).

²¹ LBP-82-43A, *supra*, 15 NRC at 1485. *See generally id.* at 1464-70.

²² *Id.* at 1479-80. *See* Memorandum and Order of July 14, 1982, *supra*, at 15-18; LBP-82-92A, 16 NRC 1387 (1982).

²³ NWRA began construction at Point Pleasant on December 15, 1982, but construction has subsequently been suspended. *See* Applicant's Notice (Oct. 28, 1982). *See also* p. 883, *infra*.

As noted, the NRC staff issued its draft environmental statement on the Limerick operating license in June 1983. The final environmental statement (FES) was issued in April 1984.

operation of and maintenance for the proposed intake and pumping station would not have a significantly adverse effect on the proposed historic district.²⁴

This appeal followed.²⁵

B. U.S. Army Corps of Engineers Review

In response to a request from NWRA for a permit authorizing construction of the intake structure, the United States Army Corps of Engineers examined those environmental matters that had arisen since the DRBC's 1981 decision and its affirmance by the court in *Hansler*.²⁶ Among the new matters evaluated, insofar as they are pertinent here, were: (1) movement of the intake system from the shore bank into the channel of the Delaware River; (2) a determination by the Advisory Council on Historic Preservation that the village of Point Pleasant was eligible to be placed on the Historic Register; (3) the assertion that shortnose sturgeon had been seen in the area near Point Pleasant; and (4) salinity and ground water studies performed by or for the DRBC.²⁷ Following its environmental evaluation, the Corps issued the permit on October 25, 1982.

Del-Aware challenged the Corps decision in federal district court, raising issues similar to those presented on appeal to us. The court decided, at least for the purpose of denying a preliminary injunction, that the Corps of Engineers had adequately considered the environmental effects of moving the intake on salinity, the shad and shortnose sturgeon, and recreation.²⁸ It also found that the historic character of the area had been properly taken into account.²⁹ The court observed:

A study of the complaint in the Hansler case demonstrates that it was wide ranging and touched upon almost all the issues which are raised here as if they were new.³⁰

²⁴ LBP-83-11, *supra*, 17 NRC at 416.

²⁵ The Licensing Board issued at least 10 orders and decisions dealing with the supplementary cooling water system at Limerick. Many of these ruled on Del-Aware's numerous, belated efforts to litigate new or assertedly new contentions on this subject. Del-Aware's arguments on appeal, however, relate almost exclusively to the Licensing Board's Special Prehearing Conference Order, LBP-82-43A, and its partial initial decision, LBP-83-11. We will discuss or note the Board's other orders and rulings only as pertinent to the resolution of particular arguments on appeal.

²⁶ See note 11, *supra*.

²⁷ See *Del-Aware Unlimited, Inc. v. Baldwin*, No. 82-5115, Tr. 1445-46 (E.D. Pa. Dec. 15, 1982), *aff'd*, 720 F.2d 661 (3d Cir. 1983), *cert. denied*, ___ U.S. ___, 104 S. Ct. 1274 (1984) (hereafter "*Baldwin*") (The district court's opinion was issued from the bench.)

²⁸ *Id.*, Tr. 1444, 1450-53.

²⁹ *Id.*, Tr. 1446-50.

³⁰ *Id.*, Tr. 1444.

C. State and Local Activity

Developments on several fronts at the state and local level have occurred in connection with PECO's Limerick facility since the record in this proceeding was closed.³¹ Del-Aware asserts that they have a bearing on this appeal, and it has filed two motions essentially seeking that we set aside the Licensing Board's decision on this basis. We discuss and rule on the motions in Part III.D. of this opinion. The various legal actions, most of which are ongoing, are summarized below.

1. *Pennsylvania Public Utility Commission*

In 1983, the Pennsylvania Supreme Court upheld a decision by the Commonwealth's Public Utility Commission (PUC) that withheld approval of PECO's request to issue additional securities to finance Unit 2.³² In two other recent decisions, the PUC has rejected PECO's new financing proposals for Limerick.³³ Pending before the PUC is also an investigation of the need for Unit 2.³⁴

Because a variance from local zoning ordinances is required, PECO sought approval from the PUC to construct the pumphouse at the Bradshaw Reservoir. In a December 1983 decision, an administrative law judge approved PECO's application to build the pumphouse, but with only one of the four pumps requested. A second pump was authorized, pending the results of a one-year program to monitor the effects of flooding and erosion.³⁵ This decision is apparently awaiting further review by the PUC itself.³⁶

2. *Pennsylvania Department of Environmental Resources*

In September 1982, the Pennsylvania Department of Environmental Resources (DER) issued permits to PECO and NWRA for certain construction and maintenance activities in conjunction with the Point Pleasant Diversion project. Del-Aware appealed DER's action before the

³¹ These developments have been brought to our attention by both Del-Aware and PECO.

³² *Pennsylvania Public Utility Commission v. Philadelphia Electric Co.*, 501 Pa. 153, 460 A.2d 734 (1983).

³³ *Securities Certificate of Philadelphia Electric Co. in the matter of the Limerick Revolving Credit/Term Loan not in excess of \$1,100,000,000*, No. S-834987 (Pa. P.U.C. Dec. 23, 1983); *Limerick Nuclear Generating Station Investigation*, No. I-80100341 (Pa. P.U.C. Dec. 23, 1983).

³⁴ See NRC Staff Response to Motion by Del-Aware to Set Aside the Partial Initial Decision (Aug. 27, 1984), Attachment.

³⁵ *Application of Philadelphia Electric Co.*, No. A-00103956 (Pa. P.U.C. Dec. 12, 1983) (ALJ Kranzel).

³⁶ See Del-Aware's Motion to Set Aside Based on New Evidence (Aug. 6, 1984) at 3-4.

Commonwealth's Environmental Hearing Board. In an extensive opinion, the Board concluded that DER had not abused its discretion in issuing the permits and had not failed to give adequate consideration to alternatives to PECO's part of the project.³⁷ It remanded the matter, however, for DER to impose certain technical conditions on the involved permits.³⁸

3. *Bucks County*

The citizens of Bucks County voted in May 1983 to withdraw from that part of the PPD project involving NWRA. Subsequently, a majority of the Bucks County Commissioners notified PECO of its "termination" of the contract between PECO and NWRA for the operation of the Point Pleasant Pumping Station.³⁹ PECO and others have brought suit in the Bucks County Court of Common Pleas to enjoin Bucks County from terminating its participation in the Point Pleasant project. A recent decision of the court dismissed the defendants' preliminary objections to the complaint.⁴⁰ The litigation, however, continues, and work on the project is apparently suspended.⁴¹

III. DISCUSSION

As indicated earlier, Del-Aware's challenges to the Licensing Board's determinations fall broadly into four categories — the Board's decision to hold early hearings on the environmental contentions; its determination that certain matters need not be considered; its disposition of those issues that were considered; and its asserted refusal to consider alternatives to the Point Pleasant Diversion project in light of recent developments. We discuss these matters in turn.

A. The Early Hearings

Construction permit proceedings for Limerick, including judicial review, were completed by 1975. PECO had all necessary NRC authoriza-

³⁷ *Del-Aware Unlimited, Inc. v. Pennsylvania*, Nos. 82-177-H and 82-219-H, slip op. at 149 (Pa. E.H.B. June 18, 1984).

³⁸ *Id.* at 152, 154, 155.

³⁹ Letter from T.B. Conner, Jr., to Appeal Board (June 2, 1983).

⁴⁰ *Sullivan v. County of Bucks*, No. 83-8358-05-5 (Bucks Co., Pa., May 29, 1984).

⁴¹ Letter from R.J. Sugarman to Appeal Board (May 15, 1984), treated as a motion, per Appeal Board Order of May 17, 1984 (unpublished).

tions in connection with construction of the plant. Nonetheless, construction of the Point Pleasant Diversion had not yet begun at the time PECO filed its operating license application. Given that happenstance, the Licensing Board decided to conduct early hearings on Del-Aware's supplementary cooling water contentions so that it might have a realistic opportunity to consider any actions necessary to mitigate possible adverse environmental effects before construction began.

Del-Aware argues, however, that the Board erred in conducting hearings on its environmental contentions before the staff had issued either its final or draft environmental impact statement. Del-Aware claims such hearings violated both the Commission's own regulations and the National Environmental Policy Act (NEPA). Further, Del-Aware charges that the premature hearings prejudiced the staff's ultimate evaluation of environmental issues by requiring it to take a tentative position, and compromised Del-Aware's participation by requiring it to develop its own environmental record from scratch. Del-Aware asserts that the staff's testimony must be stricken.

Although we agree that the Board did not act in literal accordance with agency regulations, we find no prejudice to Del-Aware resulting from the conduct of early hearings. We also find no violation of NEPA. Thus, we decline to strike the staff's testimony and to upset the Board's ruling on those grounds.

The pertinent regulation states:

In any proceeding in which a draft environmental impact statement is prepared pursuant to this part, the draft environmental impact statement will be made available to the public at least fifteen (15) days prior to the time of any relevant hearing. At any such hearing, the position of the Commission's staff on matters covered by this part will not be presented until the final environmental impact statement is furnished to the Environmental Protection Agency and commenting agencies and made available to the public. Any other party to the proceeding may present its case on NEPA matters as well as on radiological health and safety matters prior to the end of the fifteen (15) day period.⁴²

From the clear terms of the regulation, there is no question that it accords members of the public at least 15 days notice of the contents of the staff's draft environmental impact statement before litigation of such issues begins. The regulation also protects the staff against the need to defend any of its environmental determinations until the final environmental statement is prepared and circulated. Thus, in the usual case, en-

⁴² 10 C.F.R. § 51.52(a) (1982) (emphasis added).

vironmental hearings await the preparation and circulation of the staff's FES.⁴³

The fact that the Board departed from that course and the terms of the regulation, however, does not mean that the Board's action was ill-advised in the circumstances or warrants remedial action. We recognize that an agency must ordinarily adhere to its own rules and established practices. Nonetheless,

"[i]t is always within the discretion of . . . an administrative agency to relax or modify its procedural rules adopted for the orderly transaction of business before it when in a given case the ends of justice require it."⁴⁴

It is plainly apparent that the Licensing Board believed the "ends of justice" required early hearings on the Point Pleasant Diversion. We have no cause to disagree. Further, we see no prejudice to any party as a result of the procedures the Board employed.

To begin with, the Board stressed that at the early hearing it sought only an evaluation of certain specific impacts. It explicitly recognized that resolution of the ultimate cost/benefit balance under NEPA must await the issuance of the staff's environmental statement.⁴⁵ The Board went ahead with early hearings on Del-Aware's contentions because it was

concerned that some of the contentions which allege impacts after operation of the supplemental cooling water system could be rendered substantially moot prior to consideration of their merits by virtue of the construction of the intake and reservoir. [The Board was] also concerned that the Applicant will incur the time and expense of major construction work not previously reviewed in a licensing proceeding which may later have to be undone in whole or in part in the event [it were to] find a change in location or design is necessary to mitigate impacts which would arise from operation.⁴⁶

⁴³ See, e.g., *Potomac Electric Power Co.* (Douglas Point Nuclear Generating Station, Units 1 and 2), ALAB-277, 1 NRC 539, 546 (1975).

Since the Licensing Board held the hearings in question and issued its partial initial decision, the Commission has substantially amended its environmental regulations, 10 C.F.R. Part 51. See 49 Fed. Reg. 9352 (1984). Our decision, of course, must necessarily focus on the propriety of the Board's actions pursuant to the regulations as they existed in 1982. We note, however, that, while the new counterpart to former section 51.52(a) eliminates the 15-day advance notice of the DES, it makes clear that the FES is to precede the hearing on environmental issues and that the staff "may not offer the final environmental impact statement in evidence or present the position of the NRC staff on matters within the scope of NEPA and this subpart" until the FES is filed with EPA and offered for comment to other agencies and the public. *Id.* at 9396 (to be codified at 10 C.F.R. § 51.104(a)(1)) (emphasis added). See *id.* at 9365.

⁴⁴ *American Farm Lines v. Black Ball Freight Service*, 397 U.S. 532, 539 (1970), quoting *NLRB v. Monsanto Chemical Co.*, 205 F.2d 763, 764 (8th Cir. 1953).

⁴⁵ Memorandum and Order of July 14, 1982, *supra*, at 17-18; LBP-82-43A, *supra*, 15 NRC at 1480.

⁴⁶ LBP-82-43A, *supra*, 15 NRC at 1476. See *id.* at 1480.

The Board reiterated these concerns in responding to staff objections to the early hearing.⁴⁷ Moreover, for the Board "to wait to hear these issues, quite possibly until construction is completed and certain actions which might minimize environmental harm are no longer feasible[,] . . . [might] appear to violate at least the spirit of NEPA"⁴⁸ The Board's decision to move forward with the hearing was thus reasonably grounded in its legitimate desire to avoid the same potential adverse environmental impacts that prompted Del-Aware's interest in the proceeding in the first place.

We reject Del-Aware's assertion that the failure of the Licensing Board to await the FES placed an unfair burden on Del-Aware to develop its own evidentiary record from scratch. Although the staff did not prepare a formal final or draft environmental impact statement before the hearing, it prepared and filed its testimony in advance. Of course, Del-Aware was served with this testimony, and all parties engaged in what the Licensing Board termed "three months of intensive discovery."⁴⁹ Moreover, the issues Del-Aware raised have been the subject of administrative and judicial exploration for more than a decade, and Del-Aware has been an active participant in at least a portion of the earlier litigation.⁵⁰ Indeed, at oral argument, counsel for Del-Aware acknowledged that the issues involved here "are essentially within the same broad confines" as those earlier litigated, although some aspects may differ.⁵¹ Thus, Del-Aware has not demonstrated that it was in fact unfairly burdened in presenting its case.

The Board's approach also did not impermissibly interfere with the staff's role or compromise its objectivity, as Del-Aware argues. The staff independently conducted its environmental review and prepared its own testimony for the hearing. The Board did not and could not dictate the contents of that testimony.⁵²

⁴⁷ Memorandum and Order of July 14, 1982, *supra*, at 3-4.

⁴⁸ *Id.* at 15.

⁴⁹ LBP-82-92A, *supra*, 16 NRC at 1389.

⁵⁰ See, e.g., Baldwin, *supra*.

⁵¹ App. Tr. 99-100.

⁵² We note in this connection that the Board did not actually order the staff to prepare any environmental document by a date certain. It simply explained its reasons for proceeding expeditiously and afforded the staff some flexibility in the timing of its submissions. LBP-82-43A, *supra*, 15 NRC at 1480. Further, as noted at p. 865, *supra*, the staff had an opportunity to object to the Board's procedures. See Memorandum and Order of July 14, 1982, *supra*, at 15-18. Thus, although the Board's action was inconsistent with former section 51.52(a), we do not find it incompatible with our decision in *Offshore Power Systems* (Floating Nuclear Power Plants), ALAB-489, 8 NRC 194 (1978). There, in commenting on the boards' authority to control the staff's independent NEPA review, we held that "[t]he Licensing Board may direct the staff to publish its environmental documents by specific dates if, after affording the parties — including the staff — opportunity to be heard on the matter, it finds that no further delay is

(Continued)

Given the Licensing Board's stated purpose behind the commencement of early hearings on Del-Aware's contentions, as well as the lack of genuine prejudice to Del-Aware's position, it is hardly surprising that the appellant concedes that "the Board commendably moved quickly to insure timely consideration of environmental impacts in scheduling this early hearing"⁵³ Indeed, it did not even object to the Board's hearing schedule at the time it was announced.⁵⁴ Instead, it waited until after prefiled testimony and trial briefs were submitted, the staff's position was revealed, and the hearing was only a week away, before filing a request to postpone the hearing. We agree with the Licensing Board that the request was without merit and came too late.⁵⁵

Finally, we find no support for Del-Aware's alternative assertion that NEPA independently requires that hearings await the preparation of the staff's environmental impact statement. Generally speaking, NEPA does not address the timing of an environmental statement, as long as it is available by the time of the agency's recommendation or report on the proposed federal action.⁵⁶ The Licensing Board's *partial* initial decision before us on appeal does not constitute such a recommendation or report because it does not authorize the issuance of an operating license to PECO. Thus, while we agree with Del-Aware that an operating license cannot be issued without an environmental impact statement,⁵⁷ that is not the situation here. As noted at p. 864, *supra*, the Licensing Board stressed that it was not passing on the ultimate cost/benefit balance required by NEPA. Rather, it simply held hearings on certain environmental issues earlier than would ordinarily be the case in order to identify and to mitigate, before the Point Pleasant project progressed too far, any potential adverse environmental impacts.

B. Issues Excluded

1. *Salinity and Water Quality*

Del-Aware's proposed contention V-16 claimed that the operation of the supplementary cooling water system will adversely affect the water

justified." *Id.* at 208. See also 49 Fed. Reg., *supra*, at 9361 & n.14, 9383-84 (the latter to be codified at 10 C.F.R. § 51.15).

⁵³ Appellants' [sic] Brief (Aug. 23, 1983) at 12.

⁵⁴ Del-Aware did not include the hearing schedule when it sought reconsideration of the Board's pre-hearing conference order. See Request of Del-Aware, Limited [sic] Inc. for Reconsideration of Aspects of Special Pre-Hearing Conference Order (undated, but received June 21, 1982).

⁵⁵ See LBP-82-92A, *supra*, 16 NRC 1387.

⁵⁶ *New England Coalition on Nuclear Pollution v. NRC*, 582 F.2d 87, 93-94 (1st Cir. 1978).

⁵⁷ The Commission's own regulations require an impact statement for an operating license. See 10 C.F.R. § 51.5(a)(2) (1982); 49 Fed. Reg., *supra*, at 9384 (to be codified at 10 C.F.R. § 51.20(b)(2)).

quality and water supply of the Delaware River and the receiving streams.⁵⁸ In explaining the basis for the contention, Del-Aware asserted that short-term drawdowns of water could increase salinity and adversely affect drinking water.⁵⁹ The Licensing Board excluded the contention, essentially on the ground that changes in salinity result from the total quantity of water withdrawn for all uses approved by the DRBC, and that section 15.1(s)1 of the Delaware River Basin Compact precludes redetermination by the NRC of the DRBC's decisions concerning the allocation of water for Limerick.⁶⁰ Del-Aware now argues that such exclusion was error.⁶¹ We agree that the Board erred, as a matter of law, in concluding that the Compact precludes consideration of contention V-16.

Section 15.1(s)1 provides that nothing in the Compact shall impair or affect any powers or functions of the United States. This reservation of authority, however, is subject to a proviso that prohibits federal agencies from taking action that "substantially conflict[s]" with any portion of the comprehensive plan approved by the DRBC with the concurrence of the federal member.⁶² In discussing this provision, the Licensing Board explained:

We do not believe that the NRC is precluded by the Compact provision from considering all environmental questions arising from the diversion However, in light of the DRBC's role in determining the uses for water in the basin, we believe that it bars us from reevaluating the DRBC decision to allocate water to the Limerick facility operating in the river follower mode. . . . [A]lthough we will not look at the allocation decision itself, we might determine whether changes in the plan since the con-

⁵⁸ Contention V-16 reads as follows:

Operation of the SCWS will adversely affect the water quality and adequacy of water supplies in a critical reach of the Delaware River and estuary. DRBC's determination was based on a number of errors and inadequate information and cannot and should not be accepted by this Commission.

Supplemental Petition of Coordinated Intervenor (Nov. 24, 1981) at 69.

⁵⁹ *Ibid.* The NRC staff did not oppose the admission of this contention. LBP-82-43A, *supra*, 15 NRC at 1485.

⁶⁰ *Id.* at 1484-85; Memorandum and Order of July 14, 1982, *supra*, at 18-19; LBP-82-72, *supra*, 16 NRC at 969-71; Memorandum and Order of January 24, 1983 (unpublished), at 6-7.

⁶¹ We are unable to discern from Del-Aware's brief precisely why it believes the Board erred. It mentions two matters in this connection, however — (1) the "contradiction" of the Board's exclusion of the salinity issue and the staff's inclusion of this subject in its subsequent draft environmental impact statement; and (2) the assertedly "continuing concerns" of the Environmental Protection Agency (EPA) about salinity. See Appellants' Brief, *supra*, at 2, 13.

⁶² Section 15.1(s)1 provides, as pertinent:

Nothing contained in this Act or in the Compact shall impair or affect the constitutional authority of the United States or any of its powers, rights, functions, or jurisdiction under other existing or future legislation in and over the area or waters which are the subject of the Compact including projects of the Commission: *Provided, That whenever a comprehensive plan, or any part or revision thereof, has been adopted with the concurrence of the member appointed by the President, the exercise of any powers conferred by law on any officer, agency or instrumentality of the United States with regard to water and related land resources in the Delaware River Basin shall not substantially conflict with any such portion of such comprehensive plan*

DRB Compact, *supra*, § 15.1(s)1, 1961 U.S. Code Cong. & Ad. News at 807-08 (emphasis added).

struction permit stage call for new mitigation efforts or would cause significantly increased environmental impacts such that overall alternative cooling methods should be examined.⁶³

We agree that the NRC may not reevaluate the DRBC's "allocation decision itself." As the Board correctly noted, the "DRBC's function is to regulate water supply and control consumptive uses of water in the basin through development of the Comprehensive Plan."⁶⁴ We part company with the Board, however, in its determination that any NRC appraisal of the salinity or water quality issue would necessarily and substantially conflict with the plan.

The fact that the salinity of the water is a function of the total amount withdrawn does not prevent either the NRC staff or the adjudicatory boards from examining the effects of the amount withdrawn for Limerick. To be sure, following such examination the NRC could not authorize PECO to withdraw water from the Delaware River in amounts that *exceed* that allocated by the DRBC. Nor could the agency require the DRBC to make any particular allocation decision among the competing interests for the Delaware River. On the other hand, the NRC might well conclude — after its own consideration of available data and despite the findings of the DRBC — that the amount of water that must be withdrawn from the Delaware River to permit safe operation of Limerick would nonetheless adversely affect the quality of the water to an unwarranted degree.⁶⁵ In such a case, nothing in the DRBC's decision would either require the Commission to license the plant or preclude it from imposing conditions on its operation. This is so because the DRBC's allocation is permissive, not mandatory: it does not require, but rather

⁶³ LBP-82-43A, *supra*, 15 NRC at 1469.

⁶⁴ *Ibid.* See DRB Compact, *supra*, § 1.3, 1961 U.S. Code Cong. & Ad. News at 776.

⁶⁵ This is not to say that the NRC must perform a wholly independent analysis from scratch. As the Licensing Board correctly observed, the staff *may* rely on the scientific data and inferences drawn by the DRBC. LBP-82-43A, *supra*, 15 NRC at 1467-68. See ALAB-262, *supra*, 1 NRC at 193. On the other hand, the Commission need not slavishly defer to either the DRBC's findings or its conclusions about water quality. *But cf. Hansler, supra*, 536 F. Supp. at 42 n.25 ("DRBC is the agency charged with this decision, and it, not this court, has the necessary expertise to make [salinity and flow rate] determination"). (The DRBC, which was created eight years before NEPA, is, by the terms of the Compact, principally concerned with water supply and allocation — not its "quality" from an environmental standpoint. See generally *Delaware River Basin Commission v. Bucks County Water & Sewer Authority*, 545 F. Supp. 138, 140-42 (E.D. Pa. 1982).)

The critical factor is that the staff (and the NRC) exercise independent judgment with regard to its ultimate conclusions about the environmental impacts of the project. See LBP-82-43A, *supra*, 15 NRC at 1468. In this way, the Commission will discharge its independent responsibility to fulfill the purposes of NEPA "to the fullest extent possible." 42 U.S.C. § 4332. See *Tennessee Valley Authority* (Phipps Bend Nuclear Plant, Units 1 and 2), ALAB-506, 8 NRC 533, 544-49 (1978). *But see Bucks County Board of Commissioners v. Interstate Energy Co.*, 403 F. Supp. 805, 808 (E.D. Pa. 1975) (DRBC is "the federal agency designated to implement NEPA for all projects affecting the Delaware River Basin").

permits, PECO to withdraw from the Delaware for use at Limerick.⁶⁶ Thus, action the Commission might take to lessen the impact of the Limerick facility on salinity or water quality would not "substantially conflict" with the DRBC's allocation determination.⁶⁷

Despite the Licensing Board's erroneous ruling on the effect of the DRB Compact's preclusion clause on contention V-16, we do not order the admission of the contention per se. In the time since the Licensing Board's ruling, the NRC staff has issued its draft and final environmental impact statements for the Limerick operating license.⁶⁸ Both address the issue of salinity and water quality, and the FES takes account of the EPA comments in this regard noted by Del-Aware.⁶⁹ In this circumstance, the best course is to afford Del-Aware (assuming that it is dissatisfied with the FES on this score) the opportunity to reformulate its contention V-16 in light of the *specific* information included in the FES.⁷⁰

The Licensing Board recognized the possibility that the Compact might not preclude consideration of contention V-16. It observed that, if such were the case, the staff might reasonably be able to rely on the DRBC's evaluation.⁷¹ Thus, "Del-Aware would have a heavy burden of specifying why any NRC reliance on analysis by DRBC (or other agencies) was improper."⁷² We agree that, once Del-Aware reformulates its contention in light of the FES, it may well have a heavy burden in prevailing on the merits. Nonetheless, it is entitled to the opportunity to

⁶⁶ See *Philadelphia Electric Co. (Bradshaw Reservoir, Pumping Station and Transmission Main)*, No. D-79-52CP (DRBC Feb. 18, 1981) (attached to Applicant's Answer to Petition for Intervention of Del-Aware Unlimited, Inc. (Oct. 7, 1981)). The DRBC itself recognized that it may have to reconsider its decision "in light of further information developed by, or decisions rendered in, pending or future proceedings conducted by other State and Federal agencies concerning the development and operation of the Limerick Nuclear Generating Station and related facilities." *Id.* at 8. If the DRBC construed the section 15.1(s)1 preclusion as strictly as the Licensing Board, we do not believe it would have so clearly recognized the possibility that other agencies might consider the full range of issues and might reach different conclusions on them.

⁶⁷ The "substantially conflict" standard of the Compact's preclusion clause can be distinguished from stronger preemptions in other statutes. For example, the Federal Water Pollution Control Act precludes any agency, including the NRC, from even reviewing EPA's findings under section 401 of that Act. See *New England Coalition*, *supra*, 582 F.2d at 98.

There have been but few occasions where section 15.1(s)1 has been construed by the courts and other agencies. We have found none, however, where this provision has been read to preclude an agency from even considering an issue. See, e.g., *Pennsylvania Hydroelectric Development Corp.*, 15 FERC ¶ 61,152 (1981).

⁶⁸ See note 23, *supra*.

⁶⁹ NUREG-0974, "Final Environmental Statement Related to the Operation of Limerick Generating Station, Units 1 and 2," at 9-27 to 9-28. See note 61, *supra*.

⁷⁰ Because Del-Aware's original contention V-16 should have been admitted initially, a reformulation of it pursuant to our decision here does not make it subject to the Commission's standards for admitting late contentions, 10 C.F.R. § 2.714(a)(1). See *Duke Power Co. (Catawba Nuclear Station, Units 1 and 2)*, CLI-83-19, 17 NRC 1041 (1983).

⁷¹ See note 65, *supra*.

⁷² LBP-82-43A, *supra*, 15 NRC at 1485. See also LBP-82-72, *supra*, 16 NRC at 971.

challenge the staff's determinations on the salinity issue, as presented in the FES.⁷³

2. Construction Impacts

The Licensing Board concluded that it did not have jurisdiction to consider "changes in impacts of construction resulting from changed circumstances," but could properly consider "the operational impacts of construction changes."⁷⁴ In its view, the former lies within the authority of the Director of Nuclear Reactor Regulation (NRR). Del-Aware contends, by way of only a passing reference in its brief, that the Board's distinction between construction and operational impacts results in "segmented decisions" in violation of NEPA.⁷⁵ Del-Aware fails to explain *how* NEPA is thereby violated and to specify what particular environmental issues have gone unevaluated.⁷⁶ In such circumstance, we would be fully justified in ignoring Del-Aware's claim entirely. But because we find the Licensing Board's reasoning on this point somewhat unclear, we address it briefly.

In making its ruling, the Board stressed that, under the Commission's rules, its jurisdiction is governed by the hearing notice for this proceeding. That notice limits the Board's (as well as our) jurisdiction to matters involving PECO's application for a license to *operate* Limerick.⁷⁷ Having defined the scope of its jurisdiction, however, the Board was faced with applying that definition to the particular matters before it — not an easy task. In distinguishing between the impacts of construction and operation, and taking account of changes since issuance of the construction permit, the Board, we believe, meant the following. To the extent that PECO's application for the Limerick operating license reflects

⁷³ The admission and litigation of any reformulated salinity contention must, of course, be tied to changes or new information that has come to light since the issuance of the construction permit for Limerick. See pp. 870-71, *infra*.

⁷⁴ LBP-82-43A, *supra*, 15 NRC at 1476-79.

⁷⁵ Appellants' Brief, *supra*, at 13.

⁷⁶ This section of Del-Aware's brief is typical of its overall quality. For example, it refers to "*Overlook Alliance*." *Ibid*. Although no citation or discussion of its contents and relevance is provided, we assume that, by this truly cryptic reference, Del-Aware means *Indian Lookout Alliance v. Volpe*, 484 F.2d 11 (8th Cir. 1973). As explained below, that case is inapposite. Other parts of the brief can best be described as "gobbledygook," for the juxtaposition of the English words makes neither sentences nor sense. The following is illustrative: "... subsequent revelation that construction is not needed now, and failure of the staff to comply with NEPA renders present has to illadvised an unnecessary. (See Motion)". *Id.* at 12. Having rejected Del-Aware's first effort at briefing, we denied PECO's motion to strike this brief. Although we found it comprehensible enough for the other parties to reply to it, we cautioned Del-Aware that it was to bear the risk of the shortcomings of its own brief. Appeal Board Order of September 2, 1983 (unpublished). We repeat that caveat here.

⁷⁷ LBP-82-43A, *supra*, 15 NRC at 1477.

some actual changes in connection with the facility *as it was contemplated at the time of issuance of the construction permit* (e.g., the change in the location of the intake for the Point Pleasant Diversion), such changes are within the scope of this operating license proceeding and can be litigated.⁷⁸ On the other hand, if activity already authorized by the construction permit results in impacts not previously expected, that is a matter for resolution by the Director of NRR pursuant to 10 C.F.R. §§ 2.202, 2.206.⁷⁹

As noted, Del-Aware has not explained how this results in a violation of NEPA, and we see none. Del-Aware's elliptical reference to *Indian Lookout Alliance* is unavailing.⁸⁰ In any event, the Board permitted Del-Aware to litigate the operational impacts from the various changes in the project since the construction permit was issued.⁸¹ NEPA requires no more.

3. Impacts Attributable Solely to the NWRA Project

As noted above, the Point Pleasant Diversion includes (1) the intake, reservoir, and pumping station to be used jointly by PECO and NWRA; (2) transmission facilities to be used solely for Limerick; and (3) transmission mains intended solely for NWRA's use.⁸² The Licensing Board concluded that the environmental impacts of that part of the system to be used jointly by PECO and NWRA could not be meaningfully apportioned to each user. Thus, the Board considered not only the impacts solely attributable to Limerick, but also the total environmental impacts of the Point Pleasant intake and pumping station, the transmission main

⁷⁸ This is consistent with the Board's discussion of the Commission's earlier decision concerning the construction permit. The Board concluded that it would not reevaluate environmental matters considered before the permit was issued, except where circumstances had significantly changed. *Id.* at 1461.

⁷⁹ See *Consumers Power Co. (Midland Plant, Units 1 & 2)*, ALAB-674, 15 NRC 1101 (1982). Del-Aware has taken advantage of this procedure at least twice. See DD-82-13, 16 NRC 2115 (1982); DD-84-13, 19 NRC 1137 (1984).

⁸⁰ See note 76, *supra*. In *Indian Lookout Alliance*, the court found that the environmental impact statement for a portion of a proposed federal highway was too limited because it did not cover enough mileage of the interstate. After noting that this was a problem unique to highway projects, the court stressed that a segmented approach to the impact statements for many projects is often unavoidable, and that segments need only be as large as practicable in the circumstances. 484 F.2d at 15, 19. The "segmented decisions" to which Del-Aware objects here are of a different nature. The Licensing Board's distinction between construction and operational impacts is a function of the Commission's traditional two-stage (construction permit and operating license) licensing process for commercial reactors. See generally *Power Reactor Development Co. v. International Union of Electrical, Radio & Machine Workers*, 367 U.S. 396 (1961). It is also a jurisdictional distinction, concerning the NRC's internal division of decisionmaking authority based on the particular stage of the licensing process involved. It does not result in the indefinite deferral of consideration of impacts of a portion of a project, which the court in *Indian Lookout Alliance* found violative of NEPA.

⁸¹ See LBP-83-11, *supra*, 17 NRC 413.

⁸² See note 3, *supra*, and Appendix A.

to the Bradshaw Reservoir, and the Reservoir itself.⁸³ The Board determined, however, that NEPA does not require the NRC to consider the part of the system to be used solely by NWRA to supplement municipal water supplies (i.e., the separate transmission main from the Bradshaw Reservoir to the North Branch of the Neshaminy Creek, the North Branch Water Treatment Plant, and the transmission mains from the treatment plant).⁸⁴

In another rather limited argument on appeal, Del-Aware claims that the Board erred in not considering these latter impacts attributable solely to the NWRA part of the project.⁸⁵ As we understand it, the gist of Del-Aware's argument is that this part of the project would not be built but for Limerick and the financial commitment of PECO to the system. Assuming arguendo that this is so,⁸⁶ Del-Aware fails to explain why this would *require* the NRC, pursuant to NEPA, to evaluate impacts of a part of the project otherwise unassociated with Limerick.

We agree with the Licensing Board that NEPA does not require the NRC to consider the environmental impacts solely attributable to the NWRA part of the project, but for somewhat different reasons than those expressed by the Board. The Board's analysis relied on NEPA cases addressing the issue of "segmentation."⁸⁷ Those cases use a three-part test to determine if a project has been arbitrarily divided into segments with smaller environmental impacts, so as to avoid consideration of the possibly greater, cumulative impacts of the project as a whole.⁸⁸ The project segments usually follow one another in time, with no one agency having evaluated the overall project for NEPA purposes. That is not this case. The respective PECO and NWRA "segments" of the Point Pleasant Diversion project have been planned and are being executed on essentially a concurrent basis, and the DRBC has twice evaluated the en-

⁸³ LBP-82-43A, *supra*, 15 NRC at 1470-72.

⁸⁴ *Id.* at 1473-75.

⁸⁵ Appellants' Brief, *supra*, at 21.

⁸⁶ Del-Aware points to a Licensing Board reference to the statement of an NWRA official committing NWRA to constructing that part of the system to be used solely by NWRA, "with or without" PECO. Memorandum and Order of July 14, 1982, *supra*, at 9 n.2. Del-Aware complains that this commitment is now in substantial doubt. Appellants' Brief, *supra*, at 21. The extent to which the Licensing Board actually relied on the NWRA official's "commitment" is not clear. As explained below, however, NWRA's intentions with regard to its separate part of the project are of no relevance to the NRC's NEPA obligations vis-a-vis Limerick. We therefore accept for argument purposes only Del-Aware's claim that NWRA is no longer interested in pursuing the municipal water supply part of the project.

⁸⁷ LBP-82-43A, *supra*, 15 NRC at 1473-74.

⁸⁸ See, e.g., *Swain v. Brinegar*, 542 F.2d 364 (7th Cir. 1976) (en banc); *Duke Power Co. (Amendment to Materials License SNM-1773 — Transportation of Spent Fuel from Oconee Nuclear Station for Storage at McGuire Nuclear Station)*, ALAB-651, 14 NRC 307 (1981).

vironmental impacts of the total project.⁸⁹ Thus, the segmentation cases relied on by the Board are largely inapposite to the situation at hand.

We believe that *Henry v. FPC*,⁹⁰ also discussed by the Board, provides the more appropriate guidance for the disposition of this case. *Henry* involved a coal gasification project that — much like the Point Pleasant Diversion — required approval from several different agencies. The Bureau of Reclamation of the Department of the Interior was the “lead agency” for NEPA purposes and it (like the DRBC here) prepared an impact statement for the entire project. Because the Federal Power Commission’s (FPC) jurisdiction was limited to granting a certificate of public convenience and necessity for the project’s “tap and valve” facilities, the FPC contended that it need consider only the incremental environmental impacts of those facilities. Although the court actually held that the NEPA issue was raised prematurely, it opined that the FPC was obliged by *both* NEPA and the Natural Gas Act to consider the environmental impacts of the entire gasification project.⁹¹

The Licensing Board correctly noted that, under *Henry*, the NRC must consider the impacts of the jointly used portions of the PPD project.⁹² But we think it is also clear from *Henry* that the NRC need *not* consider the impacts attributable *solely* to the NWRA segment. The District of Columbia Circuit stressed that, in making its certification decision under the Natural Gas Act, the FPC would necessarily have to consider the overall gasification project, even though it did not have complete jurisdiction over it.⁹³ By contrast here, consideration of the solely-NWRA portion of the project has no role whatsoever in the NRC’s decision under the Atomic Energy Act concerning the issuance of a license to PECo to operate Limerick. Whether this part of the project is ever constructed may be of interest to the DRBC and Army Corps of Engineers, but it is of no decisional significance to the NRC.⁹⁴ Thus, the NRC has “no jurisdictional toehold”⁹⁵ over that part of the Point Pleasant Diversion and, even under *Henry*, there is no basis for requiring the

⁸⁹ See pp. 856-57, *supra*.

⁹⁰ 513 F.2d 395 (D.C. Cir. 1975).

⁹¹ *Id.* at 405-07. The court noted, however, that the FPC could rely on the lead agency’s impact statement. *Id.* at 407.

⁹² LBP-82-43A, *supra*, 15 NRC at 1472.

⁹³ 513 F.2d at 406-07.

⁹⁴ And, by the same token, Limerick — absent possible complications from the private contracts involved — is not foreclosing NWRA’s options. See LBP-82-43A, *supra*, 15 NRC at 1474-75.

⁹⁵ *Henry*, *supra*, 513 F.2d at 407 n.33.

NRC to evaluate the environmental impacts solely attributable to the NWRA branch.⁹⁶

The seminal decision on the proper scope of an agency's environmental review under NEPA supports this conclusion. In *Kleppe v. Sierra Club*, the Supreme Court held that

when several proposals for . . . related actions that will have cumulative or synergistic environmental impact upon a region are pending concurrently before an agency, their environmental consequences must be considered together.⁹⁷

The DRBC — the agency with oversight of the entire Point Pleasant Diversion project — has “considered together” the cumulative or synergistic environmental consequences of the discrete parts of the project. Further, its environmental review has passed judicial muster.⁹⁸ The question here then is how much of this review does NEPA require the NRC to duplicate. We believe it is entirely reasonable that the NRC decline to duplicate or to consider the DRBC's review of the environmental impacts solely attributable to NWRA's part of the PPD project whose only nexus to Limerick is economic.⁹⁹

C. Other Licensing Board Rulings

1. *Impact on the Point Pleasant Historic District*

Del-Aware complains that the Licensing Board erred in failing to make any findings under the National Historic Preservation Act (NHPA).¹⁰⁰ Its argument is essentially twofold. First, it asserts that the Board incorrectly distinguished between construction and operating impacts in its Memorandum and Order of July 14, 1982, *supra*, and thereby excluded consideration of the impacts on the Point Pleasant Historic

⁹⁶ Compare *Committee for Auto Responsibility v. Solomon*, 603 F.2d 992, 1002 n.44 (D.C. Cir. 1979), *cert. denied*, 445 U.S. 915 (1980) (GSA consideration of parking needs in conjunction with FES for federal building found reasonable); *Public Service Co. of New Hampshire v. NRC*, 582 F.2d 77 (1st Cir.), *cert. denied*, 439 U.S. 1046 (1978) (NRC consideration of environmental impacts of power plant transmission lines found proper); *City of Rochester v. Postal Service*, 541 F.2d 967 (2d Cir. 1976) (Postal Service, which considered impacts of new construction site, improperly failed to consider impacts of abandonment of old post office as well).

⁹⁷ 427 U.S. 390, 410 (1976) (footnote omitted).

⁹⁸ See *Hansler*, note 11, *supra*.

⁹⁹ Indeed, if the NRC were to consider the impacts solely attributable to NWRA's municipal water supply part of the project, there would be considerable question as to what recourse the agency would have, were it to find significant adverse impacts. For example, could it decline to license Limerick or impose license conditions on account of the environmental impacts caused by NWRA's effort to “piggyback” onto Limerick for economic reasons? Although we need not decide this hypothetical question, we think the answer would be “no.”

¹⁰⁰ Appellants' Brief, *supra*, at 21-23.

District. Second, Del-Aware alleges that the Board “refused to consider” the impacts of proposed baffling walls to stifle the noise emanating from the transformers at the Point Pleasant pumping station.¹⁰¹ According to Del-Aware, such barriers would have an adverse effect on the nearby Delaware Canal, a National Historic Landmark. We find no merit to the latter argument, but agree with Del-Aware that the Board erred in its Memorandum and Order of July 14, 1982.

The Licensing Board rewrote Del-Aware’s proposed contention V-14, as follows:

The esthetic impacts of the Point Pleasant pumping station, and associated hillside clearance and river-edge rip rap wall will adversely affect the peace and tranquility of the proposed Point Pleasant Historic District.¹⁰²

Because of the Board’s ruling that it had no jurisdiction over construction impacts,¹⁰³ the Board initially admitted contention V-14 only to the extent it concerned “impacts arising from the existence of the diversion.”¹⁰⁴ The Board also noted that the determination of the Point Pleasant Historic District’s eligibility for inclusion in the National Register of Historic Places was a significant change in circumstance since issuance of the construction permit, warranting present consideration.¹⁰⁵ On reconsideration and in response to PECO’s objection, however, the Board struck the contention. Acknowledging that it was “a close question,” the Board concluded that contention V-14 concerned essentially construction impacts.¹⁰⁶

We agree with the Board’s original reasoning. The Point Pleasant Historic District had not been declared eligible for the National Register at the time of issuance of the construction permit. Thus, there was no occasion for consideration of the impacts that Limerick’s supplementary cooling water system might have on the Historic District. This is clearly a significant change in circumstances that, by the Licensing Board’s own reckoning, warrants consideration in the context of this operating license proceeding.¹⁰⁷ More important, NHPA requires it. Section 106 of that act states, as pertinent:

¹⁰¹ *Id.* at 22.

¹⁰² LBP-82-43A, *supra*, 15 NRC at 1479.

¹⁰³ *See* pp. 870-71, *supra*.

¹⁰⁴ LBP-82-43A, *supra*, 15 NRC at 1483.

¹⁰⁵ *Ibid.* The NRC staff also found the contention admissible. *Ibid.*

¹⁰⁶ Memorandum and Order of July 14, 1982, *supra*, at 4-5.

¹⁰⁷ *See* LBP-82-43A, *supra*, 15 NRC at 1461. *See also* pp. 870-71 and note 78, *supra*.

the head of any Federal department or independent agency having authority to license any undertaking shall, . . . prior to the issuance of any license, . . . take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under sections 470i to 470v of this title a reasonable opportunity to comment with regard to such undertaking.¹⁰⁸

Del-Aware must therefore be afforded the opportunity to litigate its contention V-14. We note, however — as in the case of Del-Aware's salinity contention — that the staff's FES has been issued and addresses the possible impacts on the Point Pleasant Historic District.¹⁰⁹ If it still chooses to pursue this issue, Del-Aware must do so with reference to the staff's review, alleging *specifically* why that review might be inadequate under section 106 of NHPA.¹¹⁰

As for Del-Aware's second point with respect to the NRC's obligations under NHPA, it fails for several reasons. Del-Aware charges that the Licensing Board "refused to consider" the impacts of proposed sound barriers placed around the Point Pleasant pumping station on the Delaware Canal.¹¹¹ Del-Aware has provided no citation for the Board's asserted "refusal" and we can find none. Indeed, we can find no place where Del-Aware ever properly sought to raise the matter, let alone where the Board explicitly ruled against it.

The issue of sound barriers arose at the hearing, during the litigation of Del-Aware's contention V-16a, which concerned noise effects on the proposed Point Pleasant Historic District.¹¹² The staff witness testified that the transformers outside the pumphouse would produce objectionable noise at two nearby residences. Baffling walls were suggested as sound barriers, if necessary. In response to this potential problem, the Licensing Board imposed a license condition requiring PECO to perform noise tests, at specified times and sites, after the pumping station is constructed and operating, and to report the results to the staff. *If* the tests show audible noise offsite, mitigation measures — e.g., sound barriers — must be undertaken promptly.¹¹³

¹⁰⁸ 16 U.S.C. § 470f.

¹⁰⁹ See NUREG-0974, *supra*, at 5-36.

¹¹⁰ The Licensing Board observed — correctly, in our view — that, in order to comply with NHPA, the staff may properly rely on the historical impact reviews of other agencies. LBP-82-43A, *supra*, 15 NRC at 1483. See note 65, *supra*. The Army Corps of Engineers has apparently undertaken such a review of the PPD project. See LBP-82-43A, *supra*, 15 NRC at 1483; Baldwin, note 27, *supra*.

We also note that Del-Aware raised a similar matter and others in a petition to the Director of NRR. See DD-82-13, *supra*, 16 NRC at 2134-36.

¹¹¹ Appellants' Brief, *supra*, at 22.

¹¹² See note 12, *supra*.

¹¹³ LBP-83-11, *supra*, 17 NRC at 436-38, 461-62, 463-64.

When the possibility of sound barriers was suggested, Del-Aware's counsel questioned the involved witnesses about them generally, but did not attempt to pursue the specific matter about which it now complains — the assertedly adverse impact of proposed baffling walls on the Delaware Canal.¹¹⁴ In its proposed findings of fact to the Licensing Board, Del-Aware simply stated that construction of the proposed walls "might require further review for historical compliance," and that the staff and applicant had not taken any action "to minimize the impact of the facility on the Historic Landmark" in light of NHPA.¹¹⁵ In these circumstances, we think it is neither accurate nor fair for Del-Aware to allege that the Board "refused to consider" a rather specific matter that Del-Aware did not put squarely before the Board.

There is an additional infirmity in Del-Aware's argument. Del-Aware argues that the Licensing Board has not protected the Delaware Canal by complying with section 110(f) of NHPA. That provision requires agencies to undertake in advance all possible "planning and actions" necessary to minimize any direct and adverse harm to a National Historic Landmark as a consequence of any federal approval.¹¹⁶ Del-Aware's concern, however, is beyond the scope of both contention V-14 (which the Board erroneously excluded) and contention V-16a (which was litigated). Even as originally drafted by Del-Aware, both refer only to the recent eligibility of the Point Pleasant Historic District for inclusion in the National Register of Historic Places; neither refers to the Delaware Canal or to any other National Historic Landmark.¹¹⁷ By raising its concerns about the Delaware Canal and compliance with section 110(f) of NHPA, Del-Aware is clearly injecting a new element into its contention. Admittedly, there was no cause for Del-Aware's specific concern about the effect of the sound barriers on the Canal until the prospect of the

¹¹⁴ See Tr. 1056-61, 1090-92, 1120-58, 1184-85, 1186-87.

¹¹⁵ Intervenor Del-Aware's Proposed Findings of Fact, Conclusions of Law, and Opinion (Nov. 17, 1982) at 60-61.

¹¹⁶ 16 U.S.C. § 470h-2(f). That section reads as follows (emphasis added):

Prior to the approval of any Federal undertaking which may directly and adversely affect any *National Historic Landmark*, the head of the responsible Federal agency shall, to the *maximum extent possible, undertake such planning and actions* as may be necessary to *minimize harm* to such landmark, and shall afford the Advisory Counsel on Historic Preservation a reasonable opportunity to comment on the undertaking.

This provision, which Congress added to NHPA in 1980, complements section 106, 16 U.S.C. § 470f, *supra*, by setting a higher standard for governmental action insofar as National Historic Landmarks are concerned. It requires the agency to plan and to act to minimize adverse impacts, rather than simply to "take into account" such impacts. See H.R. Rep. No. 1457, 96th Cong., 2d Sess. 38, *reprinted in* 1980 U.S. Code Cong. & Ad. News 6378, 6401.

¹¹⁷ See Supplemental Petition of Coordinated Intervenor, *supra*, at 67, 69½. See also 16 U.S.C. § 470a(a) (distinction between National Historic Landmark and areas listed on the National Register); Tr. 1136 (Delaware Canal is a National Historic Landmark).

barriers was mentioned at the hearing.¹¹⁸ But if Del-Aware wanted to pursue the matter, it was incumbent upon it to do so *at that time* by seeking to amend and expand its contention V-16a.¹¹⁹ As explained above, Del-Aware made no serious effort to do so then, and it is too late to do so now in this forum.¹²⁰

2. *Impact on Shortnose Sturgeon and American Shad*

The Licensing Board devoted a considerable portion of its partial initial decision to the effect of moving the location of the Point Pleasant intake structure on shortnose sturgeon (an endangered species) and American shad.¹²¹ Del-Aware does not challenge any of the Board's detailed factual findings in this regard. Rather, it raises essentially three legal arguments, all concerned with the Board's compliance with relevant federal statutes.¹²² We address each in turn, finding none to be of any merit.

First, Del-Aware complains that because of the early hearing on its environmental contentions,¹²³ the NRC staff did not obtain the comments of the U.S. Fish and Wildlife Service (F&WS) prior to the hearing, assertedly "as required" by the Fish and Wildlife Coordination Act.¹²⁴ That statute, however, simply provides that the agency "first shall consult" with F&WS whenever any waters are proposed or authorized to be diverted pursuant to a federal license.¹²⁵ The statute does not prescribe

¹¹⁸ According to the Licensing Board, there is no "plan" for the barriers. LBP-83-11, *supra*, 17 NRC at 437.

¹¹⁹ It would have been obliged, of course, to satisfy the requirements of 10 C.F.R. §§ 2.714(b), (a)(1).

¹²⁰ See *Tennessee Valley Authority* (Hartsville Nuclear Plant, Units 1A, 2A, 1B, and 2B), ALAB-463, 7 NRC 341, 348 (1978). In any event, it is problematical whether the baffling walls will even be necessary. That will depend on the results of the noise tests ordered by the Board. Further, other mitigating measures could be employed, if necessary.

¹²¹ See LBP-83-11, *supra*, 17 NRC at 421-32, 450-57. This issue was raised in Del-Aware's combined contentions V-15 and V-16a (in part). See note 12, *supra*.

¹²² See Appellants' Brief, *supra*, at 18-20, 23.

¹²³ See pp. 862-66, *supra*.

¹²⁴ Appellants' Brief, *supra*, at 18.

¹²⁵ See 16 U.S.C. § 662(a), which states:

Except as hereafter stated in subsection (h) of this section, whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the United States, or by any public or private agency under Federal permit or license, such department or agency first shall consult with the United States Fish and Wildlife Service, Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular State wherein the impoundment, diversion, or other control facility is to be constructed, with a view to the conservation of wildlife resources by preventing loss of and damage to such resources as well as providing for the development and improvement thereof in connection with such water-resource development.

exactly when and how this consultation is to occur, so long as it precedes any definitive agency action. That consultation requirement was clearly satisfied here. In June 1982, before the hearing got under way, the staff solicited input from F&WS for the staff's environmental review of Limerick.¹²⁶ Moreover — albeit through the efforts of Del-Aware — the Licensing Board heard extensive testimony at the hearing from Del-Aware witnesses Joseph P. Miller and Richard W. McCoy, fishery biologists from F&WS.¹²⁷ The Board also referred to and relied on this testimony in reaching its decision.¹²⁸ In this circumstance, we cannot find a failure to comply with the Fish and Wildlife Coordination Act.

Second, in an argument that is somewhat difficult to follow, Del-Aware claims that “the Board failed to properly identify the issue” concerning the intake's impact on the fish species in the Delaware River.¹²⁹ Del-Aware appears to concede that some impacts are permissible and that no significant impacts on American shad and shortnose sturgeon, as species, have been demonstrated on this record. It argues, however, that NEPA nonetheless requires consideration of alternatives to the Point Pleasant Diversion.¹³⁰ Del-Aware cites no NRC or court precedent to support its interpretation of NEPA and we know of none.¹³¹ In view of the lack of support for Del-Aware's legal argument, and its failure to challenge any of the Licensing Board's extensive factual findings that undergird its conclusion of “no significant adverse effect on the Delaware River populations of either American shad or shortnose sturgeon,” we must reject Del-Aware's NEPA argument.¹³²

Third, Del-Aware claims — again, without the benefit of any case or other citations — that the Board's decision violates the Endangered Species Act (ESA) insofar as shortnose sturgeon, an endangered species, are concerned. It contends that ESA protects “*the members*” of such species.¹³³ It points out that no actual sampling was done at the time shortnose sturgeon would be expected near the intake, and that the Licensing Board did not, and could not, find “no effect” on the

¹²⁶ See Letter from R.L. Ballard to H.N. Larsen (June 14, 1982), attached to Exhibit J of Appellants' Brief, *supra*. The staff subsequently referred to the F&WS input in the FES. See NUREG-0974, *supra*, at 4-37, 9-16, 9-17, 9-18.

¹²⁷ See Tr. 3039-73, 3128-75.

¹²⁸ See, e.g., LBP-83-11, *supra*, 17 NRC at 451, 453, 454.

¹²⁹ Appellants' Brief, *supra*, at 19.

¹³⁰ *Id.* at 19-20.

¹³¹ Cf. section 102, NEPA, 42 U.S.C. § 4332(2)(C) (consideration of alternatives required only for major federal actions “significantly affecting the quality of the human environment”).

¹³² LBP-83-11, *supra*, 17 NRC at 432. Indeed, the Board concluded that the impact of the new intake location might “very probably be less” than that of the shoreline site previously evaluated and approved. *Ibid.*

¹³³ Appellants' Brief, *supra*, at 23 (emphasis in original).

sturgeon.¹³⁴ It also claims that, according to the National Marine Biological (sic) Service, the absence of sampling “made it impossible to reach any conclusion” concerning the impact on sturgeon.¹³⁵ Thus, in Del-Aware’s view, the Board’s decision does not comply with ESA.

Section 7 of ESA, as amended in 1979, provides, in pertinent part:

Each Federal agency shall, in consultation with and with the assistance of the Secretary [of the Interior or Commerce], insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an “agency action”) *is not likely to jeopardize* the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee pursuant to subsection (h) of this section. In fulfilling the requirements of this paragraph *each agency shall use the best scientific and commercial data available.*¹³⁶

The agency has complied fully with ESA with respect to the shortnose sturgeon involved here. The principal staff witness on this issue, Dr. Michael T. Masnik, based his “no jeopardy” conclusion in part on the Biological Opinion of the National Marine Fisheries Service (NMFS) of the U.S. Department of Commerce.¹³⁷ NMFS, like Dr. Masnik, reviewed the biological assessment of Harold M. Brundage, III. Brundage is a fishery biologist who has studied shortnose sturgeon in the Delaware River since 1978 and who testified as a witness for Del-Aware.¹³⁸

NMFS found Brundage’s assessment “reasonably thorough” and “based on the best scientific and commercial data presently available.”¹³⁹ That assessment was bottomed on a “worst-case” assumption that all life stages of shortnose sturgeon were present in the Point Pleasant area: no empirical data were available because no shortnose sturgeon have been found in that area.¹⁴⁰ NMFS concluded that “construction and operation of the Point Pleasant Pumping Station is not likely to jeopardize the continued existence of the endangered shortnose sturgeon in the Delaware River.”¹⁴¹ Nevertheless, NMFS recommended that field studies be conducted to determine whether shortnose sturgeon

¹³⁴ *Ibid.*

¹³⁵ *Ibid.*

¹³⁶ 16 U.S.C. § 1536(a)(2) (emphasis added).

¹³⁷ Masnik, fol. Tr. 3504, at 5-6.

¹³⁸ Professional Qualifications of Harold M. Brundage III, fol. Tr. 2965; Tr. 2965; Tr. 2923, *et seq.*

¹³⁹ Masnik, fol. Tr. 3504, Attachment 4, Enclosure at 11, 14 (hereafter “NMFS Opinion”).

¹⁴⁰ *Id.* at 11.

¹⁴¹ *Id.* at 16.

are in fact present in the project area, especially during spawning season.¹⁴²

Del-Aware has thus misstated the NMFS conclusion. The evidence clearly supports the finding that the PPD project is not likely to jeopardize the continued existence of shortnose sturgeon.¹⁴³ The fact that NMFS *recommended* further study of the matter does not detract from its *conclusion* of no likely jeopardy, based on the best scientific and commercial data available.¹⁴⁴ Moreover, further study would not likely alter the results of the Brundage analysis reviewed by NMFS, as it was already a worst-case analysis. The staff and Licensing Board thus properly relied on the Brundage and NMFS opinions; ESA requires no more.¹⁴⁵

Del-Aware's unsupported claim that ESA protects the individual members of endangered species also fails. Apart from the practical difficulty of ensuring such a high level of protection for each fish, Congress did not provide for that in the statute. "Species" means just that, and not "each member thereof." The smallest units afforded protection are "subspecies" and "any distinct population segment . . . which interbreeds when mature."¹⁴⁶ Moreover, the existence of a species is jeopardized if it "reasonably would be expected to reduce the reproduction, numbers, or distribution of a listed species to such an extent as to appreciably reduce the likelihood of the survival and recovery of that species in the wild."¹⁴⁷ The Board's "no significant impact" finding does not conflict with ESA's intended focus on the species as a whole. We therefore reject Del-Aware's construction of the Act.

D. Recent Developments

Del-Aware claims, on brief, that the Licensing Board refused to consider assertedly environmentally preferable alternatives to the Point

¹⁴² *Id.* at 16-17.

¹⁴³ And, again, Del-Aware does not take issue with any of the underlying findings of fact concerning the intake structure or the habits and life cycle of the sturgeon.

¹⁴⁴ NMFS Opinion, *supra*, at 16, 14.

¹⁴⁵ This case is easily distinguished from *Roosevelt Campobello International Park Commission v. EPA*, 684 F.2d 1041 (1st Cir. 1982), where the court found more studies were required for full compliance with ESA. Unlike here, that conclusion was preceded by a finding that "the best scientific and commercial data" available had *not* been tapped. *Id.* at 1055. Further, NMFS was unable to make a "no likely jeopardy" determination. *Id.* at 1045.

In any event, section 7 of ESA does not require acquiescence to NMFS views, just consultation. *Sierra Club v. Froehlke*, 534 F.2d 1289, 1303-04 (8th Cir. 1976). *Cf. Lake Erie Alliance for the Protection of the Coastal Corridor v. Army Corps of Engineers*, 526 F. Supp. 1063, 1081 (W.D. Pa. 1981), *aff'd*, 707 F.2d 1392 (3d Cir.), *cert. denied*, ___ U.S. ___, 104 S. Ct. 277 (1983).

¹⁴⁶ 16 U.S.C. § 1532(16).

¹⁴⁷ 50 C.F.R. § 402.02 (1983). See *Roosevelt Campobello*, *supra*, 684 F.2d at 1048-49.

Pleasant Diversion.¹⁴⁸ Specifically, Del-Aware argues that two recent developments warrant reexamination of the Point Pleasant option: (1) the possible cancellation of Limerick Unit 2 as a consequence of the Pennsylvania PUC's decision declining to approve PECO's issuance of new securities for Unit 2,¹⁴⁹ and (2) the opinion of F&WS that the Blue Marsh Reservoir on the Schuylkill River is available and fully capable of providing water for the one remaining unit at Limerick. But a review of the Licensing Board's decisions reveals anything but a "refusal" to consider Del-Aware's arguments. It is obviously the Board's disposition of its claims to which Del-Aware now objects.

Before the hearing began, Del-Aware sought to litigate several additional contentions. One of them, V-24, referred to the PUC decision affecting Unit 2 and asserted that Schuylkill River alternatives were available and preferable, both economically and environmentally, to the river-follower method using the Point Pleasant Diversion.¹⁵⁰ The Licensing Board stated that it did not have enough facts to determine whether cancellation of Unit 2 is so remote that it could be ignored. But it assumed *arguendo* that Unit 2 would be cancelled, and it considered the effect of such a development on the proposed supplementary cooling water system.¹⁵¹

In order to determine how often just one unit at Limerick would have to rely on supplementary cooling water, the Board requested from the parties, and PECO supplied, additional historical flow data on the Schuylkill River and Perkiomen Creek (the primary sources of cooling water for Limerick). Based on these data, the Board found that supplementary cooling water would be necessary for solely one unit an average of 31 percent of the time — only three percent of the time less than for operation of two units.¹⁵² Describing this as "manifestly insignificant in view of the requirement for supplementary cooling water more than 30 percent of the time even with only one unit operating," the Board concluded that the Point Pleasant Diversion would therefore be necessary even if Unit 2 were cancelled.¹⁵³ In response to Del-Aware's argument that the Blue Marsh Reservoir was available to supplement the Schuylkill flows, the Board pointed out that DRBC allocation restrictions preclude

¹⁴⁸ Appellants' Brief, *supra*, at 24-28.

¹⁴⁹ See p. 861, *supra*.

¹⁵⁰ See Licensing Board Memorandum and Order of January 24, 1983 (unpublished), at 2-3.

¹⁵¹ *Id.* at 8-9.

¹⁵² *Id.* at 10-12.

¹⁵³ *Id.* at 12.

such augmentation.¹⁵⁴ The Board reiterated these views on at least two more occasions.¹⁵⁵

We find no basis for upsetting the Licensing Board's determination. First, Del-Aware did not and does not challenge the historical flow data submitted by PECO that support the Board's conclusion that supplemental cooling water from the Delaware River will be needed even if Unit 2 is cancelled and only one unit is operated.¹⁵⁶ Second, the Board correctly noted that the Blue Marsh Reservoir is not now a real alternative for supplementing the Schuylkill River water for Limerick. DRBC Executive Director Gerald M. Hansler explained at the hearing that current DRBC restrictions prohibit use of Blue Marsh for the Limerick project.¹⁵⁷ This is clearly a water allocation determination committed to the DRBC's judgment, the F&WS opinion notwithstanding.¹⁵⁸

Since the briefing of its appeal, Del-Aware has filed two motions that ask us to "set aside" the Licensing Board's partial initial decision on the basis of certain "new evidence."¹⁵⁹ The first motion states that (1) NWRA has suspended work on the Point Pleasant Diversion and is seeking to terminate its participation in the project with PECO; (2) Bucks County wants to halt the project; (3) PECO has commented publicly on the possible use of the Blue Marsh Reservoir; and (4) the Pennsylvania PUC has under study PECO's application to build the pumphouse necessary for the Perkiomen Creek.¹⁶⁰ Del-Aware's second motion refers to the following, *inter alia*: (1) a recent decision of the Pennsylvania Environmental Hearing Board, which Del-Aware claims supports its contention V-16 concerning salinity and water quality; (2) a 1973 internal PECO memorandum about the cooling water system; (3) a recently instituted Pennsylvania PUC investigation of the need for Unit 2; and (4) the decision of a PUC administrative law judge approving, for the time being, only one pump for the Bradshaw Reservoir.¹⁶¹ The gist of both

¹⁵⁴ *Id.* at 13.

¹⁵⁵ Licensing Board Memorandum and Order of March 8, 1983 (unpublished), at 6-8; Licensing Board Memorandum and Order of March 17, 1983 (unpublished), at 6-8.

¹⁵⁶ See Memorandum and Order of January 24, 1983, *supra*, at 11.

¹⁵⁷ Tr. 1205-11.

¹⁵⁸ See pp. 867-69, *supra*.

¹⁵⁹ Del-Aware, in effect, appears to be asking us to take official notice of the assertedly new evidence upon which it relies.

¹⁶⁰ Sugarman Letter (May 15, 1984), note 41, *supra*.

¹⁶¹ Del-Aware's Motion (Aug. 6, 1984), note 36, *supra*. The motion also complains about allegedly improper ex parte contacts between the NRC staff and PECO. *Id.* at 2-3. Such contacts are not ex parte under the Commission's Rules. Those rules prohibit communications between the parties to contested proceedings, on the one hand, and, on the other, those with decisionmaking responsibilities — i.e., Commissioners, their staffs and advisers, members of adjudicatory boards, and their staffs and advisers. 10 C.F.R. § 2.780. See Administrative Procedure Act, 5 U.S.C. § 557(d). The "NRC staff" does not advise the Commission or the boards. Rather, it is a distinct and separate entity that is a party to this

(Continued)

motions is that PECO will be unable to operate both units at Limerick or to rely on the Point Pleasant Diversion for supplementary cooling water. In this circumstance, according to Del-Aware, NEPA requires consideration of other alternatives.

What Del-Aware is seeking, in fact, is an order directing PECO to abandon Unit 2 and to rely on a source of supplementary cooling water for the remaining Unit 1 other than the Delaware River via the river-follower method. But we have no legal basis here for making such an order. There is no question that PECO has some formidable obstacles to surmount if it is to operate both Limerick Units 1 and 2 in the manner currently proposed. Whether PECO will change its plans to effect an easier resolution of the problems confronting it is a matter for PECO's management, and possibly its shareholders, to decide. But the fact is we now have before us PECO's application for a license to operate *two* units, using the river-follower method to supplement the plant's cooling water system. We have previously approved the river-follower method in ALAB-262, *supra*. The purpose of this proceeding, in that regard, is consideration of the impacts of any subsequent changes relating to that supplementary cooling system. Except for two matters that we have determined should have been, but were not, litigated,¹⁶² we agree with the Licensing Board's conclusion that the impacts of the subsequent changes are not significant. In the absence of a finding to the contrary, we are without the legal predicate to dictate to PECO that it must pursue other options.¹⁶³

Moreover, Del-Aware would have us act on the basis of rulings of other federal and state entities concerned with various aspects of Limerick and the PPD project. Apart from the facts that, in many instances, these rulings are not final and that overall the situation is rather dynamic, we must decide only the federal questions before us, without

proceeding and may confer with other parties, including PECO and Del-Aware. See 10 C.F.R. § 2.102(a).

¹⁶² Viz., Del-Aware's contentions on salinity and the impacts on the Point Pleasant Historic District. See pp. 866-70, 874-76, *supra*.

¹⁶³ Of course, if PECO does change its plans and modify its pending application accordingly, it is obliged to notify us and the parties promptly. *Tennessee Valley Authority* (Browns Ferry Nuclear Plant, Units 1, 2 and 3), ALAB-677, 15 NRC 1387, 1391-94 (1982). And, as the Licensing Board correctly observed, in such circumstance the Commission "would have to reconsider its previous assessment of environmental impacts in light of changes proposed by PECO." Licensing Board Memorandum and Order of June 1, 1983 (unpublished), at 9 n.3. The parties would also have to be afforded an opportunity to challenge any newly amended, significant portion of the application. See *Philadelphia Electric Co.* (Limerick Generating Station, Units 1 and 2), ALAB-778, 20 NRC 42, 48 (1984).

being unduly influenced by the decisions of others with differing concerns and responsibilities.¹⁶⁴ Accordingly, we deny Del-Aware's motions to set aside the Board's partial initial decision on the basis of new evidence.

IV. CONCLUSION

As the history of this case over the last decade makes clear, the environmental impacts of the Limerick supplementary cooling water system have been the subject of considerable attention both at this agency and in numerous other forums. Del-Aware's general assertion that there has been an effort to avoid review of these impacts or to conceal them in some manner is without merit. With regard to its more specific complaints, however, we agree that its contentions concerning salinity and the impacts on the Point Pleasant Historic District should have been considered by the Licensing Board. We therefore *affirm, in part*, the Licensing Board's decisions concerning the supplementary cooling water system. We *reverse and remand with instructions* that Del-Aware be given an opportunity to resubmit its contentions V-14 and V-16 in accordance with this opinion. Del-Aware's motions (filed May 15 and August 6, 1984) to set aside the Board's decisions are *denied*.

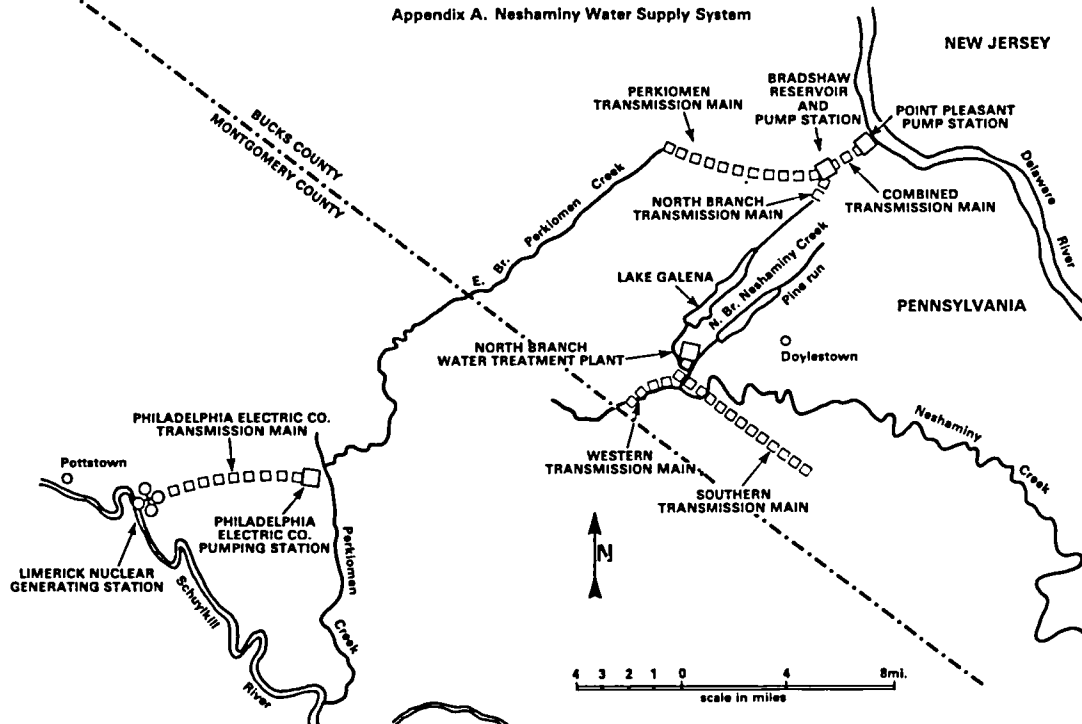
It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the
Appeal Board

¹⁶⁴ See *Kerr-McGee Corp. (West Chicago Rare Earths Facility)*, CLI-82-2, 15 NRC 232, 269 (1982), *aff'd sub nom. City of West Chicago v. NRC*, 701 F.2d 632 (7th Cir. 1983), and cases cited. See also *Cross-Sound Ferry Services, Inc. v. United States*, 573 F.2d 725, 732-33 (2d Cir. 1978).

Appendix A. Neshaminy Water Supply System



SOURCE: Neshaminy Water Resources Authority (Neshaminy Watershed Plan - Water Supply Bucks and Montgomery Counties, Pennsylvania) DRBC No. D-75-52CP (Feb. 18, 1981)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Morton B. Margulies, Chairman
Gustave A. Linenberger, Jr.
Dr. Oscar H. Paris**

In the Matter of

**Docket Nos. 50-424-OL
50-425-OL
(ASLBP No. 84-499-01-OL)**

**GEORGIA POWER COMPANY, et al.
(Vogtle Electric Generating Plant, Units 1
and 2)**

September 5, 1984

In this Memorandum and Order, the Licensing Board rules on the admissibility of Intervenor's contentions.

RULES OF PRACTICE: WAIVER OF REGULATION

Because Intervenor failed to make a *prima facie* showing of special circumstances justifying a waiver of 10 C.F.R. § 51.53(c) to permit reconsideration of the need-for-power issue at the operating license stage, 10 C.F.R. § 2.758(c) bars further consideration of the matter, and Intervenor's contention is dismissed.

OPERATING LICENSE PROCEEDINGS: FINANCIAL QUALIFICATIONS

The Commission's determination that its rule barring litigation of financial qualifications issues in operating license proceedings remains in

effect, despite the decision of the U.S. Court of Appeals for the District of Columbia Circuit in *New England Coalition on Nuclear Pollution v. NRC*, 727 F.2d 1127 (D.C. Cir. 1984), bars consideration of Intervenor's financial qualifications contention.

**MEMORANDUM AND ORDER
ON SPECIAL PREHEARING CONFERENCE HELD
PURSUANT TO 10 C.F.R. § 2.751a**

Following the publication of a Notice of Opportunity for hearing on December 28, 1983, for the captioned operating license application proceeding, petitions to intervene and to hold a hearing were filed by Campaign for a Prosperous Georgia (CPG), Georgians Against Nuclear Energy (GANE) and Coastal Citizens for a Clean Environment (CCCE).

Applicants, represented by Georgia Power Company (GPC) acting for itself and as agent for Oglethorpe Power Corporation, Municipal Electric Authority of Georgia and City of Dalton, Georgia, and the Nuclear Regulatory Commission Staff (Staff) filed responses concluding that CPG and GANE satisfied the interest requirements of 10 C.F.R. § 2.714 and that each Petitioner would have to plead one admissible contention, as required by § 2.714(b), for it to be afforded party intervenor status. They further concluded that CCCE failed to establish requisite interest.

In a Memorandum and Order of March 9, 1984 (unpublished), we found that CPG and GANE had fulfilled the requirements of 10 C.F.R. § 2.714 establishing that their respective interest to participate as intervenors in an adjudicatory proceeding and that full-party status for each was dependent on the submission of at least one litigable contention. We further found CCCE had not shown that the action being challenged could cause injury in fact to any of its members and therefore had not submitted grounds for representative intervention.

A Special Prehearing Conference was ordered pursuant to 10 C.F.R. § 2.751a to resolve, *inter alia*, the matter of standing and to pass upon any proposed contentions that would be submitted. Filings were to be made by Petitioners, through amendment or supplemental petition, by April 12, 1984.

CPG and GANE each filed thirteen proposed contentions, the last nine of which were identical to each other. Nothing was received from CCCE. Responses to the proposed contentions were timely made by Applicants and Staff.

Prior to the holding of the Special Prehearing Conference on May 30, 1984, at Augusta, Georgia, Applicants, Staff, CPG and GANE conferred in an attempt to resolve differences on proposed contentions. This conference resulted in CPG withdrawing two of its contentions, rewording of others, and it submitted a new contention which was based on material drawn from one filed previously. It proposed to resubmit another contention upon receipt of additional information. At the special prehearing conference GANE altered some proposed contentions previously filed and, like CPG, submitted the same additional proposed contention. No one opposed the submission of the additional contention by each petitioner.

A review follows of the proposed contentions submitted by Petitioners, as supplemented and amended, and of the responses of Applicants and Staff, with our respective rulings. Further, in this Memorandum and Order, we will set future scheduling and dispose of the CCCE petition.

DISPOSITION OF THE CPG PROPOSED CONTENTIONS

Proposed Contention 1

Withdrawn.

Proposed Contention 2

There is no reasonable assurance that the production capacity of Plant Vogtle will be needed, as required by NEPA (42 U.S.C. 4331-4335) and by NRC regs 10 C.F.R. 50.42 and 10 C.F.R. 51.52(c)(3).

CPG's proposed contention asserts that there is no need for the power from the subject plant. In support of its contention CPG sets forth that GPC incorrectly projected its annual electricity sales growth and peak demand. It alleges that the utility has overcapacity and had tried without success to sell this capacity to out-of-State utilities. Petitioner contends that, if additional capacity were needed, conservation, solar energy and other environmentally preferable alternatives would be the way to provide it.

Both Applicants and Staff responded that the proposed contention is inadmissible because 10 C.F.R. § 51.53(c) specifically provides:

(c) Presiding officers shall not admit contentions proffered by any party concerning need for power or alternative energy sources for the proposed plant in operating license hearings.

That response in turn resulted in CPG filing on May 25, 1984, a request for a waiver of 10 C.F.R. § 51.53(c) pursuant to 10 C.F.R. § 2.758. The latter section provides that a party may petition that the application of a specified Commission regulation may be waived or an exception made for the particular proceeding. The sole ground shall be that there are special circumstances with respect to the subject matter of the particular proceeding which are such that application of the regulation would not serve the purposes for which the regulation was adopted.

The Commission in promulgating 10 C.F.R. § 51.53(c) succinctly set forth its reasons at 47 Fed. Reg. 12,940 (March 26, 1982). It stated:

The purpose of these amendments is to avoid unnecessary consideration of issues that are not likely to tilt the cost-benefit balance by effectively eliminating need for power and alternative energy source issues from consideration at the operating license stage. In accordance with the Commission's NEPA responsibilities, the need for power and alternative energy sources are resolved in the construction permit proceeding. The Commission stated its tentative conclusion that while there is no diminution of the importance of these issues at the construction permit stage, the situation is such that at the time of the operating license proceeding the plant would be needed to either meet increased energy needs or replace older less economical generating capacity and that no viable alternatives to the completed nuclear plant are likely to exist which could tip the NEPA cost-benefit balance against issuance of the operating license. Past experience has shown this to be the case. In addition, this conclusion is unlikely to change even if an alternative is shown to be marginally environmentally superior in comparison to operation of a nuclear facility because of the economic advantage which operation of nuclear power plants has over available fossil generating plants. An exception to the rule would be made if, in a particular case, special circumstances are shown in accordance with 10 C.F.R. 2.758 of the Commission's regulations.

In the same *Federal Register* issuance at 12,942 the Commission commented that there had never been a finding in a Commission operating license proceeding that a viable, environmentally superior alternative to operation of the nuclear facility exists and that the Commission expects this to be true for the foreseeable future.

The Commission, in promulgating the restrictive regulation 10 C.F.R. § 51.53(c), relied upon its conclusion found at 46 Fed. Reg. 39,441 (August 3, 1981). It provides:

Based on all of the above, the Commission believes that case-specific need for power and alternative energy source evaluations need not be included in the environmental evaluation for a particular nuclear power plant operating license. An ex-

ception would be made to this rule if, in a particular case, special circumstances are shown in accordance with 10 C.F.R. 2.758 of the Commission's regulations. Such special circumstances could exist if, for example, it could be shown that nuclear plant operations would entail unexpected and significant adverse environmental impacts or that an environmentally and economically superior alternative existed.

In its petition for waiver CPG contends that special circumstances now exist concerning the plant which justify a reconsideration of the need for its power at the operating license stage. It gives as a basis dramatically changed circumstances since the construction permit was issued, in the areas of economics, electricity consumption patterns and availability of alternative energy.

The petition for a waiver is supported by an affidavit of Tim Johnson, executive director of CPG. His background qualifications in the area of the subject of the affidavit are not given. The affidavit is virtually a verbatim repetition of the bases given in support of proposed Contention 2.

Affiant reports that Georgia Power Company's average annual growth in territorial sales and peak demand through 1983 had been incorrectly forecast. The utility is stated to be already overbuilt. CPG names nine other generating units under construction along with the capacity of each. CPG claims this should compound GPC's overcapacity. Affiant reported further that the company had conceded to the Georgia Public Service Commission that it had tried without success to sell its overcapacity to out-of-State utilities.

Affiant's position is that even if additional capacity were needed, the facility would not be the best way to provide it. Johnson asserts conservation and solar energy are less injurious to the physical and human environment than Plant Vogtle would be. He claims that a solar water heating system could be installed on every household in Georgia at less cost than that of completing the nuclear facility. The proposed water heating system, it is alleged, would provide more energy and jobs and have less environmental impact than completion and operation of Plant Vogtle. Unnamed experts are relied upon in support of the propositions. Conservation and passive solar measures are stated to have essentially no operating costs. No figures are submitted by Petitioner to support any of its assertions as to cost comparisons. Georgia Solar Coalition, Inc., a nonprofit organization, in a notarized letter of May 28, 1984, submitted a figure of 22 MBtu as the typical yearly demand for delivered energy for an electrical resistance domestic water heater for a family of four; 15.4 MBtu is the average yearly savings that can result from energy conservation measures and a standard active solar flat-plate collector domestic hot water system.

Petitioner states that it is clear that Plant Vogtle is not needed to meet increased energy needs or to replace older, less economical generating capacity. Affiant asserts that operating costs of the facility will exceed the total costs of many environmentally preferable alternatives, including co-generation using existing industrial process steam, conservation measures consisting of increased insulation of homes and applications of solar energy for water and space heating. No details or figures are furnished.

Petitioner also relies in the matter on a statement made by a Commissioner of the Georgia Public Service Commission that unnamed experts are questioning whether large-scale generating plants should continue to be constructed, and are of the position that an era of co-generation, combined cycle generation, photocell or light-cell and fuel-cell generation is being entered and that alternative sources of generation should be studied.

Applicants filed a response on June 11, 1984, alleging Petitioner had failed to make a *prima facie* case for waiver as provided in 10 C.F.R. § 2.758 and ask that the request be denied. The pleading was supported by an affidavit from Georgia Power Company's senior vice president of marketing who is experienced in planning and marketing of bulk power resources for the utility.

Affiant noted that Georgia Power Company's currently available capacity includes only approximately one-third of the new capacity additions which the Company had planned to construct a decade ago, achieved in part through cancelling units and selling interests in others under construction. He further pointed out that the Company's generating capacity is predominantly fossil fueled and that under normal procedures Plant Vogtle's capacity will be utilized in preference to fossil-fueled generation because its fuel costs will be lower. Affiant also reported that the majority of households in Georgia Power Company's service area use natural gas to provide hot water heating.

Among other points, Applicants further asserted CPG makes no attempt to show that Plant Vogtle would not be used to replace older, less-economical generating capacity, a vital requirement for making a *prima facie* case for waiver. Nuclear Regulatory Commission Staff took the same position in its response. Three of the owners, other than Georgia Power Company, now own a majority interest in the plant.

Based upon the foregoing record, we find that CPG has not made a *prima facie* showing that should result under 10 C.F.R. § 2.758(d) in a certification of whether the regulation should be waived. Under 10 C.F.R. § 2.758(c), if the presiding officer determines that the petitioning

party has not made a *prima facie* showing, the presiding officer may not further consider the matter.

A formidable burden is placed on one seeking a waiver of 10 C.F.R. § 51.53(c). See *Duquesne Light Co.* (Beaver Valley Power Station, Unit 2), LBP-84-6, 19 NRC 393, 401-03 (1984). Here Petitioner failed to make a *prima facie* showing that the Vogtle facility will not be needed to meet increased energy needs. It provided no probative information bearing on what will be the electrical energy requirements of Georgia Power Company and its three partners who hold a majority interest, and their production capacity during the expected life of the facility. Without such information it cannot be determined whether the proposed operating plant will represent needed or excessive capacity.

The fact that Georgia Power Company erroneously estimated its annual electricity sales growth and peak demand for a preoperational period does not establish that the power of the plant will not be needed during its planned life. The providing of the names and capacities of additional facilities Georgia Power Company has coming on line and making known that Georgia Power Company had unsuccessfully attempted to sell electricity out of State does not establish that Vogtle, when ready, will represent overcapacity. Applicants' affiant has furnished information showing that Georgia Power Company reduces planned capacity when the situation warrants. CPG has not provided sufficient information to provide a comprehensive picture of what electrical needs will be during the projected life of the plant and whether Vogtle will represent needed or excess capacity. Because CPG has failed to establish that the subject plant will not be needed for increased energy needs, it has not provided a basis for waiver of 10 C.F.R. § 51.53(c) and its petition must fail.

Equally fatal to its waiver claim is CPG's failure to show that the facility would not be used to replace older, less-economical generating capacity. The Commission's regulation barring need for power as an issue in an operating license application proceeding is based on the presumption that the new nuclear plant would be used in that manner. Applicants' affiant states it will be so used. Petitioner has made no showing to overcome the presumption and the evidence that the plant would not be so used. Petitioner has not sustained its burden of proof on this aspect of the waiver petition which must therefore be denied.

CPG has not made a *prima facie* case that an environmentally and economically superior alternative exists to the proposed Vogtle Plant which could tip the NEPA cost-benefit balance against issuance of the operating license.

To be a viable alternative power source for the subject plant the substitute must be capable of serving the consumers in an equivalent manner that the power from the Vogtle Plant could be used. Consumers must be able to utilize the power from the substitute source in whatever varied ways they see fit.

Petitioner has not offered an alternative power source for the proposed plant. It proposes conservation and installation of solar water heating systems. Neither of these offers the consumer an alternative power source in the manner indicated. Petitioner only offers conservation in various forms, which the Commission concludes does not negate a need for the new plant. The Commission stated in its rulemaking on need for power at 47 Fed. Reg. 12,941:

If conservation lowers demand, then utility companies take the most expensive operating plants off-line first. Thus a completed nuclear plant would be used as a substitute for less economical generating capacity.

For the sake of argument, even if one were to consider conservation and the solar water heating system an alternative energy source, Petitioner has offered nothing convincing and probative that they are environmentally and economically superior to the Vogtle Plant. All that are offered are conclusional statements without factual support. The figures given by Georgia Solar Coalition, Inc., do not support the assertions made. Had the affiant been qualified as an expert in the subject matter under discussion, which he had not been, Petitioner's *prima facie* case still would not have been made because what was offered were unsupported conclusions.

Petitioner makes us aware that there are potentially beneficial energy sources other than from nuclear and fossil fuels and that research is being conducted on their use and more is being called for, but this does not meet the regulatory requirement of showing any of them to be currently environmentally and economically superior as an alternative to the Vogtle Plant. Its request for waiver of 10 C.F.R. § 51.53(c) therefore must be denied.

Having found that Petitioner has not made a *prima facie* showing for a waiver of 10 C.F.R. § 51.53(c), under the provision of 10 C.F.R. § 2.758(c) we cannot consider the matter further. Consideration of the matter in proposed Contention 2 being denied to us, the proposed contention is not litigable and is therefore dismissed.

Proposed Contention 3

There is no reasonable assurance that Georgia Power Company and co-owners will have the financial ability to safely operate Plant Vogtle for the period of the license or to permanently shut down the facility and maintain it in a safe condition, as required by 10 C.F.R. 50.40(b), and other applicable laws, rules and regulations.

Petitioner expects Georgia Power Company and the plant's co-owners will be subjected to hardships to the extent that their financial ability to safely operate the plant for the period of the license and to properly decommission it is questionable.

The Commission promulgated on March 31, 1982, regulations 10 C.F.R. § 50.33(f)(1) and 10 C.F.R. § 50.40(b) that eliminated as an issue the financial qualifications of an electric utility as an applicant in an operating license application proceeding.

Applicants, in their response to Petitioner, pointed out that the Commission's rule barring financial qualifications in an operating license proceeding had been the subject of a recent remand by the U.S. Court of Appeals for the District of Columbia Circuit in *New England Coalition on Nuclear Pollution v. NRC*, 727 F.2d 1127 (D.C. Cir. 1984) and the Commission had undertaken a rulemaking proceeding to revalidate the prescription. Their position is that because the matter of financial qualifications is the subject of rulemaking it is an inappropriate subject for a contention in the proceeding and at the very least the issue should be deferred pending Commission guidance to the licensing boards.

Staff in response noted that the Commission had met on April 26, 1984, to discuss policy guidance on financial qualification litigation and it recommended that the matter be deferred pending a statement by the Commission.

Staff subsequently reported that on June 7, 1984, the Commission issued its Statement of Policy which concludes:

Accordingly, the March 31, 1982 rule will continue in effect until finalization of the Commission's response to the Court's remand. The Commission directs its Atomic Safety and Licensing Board Panel and Atomic Safety and Licensing Appeal Panel to proceed accordingly.

The Commission's finding that the rule continues in effect proscribes us from considering the issue of financial qualifications of utility applicants in an operating license application. The proposed contention is therefore dismissed.

Proposed Contention 4

Withdrawn.

DISPOSITION OF THE INITIALLY IDENTICAL PROPOSED CONTENTIONS OF CPG AND GANE

Proposed Contention 5

The applicant has not properly assessed the geology of the site and has not properly considered the geology of the site in the engineering design of the project, especially in light of new data made available by the U.S. Geological Survey. This violates NRC rules on seismic standards described in 10 C.F.R. Part 100, Appendix A.

In their separate submittals of April 11, 1984, CPG and GANE cited U.S. Geological Survey (USGS) information released in 1982 relating to a postulated Millett Fault about 7 miles from the Vogtle site (USGS Open-File Report 82-156 (1982)), and to a USGS letter (J.F. Devine to R.E. Jackson, November 16, 1982) indicating that its investigations of the 1886 Charleston Earthquake do not justify confining an event of that magnitude to the immediate environs of Charleston. We address each USGS matter separately.

By the time the prehearing conference was held on May 30, 1984, CPG had amended proposed Contention 5 (submitted May 25, 1984) to delete inclusion of the postulated Millett Fault, whereas GANE retained the Millett Fault as part of its contention (Tr. 18). Applicants and Staff, in their submittals on May 7 and May 14, 1984, respectively, opposed including the Millett Fault on the grounds that its existence is only speculative, and that the extent of overlying, undisturbed sediments provides reason for not considering it to be a capable fault. At the prehearing conference, CPG stated that recent discussions (about 1 week prior to the conference) with a USGS staff member indicated that the Millett Fault lacked significance. GANE offered no basis in support of its allegation that the Millett Fault exists, is capable and should be considered. Accordingly, we dismiss any consideration of the postulated Millett Fault within the scope of Contention 5, because no adequate basis for its inclusion has been provided. The above action restores proposed Contention 5 to an identical status for CPG and GANE involving only the Charleston Earthquake. However, the Board is mindful of two considerations not addressed by the participants in the proceeding:

- (a) Board Notification 82-122A of December 30, 1982 (prompted by the USGS reconsideration of the 1886 Charleston Earth-

- quake) wherein the Staff recommended that certain studies be undertaken as the result of this revised USGS position; and,
- (b) The issuance in April 1984 of NUREG/CR-3756, "Seismic Hazard Characterization of the Eastern United States: Methodology and Interim Results for Ten Sites," which considers ten sites including the Vogtle site and which appears to be the first report on certain of the studies recommended in BN 82-122A.

In its letter of July 12, 1984, the Board asked the Staff to comment upon this matter as it relates to the proposed contention. The Staff's response of July 23, 1984, indicated that it will discuss the impact upon Vogtle of its reassessment of the Charleston event in the Vogtle SER, currently scheduled to issue in June of 1985. Further, the Staff suggested that the Board's ruling on admissibility of this proposed contention be deferred until after the Vogtle SER issues.

Other participants were also invited to comment upon the Board's inquiry. CPG filed comments on July 26, 1984, to include recognition of the recommended reassessment program identified in BN 82-122A as well as recognition of the issuance of NUREG/CR-3756. CPG alleged that these matters constitute new information that justifies admission of the proposed contention. GANE did not respond. The Applicants, on July 27, 1984, filed comments in which they concluded that the publication of NUREG/CR-3756 did not cure the lack of a basis for the proposed contention and maintained that it should not be admitted.

We find merit to the Staff's position regarding deferral. Accordingly, Petitioners are advised that within 30 days following issuance of the SER they may amend this proposed contention if they consider that the SER contains a basis for such an amendment. Applicants and Staff will have the usual prescribed time for responses. Absent the filing of an amendment by either Petitioner in accordance with these instructions, proposed Contention 5 (limited to the Charleston Earthquake) will be ruled on by the Board.

Proposed Contention 6

The applicant cannot guarantee the safe operation of the reactor for the life of the plant due to unresolved questions of thermal shock effects on irradiated reactor vessels as required by 10 C.F.R. 50 Appendices A, G, and H and other applicable laws, rules, and regulations.

Applicants and Staff both opposed the admission of this contention for reasons that include lack of a showing that a specific basis exists for

concern about pressurized thermal shock effects on the Vogtle reactor vessel, failure to show that the Applicants' analyses of thermal shock are flawed, and failure to justify inclusion of this unresolved safety issue in the Vogtle proceeding. Petitioners' concern about the existence of copper and phosphorous in the reactor vessel alloy was not shown to relate to accelerated embrittlement. Finally, Petitioners' concern about the cost to Applicants should the pressure vessel need to be heat-treated during the operating lifetime of the Vogtle Plant is beyond the scope of this proceeding. During the prehearing conference discussion, Petitioners offered no additional information that would negate the objections raised by Applicants and Staff. We agree with the position of Applicants and Staff; accordingly, the admission of proposed Contention 6 is denied on the ground that it lacks a sufficiently particularized basis.

Proposed Contention 7

Applicant has not adequately addressed the value of the groundwater below the plant site and fails to provide adequate assurance that the groundwater will not be contaminated as required by 10 C.F.R. 51.20(a), (b), and (c), 10 C.F.R. 50.34(a)(1), and 10 C.F.R. 100.10(c)(3).

Petitioners contend that the Tuscaloosa aquifer, which they state is located approximately 300 feet below the Plant Vogtle site, is a valuable regional resource of excellent quality water that supplies domestic water to many cities and communities across East Central Georgia and the South Carolina Coastal Plain. They point out that the Tuscaloosa aquifer provides water for 15,000 people in Richmond County and most of the drinking water for residents of Girard, located 5 miles from the plant, and of McBean, which is 13 miles from the plant..(GANE Supplement, April 11, 1984, at 15.)

In addition to the Tuscaloosa aquifer, Petitioners state that the Lisbon Sand Formation located approximately 200 feet below Plant Vogtle is another valuable ground water source. They contend that this aquifer is important as an existing source of drinking water and to future development along the Savannah River. They state that Plant Vogtle's cooling system makeup water wells penetrate and obtain water from both the Lisbon Sand Formation and the Tuscaloosa aquifer. (*Ibid.*)

Finally, there is a water table aquifer located directly below the surface at Plant Vogtle, and while Petitioners acknowledge that this aquifer is not as extensive as the two deeper aquifers discussed above, they contend that the water table aquifer is used in Burke County to supply water for agriculture and commercial establishments. (*Ibid.*)

Petitioners contend that any release of radioactive water on site would quickly contaminate the water table aquifer because at the site the soils are sandy and permeable and there is little runoff. They argue that radioactive contamination of the water table aquifer could endanger the public health and cause economic hardship (*id.* at 15-16). They argue, further, that contamination of the water table aquifer could result ultimately in contamination of the Lisbon Sand Formation and the Tuscaloosa aquifer, by vertical movement of contaminated water through fractures in the clay separating the aquifers, or through permeable sections of the clay. (*Id.* at 16.)

In a GANE filing of June 13, 1984, Mr. W.F. Lawless discusses at length various sources of contaminants at the Savannah River Plant (SRP). He also states that the Tuscaloosa aquifer has produced contaminated water in at least five wells, including two drinking-water-supply production wells. The contaminants appear to have been chlorinated hydrocarbons, however, not radioactive material. (GANE filing, June 13, 1984, at 13.) The hydrocarbons, however, conceivably could have come from the M-Area at SRP. (*Id.* at 13-14.) Mr. Lawless alleges, further, that ground water above the Tuscaloosa aquifer is severely contaminated. (*Id.* at 18.)

Applicants discuss the water table aquifer and the Tuscaloosa aquifer, but do not acknowledge a Lisbon Sand Formation aquifer between the two.¹ Applicants state that a 60- to 70-foot-thick marl formation makes contamination of the Tuscaloosa aquifer unlikely. They acknowledge that an accidental release could contaminate the water table aquifer, but state that spillage at the plant would eventually make its way to Mathes Pond via the water table aquifer and from there by a stream to the Savannah River. (Applicants' Response, May 7, 1984, at 42-43; Tr. 139-42.)

The Staff objects to the admission of Contention 7 on the grounds that Petitioners have raised no new facts to call into question the assessment of ground water problems at the construction permit proceeding. In addition, Staff has difficulty in discerning the gravamen of the

¹ Applicants do state that there is a third aquifer in the region, which they characterize as the "principal artesian aquifer"; because the principal artesian aquifer is not hydraulically isolated from the Tuscaloosa aquifer; however, Applicants elect to refer to the combination as the Tuscaloosa aquifer. (Applicants' Response, May 7, 1984, at 42-43 n.27.) It is not clear whether the principal artesian aquifer is distinct from, or synonymous with, the Lisbon Sand Formation aquifer. GANE refers to the principal artesian aquifer, also, but characterizes it as being "a major regional water supply aquifer" located just south of Plant Vogtle, and GANE seems to suggest that in that region the clay that separates the water table aquifer from the deeper aquifer changes to a permeable limestone (GANE Supplement, April 11, 1984, at 16).

contention, or whether it addresses normal operation or accident conditions. (Staff Response, May 14, 1984, at 12.)

The Board has no difficulty in discerning the gravamen of the contention: it is that the Petitioners are concerned that an accidental spill of radioactive water on the site could result in radioactive contamination of the shallow, and possibly the deeper, aquifers under Plant Vogtle, all of which are used as public water supplies. Moreover, from the information provided in the pleadings and at the Special Prehearing Conference, we are not convinced that radioactive contaminants that might get into the water table aquifer could not get into deeper aquifers. We believe that the Petitioners have, indeed, raised new information concerning contamination of the Tuscaloosa aquifer; this fact, if true, suggests to us that the Tuscaloosa aquifer may not be as isolated from the surface as Applicants would have us believe. In addition, we feel we need to determine whether there are one or two deep aquifers, and whether these are hydraulically connected anywhere in the vicinity of the plant.

For the foregoing reasons we conclude that the Petitioners have raised a litigable issue in Contention 7. Therefore Contention 7 is accepted for litigation in this proceeding.

Proposed Contention 8

Applicant has failed to enforce a quality assurance program in the construction of Plant Vogtle that provides adequately for the safe functioning of diverse structures, systems and components, as required by 10 C.F.R. Appendix B.

In their separate submittals of April 11, 1984, both Petitioners originally proposed the same identical contention (as stated above) and offered identically worded bases to support it. These bases included a discussion of standby diesel generator problems, which topic both Petitioners proposed to exclude from this contention and to include same in a new Contention 14 proposed by each Petitioner. Staff and Applicants offered no objection to this change (Tr. 62-63). New proposed Contention 14 will be addressed below.

CPG, in its filing of May 25, 1984, revised its Contention 8 to read as follows:

Applicant has not and will not implement a quality assurance and quality control program which will function as required by 10 C.F.R. 50 Appendix B. By restricting quality assurance methods to explicitly designated procedures in disregard to more comprehensive standards of engineering practice, the Applicant has undermined

confidence in the critical functioning of welds in both the reactor coolant and containment systems of Plant Vogtle.

CPG stated that its revised contention is restricted to a consideration of welds (Tr. 41) and that the contention faults both the quality assurance program and its implementation (Tr. 62), as they apply to the adequacy of welds. The supporting basis of this revised contention cites certain irregularities involving weldments. During the prehearing conference, CPG explained that it was not complaining about the adequacy of specific welds, *per se*, but rather that the methodology of the quality assurance program and its implementation do not generate confidence that welding practices generally meet the professional standards intended by the NRC regulations and ASME Code requirements (Tr. 41-43).

By contrast, GANE, at the prehearing conference stated that it had also modified its proposed contention, but in a different manner than CPG. GANE promised a copy of its revised language (Tr. 48), but the Board is unaware of its having been submitted. Thus, we assume that GANE is adhering to the original statement of the contention cited above. By way of amplification, GANE stated that "systematic quality assurance deficiencies have existed and continue without resolution in the following areas . . ." (Tr. 49). Those areas were identified by GANE (Tr. 49) as "[p]roper welding, vendor surveillance, inspection, testing, implementation of procedures and procurement." The Board is thus now confronted with two different proposed Contentions 8 from CPG and GANE.

Applicants' submittal of May 7, 1984, presents a lengthy detailed rebuttal supporting the adequacy of their QA program in which they make, in summary, the following points:

- No violations were more severe than severity levels IV and V;
- Applicants identified and voluntarily corrected many of the anomalous conditions adverted to;
- NRC SALP and I&E reports commended the Applicants' QA program; and
- Intervenor's identification of several anomalous matters does not impugn the adequacy of Applicants' QA program but rather evidences a lack of appreciation of how a QA program functions.

(Applicants' Response, May 7, 1984, at 46-63).

The Staff, in its May 14, 1984 response, found the original proposed contention broad and lacking in specificity; and judged the contention not to be susceptible to focused litigation (Staff Response at 12-13). During discussion at the conference, Staff counsel opined that CPG's

amended and narrowed contention approaches admissibility. However, Staff still considers the GANE contention to be too broad to be admitted (Tr. 56-57).

Despite the representations of Applicants and Staff, the Board is concerned about the possible impact upon the operational safety of the Vogtle Plant in view of the many instances of noncompliance that have been cited. Thus, we feel that an evidentiary inquiry is justified to determine whether Applicants have formulated and implemented an adequate QA program. Although we do not decide the merits of these two proposed Contentions 8 at this time, we are mindful of the concerns of Applicants and Staff with respect to what a focused litigation might comprise: they and we have a right to know more specifically what is to be litigated. Accordingly, the Board now instructs Applicants, Staff, CPG and GANE to confer about the language of these contentions with the objective of rewording them in a manner that is susceptible to more focused litigation; and the Petitioners should consider consolidating the two contentions. The results of such a conference (be it a stipulation as to acceptable wording or statements of positions regarding the reasons for continued disagreement) are to be reported to the Board 30 days after service of this Memorandum and Order subsequent to which we will rule upon its acceptability. Proposed Contentions CPG 8 and GANE 8 are admitted to the extent indicated.

Proposed Contention 9

Novel design features must be discussed and described adequately in the PSAR and FSAR as required by 10 C.F.R. 50.34. The Applicant has embarked on the implementation of the reactor coolant system primary loop at Plant Vogtle using a pipe restraint system design that differs substantially from that currently required. Although assertions of the effectiveness of this new design have been issued, substantiating mechanical modelling and empirical justification have been withheld. The Applicant has therefore failed to provide even the minimal information required to understand and assess the safety repercussions of this innovative design.

At the Special Prehearing Conference, Applicants agreed to provide Petitioners with additional information on the matter under a protective proprietary agreement. CPG agreed that within 30 days after receiving the document it would either decide to amend or withdraw the proposed contention. GANE agreed that it would follow suit. By letter dated July 26, 1984, CPG notified the Board of its withdrawal of proposed Contention 9. No separate expression was received from GANE. Based on Petitioners' taking identical positions for the handling of the proposed con-

tention at the Special Prehearing Conference, we consider it withdrawn from the proceeding.

Proposed Contention 10

Applicant has not shown that safety-related electrical and mechanical equipment and components will be environmentally qualified at the onset of operations and throughout the life of the plant as required by General Design Criteria 1, 2 and 4 of 10 C.F.R. 50, Appendix A and other applicable NRC rules.

In their submittal of May 7, 1984, Applicants used the identical supporting discussions of CPG and GANE to identify eleven specific sub-contentions; Applicants then addressed the admissibility of each. At the prehearing conference, Staff and the Petitioners agreed to this breakdown into eleven subcontentions as the basis for determining admissibility and the scope of any litigation of this contention. Staff's request to comment upon each of these was granted (Tr. 77-78). We now discuss each subcontention.

10.1 Integrated Dose vs Dose Rate

This subcontention alleges that Applicants' testing methods are inadequate because the Applicants only use high levels of radiation or integrated dose. Petitioners cite research performed at Sandia Laboratory for the proposition that many materials, including polymers found in cable insulation and jackets, seals, rings and gaskets at Vogtle may experience greater damage from lower dose rates. In its submittal of June 27, 1984 (affidavit accompanying same), Applicants' affiant quotes Regulatory Guide 1.131 as limiting the qualification test exposure rate to 10^6 rad/hr. Neither Applicants nor Staff (in its June 20, 1984 submittal) object to this subcontention if it is restricted to the polymers identified in the Sandia study report, NUREG/CR-2157, "Occurrence and Implications of Radiation Dose-Rate Effects for Material Aging Studies," June 18, 1981. With this restriction to the particular polymers so identified, Subcontention 10.1 is admitted for litigation.

10.2 Synergism

This topic deals with another Sandia study examining the effects of synergism. Petitioners state that this Sandia study (NUREG/CR-2156, "Radiation-Thermal Degradation of PE and PVC: Mechanism of Synergisms and Dose-Rate Effects," June 1981) examined the combined ef-

fects of radiation, heat, and (in some experiments) oxygen concentration and determined that "the greatest amount of degradation was found upon exposure to heat followed by exposure to radiation." Petitioners further allege that the existence of synergistic effects established by this report have not been considered by the Applicants.

The Staff does not object to admitting this subcontention (Staff Supplemental Response, June 20, 1984). However, the Applicants, in their May 7, 1984 Response, note that the Vogtle FSAR does address synergistic effects in cables. The Board's review of the FSAR indicates that the results of cable testing (cables are said (without reference) to be the only component in which synergism has been identified) will not be available until testing has been completed. Thus cables, at least, are being tested for synergistic effects, an example that Applicants point out seems to have been ignored by Petitioners. Nor can we find that Petitioners have identified any other equipment or components which they believe to be susceptible to synergistic effects, despite the Sandia report's identification of PE and PVC as possibly susceptible materials.

We find this subcontention to lack a specific basis and we deny its admissibility.

10.3 Cable in Multiconductor Configurations

Again, Petitioners cite a Sandia study (not identified) for the proposition that in tests of EPR cable material, multiconductor configurations performed "substantially worse" than single-conductor configurations and that qualification testing implying only single conductors may not be representative of multiconductor performance. Petitioners further allege that the results of this report have not been considered in Applicants' testing program. The Staff does not object to the admission of this subcontention, nor do Applicants. Based on the foregoing reasons, we admit Subcontention 10.3.

10.4 Terminal Blocks

Applicants' affiant states that there are no terminal blocks associated with safety-related applications that will be exposed to, and therefore need to be qualified in, a steam environment (Affidavit attached to Applicants' letter response of June 27, 1984). In its letter response of July 26, 1984, CPG withdrew this subcontention. Although Staff had previously offered no objection to the admission of this subcontention and GANE has not responded to Applicants' affidavit, there appears to be no basis for its support. We deny its admission.

10.5 Solenoid Valves

This subcontention challenges the qualification of solenoid valves used at Vogtle. The contention is based upon test results performed by ASCO and Franklin Research Center and upon an NRC Board Notification issuance. The Staff and the Applicants do not object to the admission of this subcontention. Having found a sufficient basis for, and no opposition to, the admission of this subcontention, the Board deems it to be acceptable for litigation.

10.6 Limitorque Motor Operators

Petitioners cite IE Notice 81-29 for the proposition that motor operators manufactured by Limitorque have exhibited failures upon exposure to steam spray. Further tests by Westinghouse confirmed the unacceptability of the motor design. Applicants' affiant (Affidavit attached to Applicants' letter response of June 24, 1984) stated that new motors designed by Westinghouse and Limitorque had been successfully qualified in a 420°F steam environment, and that these new motors have been ordered as replacements. This would seem to moot this matter; and, indeed, CPG, by letter of July 26, 1984, advised that CPG will not raise this issue. Although GANE has not replied, we consider this issue to be mooted and we deny admission of the instant subcontention.

10.7 Hydrogen Recombiners

Petitioners have presented three ingredients in this subcontention:

- (a) Rockwell catalytic recombiners have components that did not pass certain environmental qualification tests;
- (b) The entire recombiner system, as a unit, has not been qualified; and
- (c) A recombiner with unqualified transducers was delivered to another nuclear facility.

The Applicants' responses have mooted (a) and rebutted (c) by pointing out that a Westinghouse electric recombiner is to be used in the Vogtle Plant (Applicants' Response, May 7, 1984, at 69), and by stating through its affiant that no pressure transducers are contained in the Westinghouse unit (Affidavit attached to Applicants' letter response of June 27, 1984). Petitioners do not clarify whether item (c), above, exclusively relates to pressure transducers; nor do Applicants make clear that there are no transducers of any type present in their recombiner.

Furthermore, although the attachments to the above-cited affidavit indicate that radiation testing of certain recombiner components has been performed, these attachments have been expurgated in a manner that does not report or permit a critique of some of the test results. For this reason, it is difficult to determine whether a radiation-hot steam environmental test of the overall recombiner unit is appropriate. The Staff does not oppose the admission of the portion of this subcontention dealing with the radiation testing of transducers.

We believe further inquiry is necessary in the areas embraced by the following questions:

Are there any types of transducers or sensors important to the proper functioning of the Vogtle electric-type hydrogen recombiner in an accident environment that require environmental qualification testing in an accident environment; if so, what testing is planned or completed and with what results?

If environmental qualification testing in an accident environment of an entire prototype recombiner is not required, what is the basis for this conclusion? If such testing is planned or has been completed, what is the nature of the test and what criteria exist for assessing the adequacy of the test results?

The Board deems the subcontention to be acceptable for litigation.

10.8 Fire Protection

Petitioners contend that Applicants have not satisfied 10 C.F.R. § 50.48 with respect to a showing that in the event of a fire the Vogtle Plant can be safely shut down. They cite the lack of an NRC testing program on the qualification of safety equipment against fire, and a challenge by the Union of Concerned Scientists of the adequacy of NRC's fire protection requirements. There is no such NRC testing program and no regulatory requirement that Applicants' safety equipment satisfy an NRC testing program. Nor have Petitioners identified any portion of the Vogtle Plant wherein specific safety features, equipment or components have not met applicable regulatory requirements. Applicants and Staff would have us deny this subcontention as lacking any specific or particularized basis. Applicants further allege that the subcontention challenges the Commission's regulations regarding environmental qualification and fire protection. We find that the lack of an adequate basis is sufficiently compelling to justify denial, without addressing the question of an attack upon the regulation. Thus, the Board denies admission of Subcontention 10.8.

10.9 Seismic Qualification

Intervenors cite NUREG-0606, "Unresolved Safety Issues Summary," August 20, 1982, for the proposition that design criteria and methods for seismic qualification of equipment in nuclear plants have undergone significant change, requiring a reassessment of Vogtle. However, they fail to note that USI-46, "Seismic Qualification of Equipment in Operating Plants," which we assume to be the focus of their attention, is addressed to the question of the need for any backfitting of operating plants. No nexus to Vogtle is offered nor is any specific Vogtle Plant equipment or component alleged to have not met seismic qualification requirements. We agree with Applicants and Staff that this subcontention lacks an adequate basis. We deny the admission of Subcontention 10.9.

10.10 Shortcomings to Qualification Methodologies

This subcontention is vaguely based upon a Sandia Laboratory consideration of the adequacy of qualification methodologies applied to the testing of safety equipment. Petitioners identify no methods applied to components or equipment associated with Vogtle that would cast doubt upon any safety feature of the plant. Absent more, we again must agree with Staff and Applicants that there is an insufficient basis to define or support a litigable issue. We deny the admission of Subcontention 10.10.

10.11 Accident Parameters

Petitioners cite post-TMI-2 accident investigation issues raised in 1979 for the proposition that accident parameters and post-accident functionality requirement times for Vogtle safety features have not been given proper consideration. Again, no specific Vogtle inadequacies have been identified that fail to meet the Commission's upgraded (1983) qualification requirements; and again we agree with Applicants and Staff that no definitive basis has been provided to support a litigable issue. We deny admission of Subcontention 10.11.

Proposed Contention 11

In its amended supplemental petitions filing of May 25, 1984, CPG altered its version of proposed Contention 11. At the May 30, 1984 pre-hearing conference, GANE stated that it agreed with this change. Thus, the proposed contention now reads as follows:

Applicants' failure to consider defects in the Vogtle steam generator system constitutes an undue risk to public health and safety in violation of 10 C.F.R. 50.34(b), and 50 Appendix A, Appendix B.

Petitioners cite an NRC summary of Unresolved Safety Issues (August 20, 1982) for the proposition that Westinghouse PWR steam generator tubes have shown evidence of degradation from several causes. Thus Petitioners have safety concerns about Vogtle, during normal operation and under accident conditions, that they allege Applicants have not considered. Petitioners cite the following causes of steam generator tube degradation: "corrosion-induced wastage, cracking, reduction in tube diameter, degradation due to bubble collapse water hammer and vibration-induced fatigue cracks." (Supplement to Petition, filed April 11, 1984, at 26, and CPG's Second Amendment to Supplement, filed June 13, 1984, at 1.)

Applicants cite Vogtle FSAR references wherein specific measures are described to protect against water hammer effects and corrosion effects that include denting and stress corrosion cracking. Petitioners have not indicated in what specific manner any of these measures adopted by Applicants are inadequate.

Applicants do not, however, address bubble collapse or vibration-induced fatigue cracking mechanisms for tube degradation that could contribute to accidents associated with tube failure occasioned by these mechanisms. The Board concludes that an evidentiary airing of a selected portion of this contention is appropriate. Hence we admit for litigation proposed Contention 11 restated and narrowed in scope as follows:

Applicants have not demonstrated their basis for confidence that no unacceptable radiation releases will occur as the result of steam generator tube failures occasioned by vibration-induced fatigue cracking and by bubble collapse within the Vogtle steam generators.

Proposed Contention 12

The applicant has not properly assessed the amount of salt and chlorine gas release from the cooling towers and the extent of consequent adverse agricultural and environmental damage in the area of Plant Vogtle.

The gravamens of this contention are that (1) the expected salt drift from the Plant Vogtle cooling towers is in the range that can damage vegetation; and (2) chlorine gas will also be released from the cooling towers, and no consideration was given this fact in the Vogtle CP-FES or the OL Environmental Report (OL-ER). Petitioners point out that

the CP-FSAR estimates salt drift to be at the annual rate of 305 lbs/acre within 1 mile of the plant, and they state that in the OL-ER this rate of salt deposition "is admitted to be presently considered to be in the range of potential damage to vegetation." (GANE Supplement, April 11, 1984, at 29.) In fact, their citation to the OL-ER referred to a question from Staff to Applicants relating to the conclusion in the CP-FES that a deposition of 305 lbs/acre/year would be negligible. The Staff indicated that such a rate of deposition is now considered to be damaging to plant communities. (OL-ER, Question E290.3, Amend. 1, 2/84.) With regard to chlorine, Petitioners argue that chlorine gas will be injected into the circulating water system at a maximum rate of 10,000 lbs/day; consequently there is the potential for the release of thousands of pounds of chlorine gas per day from the cooling towers. They argue that the released chlorine may have an adverse environmental effect, and its impact has not been assessed.

Applicants responded by stating that the impact of the expected salt drift was assessed in the CP-FES and determined to be negligible.² Further, Applicants stated that in the OL-ER the estimate has been revised downward to 31 lbs/acre/year on site and 21 lbs/acre/year off site. (Applicants' Response at 78-80.) With regard to chlorine, Applicants acknowledged that chlorine would be used to prevent biofouling of the cooling towers, and Applicants' counsel commented on the chemical behavior of chlorine in the cooling tower water. (Tr. 91-93.)

Petitioners challenged the revised salt drift estimates during the Special Prehearing Conference, and stated that the NRC Staff had suggested that the calculation might have to be redone. Petitioners alleged, further, that the OL-ER did not describe how the recalculation was performed. (Tr. 88-89.) Our own inspection of the OL-ER, supplied to us by the Applicants subsequent to the Special Prehearing Conference, revealed that the Applicants' reassessment of salt deposition was based on the salt deposition reduction ratio obtained from data on salt drift deposition at Susquehanna. No detailed information about the reassessment was presented, however. (OL-ER, Response to Question 451.17, Amend. 1, 2/84.)

The Staff opposes this contention on the grounds that the Petitioners have shown no new information that has become available since the CP stage. (Staff Response at 15.) In response to a question from the Board,

² At first glance it might appear that the Staff's finding in the CP-FES that a deposition rate of 305 lbs/acre/year would have a negligible impact is contradictory to the Staff's statement in Question 290.3 of the OL-ER. We note, however, that in Question 290.3 Staff stated that 305 lbs/acre/year is "presently considered" to be potentially damaging to vegetation, and we assume that the apparent change in position by Staff resulted from information accrued since the CP-FES was prepared.

Staff counsel stated that he believed that the technical Staff was working on another salt drift calculation. (Tr. 94.)

Applicants' reassessed salt drift estimates are certainly new, contrary to Staff's assertion that the Petitioners have failed to show that new information has become available since the CP stage of this proceeding. Applicants point out that it would be ludicrous to assert an order-of-magnitude *reduction* in the estimates as a basis for reopening this question. We would agree, were it not for the fact that the Staff apparently is still working on its own calculations of salt drift or still working on its review of Applicants' reassessment, or both. We are unwilling to accept as dispositive the meager information about the reassessment contained in responses to questions in the OL-ER, absent an evaluation of the reassessment by Staff. We desire a more definitive estimate and a determination of whether that amount will be damaging to vegetation. Moreover, we are also dissatisfied with the record on the effects of chlorine; more definitive information is required on this matter as well.

We conclude that the Petitioners have raised issues in this contention that need to be litigated. Therefore, proposed Contention 12 is admitted.

Proposed Contention 13

Petitioner contends that Applicants' proposed emergency plan fails to ensure that protective measures can and will be taken in the event of a radiological mishap at Plant Vogtle as required by 10 C.F.R. 50.33, 50.47, 50.54 and Appendix E to Part 50.

Prior to the holding of the Special Prehearing Conference on May 30, 1984, CPG, GANE, Applicants and Staff met and it was agreed Petitioners would refile Proposed Contention 13 based upon information contained in emergency plans of Richmond and Burke Counties, expected sometime in the Fall of 1984. It has been agreed by the participants, and we concur, that the revised contention is not to be considered a late filing subject to the provisions of 10 C.F.R. § 2.714(a)(1) pertaining to tardy filings, if filed within the time prescribed for its submission.

Applicants have a target date of October 1, 1984, to revise their emergency plans. It was represented that the revision is to contain the Richmond and Burke County emergency plans. Based upon the foregoing, issuance of Applicants' emergency plans should provide the basis for measuring the time from when the revised proposed contention is due. Petitioners have 30 days from the issuance of Applicants' emergency plan in which to respond. Applicants and Staff are given the time prescribed in the regulations in which to reply.

Proposed Contention 14

There is no reasonable assurance that the emergency diesel generators manufactured by TDI to be used at Plant Vogtle will provide a reliable and independent source of onsite power as required by 10 C.F.R. Part 50, Appendix A, General Design Criteria #17, in that adequate design, manufacture and QA/QC have resulted in substandard engines which are subject to common mode failures.

The bases for the proposed contention were contained in three paragraphs which were originally a part of CPG's Proposed Contention 8 and an identical GANE contention. Prior to the holding of the Special Prehearing Conference on May 30, 1984, they were removed and made the bases for proposed Contention 14.

We find the proposed contention has adequate bases for a litigable contention. CPG stated that Applicants were made aware of problems with the diesel generators manufactured by Transamerica Delaval, Inc., as early as December 1981. Applicants reported problems on two occasions with components that could result in the nonavailability of engines. Another defect was reported as late as September 1983.

Petitioner further asserts Applicants should have made a general assessment of the suitability of the Transamerica Delaval, Inc., diesel generator for this important emergency function and alleges that its failure to do so has brought Applicants' own quality control capabilities into question, undermining confidence in the safe functioning of its operating plant in contradiction to NRC QA requirements.

At the Special Prehearing Conference both Applicants and Staff stated that they had no objection to the contention.

We find Contention 14 to be admissible and it is so admitted.

DISPOSITION OF THE GANE PROPOSED CONTENTIONS

Proposed Contention 1

Applicant has not adequately nor correctly assessed the potential release of radionuclides from Plant Vogtle during normal, transient, and accident conditions, nor the somatic, teratogenic and genetic effects of the ionizing radiation. Applicant thus fails to meet the requirements of 10 C.F.R. 50.34, 50.36, 20.103, 20.203 and Appendix I of Part 50, and, further, underestimates the human cost of the project in the cost-benefit analysis required by 10 C.F.R. 51.21, 51.20(b) and (c) and 52.23(a).

The Board cannot discern a basis for this contention. GANE argues: that the existing radiological burden of people residing in the area, resulting from releases at the SRP, has not been considered by the

Applicants; that low-level radiation has a cumulative effect (*citing* J. Goffman); that doses to which pregnant and lactating women would be exposed and the effects of those doses have not been assessed; that the risk of releases to the food chain (including the human food chain) has not been considered; and that radiocesium released into the Savannah River will pose an unacceptable threat to persons consuming fish from the river. (GANE Supplement, April 11, 1984, at 1-3.) These assertions might be considered subcontentions, but they fail to inform us on what basis GANE believes the estimates of releases have not been adequately or correctly assessed.

Applicants, who oppose admission of this contention, point out that GANE has failed to explain why it believes the estimates contained in the Vogtle Final Safety Analysis Report (FSAR) are incorrect. Applicants argue, further, that the environmental assessments and cost-benefit balancing required by 10 C.F.R. Part 51 are the responsibility of the NRC Staff and not the Applicants. (Applicants' Response, May 7, 1984, at 10-21.)

Staff also opposes admission of this contention on the ground that GANE has not stated with adequate specificity the bases for its concerns. Staff characterizes the contentions as a "generalized discussion stating that operation of the plant will involve environmental impacts without specifying what these impacts will be." (Staff Response, May 14, 1984, at 4.)

At the Special Prehearing Conference held in Augusta, Georgia, on May 30, 1984, the Board expressed its reservations with regard to the vagueness of the contention and the lack of bases for it. The Board provided GANE's representatives an opportunity to shore up the contention by an oral presentation. GANE responded by stating that it lacked the engineering and scientific expertise to really assess the data in the FSAR, but that it "just seems that there are [radiation] levels that are in question." (Tr. 100-01.)

The Board agrees with the position of the Staff. GANE's Contention 1 is not specific enough to put the Applicants on notice as to what they must defend against, nor has GANE set forth any specific basis for the contention, as is required by 10 C.F.R. § 2.714(b). Further, the Applicants are correct in stating that compliance with the requirements of 10 C.F.R. Part 51, which sets forth the NRC's policy and procedures for complying with the National Environmental Policy Act of 1969 (NEPA) (83 Stat. 852), is the responsibility of the NRC Staff and not the Applicants. NEPA requires that all *agencies* of the Federal Government conduct a careful consideration of environmental aspects of any major agency action which might significantly affect the quality of the human

environment. (See 10 C.F.R. §§ 51.1(a) and (b).) No such requirement is placed on the Applicants by NEPA, although 10 C.F.R. § 51.20 does require an applicant to submit an environmental report with an application for a construction permit or an operating license.

For the foregoing reasons, we conclude that GANE's Contention 1 must be dismissed.

Proposed Contention 2

Applicant has failed to assess the environmental and public health effects of the addition of Plant Vogtle within 20 miles of the SRP and to quantify this factor in its consideration in violation of 10 C.F.R. 20.103, 50.34(a)(4), 51.21, 51.23(b), 104, 105, 106 and 201.

GANE argues that Applicants have failed to adequately address the cumulative impact on health and safety, and on the environment, of radioactive releases projected for Plant Vogtle plus those from the SRP. GANE places particular emphasis on the proposed reactivation by the Department of Energy (DOE) of the L-reactor at SRP; it alleges that DOE has failed to make an adequate assessment of the impact of again operating the L-reactor, and that therefore it is impossible for Applicants to accurately assess the cumulative impact of Plant Vogtle and the SRP facilities. (GANE Supplement, April 11, 1984, at 3-7.)

At the Special Prehearing Conference, GANE stated that within the week preceding the conference, additional new information had become available as a result of the issuance of the environmental impact statement for the reactivation of the L-reactor and the release by DOE of documents that apparently had been previously classified. GANE argued that this information had not been, but should be, considered by the Applicants in assessing the cumulative impact of Plant Vogtle and the SRP facilities. (Tr. 109-10.)

Counsel for Applicants stated that Applicants have addressed the cumulative effects in the CP-FSAR, but GANE's representative stated that the new information indicated that the SRP releases are greater than those estimated at the time of the Vogtle construction permit. (Tr. 110-11.) Applicants maintained, further, that because the proposal to reactivate the L-reactor occurred after the proposal to construct Plant Vogtle, the responsibility for considering the cumulative effects of releases from the two plants fell on DOE, not Applicants. (Tr. 112.) Counsel for Applicants indicated that the final environmental impact statement for the L-reactor did assess the cumulative effects of SRP, Plant Vogtle, and other potential facilities in the area; he stated that he

thought the tritium estimate was higher but other estimates were lower. (Tr. 113.)

Counsel for Staff argued that the only incremental impact open for litigation in this proceeding was that from Plant Vogtle. Staff argues that other facilities contributing to the cumulative effect must be accepted as a given for this hearing because this Board and the NRC has licensing authority over only Vogtle. (Tr. 116-17.)

Subsequent to the Special Prehearing Conference, GANE filed an amplification to its bases in support of Contention 2.³ (GANE filing, June 13, 1984.) The GANE filing consists primarily of a discussion of radioactive releases from SRP facilities and ground water contamination resulting from SRP releases. The filing fails to address, except in vague, unmeaningful terms, the incremental impact of Vogtle. Nor does it attempt to show how or why the assessment of SRP releases contained in the Vogtle FSAR is in error or needs to be reexamined. Consequently the filing fails to provide support for Contention 2.

Finally, it appears to this Board that GANE's primary concern is with the radioactive releases and environmental contamination resulting from the operation of the L-reactor and other facilities at the SRP. This Board and the NRC have no responsibility or authority over the SRP. GANE may want to address its concerns about the L-reactor and other SRP facilities to DOE, the agency responsible for those facilities.

For the foregoing reasons, we find GANE Contention 2 inadmissible for litigation in this proceeding.

³ GANE's untitled document containing amplified bases for Contention 2 was filed on June 13, 1984. (GANE filing, June 13, 1984, at 1-2.) In it, GANE addressed the five factors which must be considered pursuant to 10 C.F.R. § 2.714(a)(1) when a party seeks admission of a late-filed contention. Staff stated that this effort by GANE was misplaced; Staff has never asserted that the "amended" contention is late-filed. Indeed, Staff pointed out that in the Staff Response dated May 14, 1984, it had suggested that GANE consider information available to it and either explain why the information is inadequate or why it shows some specific indication of harm to the public. (Staff Response, June 27, 1984, at 4).

The Applicants, on the other hand, took the position that the tardy filing could only be accepted upon a showing that the five factors set forth in 10 C.F.R. § 2.714(a)(1) militate in favor of the Petitioner. Applicants argued that none of the five factors should be decided in favor of the Petitioner and urged us to disallow the late-filed document.

GANE's filing consists of a document prepared by W.F. Lawless, who gave an oral presentation of bases to support Contention 2 at the Special Prehearing Conference. (Tr. 118-21.) We view the material contained in GANE's filing as providing essentially an amplification of the material contained in the oral statement of Mr. Lawless. We agree with Staff that we need not apply the criteria set forth in 10 C.F.R. § 2.714(a)(1) for considering a late-filed contention. Therefore we have accepted and considered the GANE filing.

Proposed Contention 3

Applicant fails to show that the fear caused by living adjacent to a nuclear facility will not threaten the security and well-being of the community, in violation of various laws and rules and regulations.

The gravamen of the proposed contention is that Applicants fail to address the alleged psychological impact of the threat of nuclear contamination or nuclear explosion upon the public. Petitioner asserts that laws, which were unspecified, require Applicants to do so. To the contrary, the law does not place any such requirement upon any of the parties.

The Commission in 1982 instructed licensing boards not to entertain psychological stress contentions absent evidence of a "unique and traumatic" nuclear accident in the vicinity of the plant. *Consideration of Psychological Stress Issues; Policy Statement*, 47 Fed. Reg. 31,762 (1982). There is no allegation that there has been a "unique and traumatic" nuclear accident in the vicinity of Vogtle. The rule prohibits consideration of the proposed contention.

More recently, the U.S. Supreme Court, in *Metropolitan Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766, 103 S. Ct. 1556 (1983) held that the National Environmental Policy Act does not require the Nuclear Regulatory Commission to consider whether risk of accident might cause harm to psychological health and community well-being of residents of the surrounding area, in deciding whether to permit a company to resume operations. The case held that NEPA must address environmental effects of federal action; and the effects must have a close connection to the physical environment, which stress, a psychological condition, does not meet.

Proposed Contention 3 does not present the Board with a matter that it can consider. It is therefore dismissed.

Proposed Contention 4

The Applicant has underestimated the danger to lives and health of human, livestock and plants exposed to the electromagnetic radiation of the proposed 500-kV transmission lines from Plant Vogtle in violation of 10 C.F.R. 51.20 and 51.21 and the National Environmental Policy Act of 1969, 42 U.S.C. 4321 *et seq.*

Petitioner cited several authorities for the alleged proposition that nonionizing electromagnetic radiation is injurious to health in general; and, in particular, that Applicants' proposed 500-kV transmission lines will produce undesirable health effects. In their responses of May 7,

1984, and during the prehearing conference, Applicants provided information demonstrating that, taken in full context, none of the cited authorities in reality provides a substantive basis of support for this contention. Additionally, Applicants hold that GANE has not identified any inadequacies in Applicants' and Staff's construction permit evidentiary assessment. Petitioners countered that there have been incidents (unspecified and undetailed in nature) of farmers having been knocked off their tractors while working in the vicinity of transmission lines. No attempt was made to relate such incidents to conditions that might obtain around Vogtle-type transmission lines, accepted by the prior Board at the CP stage. Applicants and Staff both find the basis for this contention to be inadequate. We concur, and we deny admission of proposed Contention 4.

ADMITTING CPG AND GANE AS PARTY INTERVENORS

Based upon the foregoing we find CPG and GANE have each submitted at least one allowable contention as required by 10 C.F.R. § 2.714(b) and they have otherwise fulfilled the requirements to be admitted as party intervenors in the proceeding. We therefore admit them as party intervenors.

The CPG and GANE contentions we have admitted are identical or one fully encompasses the other. Obviously it is to everyone's interest not to treat these in a repetitious and cumulative manner. To that end it would be appropriate for CPG and GANE to look to consolidating their efforts in the manner discussed in 10 C.F.R. § 2.715a. It may well prove more effective for a single Intervenor to be wholly responsible for an individual contention. The Intervenor shall advise the Board how they intend to proceed as to this matter within 20 days of service of this Memorandum and Order. This may obviate the need to issue orders under 10 C.F.R. §§ 2.715a and 2.757.

DISPOSITION OF THE CCCE PETITION

In our unpublished Memorandum and Order of March 9, 1984, we found that CCCE had provided no basis for intervention in the subject proceeding in its petition of January 27, 1984. As an organization seeking representative participation, it had not shown that the action being challenged could cause injury in fact to one of its members.

Petitioner was given the opportunity to cure the deficiency in its filing and to submit a contention for litigation by April 12, 1984. It failed to

make an attempt to do so, nor did CCCE appear at the Special Prehearing Conference on May 30, 1984, as directed.

On the basis of the foregoing, we deny and dismiss its petition. CCCE is ineligible to become a party intervenor having failed to establish that its interest may be affected by the subject proceeding and to submit a litigable contention, as required by 10 C.F.R. § 2.714. Its failure to appear, as directed, at the Special Prehearing Conference on May 30, 1984, provides an additional ground under 10 C.F.R § 2.707 to deny it entry to the proceeding.

PROCEDURAL MATTERS

The Parties have been able to stipulate to the following discovery schedule:

1. There will be two rounds of discovery consisting of an initial round of discovery requests and responses and a follow-on of requests and responses. Additional discovery shall be had only as provided in ¶ 6, below.
2. All initial-round discovery requests shall be served within 60 days after the date of the Licensing Board's Order allowing the contention to which the discovery request is addressed.
3. Responses to initial-round discovery requests, shall be served within 30 days after service of the request.
4. Follow-on discovery requests shall be served within 120 days after the Licensing Board's Order allowing the contention to which the request is addressed.
5. Responses to follow-on discovery request, shall be served within 30 days after service of the request.
6. Further discovery shall be had only (a) by agreement of the affected parties or (b) by order of the Licensing Board for good cause shown.

We find it acceptable and adopt it as the discovery schedule for the proceeding.

As to the matter of future locations for the holding of conferences and hearings, the decision will be made as each occasion arises and will be appropriate to the circumstances. Each participant has expressed its views extensively on the matter. We are fully aware and appreciative of the various positions and will take them into account in making our determination. No further information is desired on this issue.

Order

Based upon all of the foregoing, it is hereby Ordered that:

1. Petitioner CCCE is not admitted as a party intervenor in this proceeding.
2. Petitioners CPG and GANE are each admitted as party intervenors in this proceeding.
3. GANE's proposed Contentions 1 and 4 are withdrawn as well as CPG's and GANE's proposed Contention 9.
4. CPG's proposed Contentions 2 and 3 are dismissed as well as CPG's and GANE's proposed Contentions 6, 10.2, 10.4, 10.6, 10.8, 10.9, 10.10 and 10.11.
5. GANE's proposed Contentions 1, 2, 3 and 4 are dismissed.
6. CPG's and GANE's proposed Contentions 7, 8, 10.1, 10.3, 10.5, 10.7, 11, 12 and 14 are admitted, in the manner stated.
7. The Board defers further ruling on CPG's and GANE's proposed Contention 5 for the reasons stated.
8. Intervenors may refile their proposed Contentions 13, as discussed.
9. The discovery schedule contained in the Memorandum shall be followed. The period for discovery, as set forth, will commence immediately with the service of this Order.
10. The Board shall be advised by Intervenors within 20 days of service of this Order of their intended course on consolidating the contentions and how they will assume responsibility for handling them.
11. This Order shall control the subsequent course of the proceeding unless modified by further order of the Board. Under 10 C.F.R. § 2.751a(d), objections to this Order may be filed by a party within five (5) days after service of the Order, except that the Staff may file objections within ten (10) days after service. *See* 10 C.F.R. § 2.710.
12. This Order is appealable by Applicants, Staff and CCCE under the provisions of 10 C.F.R. § 2.714a to the Atomic Safety and Licensing

Appeal Board within ten (10) days after service of the Order. *See* 10 C.F.R. § 2.710.

THE ATOMIC SAFETY AND
LICENSING BOARD

Morton B. Margulies, Chairman
ADMINISTRATIVE LAW JUDGE

Gustave A. Linenberger, Jr.
ADMINISTRATIVE JUDGE

Dr. Oscar H. Paris
ADMINISTRATIVE JUDGE

Dated at Bethesda, Maryland,
this 5th day of September 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Marshall E. Miller, Chairman
Glenn O. Bright
Elizabeth B. Johnson**

In the Matter of

**Docket No. 50-322-OL-4
(Low Power)
(ASLBP No. 77-347-01C-OL)**

**LONG ISLAND LIGHTING
COMPANY
(Shoreham Nuclear Power
Station, Unit 1)**

September 5, 1984

Upon reconsideration, the Licensing Board grants summary disposition as to all issues relevant to proposed fuel loading, precriticality testing, and cold criticality testing. Although the site lacks a fully qualified onsite source of emergency AC power, no such power is needed to protect public health and safety during the requested activities; thus, they may be authorized without contravention of applicable regulatory criteria.

OPERATING LICENSE: LOW POWER

Fuel loading, precriticality testing and cold criticality phases of proposed low-power program require no onsite emergency AC power.

REGULATIONS: GENERAL DESIGN CRITERIA

Although GDC 17 is applicable to low-power operations, it may be applied in view of a "rule of reason" where requested activities require no emergency AC power to protect public health and safety.

ORDER RECONSIDERING SUMMARY DISPOSITION OF PHASE I AND PHASE II LOW-POWER TESTING

On July 24, 1984, we issued an Order (unpublished) granting in part and denying in part LILCO's motions for summary disposition on Phase I and Phase II of its low-power testing program.¹ LILCO's motions were based upon its assertion that even if the Shoreham facility lacks a qualified onsite source of emergency AC power, the activities to be performed in Phases I and II require no emergency AC power to perform any of the safety functions specified by the General Design Criteria (GDC), specifically GDC 17.² We granted the LILCO motions as to certain uncontroverted statements of material facts, but denied them as to the ultimate issues which would permit LILCO, prior to decision on LILCO's pending application for exemption from GDC requirements, to proceed with the fuel loading, precriticality testing, and limited low-power testing and activities of Phases I and II.

In reaching our decision on the motions we looked for guidance to the Commission's Order of May 16, 1984 (CLI-84-8, 19 NRC 1154), in which the Commission held that GDC 17 is applicable to low-power operation and that, in the circumstances of this proceeding, LILCO would either have to demonstrate compliance with GDC 17³ or apply for and

¹ Phase I: Fuel load and precriticality testing; Phase II: Cold criticality testing.

² Appendix A to 10 C.F.R. Part 50.

³ GDC 17 states, in pertinent part, that:

An onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

The onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure.

(10 C.F.R. Part 50, Appendix A, Criterion 17).

receive an exemption to it pursuant to 10 C.F.R. § 50.12(a) before a low-power license could be issued.

However, it has become increasingly clear that the Commission's Order (CLI-84-8) is not without serious ambiguities. Although summary disposition motions regarding LILCO's Phases I and II were technically before the Commission when its Order was written, that Order does not consider or address permission for fuel loading or initial criticality, and it cannot be construed as even purporting to be dispositive of Phase I and II issues. We also looked to the NRC Staff, with its professed expertise in the interpretation and analysis of Commission regulations and rulings, for assistance in interpreting the Order in question.

Prior to the Commission's Order, the Staff had taken the position that the requirements of GDC 17 "should be applied with flexibility and dependent upon the nature of the activity sought to be licensed."⁴ However, the Staff in its June 13, 1984 response to LILCO's summary disposition motions, said that in arguing that no emergency AC power is needed during Phases I and II, LILCO was essentially arguing that GDC 17 did not apply at that level of operation. The Staff stated its belief that CLI-84-8 stands for the proposition that GDC 17 means the same for low-power operation as for full-power operation, and that in the absence of a fully approved onsite power system, an exemption from GDC 17 is needed before any low-power operating license may be issued (Staff's June 13 Response at 4).

Subsequent to our decision on summary disposition, LILCO on August 2, 1984, moved for referral and/or for directed certification to the Commission of that decision. In its August 17 Response, the Staff rather abruptly and without adequate explanation again changed its position and now supported LILCO's motion because "early Commission guidance would be helpful" in interpreting CLI-84-8. The Staff did not explain why, if the Commission's Order was as clear as it originally contended, any further (presumably different) guidance would be helpful or necessary. Instead, it merely stated that "the question raised by LILCO here, whether (or how) GDC 17 should be applied to fuel loading and low-power testing, is an issue that may well involve other general design criteria and other license applications" (Staff's Response at 4). The Staff further revealed that "in a similar situation to that posed by LILCO, the Staff recently granted an exemption from GDC 17 to Duke Power Company to permit fuel loading and precriticality testing at the Catawba facility" (Staff's Response at 5 n.4).

⁴ NRC Staff Response to LILCO's Motion for Directed Certification of the Licensing Board's July 24, 1984 Order (August 17, 1984), at 3. See also SECY-84-290 (July 17, 1984).

It now appears that the Staff, subsequent to our original summary disposition Order, "has already met with the Commission once (on July 25, 1984) for guidance on how to apply CLI-84-8 to other license applications" (Staff's August 17 Response at 4-5). That meeting with the Commission was apparently triggered by a July 17, 1984 paper or communication from the Executive Director for Operations to the Commission, to "request Commission guidance on the need and standard for exemptions from the regulations in light of the Commission's *Shoreham* decision, CLI-84-8 (SECY-84-290)." That Staff paper further stated in pertinent part:

The *Shoreham* decision, involving compliance with NRC regulations during the early stages of operation, the need for exemptions from the regulations and the standards for granting exemptions under 10 C.F.R. § 50.12, establishes practices and requirements for licensing which differ significantly from prior regulatory interpretation and practice. . . .

Prior to the Commission's May 16, 1984 decision in *Shoreham*, the staff had viewed the requirements of the regulations as being reasonably flexible, with various regulatory requirements applicable or important from a health and safety standpoint only for certain modes of operation and operation at certain times and power levels. . . .

In *Shoreham*, CLI-84-8, the Commission had occasion to examine the matter of the applicability of General Design Criterion (GDC) 17 to fuel loading and low power operation. Therein, the Commission ruled that GDC 17 does apply to such operations below full power and at least implicitly found that an exemption from GDC 17 must be granted if *Shoreham* is to be licensed for fuel loading or low power operation prior to compliance with GDC 17. . . .

In the context of exemptions related to plant operations, these determinations regarding "exigent circumstances" and "as safe as" are wholly new requirements going beyond anything explicitly required by 10 C.F.R. § 50.12. (The concept of "exigent circumstances" had previously been considered a factor only in exemptions granted pursuant to 10 C.F.R. § 50.12(b), issuing limited work authorizations.) . . .

- (5) Does the Commission intend, by its *Shoreham* decision, to modify those regulatory standards for granting exemptions set forth explicitly in 10 C.F.R. § 50.12(a) by adding the standards on "exigent circumstances" and "as safe as" which are raised in CLI-84-8?
- (6) Is it the Commission's intent that the "as safe as" standard be read literally or is there some *de minimus* reduction in safety that would be acceptable in granting an exemption under the Commission's standards in *Shoreham*?

(*Id.* at 1-3, 5).

As a result of the Staff's request for clarification of the *Shoreham* decision, the Commission held a Discussion of Commission Practice on

Granting Exemptions at an open meeting on July 25, 1984.⁵ The General Counsel had filed a written discussion of various aspects of the ramifications of the *Shoreham* exemption decision. Among other things, it stated that “[s]ome regulations, including some GDC, may properly be considered inapplicable to fuel loading and low power testing if such a conclusion is fairly compelled by simple logic and common sense”⁶

Finally, the Staff has recently modified and restated its interpretation of CLI-84-8 in the instant proceeding. During closing arguments on August 16, 1984, the Staff stated that the “as safe as” rule laid down in CLI-84-8 is a “comparable level of safety” rule.⁷ It further agreed that a comparable level of safety is “some kind of a rule of reason” (*id.*). And the Staff also stated that its recommended comparable level of safety rule is the same as “substantially as safe as.”⁸

Given this rich diversity of views regarding the Commission’s intent and meaning in its Order CLI-84-8, we conclude that the Staff’s original advice to the Board regarding the summary disposition motions on Phases I and II, was not correct. We are also concerned that a court of law reviewing these orders might well conclude that LILCO was being discriminated against and treated differently than other utilities similarly situated, contrary to the equal protection of the laws and the due process requirements of the Fifth Amendment to the United States Constitution. Accordingly, our Order of July 24, 1984, denying summary disposition of Phases I and II of LILCO’s low-power testing program, will be reconsidered and reversed.

In its original summary disposition motion, LILCO argued that as to Phase I fuel loading and precriticality testing, there are no fission products in the core and no decay heat. Therefore core cooling is not required, and with no fission product inventory, fission product releases are not possible. Because no core cooling is required, no AC power (either on site or off site) is needed “to permit functioning of structures, systems, and components important to safety” (GDC 17).

As to Phase II cold criticality testing, LILCO asserted that any self-sustaining nuclear reaction will be conducted at extremely low power levels and for very short periods of time, and that radioactive fission products produced will be negligible. A review of the accident and transient events contained in Chapter 15 of the *Shoreham* FSAR shows that there are no consequences even assuming no onsite AC power source,

⁵ Although a transcript of this open meeting is readily available, we have not considered or relied upon it in light of the Commission’s Disclaimer Statement and the provisions of 10 C.F.R. § 9.103.

⁶ General Counsel’s Discussion of Exemptions, dated July 24, 1984 (SECY-84-290A), at 26.

⁷ Tr. 3043.

⁸ Tr. 3045-47.

and in fact no AC power is required to protect the core. In essence, LILCO seeks summary disposition as to Phases I and II, because no onsite or offsite AC power is necessary to perform the safety functions needed to protect the public health and safety. We believe that such summary disposition should be granted. In reconsidering Phases I and II summary disposition motions, we note that an evidentiary hearing has been concluded and that uncontroverted factual information is available to the Board. The following material facts were not controverted and were therefore admitted in this proceeding.

Phase I

(7) During Phase I fuel loading and precriticality testing, there are no fission products in the core and no decay heat exists. Therefore, core cooling is not required. In addition, with no fission product inventory, there are no fission product releases possible. Rao, *et al.*, Tr. 283-84; Sherwood Affidavit at ¶ 11; Hodges Affidavit at ¶ 4.

(8) Even a loss of coolant accident would have no consequences during Phase I since no core cooling is required. . . .

(9) No core cooling is required during Phase I and, therefore, no AC power is necessary during Phase I to cool the core.

Rao, *et al.*, Tr. 285; Sherwood Affidavit at ¶ 13; Hodges Affidavit at ¶ 3.

Phase II

(8) Because of the extremely low-power levels reached during Phase II testing, fission product inventory in the core will be only a small fraction of that assumed for the Chapter 15 analysis. The FSAR assumes operation at 100% power for 1,000 days in calculating fission product inventory; inventory during Phase II low-power testing will be less than 1/100,000 (0.00001) of the fission product inventory assumed in the FSAR. Rao, *et al.*, Tr. 295; Sherwood Affidavit at ¶ 17.

(9) If a LOCA did occur during the cold criticality testing phase (Phase II), there would be time on the order of months available to restore make-up water for core cooling. . . . With these low decay heat levels, the fuel cladding temperature would not exceed the limits of 10 C.F.R. § 50.46 even after months without restoring coolant and without a source of AC power. Thus, there is no need to rely on the TDI diesel generators, or any source of AC power. Rao, *et al.*, Tr. 292-94; Sherwood Affidavit at ¶ 19; Hodges Affidavit at ¶ 8.

(10) During Phase II cold criticality testing conditions, there is no reliance on the diesel generators for mitigation of the loss of AC power event or the feedwater system piping break event. . . .

(12) None of the events analyzed in Chapter 15 could result in a release of radioactivity during cold criticality testing that would endanger the public health and safety. Rao, *et al.*, Tr. 296; Sherwood Affidavit at ¶ 17.

(13) Even if AC power were not available for extended periods of time, fuel design limits and design conditions of the reactor coolant pressure boundary would

not be approached or exceeded as a result of anticipated operational occurrences, and the core would be adequately cooled in the unlikely event of a postulated accident. Rao, *et al.*, Tr. 295-96; Sherwood Affidavit at ¶ 22.

(Board Order entered July 24, 1984, at 10-13.)

The Board interprets the Commission's Order of May 16, 1984 (CLI-84-8), as implicitly containing a rule of reason in applying the requirements of GDC 17 to fuel loading and low-power testing. If no emergency AC power is required for core cooling during Phases I and II, then the proposed changes in the AC power source could have no effect on the "functioning of structures, systems, and components important to safety," as required by GDC 17. Accordingly, "simple logic and common sense" indicate that LILCO should be permitted to conduct fuel loading and low-power testing as proposed in Phases I and II, and it is so ordered. This result is consistent with the recent action of the Staff in permitting Duke Power Company to load fuel and conduct precriticality testing at the Catawba facility.⁹ It is also consistent with the Commission's action regarding use of similar TDI diesel generators at the Grand Gulf facility.¹⁰ Such a result is compatible with the Commission's underlying reasoning and with the Staff's widespread practice over a number of years. It also gives the Applicant the same treatment as that accorded other utilities under the same or similar circumstances, and hence complies with the constitutional requirement of nondiscrimination and equal protection of the laws.

Finally, in CLI-84-8 the Commission expressly reserved its power to conduct an immediate effectiveness review of any initial decision authorizing the grant of an exemption. Accordingly, this Order Reconsidering Summary Disposition of Phase I and Phase II Low-Power Testing is

⁹ Staff's August 17, 1984 Response at 5 n.4. See Catawba SSER No. 3, at 8-1 through 8-3, NUREG-0954.

¹⁰ Safety is the paramount concern of the Staff at whatever stage of operation or procedural posture.

transmitted herewith directly to the Commission for its appropriate action.

It is so ORDERED.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Marshall E. Miller, Chairman
ADMINISTRATIVE JUDGE

Dated at Bethesda, Maryland,
this 5th day of September 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Bloch, Chairman
Herbert Grossman, Esq.
Mr. Walter H. Jordan

In the Matter of

Docket Nos. 50-445-OL-2
50-446-OL-2
(ASLBP No. 79-430-06A-OL)

TEXAS UTILITIES ELECTRIC
COMPANY, *et al.*
(Comanche Peak Steam Electric
Station, Units 1 and 2)

September 17, 1984

The Licensing Board orders the Office of Investigations (OI) to provide to the Board and parties, subject to protective order, a copy of each of the investigation reports that OI had offered to provide to the Board *ex parte*.

RULES OF PRACTICE: *EX PARTE* CONTACTS

In a case in which serious allegations of intimidation have been the subject of intensive hearings, it is not proper for the Licensing Board to receive reports of twenty-two related investigations *ex parte*, without providing the parties the opportunity to comment on the relevance of the reports. The proper way to handle the matter is to provide the materials under protective order to the parties, making whatever provisions are necessary in the circumstances to avoid release of the names of confidential informants. In the past, sensitive security matters have been handled in this way. So too should confidentiality matters.

MEMORANDUM AND ORDER

(Directing Release of OI Reports)

On August 28, 1984, the Nuclear Regulatory Commission Staff (Staff) issued Board Notification 84-149 listing Office of Investigation (OI) reports as important documents related to Comanche Peak Steam Electric Station not previously submitted to this Board. The Staff indicated its intent to transmit to the Board for review *in camera*, *ex parte* any reports the Board deems pertinent to this proceeding. By this Order, the Board directs OI to release to the Board and parties (under protective agreement) all OI reports listed in Board Notification 84-149.

Board Notification 84-149 lists twenty-two OI reports on Comanche Peak which have not previously been released to this Board. *See* Board Notification 84-149, Enclosure 1. Without reviewing the text of these reports, the Board cannot make an intelligent evaluation of their relevance to issues pending before it and cannot decide whether the record in this proceeding is adequately developed and can be closed. Based upon a review of the subject of the reports as listed by the Staff, we find all of these reports to be potentially relevant to matters pending before the Board. Therefore, we direct OI to release under protective agreement copies of all twenty-two reports to the Board and parties for review.

The Board will not review these reports *ex parte* as suggested by the NRC Staff, unless ordered to do so by the Commission. The Board agrees that *ex parte* review of investigation reports could be prejudicial to the rights of the Applicants and other parties. The Applicants have in the past objected to *ex parte* review by the Board of OI reports.¹ *Ex parte* information in the context of this formal adjudication would violate fundamental principles of administrative due process.²

Ex parte contacts between interested parties and agency decisionmakers have consistently been held to be improper in administrative proceedings. *See, e.g., Sangamon Valley Television Corp. v. United States*, 269 F.2d 221 (D.C. Cir. 1959). Secret exchanges of information are inconsistent with reasoned decisionmaking based upon a public record. *Home Box Office, Inc. v. FCC*, 567 F.2d 9, 54-56 (D.C. Cir. 1977). The problem is exacerbated in a situation such as this where a formal adjudicatory hearing is under way. *National Small Shipments Traffic Conference, Inc. v.*

¹ *See* "Applicants' Motion to Obtain Access to Information Regarding Investigations at Comanche Peak or for Alternative Relief" (May 10, 1984).

² *See* our unpublished May 17, 1984 "Memorandum and Order (Secret Communications from Office of Investigations)."

ICC, 590 F.2d 345, 350 (D.C. Cir. 1978). The hearing requirements of the Atomic Energy Act and due process mandate that all parties be afforded a full, fair, expeditious, and open hearing.

Where OI reports have been prepared and made available to this Licensing Board, they must also be made available to all parties. *Ex parte*, extra-judicial information will not be relied upon in any manner by the Board. To do so would reduce the hearing to something less than the adversary proceeding required by the Atomic Energy Act. Fundamental principles of fairness require that all parties be aware of the content of information presented to the Board, be given the opportunity to test its reliability or truthfulness, and be given the opportunity to present rebuttal testimony if deemed necessary. *Green v. McElroy*, 360 U.S. 474, 495-96 (1959).

Ex parte communications are no less troublesome because they come to the Board from the agency Staff, in this case OI. See 10 C.F.R. § 2.780; see also *United States v. B&O Southeastern Railroad Co.*, 226 U.S. 14, 20 (1912). Even if OI alone is given the opportunity to present *ex parte* information which may form a basis for the Board's ultimate decision, the public's perception of the Board's independence would be lost.

The Commission has issued a Policy Statement to provide guidance to licensing boards and the Staff for cases in which pending investigations are related to matters in controversy and there is a conflict between the need for disclosure to the Board and parties and the need to protect an inspection or investigation.³ The Commission suggests that in cases where unrestricted investigation could compromise the investigation, the Staff should provide information to the Board *in camera ex parte*. 49 Fed. Reg. at 36,033-34. However, the Commission has emphasized that "[a]s a general rule [it] favors full disclosure to the boards and parties . . ." and that its Policy Statement does not abrogate the well-established principle of administrative law that a licensing board *may not* use *ex parte* information presented *in camera* in making its decision. *Id.* at 36,033.

The Board believes that a protective order could be used in order to avoid the need for *ex parte* examination while providing some assurance that necessary confidentiality is not compromised. Through such protective agreements, all parties to NRC proceedings have been given access to such sensitive information as the security plans for power reactors, when issues have been raised in connection with those plans. *Pacific Gas*

³ "Statement of Policy; Investigations, Inspections and Adjudicatory Proceedings," 49 Fed. Reg. 36,032 (September 13, 1984).

and Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-80-24, 11 NRC 775 (1980). There is little reason to believe that the information here is more important than security plans that have been previously disclosed. The Board is willing to limit those included in the protective order to two legal representatives for each party in an effort to maintain a strict level of confidentiality. Alternatively, the Board proposes that OI set forth a protective order which it feels will meet the needs and purposes of its investigation program.

In this case, the parties have vigorously litigated issues which may well be the subject of the OI investigations, and they are entitled to a prompt decision by this Board on those issues. Applicants are coming close to the date on which they will be ready to load fuel. For this proceeding to be held in abeyance because another arm of the agency is unwilling to share what could be relevant information is fundamentally unfair to the parties and makes it difficult for this Board to do its job. Accordingly, the Board believes that the rights of the parties to a fair hearing on issues relating to intimidation could be prejudiced without disclosure of the reports to the parties as well as the Board. We are therefore directing that the twenty-two enumerated OI reports be released under a protective agreement to the parties in this proceeding.

If the Office of Investigation is unwilling to comply with this Order, the Board urges OI to explain to the Board and parties those important considerations which prevent it from carrying out this Order, and the

Board requests that OI suggest a course of action which will provide an acceptable means of meeting the needs of the Board, OI, and the parties.
IT IS SO ORDERED.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE

Herbert Grossman
ADMINISTRATIVE JUDGE

Walter H. Jordan (not participating)
ADMINISTRATIVE JUDGE

Bethesda, Maryland
September 17, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Morton B. Margulies, Chairman
Dr. Frank F. Hooper
Dr. Robert M. Lazo**

In the Matter of

**Docket Nos. 50-413-OL
50-414-OL
(ASLBP No. 81-463-06-OL)
(Emergency Planning)**

**DUKE POWER COMPANY, *et al.*
(Catawba Nuclear Station,
Units 1 and 2)**

September 18, 1984

In this Partial Initial Decision, the Licensing Board completes consideration of all emergency planning issues and authorizes the issuance of an operating license to Applicants subject to certain conditions.

**LICENSING BOARDS: RESPONSIBILITY IN
EMERGENCY PLANNING**

A responsibility of the Licensing Board in deciding emergency planning issues is to determine if the planning is in conformity with regulatory standards. Although the Intervenor may "desire that the level of the emergency preparedness be enhanced to the maximum extent possible," the Licensing Board's role is not to require that measures be taken which exceed the requirements of the regulations and regulatory guides.

EMERGENCY PLANS: INFORMATIONAL REQUIREMENTS

The Commission's emergency planning regulations and regulatory guide require that informational brochures must advise the public by unobtrusive language that high levels of radiation are harmful to health and may be life-threatening. *See* 10 C.F.R. § 50.47(b)(7) and Part 50, Appendix E, § IV.D.2; NUREG-0654/FEMA-REP-1, Rev. 1, § II.G.1.

EMERGENCY PLANS: INFORMATIONAL REQUIREMENTS

The Commission's emergency planning regulations and regulatory guide require that warning signs and decals must not be so general in their message that they do not state that the warning relates to a nuclear emergency. There should be made available to transients a source of local emergency information so that they too have the opportunity to become aware of how to cope in a nuclear emergency prior to the time an event may occur. *See* 10 C.F.R. § 50.47(b)(7) and Part 50, Appendix E, § IV.D.2; NUREG-0654/FEMA-REP-1, Rev. 1, § II.G.2.

EMERGENCY PLANNING ZONES: LIMITS OF THE PLUME EPZ

The Commission's emergency planning regulations and regulatory guide do not require the inclusion within the plume emergency planning zone any portion of the City of Charlotte, North Carolina, whose city limits come within 9.7 miles of the plant. *See* 10 C.F.R. § 50.47(c)(2) and NUREG-0654/FEMA-REP-1, Rev. 1, § I.D.2.

EMERGENCY PLANS: LICENSING CONDITION

Although the Commission does not require that all aspects of emergency plans be complete before a final licensing decision is reached, where the planning for the evacuation of a theme amusement park, that can have in excess of 25,000 attending at a time, is being read-dressed and the process is not near completion, it is appropriate for the Licensing Board to require as a condition of licensing the plant that plans be completed within a specified time to the satisfaction of the NRC Staff.

APPEARANCES

**J. Michael McGarry, III, Anne W. Cottingham, Mark S. Calvert,
Albert V. Carr, Jr. and Ronald V. Shearin for Applicants.**

Robert Guild for Intervenor, Palmetto Alliance.

Jesse L. Riley, Phillip L. Rutledge and Betsy M. Levitas for Intervenor, Carolina Environmental Study Group.

Henry J. McGurren and George E. Johnson for the Nuclear Regulatory Commission Staff.

Richard P. Wilson for the State of South Carolina.

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SUPPLEMENTAL PARTIAL INITIAL DECISION ON EMERGENCY PLANNING

I. SCOPE OF DECISION

This is a contested operating license proceeding within the meaning of 10 C.F.R. § 2.4(n). In this Partial Initial Decision we consider the emergency planning issues in the application of joint owners Duke Power Company (Duke or the Company), North Carolina Electric Municipal Power Agency Number 1, North Carolina Electric Membership Corporation and Saluda River Electric Cooperative (the Applicants) for operating licenses for Units 1 and 2 of the Catawba Nuclear Station (Catawba). Duke has exclusive responsibility for the design, construction and operation of Catawba.

The Catawba facility consists of two pressurized water nuclear reactors designed to operate at core power levels of up to 3411 thermal megawatts with a net electrical output of 1145 megawatts per unit. It is located on Applicants' site in York County, South Carolina, 6 miles north-northwest of Rock Hill, South Carolina. The facility is in the north-central part of the State and a 10-mile radius drawn from it takes in parts of Gaston and Mecklenburg Counties, North Carolina.

There were ten contentions litigated in the proceeding challenging various aspects of the offsite emergency plans for Catawba. In this Supplemental Partial Initial Decision, we rule on the adequacy of emergency planning for the facility. We find, based on the weight of the evidence, that the emergency plans for Catawba meet the requirements of the applicable law and regulations except to the extent indicated.

II. PROCEDURAL BACKGROUND

This Board came into being on February 27, 1984, to preside over all emergency planning issues, in the captioned proceeding for an operating license.

This action came about as the result of a motion before the original Board, by Applicants supported by Nuclear Regulatory Commission Staff (Staff) and opposed by Intervenor, Palmetto Alliance and Carolina Environmental Study Group (CESG) to split the proceeding along safety and emergency planning issues. By an unpublished memorandum and order of February 21, 1984, the presiding Board concluded that the procedure would prevent significant unnecessary delay and be consistent with a fair and thorough hearing process. It recommended instituting the bifurcated process to the Chief Administrative Judge, Atomic Safety and Licensing Board Panel, who followed the recommendation with our establishment on February 27, 1984.

The original Board issued a Partial Initial Decision in this proceeding on June 22, 1984. LBP-84-24, 19 NRC 1418. It covers the safety issues and contains a relevant procedural history. The Board ruled on the safety contentions for the most part in Applicants' favor. Some matters were decided conditionally and the Board has retained jurisdiction to hear an additional safety matter.

By unpublished orders of August 17, 1983, and September 19, 1983, the original Board had ruled upon and admitted ten emergency planning contentions sponsored jointly by the Intervenor. These became the subject of the adjudicatory proceeding held by this Board. Hearings were held on May 1-4 and May 7-11 at Rock Hill, South Carolina, May 23-25 at Charlotte, North Carolina, and June 5-8, 1984, at Rock Hill, South Carolina. Limited appearance statements were taken at evening sessions at Rock Hill and Charlotte.

Testimony was taken from forty-nine witnesses, who were presented by all of the parties. Attached as Appendix A is a witness list. A total of eighty-six documents were identified, of which seventy-two were admitted into evidence.¹ Attached as Appendix B is a list of documents that

¹ The exhibits admitted during the emergency planning phase of this proceeding are numbered separately from those admitted during the previous safety phase, and are designated as "Ex. EP-1," etc. The transcript pages have also been numbered anew beginning with the appointment of the emergency planning Licensing Board. All transcript references are to the emergency planning hearing sessions unless otherwise indicated.

The format for citations to the emergency planning record is as follows: transcript citations include the page numbers, the speaker and the date, i.e. (Tr. 161, Carter 5/1/84); and citations to the prefiled testimony include the exhibit number, the name of the person or persons sponsoring the testimony, and the page number, i.e. (App. Ex. EP-7, Pugh at 1). Citations to the record of the safety phase of the hearing will be designated "S. Tr. ____"

were identified and admitted. The record was closed on June 8, 1984 (Tr. 4622), with the exception of the Board's future ruling to be made on Intervenor's proposed Contention 20, which was submitted on May 30, 1984. We ruled on July 11, 1984, to reject the proposed contention and closed the record for all purposes as of that date.

Applicants' proposed findings of fact and conclusions of law were submitted on July 9, 1984. Intervenor's were filed on July 27, 1984, following the grant of an extension of time, and Staff's on August 8, 1984. A response was submitted by Applicants on August 20, 1984.

It should be noted that all of the proposed findings of fact and conclusions of law submitted by the parties have been considered and those not incorporated directly or inferentially in this Partial Initial Decision are rejected as unsupported in fact or law or are unnecessary to the rendering of this decision.

III. REGULATORY REQUIREMENTS

The regulatory scheme for emergency planning issues was outlined as follows (with footnotes omitted in part) by the Appeal Board in *Cincinnati Gas & Electric Co.* (Wm. H. Zimmer Nuclear Power Station, Unit No. 1), ALAB-727, 17 NRC 760, 764 (1983).

Under Commission regulations, no operating license for a nuclear power reactor can issue unless the NRC finds that there is reasonable assurance that adequate protective measures both on and off the facility site can and will be taken in the event of a radiological emergency. 10 C.F.R. 50.47(a)(1). With regard to the adequacy of offsite emergency measures, the NRC must "base its finding on a review of the Federal Emergency Management Agency (FEMA) findings and determinations as to whether State and local emergency plans are adequate and whether there is reasonable assurance that they can be implemented." 10 C.F.R. 50.47(a)(2).³

Central to the development of offsite emergency response plans is the concept of emergency planning zones (EPZ). The regulatory scheme contemplates the establishment, for planning purposes, of two such zones: a plume exposure pathway (plume) EPZ, a more or less circular area extending approximately ten miles

³ Section 50.47(a)(2) reads in full as follows:

(2) The NRC will base its finding on a review of the Federal Emergency Management Agency (FEMA) findings and determinations as to whether State and local emergency plans are adequate and whether there is reasonable assurance that they can be implemented, and on the NRC assessment as to whether the applicant's onsite emergency plans are adequate and whether there is reasonable assurance that they can be implemented. A FEMA finding will primarily be based on a review of the plans. Any other information already available to FEMA may be considered in assessing whether there is reasonable assurance that the plans can be implemented. In any NRC licensing proceeding, a FEMA finding will constitute a rebuttable presumption on questions of adequacy and implementation capability. Emergency preparedness exercises (required by paragraph (b)(14) of this section and Appendix E, Section F of this part) are part of the operational inspection process and are not required for any initial licensing decision.

from the plant, and an ingestion exposure pathway (ingestion) EPZ, a similarly shaped area with a fifty mile radius. The plume EPZ is concerned principally with the avoidance in the event of a nuclear facility accident of possible (1) whole body external exposure to gamma radiation from the plume and from deposited materials and (2) inhalation exposure from the passing radioactive plume. The duration of those exposures could vary in length from hours to days. The ingestion EPZ is established primarily for the purpose of avoiding exposures traceable to contaminated water or foods (such as milk or fresh vegetables), a potential exposure source that could vary in duration from hours to months.

Offsite emergency response plans must meet the sixteen standards set forth in 10 C.F.R. § 50.47(b). In addition to the criteria contained in § 50.47, Appendix E to Part 50 sets forth in greater detail certain information which Applicants' emergency plans must contain.

Guidance as to how these regulatory standards can be satisfied is provided by an NRC regulatory guide, entitled NUREG-0654/FEMA-REP-1, Rev. 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" November 1980.² These criteria are intended for use in drafting and reviewing emergency plans. Reviewers of emergency plans may determine that measures other than those the criteria recommend are adequate to bring the plans into conformity with the standards in § 50.47(b). See *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-644, 13 NRC 903, 937 (1981). NUREG-0654 is entitled to "considerable weight" by NRC licensing boards when evaluating emergency plans.³

The finding a board must make on emergency planning is necessarily a predictive finding. Emergency planning is an ongoing process and should continue through the life of a plant. Thus the NRC does not require that all aspects of the plans be complete before a final licensing decision is reached. See *Detroit Edison Co.* (Enrico Fermi Atomic Power Plant, Unit 2), ALAB-730, 17 NRC 1057, 1066 (1983). Furthermore, boards do not need to inquire into the details of implementing procedures. *Louisiana Power and Light Co.* (Waterford Steam Electric Station,

² This document was written by a joint committee of Staff from the Commission and the Federal Emergency Management Agency (FEMA). It is cited hereafter as NUREG-0654. This Board has taken official notice of NUREG-0654 (Tr. 4615-17, Margulies, J., 6/8/84).

³ NUREG-0654 was specifically considered in the rulemaking proceeding in which current emergency planning regulations were developed, and the language of the regulations restates the standards set forth in NUREG-0654. The regulations require that emergency response plans must meet the standards addressed in NUREG-0654. See 10 C.F.R. § 50.47(b) and footnote 1 thereto and 10 C.F.R. Part 50, Appendix E, § IV and footnote 4 thereto. This NUREG has therefore been held to carry "considerable weight." *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), LBP-83-32A, 17 NRC 1170, 1177 n.5 (1983). See also *Duke Power Co. v. NRC*, No. 80-2253, slip op. at 1 (D.C. Cir. Sept. 29, 1981).

Unit 3), ALAB-732, 17 NRC 1076, 1103-04, 1106-07 (1983). On the basis of the record before us, we need find only reasonable assurance that adequate measures can and will be taken.

The Commission's regulations do not require that extreme or unreasonable emergency planning measures be taken. See *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), CLI-83-10, 17 NRC 528 (1983). The planning standards of 10 C.F.R. § 50.47(b) and NUREG-0654 provide a reasonable planning basis rather than absolute planning requirements. This Board does not have to find that all individuals are covered by the plans under all circumstances. The Commission explained in *San Onofre*:

It was never the intent of the regulation to require directly or indirectly that state and local governments adopt extraordinary measures, such as construction of additional hospitals or recruitment of substantial additional medical personnel, just to deal with nuclear plant accidents. The emphasis is on *prudent* risk reduction measures. The regulation does not require dedication of resources to handle every possible accident that can be imagined. The concept of the regulation is that there should be core planning with sufficient planning flexibility to develop a reasonable *ad hoc* response to those very serious low probability accidents which could affect the general public.

17 NRC at 533 (emphasis in original). Therefore, in reaching our decision on the Intervenor's contentions, we have applied the basic test of whether or not the Applicants' emergency plans take the necessary "*prudent* risk reduction measures."

The Commission gives great weight to FEMA's views on the need for and adequacy of specific offsite protective planning measures. *Id.*

We are a body of limited authority with a responsibility to determine if the emergency response planning is in conformity with regulatory standards. Although we recognize Intervenor's "desire that the level of emergency preparedness for those residing near the Catawba Nuclear Station be enhanced to the maximum extent possible," our function is not to require that measures be taken which exceed the Commission's requirements. The agency is charged with establishing standards that are adequate to preserve the public's health and safety. We accept that the Commission's laws, rules and regulations establish requirements that will accomplish the intended purpose. Our role is not to substitute other standards for those set by the Commission, which are binding upon us.

In apparent recognition of the complexities of the Commission's emergency planning requirements and the limited control that applicants exercise over offsite emergency planning, 10 C.F.R. § 50.47(c)(1) provides that a failure to meet the standards set forth in 10 C.F.R. § 50.47(b) will not necessarily result in the denial of an operating

license. Rather, the applicant will be given "an opportunity to demonstrate to the satisfaction of the Commission" that deficiencies in the plan "are not significant for the plant in question," that "adequate interim compensating actions" have been or will be taken, or that there are "other compelling reasons" to permit plant operation.

IV. FINDINGS OF FACT

A. Intervenor's Emergency Planning Contentions 1 and 7 -- Public Information and Education

These contentions have been treated together throughout the proceeding and the practice will be followed here.

1. Intervenor's Emergency Planning Contention 1 (EPC-1) reads as follows:

Public information provided by Applicants and state and local officials is not adequate to ensure appropriate responses to notification procedures.

The principal source of information is Applicants' brochure, which is inadequate, intentionally deceptive regarding potential health effects of radiation, and misleading, in that:

A significant body of scientific evidence that indicates health effects at very low levels of radiation is not cited. Therefore, people with compelling reasons to stay (such as farmers tending to livestock) may not take the threat seriously, especially after being repeatedly told in the past that radiation is not particularly harmful, and that a serious accident is extremely unlikely. It does not indicate that there is danger in accumulated radiation dosage. It does not give adequate information on protection from beta and gamma rays. It does not specify how young "very young" is. There is no chart to indicate overexposure during non-routine releases or accident to put into perspective the possible dose received before or during an evacuation. It does not specify ingestion dangers from contaminated food and water. It does not specify the importance of getting to reception areas for registration for purposes of notification for evacuees' re-entry to their homes, nor of emergency notification for evacuees, accounting for fiscal aspects of evacuation and for the basis of establishing legal claims which might result from the evacuation, as specified in "Catawba Site Specific NUREG Criteria" p. B2, #3. In fact, citizens are told they may go directly to "stay with friends or relatives living at least 15 miles from the plant" (p. 10, #5). Neither does it state that the reception areas exist to provide decontamination of people and vehicles. It states that in an emergency at Catawba, citizens "would be given plenty of time to take necessary action." This cannot be guaranteed in the event of a sudden pressure vessel rupture, where sheltering would be indicated. This eventuality is not mentioned. It assumes all recipients can read, and at a certain level of comprehension.

As a primary source of information, it is imperative that all have access to and understanding of the emergency procedures to be taken. There is no information concerning the existence of a "plume exposure pathway," which would influence a citizen's choice of escape route. Although this information may be available via other media during a crisis, it is important for citizens to be aware of this phenomenon beforehand. Although the North Carolina state plan calls for emergency information to be distributed as detailed in Part 1, Section IV, 2, 3, and 4, no such material other than Applicants' brochure has been made available. When and if such material is formulated, it should include information on points of concern as listed in this contention. The emergency brochure falsely reassures residents that they "would be given plenty of time to take necessary action" in the event of an emergency. In the event of a vessel rupture, such as one resulting from a PTS incident, a catastrophic failure of the containment is a proximate likelihood. In that event, significant releases would reach residents well before they were able to remove themselves from harm even under Duke's overly optimistic evacuation time estimates.

2. EPC-7 provides as follows:

The Applicants' emergency plans and public brochure and the plans of relevant State and local authorities do not adequately address the preparations that should be made to achieve effective sheltering, nor the actions that people should take when advised to seek shelter. Hence, the plans and brochure fail to provide a reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency as required by 10 C.F.R. 50.47(a)(1).

The regulations governing public education and information efforts as part of emergency planning are set forth at 10 C.F.R. § 50.47(b)(7) and Part 50, Appendix E, § IV.D.2.

Section 50.47(b) provides that onsite and offsite emergency plans must meet certain standards, including:

(7) Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance, and procedures for coordinated dissemination of information to the public are established.

Part 50, Appendix E, § IV.D.2 provides that an applicant's emergency plans should contain information needed to demonstrate compliance with various elements, including, as to notification procedures:

Provisions shall be described for yearly dissemination to the public within the plume exposure pathway EPZ of basic emergency planning information, such as the methods and times required for public notification and the protective actions planned if an accident occurs, general information as to the nature and effects of radiation, and a listing of local broadcast stations that will be used for dissemination of information

during an emergency. Signs or other measures shall also be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an accident occurs.

3. Guidance as to how these regulatory standards can be satisfied is provided in NUREG-0654, § II.G. Paragraph 1 provides:

Each organization shall provide a coordinated periodic (at least annually) dissemination of information to the public regarding how they will be notified and what their actions should be in an emergency. This information shall include, but not necessarily be limited to:

- a. educational information on radiation;
- b. contact for additional information;
- c. protective measures, e.g., evacuation routes and relocation centers, sheltering, respiratory protection, radioprotective drugs; and
- d. special needs of the handicapped.

Means for accomplishing this dissemination may include, but are not necessarily limited to: information in the telephone book; periodic information in utility bills; posting in public areas; and publications distributed on an annual basis.

4. The thrust of Intervenor's position on the contentions is that the public information presently provided by Applicants and State and local authorities has not been demonstrated to be adequate to assure appropriate responses in the event of a radiological emergency at the facility. It levels specific criticisms at the design and content of Applicants' emergency plan brochure. They believe that whatever useful information is contained in the brochure is undermined by the public relations efforts conducted by Duke and directed at the Catawba EPZ population. Intervenor's claim State and local authorities have failed to demonstrate effective implementation of the commitments made in their own emergency plans and fail to share in the coordinated responsibilities for effective public information.

5. More particularly as to Contention 7, Intervenor's contend that the efforts of Applicants and State and local authorities, including the brochure, fail to adequately address the subject of in-place sheltering such that inadequate protective action would result if sheltering were the advised response. It is alleged there has been a failure to provide clear, concise and adequate instructions on the subject for the public to adequately protect themselves.

6. Central to the contentions is the 1984 emergency plan brochure for Catawba (App. Ex. EP-5), which was prepared by Duke. The brochure is fourteen pages in length and has a tabular index with head-

ings: How a Nuclear Plant Works; About Radiation; Definitions; Emergency and You; Evacuation Procedures; and Protective Action Zones and Maps. Distribution was to all plume EPZ households in January 1984. An updated version will be distributed in September 1984 which will reflect comments of State and local officials.⁴ Annual revisions will be made to improve upon it.

7. The 1984 brochure replaced a 1983 version (App. Ex. EP-8), on which Contentions 1 and 7 were based. Applicants responded to the criticisms in the contentions by specifying in the revised 1984 brochure: how young "very young" is; by setting forth procedures that will be taken when there are "ingestion dangers from contaminated food or water"; by noting that in evacuations there should be registering at shelters before "choosing to stay with friends or relatives"; by adding information about the services of insurance companies being available at shelters and that shelters would have facilities for decontamination of evacuees and their vehicles; and by omitting from the brochure the statement that in an emergency people "would be given plenty of time to take necessary action." We find these areas in which objection was raised are no longer matters of contention and will not be considered further.

8. FEMA has reviewed Duke's 1984 brochure and has found it complies with all five evaluation criteria of the NUREG-0654 emergency planning standard applicable to public information (Staff Ex. EP-2, Heard and Hawkins at 7; Tr. 1519, Heard 5/9/84).⁵

9. The 1984 brochure was further changed from that preceding it in response to Intervenor's allegation in Contention 1 that the 1983 brochure "assumes all recipients can read, and at a certain level of comprehension." Duke revised the earlier version of the brochure to reduce complexity and verbosity. Narrative portions of the current brochure are written on an eleventh grade level, while instructional sequences are written on a seventh grade reading level (App. Ex. EP-7, Duckworth at 14-15; Tr. 444-46, 450, Duckworth 5/2/84). It is stated on page 1 of the brochure, "[i]f you know someone who is blind or does not read well read this information to them. Talk to them about what to do in an emergency."

⁴ By letter dated September 7, 1984, Applicants advised that, because of a delay in preparation, the next edition of the brochure is expected to be distributed in November 1984, rather than in September.

⁵ FEMA issued an Interim Findings Report on the adequacy of radiological emergency response preparedness for Catawba on April 17, 1984. The Interim Findings Report, Staff Ex. EP-3, and its conclusions are referred to throughout the findings. On July 27, 1984, following the close of the record, FEMA in a letter to the NRC, confirmed its prior findings as to the adequacy of State and local emergency plans for offsite preparedness for Catawba. The letter was prepared after inquiries about the plans were made by FEMA to the States of North and South Carolina and their responses were received. The Interim Findings referred to in these findings remain unchanged.

10. Duke's reading specialist, Dr. Susanna V. Duckworth, testified that in her opinion, the 1984 brochure effectively communicates how the public would be notified of a radiological accident at Catawba and what actions the public should take in such an emergency (*id.*, Tr. 450-51). She is an expert in the area and we find her testimony convincing.

11. Intervenors contend the required information in the brochure is obscured by secondary information, thereby assuring the reader of the plant's safety and Duke's goodwill. To substantiate their position they presented the testimony of Arlene Bowers Andrews, a doctoral candidate in Clinical-Community Psychology at the University of South Carolina and Ruth Wanzer Pittard, the Director of Audio-Visual Services at Davidson College.

12. Ms. Andrews' critique of the brochure is "[a]s presently designed [it] does not provide the clarity and direction needed by individuals in a state of anxiety and potential psychological crises" (Int. Ex. EP-38, at 4). In her opinion the brochure fails to adequately promote effective emergency response by individuals because information regarding what to do is "embedded in lengthy text about the power plant and radiation" (*id.* at 4-5). Ms. Andrews further testified she was not familiar with Commission regulations and guidance on emergency planning (Tr. 1759, Andrews 5/10/84), and was unaware of whether Duke's brochure complied with such requirements (*id.* at 1760).

13. Ms. Pittard found the required message specified in NUREG-0654 to be obscured by the "design theme" of the brochure. The design theme involves factors such as the location of the message within the text, repetitiveness of the message, use of illustrations to enforce the message, boldness of print, use of colors, placement of the message, the language made and volume of the material to be read (Int. Ex. EP-38, at 7). She acknowledged that the brochure repeats at least eight times that the public should listen to the EBS broadcasts in the event of an emergency (Tr. 1735-42, Pittard 5/10/84). The witness admitted that Duke's brochure minimally complies with the requirements of NUREG-0654 but objects that the required message is not presented effectively (*id.* at 1731).

14. We agree with the Licensing Board in *Consumers Power Co.* (Big Rock Point Plant), LBP-82-60, 16 NRC 540, 544 (1982) that the purpose of the emergency planning brochure is to provide information to the readers that they are to respond to audible alarm systems and to be sufficiently knowledgeable to understand the importance of responding. In order to do that the brochure must be clear, concise and well organized. See also *Louisiana Power and Light Co.* (Waterford Steam

Electric Station, Unit 3), LBP-83-27, 17 NRC 949 (1983). We find the 1984 Catawba brochure meets these requirements.

15. We agree with Dr. Duckworth, the reading specialist, that the 1984 emergency planning brochure effectively communicates the information required by the regulations. Even Intervenor's expert Ms. Pittard agrees that the requirements of NUREG-0654 are met. No one would deny the brochure cannot be enhanced, but in its present form it meets the regulatory requirements as found by FEMA.

16. The testimony of Ms. Andrews is insufficient to upset that conclusion. The brochure has its first six pages devoted to general information with the last eight pages given to emergency response information. Tabular indexing identifies the various sections. What minor spillover there is in the various kinds of information is not sufficient to render the brochure inadequate under the regulations and evaluation criteria. The message still comes across effectively. The brochure must be directed to normally functioning individuals. In that it is always available to the public, the opportunity is there to read it in other than an emergency situation when crisis is not a factor. The emergency response information is readily available to a reader even in a crisis situation because of the way it is segregated and identified.

17. There is no convincing evidence of record that Applicants have prepared the brochure in such a manner so as to obfuscate or defeat the effective transmission of the message required by the regulations. Emergency planning is an ongoing process which is fully recognized by all of the parties. Although the brochure meets the regulatory requirements, that is not to say it cannot be improved. That is a reason why the brochure is to be revised annually. No one is precluded from offering recommendations for its improvement and they have been accepted in the past.

18. Specific criticism of Intervenor's of the content of the brochure includes the claim that the brochure fails to cite "a significant body of scientific evidence that indicates health effects at very low levels of radiation" and that people with compelling reasons to stay, such as farmers, may not take the threat seriously, especially after being repeatedly told in the past that radiation is not particularly harmful, and that a serious accident is unlikely.

19. Basic elements of the charge are unsupported in this record. The uncontroverted testimony is that there is no significant body of scientific evidence that indicates health effects at very low levels of radiation (App. Ex. EP-7, Birch at 7). There is no evidence of record that people such as farmers have been told repeatedly in the past that radiation is

not particularly harmful. There is no basis for the criticism in this record or evidence that a material problem exists that must be rectified.

20. Applicants' response in part to the above criticism is that the brochure clearly indicates that radiation is harmful. It relies upon three of its aspects. The first is the statement contained at page 4 of the brochure, "[e]xposure to high levels of radiation causes health effects." The others are that the brochure gives instructions as to what to do in an emergency and that it does not attempt to discount the possibility of an emergency at Catawba (App. Ex. EP-5, at 4, 9).

21. Of the three we cannot accept Applicants' claim that the statement "[e]xposure to high levels of radiation causes health effects" makes very clear to those to whom the brochure is directed that radiation is harmful. Although it may be so to those familiar with health physics that the term health effects means that radiation is harmful, i.e., Intervenor employed the very term in Contention 1 to that end, at best to the lay individual it is obtuse. The language used should state directly that high levels of radiation are harmful to health and may be life-threatening. Also it would better serve the reader of the brochure for it to at least contain such a statement within that section of the brochure that deals with action to be taken in the event of an emergency.

22. Intervenor alleges that the Duke brochure "does not indicate that there is danger in accumulated radiation dosage"; that it does not contain a chart indicating "over exposure during nonroutine releases or accident" to put into perspective the possible dose received before or during an evacuation; and that it does not give adequate information on protection from beta and gamma rays. On the one hand Intervenor takes the position the brochure is overly voluminous to be effective and on the other they want to add to it. We find that the brochure, through the protective action it instructs be taken, inherently addresses the matters sought to be covered. We agree with FEMA's findings that nothing more is required. Intervenor has not established the need to specifically add such additional information to the brochure.

23. Intervenor alleges that the brochure contains no information "concerning the existence of a 'plume exposure pathway,' which would influence a citizen's choice of escape route," and that "it is important for citizens to be aware of this phenomenon beforehand." In ¶ 107 at page 69 of their brief Intervenor cites with approval a description of the plume transport phenomenon in *Big Rock Point*, LBP-82-60, *supra*. The equivalent is contained in the 1984 brochure at page 9, where it is stated, "[t]he areas affected [within 10 miles] would depend on such things as wind speed and wind direction. It would also depend on how serious the accident is." Intervenor's criticism is without merit.

24. Other specific criticism leveled at the 1984 brochure is contained in Contention 7. It alleges the information presented is inadequate because it does not address preparations for effective sheltering or the actions that should be taken when one is advised to seek shelter. We agree with FEMA that NUREG-0654 does not require that any "pre-planned preparations" for effective sheltering be addressed in emergency plans (Staff Ex. EP-2, Heard and Hawkins at 14). We find no regulatory requirement for that which Intervenor seek.

25. The brochure contains six steps that should be followed when one is advised to be sheltered. Intervenor find them inadequate. It notes, for example, the instructions call for the placement of a "damp cloth over your nose and mouth," whereas there are more effective measures that can be taken.

26. We find that the brochure addresses the subject of sheltering adequately and meets applicable regulations. The steps listed are in conformity with environmental protection action guides. They are in accord with NRC standards as found by FEMA (*id.*). The instructions provide the reader with the necessary basic information on what to do when sheltering is called for. That more detailed and informative information can be provided is unquestionable. The information contained in the brochure represents a reasonable approach in getting the required message to the public. That there may be other methods does not render that employed as inadequate.

27. Duke had prepared and distributed a Catawba emergency plan brochure designed especially for schoolchildren (App. Ex. EP-6). It is directed to familiarizing students, their parents and teachers with their respective roles in the event of a radiological emergency at the facility. There is no regulatory requirement for such brochure. Intervenor are critical of the brochure in the same manner they were of the brochure for general distribution, i.e., not accomplishing stated purposes and suffering from design and content problems. We find the brochure to provide valuable information to a segment of the plume EPZ populace with special concerns. It makes a positive contribution to emergency planning. As with the other brochure, it is capable of being improved upon. A local high school teacher, Ms. Brenda Best, testified that although the brochure states that the students' teachers and principals had been taught what to do, she had not been effectively educated in that regard (Tr. 4565-66, Best 6/8/84). We expect that the brochure plans will be implemented and the education will be provided in the near term.

28. Intervenor further contend the public information provided to transients is inadequate. Applicants have posted signs at Lake Wiley, where recreational boating is popular. The signs read that "[i]n the

event of an emergency requiring evacuation of the lake you will be notified by sirens and red smoke or flares. If these signals are observed, please (1) Leave the lake immediately; (2) Turn on radio or television for information and instructions." Decals, 3" x 5" in size, are being distributed to public facilities that were unspecified. They contain the message, "[y]ou are in an area covered by an emergency warning system. If you hear a steady three minutes siren, tune a radio to an Emergency Broadcast System station and follow the broadcast instructions" (App. Ex. EP-9; Tr. 269-72, Carter 5/2/84). Intervenors' criticism is that there is no evidence that the information is being disseminated to transients at places where they usually are, including the Carowinds theme amusement park and the Heritage U.S.A. religious retreat. They are locations where there are large numbers of transients.

29. The posting of signs and decals is required by Evaluation Criterion II.G.2 of NUREG-0654, which provides:

2. The public information program shall provide the permanent and transient adult population within the plume exposure EPZ an adequate opportunity to become aware of the information annually. The programs should include provision for written material that is likely to be available in a residence during an emergency. Updated information shall be disseminated at least annually. Signs or other measures (e.g., decals, posted notices or other means, placed in hotels, motels, gasoline stations and phone booths) shall also be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an emergency or accident occurs. Such notices should refer the transient to the telephone directory or other source of local emergency information and guide the visitor to appropriate radio and television frequencies.

30. Although we agree with the North and South Carolina emergency planning officials that the more general wording of the warning signs and the decals enhanced their effectiveness by broadening their applicability to all hazards (Tr. 276-78, 526-28, Pugh and Lunsford 5/2/84, 5/3/84), they are sufficiently cryptic that the importance of the message is defeated and lost. The signs and decals should specify the emergencies covered, to at least include nuclear.

31. The messages contained on the signs and decals do not conform to NUREG-0654 Evaluation Criterion II.G.2 for providing information to transients. The last sentence of the guide provides that the notices should refer the transient to (1) the telephone directory or (2) to a comparable other source of local emergency information, and also (3) should guide the visitor to appropriate radio and television frequencies. Applicants' messages eliminate steps (1) and (2) and only provide for step (3). There is good reason for steps (1) and (2). The health and safety of a transient is of no less importance than that of a resident and

they should be treated equally, within reason. Transients too should have the opportunity to become aware of how to cope in a nuclear emergency before the event occurs. Further, it cannot be expected that the overwhelming number of transients will have accessibility to radios and television receivers at the time an emergency occurs. Information as to how they are to react in an emergency should be made available to them before any event. Evaluation Criterion II.G.2 provides the methods as to how this should be done. Applicants have the option of making such information available in the telephone directory or other source of local emergency information. The signs and decals should state the method being used and if it is (2), where the information is available. If Applicants choose not to make the information available in the telephone directory, the comparable source should be similarly accessible to the transients.

32. We require the foregoing changes to be made in the signs and decals and that emergency response information be made available to transients in the manner indicated. There shall be reflected in Applicants' emergency plans the kinds of locations within the plume exposure EPZ where the signs and decals and emergency response information will be placed and the procedures employed to assure that sufficient numbers are being distributed to effectively reach the transients. Applicants shall promptly implement the foregoing and make the appropriate distribution.

33. Intervenors urge that the overall impact of Duke's public information program for the facility is to falsely reassure the public regarding the hazard in a potential nuclear accident and, therefore, lulls the public into a false sense of security and reduces the likelihood of effective response in the event of an actual accident. They rely in large measure on an internal Duke memorandum authored by Duke's General Manager for Community Relations, entitled "Catawba Information Programs." The memorandum reports on Duke's public acceptance efforts, which focus on issues admitted in some form as contentions. It states that media efforts are "designed to humanize the plant." A number of its community programs were reported to have focused on the emergency planning zone for Catawba. Examples of activities included, "[w]e let people know the sirens were going in and what their purpose was." Emergency planning matters, presented at thirteen meetings, were handled by Duke staff with presentations made by county and State emergency planning personnel. Various public relations activities were also reported upon. The memorandum stated that opinion researching in the facility emergency planning zone "confirmed the success of our Catawba information programs" (Int. Ex. EP-7, at 5). In further support

of their position, Intervenor's rely on a statement made in a brochure, by Michael E. Bolch, the Emergency Preparedness Coordinator for the Catawba Nuclear Station, that "[t]he possibilities of us ever having a serious problem are very, very low — but they're not zero . . . that . . . is why we have an extensive emergency plan for this plant." Intervenor's assert that Applicants unduly emphasize Duke being a good neighbor rather than providing effectively communicated information on emergency preparedness.

34. Marvin Chernoff, a subpoenaed witness of Intervenor's who was responsible for Duke's opinion research, found that Catawba EPZ residents are less concerned about radiation effects and the possibility of a radiological accident than the general population as a whole. He felt the residents are "comfortable with the information in support of Duke" (Tr. 4304-05, Chernoff 6/7/84).

35. Rather than accepting Intervenor's interpretation that the residents have been "lulled into a sense of false security" by Duke, Applicants' position is that the Catawba EPZ residents have sufficient information to be reassured that if there were an accident, the officials involved know what they're doing about helping to protect the people (Tr. 4521, Turnipseed 6/8/84).

36. We see nothing nefarious in Applicants' seeking to find acceptance with the affected populace through public information programs which relied heavily on public relations but also have an edifying content. It would be rather unusual to expect Duke to want to exist in a community where there was acrimony and hostility rather than accord and harmony. Fully accepting Mr. Chernoff's public opinion findings, we have no reason to conclude that Applicants, through design or otherwise, undertook a program to destabilize and undermine the public information and education plan required to be provided to the public by Commission regulation. We find on the evidence of record, the required information and education plan, except to the extent noted, has been made available to the public in accordance with the applicable law. We find no support for the claim that the public has been lulled into a false sense of security which has reduced the likelihood of an effective response in the event of an actual accident. Intervenor's allegations are belied by Applicants' continuing effort to improve its program, including making revisions, in response to Intervenor's criticisms. Intervenor's citing Applicants' Emergency Planning Coordinator that a nuclear accident is possible and that there is an extensive emergency plan for the plant is not consistent with the argument that emergency planning and education are being denigrated, but to the contrary indicates its significance.

37. Intervenor critics North Carolina for not utilizing the means called for in its plan for getting out required educational information. There are nine methods provided, ranging from the Catawba Nuclear Station Emergency Brochure to programs presented to civic organizations. The plan provides that the means used "may include, but not necessarily be limited" to the nine specified (IV.D.2). The plan further provides, "State and local governments and Duke Power Company share a joint responsibility for disseminating this type of information. Duke Power Company will serve as the managing agency for the production and distribution of the brochure" (*id.*).

38. We find as FEMA did, North Carolina is following the requirements of its plan. Under the plan it need not follow any number of the means listed. It has opted to use the Catawba brochure as its principal medium. North Carolina has input in its content so that it is a collaborative effort. As we have found, except for transients, the brochure provides the required educational information under the regulations.

39. The State of North Carolina uses other methods for providing education and information to the public. It prepared and distributes an all-hazards brochure entitled "Disaster and What to Do to Protect Yourself," which has a segment on nuclear power plant emergencies (App. Ex. EP-12). The Division of Emergency Preparedness participates in various educational programs presented to civic organizations and interested groups. There are radio and television interviews of State emergency planning officials (Tr. 293, 295-96, Pugh 5/2/84). Emergency planning is an ongoing process, which the State of North Carolina recognizes. It is in the process of hiring a full-time public information officer, who will expand public information efforts (App. Ex. EP-7, Pugh at 6; Tr. 532, Pugh 5/3/84). We find the North Carolina plans for providing information and education on emergency planning satisfactory and that they are being fulfilled adequately.

40. Intervenor critics find the South Carolina plans adequate but complain there is no evidence of real effort at implementation. Like North Carolina we find South Carolina meets the regulatory requirements. It too relies primarily on the brochure which is permissible. For farmers, they distribute a brochure that contains information on protective action that should be taken for livestock and agricultural commodities in the event of a radiological release (App. Ex. EP-10). A FEMA booklet, "In time of Emergency; A Citizen's Handbook on Nuclear Attacks and National Disasters" (App. Ex. EP-11) is distributed to the counties (Tr. 316-17, McSwain 5/2/84). Planning officials participate in annual press briefings to provide information on emergency planning exercises (Tr. 4514-16,

Turnipseed 6/8/84). State officials have attended public meetings sponsored by Duke, previously referred to. The Chief Area Coordinator of the Emergency Preparedness Division and the Public Information Officer for the Division of Public Safety in the South Carolina Governor's Office each agree that not enough has been done and that it requires a continuing effort (App. Ex. EP-7, Lunsford at 16; Tr. 223-24, Lunsford 5/1/84; Tr. 4530-31, Turnipseed 6/8/84). There is no reason to doubt that the State of South Carolina will not continue in its efforts to continually improve implementation of its plans.

41. We likewise find, as FEMA found, that public information and efforts at the county level fulfill the regulatory requirements. The counties also rely heavily on the brochure, which is acceptable. Their planning officials speak to interested groups. They publicize planning efforts on radiological response in local newspapers. They respond to requests by the public for information (App. Ex. EP-7, Phillips at 5, 7, Broome at 7-8, Thomas at 6). The efforts are commensurate with the local government responsibilities. There is no requirement that they each formulate and implement a wholly separate and independent program.

42. Philip Layne Rutledge, who has assisted CESC in other licensing proceedings and is informed in the area of emergency planning, was permitted to testify regarding recommendations for improving Catawba emergency planning (Int. Ex. EP-38, page titled *Recommendations*; Tr. 1788, Rutledge 5/10/84). His first recommendation is that a public committee be established to perform most of the public information functions now performed largely by Duke. His second recommendation is that the funds Duke spends on public education planning be placed in a "community chest," the use of which would be determined by a public committee. The Commission's regulations place responsibility on Applicants for emergency plans. See Part 50, Appendix E, § IV.D.2. There is no basis, legal or otherwise, to place authority in public bodies to carry out emergency planning activities and use Applicants' funds to do it, where Applicants have the responsibilities regarding those functions. The recommendations if implemented would result in a violation of fundamental rights and are without merit.

43. As to the third recommendation, Mr. Rutledge is concerned that the brochure might be misplaced or lost and suggests that a better medium would be a poster that could be hung in a permanent location where it can always be found. The record fails to indicate that possible misplacement or loss of the brochure will present a problem. There is no reason given why the brochure cannot be kept in a permanent location. The question of whether the necessary message would fit on a poster was not addressed. We find no basis to support the recommendation.

44. The fourth recommendation is that there is a clear need to strengthen the involvement of educational groups, civic groups and the media in disseminating information. An example given is to have the media repeat pertinent public service announcements. We have found that existing public information and educational efforts meet regulatory standards. Our function is not to review measures that might be taken which exceed the Commission's standards. It is up to Applicants and State and local governments to decide in what way they might enhance the current program. They are free on a voluntary basis to incorporate into the program whatever they may wish from the recommendation.

45. The last recommendation is that emergency plans should be reviewed and updated annually using results of surveys performed by an independent research firm responsible to a public body. The action that Mr. Rutledge recommends as to using surveys in the manner described to update the program is beyond the requirements of NRC regulations. Again it is not our function to review such measures. Applicants, State and local governments can on a voluntary basis decide on whether to employ survey information to revise existing programs, which we have found meet regulatory standards.

46. Except to the extent found in ¶¶ 21, 30, 31 and 32, *supra*, we find the Catawba offsite emergency planning for public information and education is in conformity with regulatory requirements, and Intervenor's Contentions 1 and 7 are without merit.

B. Intervenor's Emergency Planning Contention 3 — Adequacy of Food, Clothing, Bedding and Shelters

1. EPC-3 reads as follows:

The Emergency Plans do not provide for adequate emergency facilities and equipment to support the emergency response as required by 10 C.F.R. 50.47(b)(8) in that:

- a) the plans do not provide for sufficient uncontaminated food, clothing, and bedding for persons who are evacuated. The plan does not attempt to estimate these needs nor provide specific information on how they are to be met.
- b) The plans do not demonstrate the unlikely proposition that just 14 reception centers/shelters are adequate to register and process some 75,000 evacuees. Indeed, the Catawba Nuclear Station Site Specific Plan (Part 4, SCORERP) provides that "all evacuees, both those ordered and those spontaneous, will be processed through their respective reception centers" (p. B-2). With no clear plan for controlling entry and exit from the reception centers, and no restrictions on who may enter, it is very likely that reception centers will

become overcrowded. Persons from outside the evacuation area will be understandably concerned about whether or not they have been exposed to radiation and might well proceed to a nearby reception center — exacerbating problems of crowding that already loom as serious given the enormity of the task of processing EPZ evacuees at reception centers with limited space and supplies.

2. The contention raises two basic concerns: First, the alleged absence of planning for provision of the specified “food, clothing, and bedding” to be utilized in the shelters in the event of an evacuation; and, second, the alleged inadequacy of the plans to provide for reception centers or shelters which can accommodate the registration, monitoring, decontamination and housing of the large numbers of persons who may evacuate upon instructions or spontaneously in the event of an accident at Catawba.⁶

3. The initial plans had proposed fourteen designated reception centers to process evacuees, which the contention raised as an issue. The reception center concept was then abandoned and instead evacuees will be directed immediately to thirty-eight primary shelters. It is estimated that these shelters can accommodate the entire population of the Catawba plume EPZ, from 70,000 to 80,000 people (App. Ex. EP-13, Pugh at 9). In addition, over 100 secondary shelters have been identified in the plans as well, which would be called upon if necessary (*id.*, McSwain at 11-12).

4. Under both the North and South Carolina plans, which address providing food, clothing and bedding to evacuees (App. Ex. EP-13, Pugh at 4-5, Gregory and McSwain at 2-3), the items will not be stored at the shelters on an ongoing basis. The supplies will be called upon as needed from the Red Cross, the Salvation Army and existing stocks controlled by the county, State, and/or federal governments (*id.*). The plans are not limited to providing for a specific number of people or a sheltering period of a specific duration (Tr. 688-89, 697, 750-51, Johnson 5/3/84). The plans provide that, should the situation develop that more supplies are required, they can be drawn from more distant areas. (Tr. 664, Neves 5/3/84). We find the plans to be adequate and are convinced there should be sufficient supplies of uncontaminated food, bedding and clothing at the emergency shelters designated for a Catawba emergency.

⁶In raising Contention 3, Intervenor challenge compliance with 10 C.F.R. § 50.47(b)(8) which states: “Adequate emergency facilities and equipment to support the emergency response are provided and maintained.” The areas deemed by NUREG-0654 to be covered by this requirement include, in pertinent part, provision for timely activation and staffing of the facilities and centers described in the plan, and the listing and maintenance of emergency equipment and instruments.

5. The witnesses testifying on the emergency evacuation and sheltering issues are highly qualified in the areas of providing disaster relief and very credible in their testimony. The Red Cross Disaster Specialist called to testify by the Applicants, Dennis Johnson, was personally involved in the sheltering of 52,000 refugees in a war in Nicaragua. The testimony of the witnesses was supported by specific figures as to the quantities of supplies that could be provided in an emergency situation. There is no reason of record to doubt the accuracy of the quantities involved or that they could be provided.

6. Under the State plans the primary foodstuffs would come from school lunch supplies located at the schools and in warehouses. This would be immediately available. Additional sources can be drawn from the Red Cross, the North Carolina Department of Corrections and commercial warehouses (App. Ex. EP-13, Neves and Pugh at 4-6, Gregory and McSwain at 2-4).

7. The State plans call for bedding to be supplied by the Red Cross. Large supplies of cots and blankets could be supplied immediately. All evacuees may not have a cot on the first day but we agree with the Red Cross that it is not necessary for all evacuees to have a cot immediately for the plan to be viable and adequate (*id.*, Johnson at 7-8).

8. The Salvation Army, under the State plans, will provide clothing to those persons who have become contaminated. The Salvation Army can clothe up to 75,000 people in 48 hours (*id.*, Needham at 3).

9. The arrangements already made for food, bedding and clothing will reasonably satisfy the needs of the 70,000 to 80,000 people that may be evacuated. We are convinced, based on the experience and expertise of the witnesses in disaster relief, that should additional supplies be needed they can be promptly located and made available (Tr. 750-51, Johnson 5/3/84; App. Ex. EP-13, Pugh and Neves at 8, Gregory at 6-8).

10. We find as did FEMA that the 38 primary relocation centers, which are capable of servicing the populace of the plume EPZ, and the 100 secondary centers are sufficient to accommodate the number of people expected to seek shelter (Staff Ex. EP-2, Heard and Hawkins at 9). Intervenors expressed concern about individuals outside of the planning areas who might evacuate to the shelters even if told not to do so. The Red Cross disaster specialist found the "shadow effect" hypothesis contrary to his experience. In his opinion, people in a disaster follow instructions (Tr. 725-27, Johnson 5/3/84). FEMA's experience is that approximately 20% of the people who evacuate actually seek shelter at the public facilities (Staff Ex. EP-2, Heard and Hawkins at 9). The witness from the Red Cross confirmed this (Tr. 717, Johnson 5/3/84). Even if the "shadow effect" exists, although the record is to the contrary, there

are ample sheltering facilities for all of those who can reasonably be expected to evacuate, including all of those from the plume EPZ.

11. FEMA has reviewed the plans submitted for the Catawba facility and found them to be adequate under NUREG-0654, which requires that the means for registering and monitoring evacuees at shelters be described (Staff Ex. EP-2, Heard and Hawkins at 10). The Red Cross in conjunction with the North and South Carolina Departments of Social Services, will have responsibility for administration of the shelters related to Catawba (App. Ex. EP-13, Pugh at 10, Gregory and Lunsford at 9). We agree that the planning conforms to the regulatory requirements.

12. Responsibility for the operations of the shelters in North and South Carolina will be that of the Red Cross, except in Union County, North Carolina, where the county has the lead role (Tr. 699-701, 728, Johnson 5/3/84). In North and South Carolina, State and county officials selected the shelters based on FEMA standards. The Red Cross standards are somewhat more stringent and will be employed for final site selection. As a result of the differing standards, shelters in York County were eliminated from the list because of inadequate showers. If any facilities are eliminated, as has occurred, others will be located and added to the list.⁷ The Red Cross review has confirmed the shelter selection in Mecklenburg Counties, and the review of all shelters should be completed by the end of the year, if possible (App. Ex. EP-13, Johnson at 12-14, Gregory at 13; Tr. 735-36, Johnson 5/3/84).

13. Considering that the shelters already designated meet FEMA standards and that an upgrading is in the process, where needed, to assure that they will meet the Red Cross standard, we are satisfied that adequate facilities will be available to properly shelter any affected populace. Under *Fermi*, ALAB-730, *supra*, and *Waterford*, ALAB-732, *supra*, the emergency plans need not be complete or fully implemented before we make our finding.

14. Intervenor claim that the planning for employing shelters will not be carried out effectively, is not founded on convincing evidence and is without merit. The few examples given to support Intervenor's allegations are not of material significance. The Red Cross Shelter Coordinator for York County was not made aware of her assigned tasks until the January 1984 revision of the York County plan had been published (Tr. 4463-64, Anderson 6/8/84). In carrying out her duties she found the York County shelters did not meet Red Cross guidelines (*id.*, Tr.

⁷ Applicants' post-hearing listing and maps show a total of 33 primary shelters and 103 secondary shelters. There are 30 primary sites in South Carolina and 3 primary sites in North Carolina (App. Ex. EP-22).

4465-67). The 1984 brochure listed four York County shelters as being available for use (App. Ex. EP-5, at 13). The January 1984 revision of the Mecklenburg County, North Carolina plan, placed in evidence, shows the University of North Carolina, at Charlotte, to have 20,100 designated shelter spaces (App. Ex. EP-1, pt. 3, at 34). The Red Cross had rated the facility as having space for only 5000 evacuees, when it reviewed the matter 2 years earlier in connection with another matter (Tr. 4474-81, Long 6/8/84).

15. The planning for the facility is in an early shakedown stage. It must be expected that not everything will go perfectly at the start. What has occurred has not established any major flaw and what did happen is correctable and is being corrected. The Red Cross Coordinator for York County is working very effectively. She eliminated from use the facilities that will not meet the higher Red Cross standards. The fact that four shelters were listed in the January 1984 brochure that should not have been can be corrected in the September 1984 brochure. Responsible officials will direct away any individuals that might seek out the York County facilities, despite the change in the brochure (Tr. 830-34, Gregory 5/4/84). Despite the incorrect listing of the capacity of the University of North Carolina, at Charlotte, there are enough spaces available for the County's affected population of 7000. There are more than twenty additional shelters that can be activated in Mecklenburg County, if necessary (Tr. 851-52, Pugh and Broome 5/4/84; Tr. 4482-84, Long and Anderson 6/8/84). The deficiencies that were disclosed were magnified out of proportion to their importance.

16. Staffing and logistical requirements for sheltering have been planned for and should be adequately met. Red Cross shelter managers will have received Red Cross shelter management training. Shelters will be staffed by a combination of Red Cross, State and volunteer personnel. Training of these individuals is not an important factor because the Red Cross is experienced in utilizing volunteers with little or no experience (App. Ex. EP-13, Johnson at 9-10). Red Cross procedures will be followed for registration. It will require approximately 2 minutes to register a person and 3½ for a family of four (*id.* at 15). There should be adequate staff to register the number of evacuees within required time limits. If additional staff is required to overcome bottlenecks, they will be found and put on the job, i.e., early evacuees can be used to assist in registration and shelter operations (App. Ex. EP-13, Pugh at 10). We find the registration of evacuees should not hinder the functioning of shelters.

17. Monitoring and decontamination will be performed at each of the thirty-eight shelters, which will be prior to registration. The proce-

dures have been prepared and are ready for implementation. Trained personnel will be provided by the counties (Tr. 702, Johnson 5/3/84). Supplies necessary for decontamination at the shelters are soap, water and towels, all of which are obtainable. The equipment necessary for monitoring has been identified and will be provided (App. Ex. EP-13, McSwain at 10). Sufficient personnel and equipment should be available to assure that evacuees are monitored within 12 hours (Tr. 803-04, Gregory 5/4/84). See Findings C.6 to C.10, *infra*. If there is any significant buildup of evacuees waiting to be monitored they can be sent to another facility (Tr. 703, Johnson 5/3/84).

18. Based on the foregoing findings of fact we conclude that Emergency Planning Contention 3 is without merit. Adequate provision has been made to give us reasonable assurance that sufficient uncontaminated food, clothing, and bedding will be available promptly at shelters in the event of an emergency. The 38 designated primary shelters and 100 secondary shelters should assure that there is adequate sheltering space for all who would call upon it for use. The Staff and equipment at shelters should also prove adequate to complete necessary registration, monitoring and decontamination functions without undue delay.

C. Intervenor's Emergency Planning Contention 6 — Preventing Contaminated Persons from Entering Noncontaminated Zones

1. EPC-6 provides as follows:

The emergency plans do not provide reasonable assurance that adequate protective measures can and will be taken [10 C.F.R. 50.47(a)(1)] in that:

There are no adequate provisions for preventing contaminated persons from entering a noncontaminated zone. The plans do not make clear whether or not registration at a reception center/shelter is mandatory or not; if mandatory, by what procedures will it be enforced and what effect will these procedures have on evacuation times and traffic flow?

2. The issues raised by the contention are whether the emergency plans are adequate for preventing contaminated persons from entering a noncontaminated zone, whether adequate personnel and equipment will be available to perform decontamination functions and whether it can be accomplished without adversely affecting evacuation times and traffic flow. Intervenor's participation on the contention was to rely upon cross-examination. In the proposed findings they remain skeptical on the assurances given in the testimony that the tasks can be accomplished. We arrive at a different conclusion than that of Intervenor's.

3. FEMA witnesses noted that NUREG-0654 has no requirement for offsite plans to contain provisions for preventing contaminated persons from entering noncontaminated zones or that registration at shelters be mandatory (Staff Ex. EP-2, Heard and Hawkins at 12). Information is provided to the public through the brochure about the need of going to the shelters, registering and being decontaminated (App. Ex. EP-5, at 4, 10). The information will be further provided through EBS messages (App. Ex. EP-14, McSwain at 1).

4. The expert opinion of several experienced emergency specialists is that the public will follow procedures for registration at shelters and for preventing contaminated persons from entering a noncontaminated zone (App. Ex. EP-14, Brown and Pugh at 3-4, Broome at 2, Thomas at 1; App. Ex. EP-13, Johnson at 2-3).

5. North and South Carolina emergency plans are designed to assure that evacuees will report to shelters to be monitored for possible contamination. In the event of an evacuation, personnel at checkpoints would monitor the vehicles and passengers and advise people to go to a shelter for further monitoring and registration (App. Ex. EP-14, Brown and Pugh at 3-4). Procedures to be followed at the shelter will keep contaminated persons from associating with the general population and keep from spreading contamination. Contaminated vehicles will be washed down for decontamination (App. Ex. EP-14, Broome at 1-2, McSwain at 2). Once an area has been evacuated, all persons would be monitored when entering and leaving the evacuated area (Tr. 915-16, Brown 5/4/84). The measures to be taken should result in keeping the rational individuals, who may be contaminated, from entering a noncontaminated zone. That is the recognized planning objective. *Compare San Onofre*, CLI-83-10, *supra*.

6. The testimony of North and South Carolina emergency planning personnel indicate that there will be a sufficient number of trained personnel and sufficient instrumentation available to screen all contaminated individuals and their possessions at the shelters (App. Ex. EP-14, McSwain at 2, Brown and Pugh at 4-5; Tr. 977, Pugh 5/8/84; Tr. 975, McSwain 5/8/84).

7. South Carolina has large stocks of monitoring equipment available to it in addition to that in the counties in and adjacent to the plume EPZ (App. Ex. EP-14, McSwain at 2-3). Additional equipment can be acquired from other States (Tr. 2882-83, Lunsford and Harris 6/5/84). In North Carolina there are stocks of monitoring equipment in Gaston and Mecklenburg Counties. The State Highway Patrol has monitoring equipment in its cars (Tr. 976, Pugh 5/5/84).

8. There is reasonable assurance that the monitoring equipment will be operated by properly trained personnel. Existing numbers of monitors in the involved counties are Mecklenburg, 300 to 350; Gaston County, approximately 110; and York County, about 100 (Tr. 926, Phillips and Broome 5/4/84; Tr. 951, Thomas 5/4/84). Gaston County expects to have a minimum of twelve persons at each shelter to monitor, with the capability of increasing the number to twenty-four. There are ongoing training programs for monitors in the States and counties involved (App. Ex. EP-14, Brown and Pugh at 5-6, McSwain at 3, Phillips at 2; Tr. 987, Pugh 5/4/84). Additional resources could be provided by neighboring counties or States (Tr. 981, Phillips 5/4/84; Tr. 984, McSwain and Brown 5/4/84). *See also* Findings B.9 and B.17, *supra*.

9. From the testimony of Bob E. Phillips, Director of the Gaston County Emergency Management Agency, on May 4, 1984, we are satisfied that Gaston County will provide necessary monitoring in an emergency. Because based on the February 1984 exercise evaluation, FEMA found that more staff trained in monitoring and decontamination procedures is needed for Gaston County (Staff Ex. EP-3, FEMA Interim Findings at 12), and the matter was not resolved of record, we direct that Applicants confirm to FEMA and the Staff that this matter has been addressed. The action that we order be taken does not involve a matter of sufficient consequence to the planning that we make it a basis for a licensing condition.

10. Registration at shelters is not expected to affect evacuation times and traffic flow since shelters are located outside the EPZ (Staff Ex. EP-2, Heard and Hawkins at 12). It is not anticipated that procedures for screening individuals, their possessions and their automobiles for possible contamination will have any significant adverse effect on traffic flow or evacuation times (App. Ex. EP-14, Brown and Pugh at 6-7, McSwain at 3-4, Phillips at 3). Having people go to shelters to be checked for radioactive contamination and to be decontaminated, if needed, should not have more than minimal impact on evacuation time and traffic flows since the evacuation time study makes the assumption that everyone who is a willing evacuee goes to a shelter (*id.*, Glover at 2).

11. After review of all of the evidence, we conclude that Intervenor's EP-6 is without merit. We find that there is adequate provision to prevent contaminated vehicles and evacuees from going into noncontaminated zones. We further find that traffic control measures designed to monitor for contamination and to route evacuees to shelters will not significantly impede traffic flow or evacuation times.

D. Intervenor's Emergency Planning Contention 8 — Coordination of Emergency Response Activities

1. Intervenor's EPC-8 reads as follows:

There is no reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency in that the emergency plans of Applicants, the States of North Carolina and South Carolina, and the counties of Mecklenburg, Gaston and York fail to assign clear and effective primary responsibilities for emergency response and fail to establish specific responsibilities of the various supporting organizations. Conflict, confusion and lack of coordination are likely to prevail. Conditions may be the worst during the 7 to 8 hours after notification of state authorities of the existence of an accident at the Catawba Station while the North Carolina State Emergency Response Team (SERT) assembles and travels from Raleigh to the South Carolina Forward Emergency Operations Center (FEOC), located dangerously within the 10 miles EPZ at Clover, South Carolina.

The FEOC itself would require at least three and one-half hours to be assembled and staffed from Columbia, South Carolina. While the formal authority to order evacuation of the plume exposure pathway EPZ straddling the North Carolina-South Carolina border rests with the respective state governors, a confusing and ineffective array of consultative and delegative authority appears to cloud the lines of primary responsibility. The residual responsibilities of the respective County governments, agencies and the support organizations are either unspecified or inadequate to the task of effective protective response.

2. In admitting the contention the Board ruled that the first few sentences were introductory and that it substantively started with the third sentence (S. Tr. 1088, Kelley, J., 8/8/83).

3. As provided in 10 C.F.R. § 50.47(b)(1), offsite emergency planning must meet the following standard:

Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations within the Emergency Planning Zones have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.

Planning Standard II.A of NUREG-0654 repeats the above. Evaluation criteria include the following:

- 1.a. Each plan shall identify the State, local, federal and private sector organizations (including utilities), that are intended to be part of the overall response organization for Emergency Planning Zones. (See Appendix 5).
- b. Each organization and suborganization having an operational role shall specify its concept of operations, and its relationship to the total effort.

.....

- 2.a. Each organization shall specify the functions and responsibilities for major elements and key individuals by title . . . The description of these functions shall include a clear and concise summary such as a table of primary and support responsibilities . . .
- b. Each plan shall contain (by reference to specific acts, codes or statutes) the legal basis for such authorities.

Appendix 5 of NUREG-0654, a *Glossary*, provides the following under *State* organizations:

There may be more than one State involved, resulting in application of the evaluation criteria separately to more than one state. To the extent possible, however, one state should be designated lead.

4. FEMA found that the emergency plans of the States of North Carolina and South Carolina and the counties of Mecklenburg, Gaston and York assign clear and effective primary responsibilities for emergency response and specific responsibility of the various supporting organizations (Staff Ex. EP-2, Heard and Hawkins at 15). FEMA conducted an exercise testing the Catawba emergency planning in February 1984 and found that the assignment of responsibilities worked well (*id.*). FEMA officials further found that North and South Carolina worked effectively together and demonstrated an efficient and cooperative relationship throughout the planning and implementation of the exercise (Tr. 1660-63, Heard and Hawkins 5/9/84).

5. Intervenors contend that the exercise selected by FEMA was an ineffective test of the abilities of the authorities to respond because it involved a gradually unfolding incident with a minor release of radiation occurring on the second day and only involved Gaston County and not Mecklenburg County in North Carolina. Further, the Forward Emergency Operations Center (FEOC) for the South Carolina Emergency Response Team (SERT) had been set up at the Clover, South Carolina Armory in advance of the exercise.

6. We do not find the FEMA exercise inadequate to test the effectiveness of the Catawba emergency plan. Although the test was not as severe as Intervenors would have liked it to be, it presented a reasonable accident scenario. It would have been more realistic had the FEOC not been set up in advance of the exercise, but we find acceptable FEMA's satisfaction with this aspect of the exercise on the basis that the State of South Carolina had on at least three occasions previously demonstrated its capability of moving out of Columbia, South Carolina, to a forward armory to be used as a command center (Tr. 1643-44, Heard 5/9/84).

7. Nothing Intervenor has presented to rebut the FEMA findings on the adequacy of the State and county plans assigning clear and effective primary responsibilities for emergency response and specific responsibility to the various supporting agencies and the plans' workability in an actual test.

8. Intervenor's first charge is that primary and supporting emergency roles are not clearly and effectively delineated during the initial period after a radiological accident, before the South Carolina Forward Emergency Operations Center (FEOC) and the North Carolina State Emergency Response Team (SERT) headquarters are established. Intervenor's contention indicates that SERT is to assemble and travel to the South Carolina FEOC. This is not part of the plan. It is asserted that conditions of conflict, confusion and lack of coordination may be the worst during the 7 to 9 hours after notification of State authorities of the existence of an accident at the Catawba facility. The evidence of record is contrary to Intervenor's allegation.

9. In the event of a radiological emergency at Catawba the plant will notify the States of South and North Carolina and the counties of York, Gaston and Mecklenburg. Procedures for alerting State agencies are set forth in the South Carolina plan (App. Ex. EP-2, SCORERP, at 21-22). The State Emergency Operations Center (SEOC), which coordinates the offsite emergency response activities of State agencies, local governments, federal agencies and contiguous States, would be activated in Columbia, South Carolina. The field command headquarters, FEOC, would be dispatched to the Clover National Guard Armory, which is at the periphery of the 10-mile plume EPZ (App. Ex. EP-21, Lunsford and McSwain at 3-5). It is anticipated it will take 3½ hours to become operational (*id.* at 4-5). Once the FEOC is established, the role of the SEOC will be to support the FEOC (App. Ex. EP-2, at 22; App. Ex. EP-21, Lunsford and McSwain at 9).

10. Upon notification by the plant, the Director of the Division of Emergency Management of North Carolina would activate the State Emergency Operations Center (EOC) in Raleigh and notify members of the State Emergency Response Team (SERT) to assemble. SERT would then travel to its field command post at the North Carolina Air National Guard Headquarters at Douglas Airport in Charlotte, North Carolina. The estimated time required to complete activation of the SERT field command post is 7 to 9 hours (App. Ex. EP-1, at 4).

11. A joint field post for North and South Carolina officials is not feasible because of the large number of people involved (Tr. 2977-80, Harris, Lunsford and McSwain 6/5/84). To ensure coordination of the States' emergency response efforts, North Carolina will have a liaison in

the FEOC in Clover, South Carolina, and there will be a representative of South Carolina at SERT headquarters in Charlotte (Tr. 3948-49, Sanders 6/6/84).

12. Intervenors raised for the first time, in their proposed findings, Appendix 5 of NUREG-0654, which states "to the extent possible, however, one state should be designated lead." The record fails to establish any need for this to be done in the North Carolina-South Carolina plans. The two States have elected instead to act in a coordinated manner, with a representative in each other's command post. The coordination worked well during the February exercise. See FEMA's comments above. We do not find the failure to designate a lead State to be a breach of the regulatory guidance, so that a change would be required in their procedures. The guideline is not absolute but permissive in nature.

13. Until such time as the FEOC is operational in South Carolina, and before SERT begins operations at Douglas Airport in Charlotte, emergency response officials in the counties in the respective States have primary responsibility for offsite response (App. Ex. EP-21, Pugh and Harris at 4-5, Lunsford and McSwain at 9, Phillips at 2, Broome at 1-2). County officials, operating out of their individual Emergency Operations Centers (EOCs), have the authority and responsibility to implement protective actions for the respective counties (*id.*, Pugh and Harris at 4-5). During this time, the counties have access to State resources, if needed, and State emergency personnel (*id.*, Lunsford, McSwain, Pugh and Harris at 5).

14. In North Carolina, primary responsibility for offsite emergency response shifts from Gaston and Mecklenburg Counties once the SERT is established and is ready to assume its role. SERT then directs State agency participation in emergency operations and coordinates actions involving State and county agencies (App. Ex. EP-21, Pugh and Harris at 4; Tr. 3000-01, 3020, Harris 6/5/84). There need not be a declaration of emergency by the Governor for SERT to assume control (Tr. 3000-01, Harris 6/5/84; Tr. 4214A-15, Pugh 6/7/84).

15. In South Carolina the shift of primary authority from York County to the State is accomplished by the Governor's declaration of an emergency (Tr. 3005-06, Lunsford 6/5/84). Prior to this point, State officials would have been working to ready the SEOC in Columbia for operation and would have dispatched the FEOC to Clover. Once adequate State resources are in place and are operational, the Governor would declare the emergency. The declaration formally establishes the SEOC and the FEOC (Tr. 3006, McSwain 6/5/84; App. Ex. EP-21,

Lunsford and McSwain at 9). However the FEOC may not yet be operational at this point.

16. County emergency management officials confirmed that the responsibilities of county departments, agencies and support organizations are clearly assigned, understood by those involved, and the resources are available to carry out those responsibilities. (App. Ex. EP-21, Phillips at 1-2, Broome at 1, 5-8, Thomas at 1-2, 5-6). State officials found that county organizations with support responsibilities know what they are supposed to do, as well as who is in charge (Tr. 4235-36, Pugh 6/7/84; Tr. 3962, Sanders 6/6/84). These evaluations were borne out by these officials' observations that, during the February exercise, the various State and county organizations worked together without confusion as to who was in charge, and who was responsible for what (Tr. 3049-50, Harris, Broome, Phillips, McSwain, Lunsford, Thomas 6/5/84).

17. Sheriff J. Elbert Pope was subpoenaed by Intervenors to testify on his responsibilities in a radiological emergency. Sheriff Pope testified that he had delegated his responsibilities in this area to his Chief Deputy (Tr. 3969, 3978, 3980-81, 3984, Pope 6/6/84), who had in turn familiarized himself with the York County plan, attended various meetings with other county emergency response personnel, participated in the Catawba exercise, and generally assumed the lead role in the County Sheriff's Office on this matter (Tr. 3969, 3991-92, Pope 6/6/84). Accordingly, Sheriff Pope's personal knowledge of the plan's details and specific procedures was limited. Sheriff Pope corroborated earlier testimony of the county's response responsibilities in the event of a radiological emergency. He specified what the primary responsibilities of the Sheriff's Office would be in the event of an accident at Catawba (Tr. 3972-73, 3980, 3988, Pope 6/6/84). Sheriff Pope testified that his department had not noticed any confusion or lack of coordination during the Catawba exercise as to lines of authority or communications between State and county officials (Tr. 3986, Pope 6/6/84). This record shows that the York County Sheriff's Department is adequately prepared to function effectively in accordance with the York County Emergency Plans.

18. The foregoing establishes that the offsite emergency plans for Catawba satisfy the applicable planning standards in that the plans provide clear and effective assignments of primary and support responsibility. There is nothing to support Intervenors' assertions that the assignments of responsibility and coordination of emergency response activities would be at the weakest during the first hours after a radiological accident at Catawba. The roles of the counties and States are clearly set forth as well as when they are to be exercised. No inadequacies were established as to the ability of each of the entities to fulfill the planning re-

quirements right from the start. The Board further finds based on the foregoing evidence that support responsibilities of the counties have been clearly assigned and that there is reasonable assurance that they will be effective for protective action response.

19. Another claim of Intervenor is that there is a confusing and ineffective array of consultative and delegative authority that appears to cloud the lines of primary responsibility. We find lack of merit in this allegation. The authorities enabling the counties and States to take necessary protective actions under the plans are readily understandable so that the operations can be conducted effectively.

20. Proof of lack of substance of the claim is that existing authorities in the plans permitted the carrying out of a successful exercise in February 1984. As discussed above, this was confirmed by State and county emergency response personnel as well as FEMA officials. In addition North Carolina officials pointed out that their respective plans have both been used in exercises for various nuclear power plants within the States, and have thus been "critiqued and fine tuned many times in the past" (App. Ex. EP-21, Pugh and Harris at 3).

21. Because the plans have been successfully tested, Intervenor's criticisms are more academic than substantive. One of their areas of concern is the delegation within the Office of the Governor of South Carolina. Under the State Constitution and by statute, the Governor has ultimate responsibility for decisions within the State in the event of man-made or national disasters. He alone has legal authority to "direct and compel" evacuation (App. Ex. EP-2, SCORERP, § I.B.3, at 1; Tr. 2935-36, 2942, Lunsford 6/5/84; Tr. 3099, Sanders 6/6/84). He has delegated to the Director of the Division of Public Safety, Frank B. Sanders, the authority to order (but not compel) evacuations. The Division of Public Safety is a unit within the Office of the Governor and SCORERP states that the Office of the Governor has the task of ordering evacuations (App. Ex. EP-2, SCORERP, at 1).

22. Intervenor raises as an issue whether the Office of the Governor is legally empowered to exercise the command and control responsibilities assigned to it under the South Carolina plan. In effect Intervenor is requesting us to legally interpret the State Constitution and a South Carolina statute to determine if the Office of the Governor is acting lawfully. That is not our function nor is it necessary for deciding the emergency planning issue at hand. Section II.A.2.b of NUREG-0654 only requires that the plan contain, by reference to specific acts, codes or statutes, the legal basis for such authorities. No legal interpretations by this Commission are called for. There is a presumption that State officials are carrying out their duties in a proper and lawful manner. If Inter-

venors question that, they should seek a more appropriate forum than this licensing proceeding. We conclude on the record before us that the Office of the Governor can exercise the command and control responsibilities assigned to it under the South Carolina plan. Furthermore, the Office of the Governor of the State of South Carolina readily functions effectively during emergencies under existing delegations as it has done recently in instances caused by tornados and a threatened dam rupture (Tr. 3923-35, 3965-66, Sanders 6/6/84). There has been a similar delegation by the Governor of North Carolina and for the same reason we make the same finding as to the adequacy of the assignment of command and control responsibilities in North Carolina and the sufficiency of the North Carolina plan in regard to it. The State of North Carolina also responds effectively under the existing delegation as it did during recent tornados (Tr. 4214A-20, Pugh 6/7/84).

23. Intervenors note that SCORERP makes no reference to the existence of the Division of Public Safety and the assignment to it of responsibility for ordering an evacuation. Neither does it name key individuals by title. Although this does not prevent a finding of substantial compliance with Planning Standard II.A, because the Division is a unit within the Office of the Governor, we believe the matter should be clarified in SCORERP and therefore direct Applicants to supply changes to the State plan, to FEMA and Staff.

24. No one disputes the authority of the Governor of South Carolina to "direct and compel" an evacuation and the Governor of North Carolina, with the concurrence of the Council of State, to do the same. It is understood that the ability to compel empowers the use of force and the ongoing delegations of authority by the Governors to order evacuation do not empower the subordinate officials to compel it. The thrust of Intervenors' argument appears to be that there is an attempt to bestow on the county level the authority to compel an evacuation. Local governments in North Carolina, including Gaston and Mecklenburg Counties, are authorized to issue orders of evacuation (Tr. 2988, Harris 6/5/84). The 1980 York County Ordinance provides for "directing evacuation."

25. Much examining was done about the authority of York County, as to whether it was limited to "warning or encouraging" an evacuation or "directing and ordering" it. South Carolina State emergency management officials and the emergency response official for York County all agreed, notwithstanding a differing Attorney General's opinion, that local authorities have the power to "direct and order" not simply "warn or encourage" an evacuation and that the use of the word "order" may be interpreted or perceived as being mandatory (Tr. 2968-69, 2974, Lunsford 6/5/84; Tr. 2968-69, 2975, McSwain 6/5/84; Tr. 2969-70,

2974-75, Thomas 6/5/84). At no point did anyone contend that York County could compel an evacuation.

26. The nature of the authority that the counties have in South and North Carolina in regard to evacuation is more academic than real for purposes of providing an effective emergency response. The decision-makers and emergency response personnel are clear as to what their responsibilities are and the limits of their authority during a radiological emergency, under current authorities. All recognize that they can recommend or encourage residents to evacuate but they cannot force or compel them to do so. No more authority than that given the counties is necessary to provide for an effective protective response. Even in a fast-breaking emergency, the plans do not call for the forceful removal of anyone. The counties can effectively execute their roles under existing planning and regulatory requirements by recommending or encouraging residents to evacuate. The responsibilities and authorities of the various entities are adequately set forth in the State and local plans. The States and counties know what their roles are and are equipped to respond with what is required.

27. With respect to the York County plan, Intervenors assert there is "a confusing and ineffective assignment of primary responsibility to York County officials." They point out that the 1980 York County Ordinance provides that the County Council may direct evacuation. They further note that Annex Q to the York Emergency Operations Plan, which applies to radiological accidents at Catawba, places responsibility for direction and control in: (1) the County Manager; (2) the Director, General Services; (3) the Emergency Preparedness Director; and (4) Support Services (App. Ex. EP-2, York County Plan, Annex Q, at Q-12). We find no real inconsistency in the assignment of responsibility within the emergency plan. The York County Ordinance, § III, establishes the Municipal-County Emergency Preparedness Agency as "the instrument through which the York County Council" shall exercise its authority in disasters. Responsibility for operation of the Emergency Preparedness Agency is delegated in § III of the Ordinance to the Emergency Preparedness Coordinator (Director) who is responsible to the County Manager. In an emergency the Director calls the County Manager and support staff (Tr. 4008, Dickson 6/6/84). Under the delegation the County Council would not be in charge. The Director has the necessary authority to call for an evacuation, if that is required, without a County Council meeting. The responsibility of responding to a radiological emergency rests with the County Manager (Tr. 4021-25, Dickson 6/16/84). The Board concludes that the responsibility for a radiological

emergency response in York County is adequately set out by the Ordinance and there is no conflict between the Ordinance and Annex Q to the York Emergency Operations Plan.

28. Applicants and State and local officials will be able to effectively coordinate emergency response activities through the availability of an adequate communications system. A "ring down" system is employed which avoids the use of local telephone lines. It is composed of both microwave and leased telephone circuits and has battery power as a backup. The system is like a party line and links Duke's emergency center at Charlotte, North Carolina, and Catawba, the three county EOCs, the FEOC, the SERT, the EBS control station and the Media Center in Charlotte (App. Ex. EP-21, Coleman at 2). Officials at any of the places can contact each other and will not be affected by possible overloads on the local phone system (*id.* at 3). There are also redundant communications systems that link the various centers.

29. The Board finds that the communications system will permit necessary coordination between the various State and county organizations, which helps to provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at Catawba.

30. We find that the offsite emergency response plans for Catawba satisfy the applicable regulations and guides as they bear on the issues under consideration. The plans provide clear lines of authority and the legal basis therefor, provide for the necessary coordination among the responding States and counties, and subunits thereof, and provide for adequate means of primary and backup communications to permit effective coordination and response. The action that we ordered be taken in ¶ D.23, *supra*, is for a minor clarification that does not significantly affect the adequacy of the response plans. The matters involved are not of sufficient magnitude so as to consider them the basis for licensing conditions.

E. Intervenor's Emergency Planning Contention 9 — Public Notification

1. In EPC-9 the Intervenor alleges:

The emergency plans for Catawba do not adequately provide for the early notification and clear instruction to State and local response organizations and the public that are required by 10 C.F.R. 50.47(b)(5) in that:

- (a) If the sirens do sound, not all citizens who would be affected and therefore require notification would be able to hear a warning siren. Such a situation

could arise as a result of hearing impairments, weather conditions, distance from sirens, etc.

- (b) In the event of a power outage the public's access (and possibly the access of state and local authorities with emergency responsibilities) to emergency broadcast information would be seriously impaired. Without a specific, reasonable plan to deal with such a contingency, the emergency plans do not meet 10 C.F.R. 50.47(b)(6) as well as (b)(5)).
- (c) [N]either the Carowinds Theme Park nor the Heritage U.S.A. religious retreat appear to have any notification plans or procedures. A conservative estimate of a peak summer crowd at Carowinds is 30,000 to 35,000 people. For such a crowd to be notified and given instructions on how to leave the park in a quick, orderly and safe manner clearly requires some set of special procedures that is yet to be formulated.

2. The Applicants presented as witnesses on the contention: R. Michael Glover of Duke; Dr. M. Read Bassiouni, consultant for Acoustic Technology, Inc. (ATI); J.T. Pugh, III, for the State of North Carolina; P.R. Lunsford for the State of South Carolina; Bob E. Phillips for Gaston County; Lewis Wayne Broome for Mecklenburg County and Phillip Steven Thomas for York County. FEMA witnesses John C. Heard, Jr., and Thomas I. Hawkins addressed this contention.

3. On this contention the Intervenors called a rebuttal witness, James Thomas Oliphant, who testified on notification and evacuation of the Carowinds theme park. They also developed their case through cross-examination. Their examination focused on three primary issues: (1) the adequacy of the Catawba prompt alerting siren, (2) the effectiveness of the Emergency Broadcasting System (EBS) in the event of a power outage, and (3) the adequacy of notification and evacuation plans for Carowinds theme park and the Heritage U.S.A. religious retreat.

Adequacy of Siren Systems

4. Siren systems are evaluated by FEMA using the guidance of NUREG-0654, Appendix 3, and FEMA-43, "Standard Guide for Evaluation of Alert and Notification Systems for Nuclear Power Plants" September 1983. We have taken official notice of the latter document (Tr. 1597, Margulies, J., 5/9/84). FEMA had not evaluated the Catawba siren system at the time of the hearing. However, we have considered the acceptance criteria in the above FEMA documents and whether these criteria will be met in our evaluation of this contention.

5. According to FEMA-43, a siren alerting system may be designed so that the siren sound level either exceeds 10 dBC above the average outdoor daytime ambient sound levels, or be designed so that it provides

60/70-dBC acoustic alert coverage. Depending upon the population of the area, one or the other of these designs can be used (App. Ex. EP-17, Bassiouni at 2-3).

6. Applicants contracted with ATI of Boston, Massachusetts, to verify and field test the acoustic coverage of the siren system installed within the Catawba EPZ and to evaluate the sirens against the criteria of FEMA-43 (*id.* at 1-2). In its verification of the acoustical coverage of the sirens, ATI used field measurement of sound levels and an ATI computer model. Measured siren outputs at 100 feet were obtained through field tests of a sample number of sirens. These outputs were used to determine the extent of the 60- and 70-dBC acoustic coverage of the siren system for average daytime meteorological conditions. A series of predicted siren sound pressure levels for each of the measuring locations was then obtained from the ATI computer model of the Catawba siren coverage. These predicted sound levels were then compared with measured values and were found to be in excellent agreement (*id.* at 2). ATI then mapped the composite 60/70-dBC siren acoustic coverage (see App. Ex. EP-17, Bassiouni Attach. B, Map 1). For those areas outside the 60/70-dBC acoustic contour but inside the EPZ, ATI conducted a survey to measure average outdoor ambient background noise (*id.*, Bassiouni at 2-3). The average outdoor ambient noise levels were then compared to the 50-dBC acoustic coverage contours plotted for each siren location (see *id.*, Bassiouni Attach. B, Map 2).

7. Applicants' witness Bassiouni testified that ATI's evaluation verified that the Catawba siren system will meet FEMA-43 guidelines. ATI found that the installed siren system provides the required 60- and 70-dBC coverage for most of the Catawba EPZ (*id.*, Map 1; *id.*, Bassiouni at 3). There were areas outside the 60-dBC contours. However the installed siren warning system provides adequate notification in most of these areas because the siren levels will be more than 10 dBC above the ambient background noise (*id.*, Bassiouni at 3-4). The ATI analysis showed that acoustic coverage was not adequate to meet the FEMA guidelines for the remaining areas outside the 60-dBC contours in which the plume EPZ has been extended beyond 10 miles (*id.* at 4). The Applicants identified locations for ten additional sirens to be installed by September 1, 1984, to meet these deficiencies and bring the Catawba siren system up to guidelines for the entire plume EPZ (*id.*, Bassiouni Attach. C; Tr. 1822, Glover 5/11/84). The Board concludes that there is reasonable assurance that this commitment will be met and the Catawba siren system will provide adequate prompt public notification coverage for the plume EPZ. (See *Fermi*, ALAB-730, and *Waterford*, ALAB-732, *supra*).

8. One of the Intervenor's concerns with the sirens was the influence of weather conditions upon their operation. Witness Bassiouni, however, testified that FEMA considered weather conditions in setting the siren standards (App. Ex. EP-17, Bassiouni at 2). The "average summer daytime weather conditions" may be used in the analysis establishing the 60/70- and 10-dBC above-the-ambient criteria (FEMA-43, at E-7). The Applicants used average summer conditions as reported for the Charlotte, North Carolina airport in its model (App. Ex. EP-17, Bassiouni Attach. B, at 6-8). We therefore conclude that we are not required to give special consideration to the influence of weather conditions upon operation of the Catawba siren system in order to meet the guidance of FEMA-43.

9. The Intervenor's have also questioned whether or not individuals that are indoors will be able to hear the sirens. Bassiouni testified that the FEMA-43 and NUREG-0654 requirements for sirens are expressly based on outdoor sound levels (App. Ex. EP-17, Bassiouni at 2-3; Tr. 1834, Bassiouni 5/11/84; *see* FEMA-43, at E-6; NUREG-0654, Appendix 3, at 3-9). There may be situations where the ambient noise inside a building may exceed the siren volume; however, these do not make the siren system inadequate. The requirements of FEMA-43 and NUREG-0654 were not intended as a guarantee that 100% of the population in the EPZ will actually hear the sirens in an emergency but rather were meant to establish a design objective for the siren system (*see* FEMA-43, at E-4 to E-5). We find Catawba sirens meet this objective and are in compliance with the acceptance criteria.

10. Individuals who do not actually hear the sirens can receive notification by other means. This can be done by word of mouth (Tr. 1903, 1874-75, Bassiouni 5/11/84) and by the EBS network which will broadcast messages on radio and TV (App. Ex. EP-17, Glover at 1) and by the tone alert radio system which will be used to notify special facilities (Tr. 1873, Glover; Tr. 1874-75, Bassiouni 5/11/84).

11. Route alerting will be another means of supplemental notification. Under the North Carolina plan, local law enforcement and volunteer fire department personnel will drive the roads and streets of the EPZ using loudspeakers to notify residents to take action (App. Ex. EP-17, Pugh at 1-2). In both Gaston and Mecklenburg Counties, this system of notification is initiated immediately upon activation of the fixed siren system. The vehicles, routes and personnel have already been designated in these two counties (*id.*, Phillips at 1-3, Broome at 1-3). In South Carolina, supplementary route alerting is the responsibility of York County (*id.*, Lunsford at 2). York County has available fifteen to eighteen vehicles with installed audio equipment for route alerting.

Additional vehicles not so equipped will be provided with bullhorns and used if necessary (*id.*, Thomas at 2). In York County, route alerting will not be utilized automatically but will be used in areas where volunteer firemen report that the sirens have not been heard (Tr. 1911-12, Thomas 5/11/84).

12. The Board finds that means of notification supplementary to the siren system which include route alerting, tone alerting, the EBS network as well as word of mouth, are sufficient to give reasonable assurance that the population within the Catawba plume EPZ will be promptly notified.

13. Concern was expressed by the Intervenor on cross-examination as to the large differences in perceived sound intensity which is created as the sirens rotate through 360 degrees (Tr. 1841-42, Glover 5/11/84). The siren signal is constant but rotation creates relative minima and maxima in the perceived acoustic output, depending upon the listener's location and the direction of the horn at any given time (Tr. 1843-44, Bassiouni 5/11/84). The FEMA guidelines for sirens refer to the steady signal strength, and not to the effective minima due to modulation in the signal caused by rotation. This modulation also acts to attract people's attention (Tr. 1844-45, Bassiouni 5/11/84). The Board finds that modulation due to the rotation does not make the sirens inadequate and does not decrease their effectiveness.

14. Contention 9 also considers the problem of notifying the hearing-impaired. The public information brochure mailed by the Applicants to all plume EPZ residents includes a statement that hearing-impaired persons should contact their local emergency management agency upon receipt of the brochure. The new brochure will contain a mail-back card for this purpose. In this way, arrangements can be made for special prompt alerting prior to an emergency (App. Ex. EP-17, Glover at 3). Provisions are also in place in the emergency plans for printed "crawl messages" on EBS television broadcasts (*id.*, Broome at 3). Steps are also being taken by local organizations to assure prompt notification of the hearing-impaired. Specialty notification lists are being compiled to identify hearing-impaired individuals to enable contact persons to go to their homes if necessary (*id.*, Thomas at 2, Phillips at 3; Tr. 1913-14 5/11/84).

15. The Board finds that the brochure statement, the TV "crawl messages" and the steps being taken by local organizations to notify the hearing-impaired are sufficient to give reasonable assurance that these individuals will be promptly alerted in an emergency.

16. The Board has considered all of the issues raised by the Intervenor in regard to the adequacy of the siren system at Catawba and finds

that there is reasonable assurance that the sirens will meet the requirements of FEMA-43 and in the event of an emergency will provide an adequate prompt alerting system.

Effectiveness of the Emergency Broadcasting System (EBS) During a Power Outage

17. The Intervenors contend that, in the event of a power outage, public notification could not depend upon broadcasts from EBS stations. A power outage would eliminate some of the broadcast systems and thereby limit notification to battery-operated radios. However, Applicants' witness Pugh testified that of the forty-one EBS stations in the Charlotte area, eleven are equipped with emergency backup power sources (App. Ex. EP-17, Pugh at 2).

18. Backup public notification will also be provided by the mobile alerting system discussed above (*see* ¶¶ E.10 and E.11). In Gaston County, vehicles with sirens and PA systems will be used to go through neighborhoods notifying people and advising them with appropriate messages. Vehicles, routes and personnel for this notification have already been identified. It is estimated that these routes can be completed in 14 to 22 minutes (App. Ex. EP-17, Phillips at 1-3). In Mecklenburg County, the volunteer fire departments are committed to this responsibility. Radio communications and PA systems are available in their vehicles, and standard operating procedures provide a taped message to broadcast over the vehicles' PA system (*id.*, Broome at 1-3). The maximum time to complete this function in Mecklenburg County is estimated to be 45 minutes (Tr. 1913, Broome 5/11/84). In York County, fifteen to eighteen vehicles with installed audio equipment and other vehicles with bullhorns will be utilized for backup notification. In some rural areas volunteer firemen will be used for door-to-door notification. Notification will require between 20 minutes and 2 hours (App. Ex. EP-17, Thomas at 2). The longer time will be required only for door-to-door notification (Tr. 1955-56, Thomas 5/11/84).

19. The Board finds that there are reasonable assurances that the backup facilities and personnel are adequate for prompt public notification, in the event of a power outage.

Notification and Evacuation of Carowinds and Heritage U.S.A.

20. A final Intervenors' concern is the adequacy of plans for notification and evacuation of Carowinds and Heritage U.S.A., two facilities within the plume EPZ. The contention argues that these special facilities

require specific plans for notification and evacuation, and that these plans are not yet formulated. Carowinds is a theme amusement park, mostly in Mecklenburg County, North Carolina, and extending into York County, South Carolina. It is on the fringe of the plume EPZ and is open each year from March to October. Heritage U.S.A. is a religious retreat in York County.

21. Notification of Carowinds in an emergency will be the responsibility of Mecklenburg County (App. Ex. EP-17, Broome at 3-4). Notification will be made by tone alert radio (*id.*, Thomas at 3). Mecklenburg County has made contact with Carowinds' officials and has discussed a procedure to provide support for an evacuation of Carowinds which will include bases for pickup and evacuation of children, and law enforcement personnel to assist in traffic and crowd control (*id.*, Broome at 4). The York County Sheriff's Department will also assist in traffic control for a Carowinds' evacuation (*id.*, Thomas at 5). Mecklenburg County cannot order Carowinds to close, but Carowinds management has agreed to accept the protective action recommendation of Mecklenburg County — whatever that recommendation might be (Tr. 1925-26, Broome 5/11/84).

22. Notification of Heritage U.S.A. in an emergency will be by telephone and by tone alert radio (App. Ex. EP-17, Thomas at 3, 5). Heritage U.S.A. has internal plans and procedures for notification and evacuation of visitors and employees in the event of an emergency (*id.*, Lunsford at 3). York County has been in contact with officials of Heritage U.S.A. and has reviewed their plans and procedures for evacuation. The York County Sheriff's Department will assist in traffic control; standard operating procedures to be relied upon to handle evacuating automobiles have been reviewed with Heritage U.S.A. (*id.*, Thomas at 5). There was no dispute during the hearing concerning the adequacy of the Heritage U.S.A. plans.

23. During cross-examination of the Applicants' panel on this contention, the Intervenor introduced into the record three documents describing emergency planning at Carowinds. These were: (1) the seven-page Carowinds all-purpose emergency evacuation plan with a covering letter dated December 27, 1983 (Int. Ex. EP-39); (2) a two-page letter from the Emergency Preparedness Division of the Office of the Adjutant General of the State of South Carolina titled "Carowinds/PTL Planning Meeting, 1 February 1983, York County ECC," which contains an agenda for a planning meeting for the evacuation of Carowinds (Int. Ex. EP-40); and (3) a two-page letter from Jerry Lutes of PRC Voorhees, an Applicants' consultant planning research corporation, to John Lee of Duke Power Company, dated March 9, 1981, titled

"Carowinds Evacuation," which includes a discussion of evacuation routes from Carowinds (Int. Ex. EP-41). These documents contain the Carowinds all-purpose emergency plan and describe on-going emergency planning efforts.

24. During cross-examination regarding the relevance of these documents, Lewis Broome, Administrative Officer, Charlotte-Mecklenburg Emergency Management Office, testified that many of the items considered in Intervenor's Exhibit EP-40 were outdated and either had been re-addressed or would be re-addressed in procedures within the standard operating procedures to implement the Mecklenburg County Emergency Plan. Included would be items discussed in ¶ E.21, *supra*. He stated that these procedures will be completed within 90 to 120 days (Tr. 1924-25, 1944, Broome 5/11/84).

25. The Intervenor subpoenaed Mr. James Thomas Oliphant as a rebuttal witness on EPC-9. Mr. Oliphant is the Loss Prevention Operations Manager at Carowinds and is responsible for emergency planning. Oliphant testified that because of the large number of people at the park and the time it will take to evacuate them, Mecklenburg County will provide Carowinds with an advance notification of any emergency at Catawba and as a precautionary measure Carowinds would evacuate prior to receipt of the public alert. He testified that Carowinds would give a "precautionary notice" of evacuation because of the numbers of people at this one location (Tr. 4352, 4417-18, Oliphant 6/7/84).

26. Witness Oliphant stated that, through discussions with Broome, he was refining the Carowinds evacuation plan to take into consideration nuclear emergencies and that this would be accomplished before the plant goes on line (Tr. 4424-26, Oliphant 6/7/84). The record is indefinite as to the status of this plan. When examined by the Intervenor's counsel, it was clear that it was not near completion (Tr. 4401-02, Oliphant 6/7/84).

27. The in-park count at Carowinds during peak usage can be 26,000 people (Tr. 4188, Oliphant 6/7/84). In his letter to Duke Power Company (Int. Ex. EP-41), the Applicants' planning consultant Jerry Lutes states:

In summary, it appears that evacuation of Carowinds on a peak day is a monumental task requiring careful planning and good traffic control. But the time required for evacuation is well under the three hours and twenty-five minutes required to evacuate the residential population.

The Board notes the consultant's concern for planning and traffic control, and we conclude that a detailed and carefully coordinated plan

for evacuation of Carowinds is required. We do not find such a plan to be in place.

28. The documents introduced into the record by the Intervenor dealing with planning at Carowinds (Int. Ex. EP-39, at 40-41) and testimony of witnesses Glover, Broome and Oliphant demonstrates the existence of a general plan and the on-going process of revision. This record, together with the testimony of FEMA witnesses Heard and Hawkins which finds that plans have been made for evacuation of Carowinds (Staff Ex. EP-2, Heard and Hawkins at 21) provide the basis for a finding that there is reasonable assurance that the regulatory requirements will be met. However, the plans and procedures for Carowinds are not yet fully in place. Because of their importance in emergency planning for Catawba, we make the completion of adequate plans a condition of the operating licenses. We require that there be a comprehensive plan for early notification to Carowinds of a radiological emergency at Catawba and for evacuation of Carowinds. It shall describe the responsibilities of the emergency response organizations of Mecklenburg and York Counties and how their efforts will be coordinated among themselves and with officials at Carowinds. Provisions in the plans shall be made to immediately notify patrons and staff of Carowinds at the time of the precautionary closing of the park, of the cause of the emergency.

29. The Board's conclusion regarding EPC-9 is that there is reasonable assurance that the Catawba Prompt Alerting (siren) system, as augmented by the ten additional sirens to be installed, will meet the guidelines of FEMA-43 and therefore will be adequate. We conclude that the influence of weather conditions and the reduced sound levels to people indoors were considered in establishing these FEMA guidelines. We find that supplemental means of notification available, such as word of mouth, the tone alert system, the EBS network and mobile sirens, provide reasonable assurance that individuals within the plume EPZ will be notified of an emergency. We find that adequate measures have been taken to provide special notice to the hearing-impaired. We conclude that there are adequate plans for emergencies involving loss of offsite power; the fact that there is backup power available to many of the EBS stations and that local route alerting procedures are in place gives us reasonable assurance that timely public notification can be achieved. Finally, we conclude that provided the requirements of ¶ E.28, *supra*, are met for Carowinds, the plans for evacuation of Carowinds as well as for Heritage U.S.A. will be adequate and that they will meet the requirements of the regulations and NUREG-0654.

F. Intervenor's Emergency Planning Contention 11 — Expansion of the Plume EPZ into Southwest Charlotte

1. Contention 11 alleges:

The size and configuration of the northeast quadrant of the plume exposure pathway emergency planning zone (Plume EPZ) surrounding the Catawba facility has not been properly determined by State and local officials in relation to local emergency response needs and capabilities, as required by 10 C.F.R. 50.47(c)(2). The boundary of that zone reaches but does not extend past the Charlotte city limit. There is a substantial resident population in the southwest part of Charlotte near the present plume EPZ boundary. Local meteorological conditions are such that a serious accident at the Catawba facility would endanger the residents of that area and make their evacuation prudent. The likely flow of evacuees from the present plume EPZ through Charlotte access routes also indicates the need for evacuation planning for southwest Charlotte. There appear to be suitable plume EPZ boundary lines inside the city limits, for example, highways 74 and 16 in southwest Charlotte. The boundary of the northeast quadrant of the plume EPZ should be reconsidered and extended to take account of these demographic, meteorological and access route conditions.

2. The appropriate regulation, 10 C.F.R. § 50.47(c)(2), provides in part:

Generally, the plume exposure pathway EPZ for nuclear power plants shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. The exact size and configuration of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries.

3. The Applicants and Staff argue that the plume EPZ boundaries which were established by local and State emergency planning officials conform to the Commission standards of "about 10 miles" and that the Catawba site does not differ from the average site contemplated by the Commission in regard to possible radiological hazards, demography, meteorology and access road conditions. Thus the plume EPZ does not require extension beyond the existing boundaries.

Radiological Considerations

4. Guidelines stated in NUREG-0654 give the basis for establishing the "about 10 miles" requirement for the plume EPZ.

The size (about 10 miles radius) of the plume exposure EPZ was based primarily on the following considerations:

(a) projected dose from the traditional design basis accidents would not exceed Protective Action Guide levels outside the zone;

(b) projected doses from most core melt sequences would not exceed Protective Action Guide levels outside the zone;

(c) for the worst core melt sequences, immediate life-threatening doses would generally not occur outside the zone; and

(d) detailed planning within 10 miles would provide a substantial base for expansion of response efforts in the event that this proved necessary.

5. Projected doses from design basis accidents (consideration (a), above) were not in dispute. Both Applicants' witness Thomas E. Potter and Intervenors' witness Steven C. Sholly found that design basis accidents would not exceed upper Protective Action Guide (PAG) doses beyond the established plume EPZ (App. Ex. EP-19, Potter at 6-7; Int. Ex. EP-49, Sholly at 5-6).

6. For analysis of considerations (b) and (c), the Applicants relied on an analysis by witness Potter which compared possible core melt accident sequences calculated specifically for Catawba with comparable analyses used by the Commission in establishing the 10-mile EPZ (NUREG-0396). His analysis showed that there was no significant difference between the probability of exceeding PAG doses or life-threatening doses beyond the 10-mile EPZ at Catawba compared to similar probabilities calculated for the generic core melt accident contained in NUREG-0396 (App. Ex. EP-19, Potter at 7).

7. A somewhat similar set of calculations of probable doses beyond the 10-mile zone were performed by Intervenors' witness Sholly. His analysis projected early severe releases, and he therefore recommended emergency planning for southwest Charlotte (Int. Ex. EP-49, Sholly at 12-13, 22-23).

8. Witnesses Potter and Sholly both used probabilistic risk analysis (PRA), the approach used in NUREG-0396. Since a PRA based upon specific release categories for Catawba had not been performed, it was necessary for both Potter and Sholly to use data from other BWR reactors for which a PRA had been performed. Potter used WASH-1400 as a source for data characterizing the release categories and the probabilities of release for the Catawba analysis. Because WASH-1400 used Surry as its model BWR, and Surry has a large, dry containment whereas Catawba has an ice-condenser containment, Potter realized that this design difference between the two plants might make the WASH-1400 data inappropriate for use in calculating Catawba releases (Tr. 2073, Potter 5/23/84). Absent a plant-specific PRA for Catawba, Sholly used the data of the Reactor Safety Study Methodology Application Program

(RSSMAP) for Sequoyah Unit 1 (NUREG/CR-1659, Vol. I). Although he recognized that there were large uncertainties involved, Sholly felt the risk posed by Catawba was reasonably approximated by Sequoyah (Int. Ex. EP-49, Sholly at 10-11, 16-17).

9. Potter considered using as a data base the probabilistic risk assessment performed by the RSSMAP program for Sequoyah because it, like Catawba, has an ice-condenser containment. However, he did not use the Sequoyah RSSMAP analysis because it did not account for the presence of a hydrogen mitigation system, which is present at Catawba. Since Sequoyah sequences are premised on early containment failure due to explosive hydrogen burn, he considered the Sequoyah RSSMAP data misleading if applied to Catawba because the probabilities of severe radioactive releases to the atmosphere in the Sequoyah RSSMAP analysis were higher than one would expect at Catawba, which has an effective hydrogen mitigation system (Tr. 2074-75, Potter 5/23/84).

10. Potter made use of a study of the hydrogen mitigation system at the McGuire plant to calculate the impact of this system upon the release frequencies from RSSMAP study of Sequoyah. When this was done, the resultant release frequencies were virtually identical to those calculated for the Surry plant in WASH-1400 (Tr. 2076, Potter 5/23/84).

11. When questioned about the possibility of failure of the hydrogen mitigation system, Potter stated that his probability analysis allowed for failure of this system (Tr. 2074-75, 2079, Potter 5/23/84).

12. A second difference between Sequoyah and Catawba is the containment failure pressure. The Sequoyah containment, modelled in the Sequoyah RSSMAP, has a failure pressure of 30 psig, while the Catawba containment has a failure pressure of 72 psig. A higher containment pressure would delay failure and release of fission products. Sholly appeared to be unaware of this difference between these plants (Tr. 2407-08, Sholly 5/24/84).

13. The Board finds Potter's probability analyses of the accident sequences to be more credible than Sholly's because a more appropriate data base was used and because Sholly failed to consider the effects of a hydrogen mitigation system and the higher containment pressure at Catawba, as compared to Sequoyah.

14. Potter analyzed the probabilities of exceeding specified doses at various distances from the site using Catawba meteorology, and also using meteorological data from NUREG-0396. He then compared the Catawba-specific probabilities of exceeding given doses with those in NUREG-0396. His analyses evaluated considerations (b) and (c), above, and established that there is no significant difference between the probabilities of exceeding PAG doses or life-threatening doses

beyond 10 miles at Catawba, compared to similar probabilities calculated for the generic core melt accident analyses contained in NUREG-0396 (App. Ex. EP-19, Potter at 6-7, Potter Attach. B, at 8-10).

15. The Intervenor presented two additional witnesses on Contention 11 whose testimony was directed to the need for extending the plume EPZ into southwest Charlotte. Mr. Ray Twery's testimony attempted to show that southwest Charlotte was exposed to an unusually high risk which justified an expansion of the plume EPZ (Int. Ex. EP-48, Twery at 1-4). Cross-examination developed serious flaws in his analysis (Tr. 2343-59, 2364-84, Twery 5/24/84). The Board concludes that his testimony is entitled to little weight and that it does not demonstrate any unusual risk to the population of southwest Charlotte.

16. Intervenor's witness Jesse L. Riley relied on the Sandia Laboratories' study, NUREG/CR-2239, "Technical Guidance for Siting Criteria," ("the Sandia Siting Study") and the Catawba Final Environmental Statement ("FES") to arrive at estimates of injuries and fatalities in the event of a radiological emergency at Catawba (Int. Ex. EP-48, Riley at 1-3). Riley did not accept the fact that the Sandia Study does not represent risks and that it assumes no emergency responses beyond 10 miles for 24 hours (Tr. 2312-14, Riley 5/24/84).

17. Riley also criticized the practicality of estimating the probability of a reactor accident, as used in the Sandia Siting Study, in the FES and in the Reactor Safety Study (WASH-1400). (Int. Ex. EP-48, Riley at 3-5). Riley asserted that WASH-1400 did not consider accidents such as occurred at Three Mile Island, Browns Ferry and Enrico Fermi (*id.* at 4-5). Riley asserted that the FES's worst-case analysis projected the possibility of 24,000 fatalities of which the largest fraction would occur in Charlotte, but he was unwilling to accept the calculated probabilities associated with these fatality estimates (*id.* at 2-3; Tr. 2427, Riley 5/24/84).

18. Applicants' witness Potter refuted Riley's allegations in his discussion of "phenomenological analysis" which is an analysis based on a statistical analysis of the actual performance of plant systems and components over the approximately 1000 reactor-years of operating experience (Tr. 2061-64, Potter 5/23/84). By making a system-by-system treatment of reactor component failure data, it is unnecessary to wait for the occurrence of a major accident to estimate its probability since the major accident is based on the occurrence of a sequence which involves a number of low-probability events. In effect, the probability of the whole is projected from the probability of the parts (Tr. 2201, Potter 5/23/84).

19. The Board concludes that the testimony of witnesses Riley and Twery does not provide a justification for extending the plume EPZ into

southwest Charlotte. None of the testimony presented by these witnesses calls into question the correctness of the evidence presented by the Applicant and Staff. The Board accepts the method of calculation of probabilities outlined in Potter's testimony.

20. Potter's projected doses from most core melt sequences would not exceed the EPA's PAG levels outside the Catawba plume EPZ. For the worst-case core melt sequences, immediate life-threatening doses would generally not occur outside the Catawba plume EPZ. This is consistent with the generic analyses in NUREG-0396. Thus expected radiation doses at Catawba are no different from those accepted by the NRC in setting the plume EPZ at "about 10 miles." Hence there is nothing about Catawba in this respect that would justify altering the plume EPZ size (App. Ex. EP-19, Potter at 7-8). From these findings, the Board concludes that the plume EPZ boundary for the Catawba facility has been properly determined in relation to radiological considerations.

21. The fourth consideration used by the NRC/EPA Task Force that established the plume EPZ standard at "about 10 miles," item (d) above, states that "detailed planning within 10 miles would provide a substantial base for expansion of response efforts in the event that this proved necessary." The Task Force also stated "[t]herefore, although protective actions may be required for individuals located in areas further than 10 miles from the reactor, for an atmospheric release the actual measures used and how rapidly or efficiently they are implemented will not strongly influence the number of projected early health effects" (NUREG-0396, Appendix 1, at 52). We find NUREG-0396 does not require emergency planning beyond the 10-mile plume EPZ. However, Applicants' witness R. Michael Glover interpreted the guidelines as approval of "ad hoc" planning outside the 10-mile zone. He testified that the City of Charlotte All-Hazard Plan addresses the need for "ad hoc" planning outside the 10-mile zone (App. Ex. EP-19, Glover at 8-9).

22. The All-Hazards Plan (Int. Ex. EP-46) outlines protective action for residents of Charlotte and Mecklenburg County. Applicants' witness Lewis Wayne Broome, Administrative Officer, Charlotte-Mecklenburg Emergency Management Office, testified that this plan together with the resources of his agency are adequate to provide protective actions in southwestern Charlotte outside the 10-mile zone. He testified that the people and resources are identified in this plan to provide protective actions for a distance of 15 miles from Catawba for an additional 100,000 people (App. Ex. EP-19, Broome at 2-3). This plan was used successfully to notify, evacuate and shelter 2000 to 3000 residents of Charlotte during a chemical fire in 1982 (*id.* at 6-8).

23. In case of emergencies in southwest Charlotte, the All-Hazards Plan provides for notifying the affected population by means of mobile sirens, public address systems and the Emergency Broadcast System (EBS). It also provides for the necessary coordinating mechanism for protective action (*id.* at 3-5).

24. The testimony of Glover and Broome addresses consideration (d) of NUREG-0654, and demonstrated that current emergency planning in southwest Charlotte exceeds that contemplated in NUREG-0654 for areas outside the plume EPZ. Because of the planning in place in the All-Hazards Plan and the resources available from the Charlotte-Mecklenburg Emergency Planning Agency, the Board finds that protective action, if needed, can be implemented for Charlotte and Mecklenburg County residents outside the EPZ without extending the existing plume exposure EPZ in the direction of Charlotte.⁸

Meteorological Considerations

25. One of the Intervenor's concerns expressed in Contention 11 is that local meteorological conditions are such that an accident at the facility would pose a threat to the residents of southwest Charlotte. They suggest that the 10-mile radius of the plume EPZ should be extended because of the unique meteorological conditions of this area. Testimony of Applicants' witness Mark A. Casper and Staff witnesses James E. Fairbent and Leonard Soffer (1) provided information on site-specific meteorology, (2) compared the meteorology of this area with that of other plant sites, and (3) showed how site meteorology is related to meteorological conditions anticipated by the authors of NUREG-0396.

26. The applicable regulation in regard to size and configuration of the plume EPZ is 10 C.F.R. § 50.47(c) (2) which provides:

Generally, the plume exposure pathway EPZ for nuclear power plants shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. The exact size and configuration of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries.

Witness Soffer explained that this regulation considers conditions which might determine the exact configuration of the plume EPZ, including

⁸ There are various deliberations under way (Nurkin Committee) aimed at improving emergency planning in the Charlotte area. The ultimate results to be reached in the matter are not necessary to our deciding the relevant issues in this proceeding and they will not be given any further consideration.

demography, topography, land characteristics, access routes and local jurisdictions, but does not mention meteorological considerations because meteorology was taken into consideration by the authors of NUREG-0396 in determining that "about 10 miles" was appropriate for the plume EPZ (Staff Ex. EP-5, Soffer at 3-4). Thus, only meteorological conditions existing at this specific site, which are not anticipated by NUREG-0396, and which pose a threat to residents of Charlotte outside the existing EPZ, are relevant to this contention.

27. Witness Soffer testified that in NUREG-0654 FEMA and the Staff took into consideration not only design basis accidents but also the most severe core melt sequences (Class 9 accidents) in determining the size of the plume EPZ, and that very conservative meteorology was used in calculation of dose and in considering consequences from these accidents. Doses were calculated assuming the exposed individual was directly downwind of releases for both design basis and core melt accidents. This means that the fact that the wind may blow more in one direction than another at a given site had no bearing on the selection of 10 miles as the plume EPZ distance (*id.* at 8-10).

28. Staff witness Fairobent's testimony was directed toward showing that meteorology at Catawba was not unique and was within the range of conditions considered in analysis of severe core melt accidents in NUREG-0396 (Staff Ex. EP-5, Fairobent at 11-14). Fairobent compared atmospheric transport and diffusion conditions in the vicinity of the Catawba facility to conditions at other power plants in southeastern United States. At the Catawba site for the period December 17, 1975-December 16, 1977, stable conditions (Pasquill types "E," "F" and "G") occurred about 41% of the time. Most of these stable conditions occurred with wind speeds less than or equal to 2 m/sec (*id.* at 11-12). He noted that similar stable atmospheric conditions were observed at the Shearon Harris facility for the period February 1979-January 1980, and at the Virgil C. Summer facility for the period January 1975-December 1977. He testified that at Catawba, the prevailing wind direction is from the southwest, with winds from the south-southwest, southwest and west-southwest occurring about 33% of the time for the period December 17, 1975-December 16, 1977 (*id.* at 13). Meteorological observations at other nuclear power plants indicate that total frequencies of wind in the three 22½° sectors are in excess of 25%; they range from 26% at Shearon Harris to 36% at Limerick for equivalent time periods (*id.*). On cross-examination, Fairobent acknowledged that the difference between Limerick (36%) and Catawba (33%) was not significant (Tr. 2614, Fairobent 5/25/84).

29. Fairobent testified that better data available for Catawba would bring a reduction of the 33% wind direction frequency blowing towards the three northeast sectors to 28% (Tr. 2695-96, Fairobent 5/25/84).

30. At Indian Point, the site used in analysis of severe accidents in NUREG-0396, stable atmospheric conditions (Pasquill "E," "F" and "G") occur about 48% of the time, compared to 41% at Catawba, with most of these stable conditions (about 60% vs 75% at Catawba) occurring with wind speeds less than or equal to 2 m/sec (Staff Ex. EP-5, Soffer and Fairobent at 14). On cross-examination, Fairobent acknowledged that these differences between Catawba and Indian Point were based upon temperature differences at the observation sites which did not take into consideration the effect of other inversions aloft (Tr. 2623-25, Fairobent 5/25/84).

31. Applicants' witness Casper testified that rainfall at the site is average or below average for the southeastern United States (App. Ex. EP-19, Casper at 16).

32. The subject of the combined effect of prevailing wind direction and concentration of population arose in the testimony of Applicants' witnesses Robert F. Edmonds and Mark A. Casper. Edmonds' testimony contained a table showing that there were a large number of nuclear plants with adjacent population concentrations similar to Catawba (*id.*, Edmonds at 7). Witness Casper testified that there were a number of these plants at which there were large populations within the sector of the prevailing wind direction or within a sector with a greater wind direction frequency than given by a uniform distribution (*id.*, Casper at 13).

33. The subject of the relationship of wind direction and population concentration was further explored in the cross-examination of Edmonds and Casper by Riley. In this examination, data on incidence of wind direction and population in NUREG/CR-2239 (Technical Guidance on Siting Criteria Development) were considered. Table A.4-1 in that document contains windrose data for plants listed in Edmonds' table. When windrose frequency was multiplied by population to give a risk index, Edmonds acknowledged that Catawba became number one in risk among the plants listed in his table (Tr. 2021-23, 2179-80, Edmonds 5/23/84).

34. On re-direct examination, Edmonds identified Table D.3-1 of NUREG/CR-2239 which used an approach similar to that in Riley's cross-examination. This table combined population data and wind direction frequency data to arrive at a factor representing risk. This approach used data from all sectors, rather than a single sector. When data from this table are used, Catawba ranks tenth or eleventh on the list (Tr. 2180-81, Edmonds and Casper 5/23/84). Witnesses Edmonds, Glover,

Casper and Potter agreed that all plants listed in this table, including Catawba, meet the Commission's siting criteria (Tr. 2182-88, Edmonds, Glover, Casper and Potter 5/23/84). The Board finds that this approach used by Edmonds is more encompassing and therefore is preferable and accepted.

35. Casper testified that the city of Charlotte would create an Urban Heat Island effect which would increase dispersion and lower the frequency of inversions, and thus would give rise to a lower frequency of stable air conditions. He also testified that mechanical dispersion due to surface roughness increases dramatically as a plume travels from rural to urban areas (App. Ex. EP-19, Casper at 15-16). The Board finds the above meteorological conditions at Charlotte would reduce the potential hazard from severe accident releases.

36. Based on the testimony of the witnesses, the Board finds that the site-specific meteorology at Catawba is not a factor to be considered in determining the size and configuration of the plume EPZ surrounding the Catawba nuclear facility, and that meteorological conditions at this site are within the limits anticipated by the authors of NUREG-0396. Moreover, the evidence shows that the meteorology at Catawba is comparable to meteorology at other nuclear facilities in the southeastern United States and is comparable to the meteorology at the facility (Indian Point) used for the severe (Class 9) accident analysis in NUREG-0396.

Demographic Considerations

37. Contention 11 alleges that the demography of the Catawba area requires an extension of the plume EPZ into southwest Charlotte. The Intervenor's allege that there is a substantial resident population in the southwest part of Charlotte near the plume EPZ boundary. Edmonds testified that the current plume EPZ boundary with southwest Charlotte approximates the transition from rural to urban conditions (Tr. 2015, Edmonds 5/23/84). The population density outside the current plume EPZ does not exceed 1300 persons per square mile until reaching 12 to 13 miles from the plant in the east-northeast sector, and 13 to 14 miles in the northeast sector (Int. Ex. EP-43). Thus only if southwest Charlotte was added to the plume EPZ would there be a "substantial population" adjoining the EPZ boundary.

38. The plume EPZ boundaries were established by the State and local officials and were based on local topography, demography and jurisdictional boundaries, in accordance with 10 C.F.R. § 50.47(c)(2). Duke Power Company made a review of the boundaries after their selection

by the government officials which led to an after-the-fact expansion of the plume EPZ in York County so as to make the boundary conform to an easily identifiable geographical feature. Jurisdictional boundary considerations caused these officials to include all of the city of Rock Hill within the plume EPZ (Tr. 2028-30, Glover 5/23/84; Tr. 2090-91, Broome 5/23/84; App. Ex. EP-19, Broome at 1).

39. There were good reasons for including Rock Hill, South Carolina, but not Charlotte, North Carolina, in the plume EPZ. The city limits of Rock Hill come as close as 5-7 miles from Catawba, with most of the city within 10 miles of the plant. The State and local planners did not want to divide Rock Hill so that most of the city would be in the plume EPZ, and a small part would be outside (Tr. 2027, Glover 5/23/84.)⁹ Charlotte, on the other hand, at only one point comes as close as 9.7 or 9.8 miles from the plant. The city extends to some 15 miles beyond the plume EPZ boundary. Thus the planners used 9.7 or 9.8 as "about 10 miles" and excluded Charlotte from the plume EPZ (Tr. 344, Glover 5/2/84; Tr. 2670, Robinson 5/25/84).

40. The Board finds that the present EPZ boundaries reflect reasonable consideration of local geographic and jurisdictional boundaries, and that there is no compelling demographic consideration which would require extension of the plume EPZ into the southern portion of Charlotte.

Evacuation Considerations

41. The Intervenor's concern in Contention 11 that the flow of evacuees through Charlotte would necessitate expanding the plume EPZ was addressed by Applicants' witness Walter Kulash, a traffic planning consultant. Kulash's firm conducted two studies relating to evacuation of Charlotte. From these studies he testified that without expanding the plume EPZ, given normal weather, southwest Charlotte could be evacuated in about 5¼ hours and all of Charlotte in about 9 hours. Only with very adverse assumptions would any "voluntary" evacuation of Charlotte residents impede the evacuation of the current plume EPZ, and

⁹ By letter dated September 7, 1984, Applicants advised that it was their understanding that the plume EPZ was altered, in that a portion of Rock Hill was excluded. The new boundaries follow an unnamed creek, railroad tracks and a highway in addition to parts of the Rock Hill city limits. It was stated that the excluded portion of Rock Hill contains a city landfill area, the Plaza Shopping Center, and Castle Heights Junior High School. No permanent residences are said to be involved. The excluded area is 10.5 to 11 miles from the plant. The change alters the previous situation where all of the City of Rock Hill, as a jurisdictional entity, was included within the EPZ. This represents a minor change geographically and demographically. Although the point of using an undivided Rock Hill as an example for not splitting a municipality by the boundaries of the EPZ is lessened, it does not advance Intervenor's position for extending the EPZ boundary into Charlotte. Most all of Rock Hill is within a 10-mile radius of the plant, whereas the converse is true for Charlotte.

then only by lengthening slightly the evacuation time on only one route (App. Ex. EP-19, Kulash Attach. C, at 5-10; *id.*, Attach. B, at 8-9). We find the Kulash testimony is convincing and conclude that expansion of the plume EPZ would not materially assist in evacuation and therefore is not required.

42. Based upon all of the evidence presented, the Board's finding is that the allegations in Contention 11 lack merit. We find that the size and configuration of the plume EPZ as defined in the emergency plan have met the requirements of 10 C.F.R. § 50.47(c)(2), and that expansion of the boundaries into southwest Charlotte is not warranted. In arriving at this conclusion, the Board considered the potential radiological hazards to the population of southwest Charlotte, meteorological and demographic conditions of this area, and requirements for evacuation.

G. Intervenors' Emergency Planning Contentions 14 and 15 — Evacuation

Contentions 14 (EPC-14) and 15 (EPC-15) raise closely related issues and have been treated together throughout the proceeding. Accordingly, that practice will be continued here.

1. EPC-14 alleges:

The Applicants have failed to demonstrate their ability to take effective actions to protect the health and safety of the general public in the event of an accident in that the evacuation time study presented by the Applicants is a piece of fiction in the guise of science and may not be relied upon for determining the ability of Applicants and public authorities effectively to evacuate residents of the Catawba EPZ in a timely manner.

By overestimating the flow of traffic on evacuation routes, the Applicants' time study overestimates actual traffic movement by a factor of between three and twelve. A flow of no more than 900 vehicles/lane/hour should be assumed, according to preliminary estimates by Sheldon C. Plotkin of the Southern California Federation of Scientists.

Traffic flows are further overestimated by failing to account for voluntary evacuation likely to take place from Charlotte via I-77. All of the study's estimates are premised only on estimates of traffic flow within the EPZ congestion. They fail to account for backups caused by extra-EPZ congestion, especially on I-77 in Charlotte.

The Applicants' evacuation time estimates erroneously assume quick response by school buses and multiple school bus trips. School buses in South Carolina are driven by high school kids. No public official would dare to send high school kids into an evacuation zone to transport those without vehicles. Time must be allotted for finding drivers.

The Applicants' study is fundamentally useless to making a determination regarding the time within which evacuation can be accomplished in that it makes numerous as-

sumptions regarding work and living habits which are apparently made up out of whole cloth. No references or other data bases are given for the assumptions underlying these evacuation time estimates and they cannot be credited.

The evacuation time estimates should be based only upon worst case conditions, rather than best case conditions. The Applicants' study is far too optimistic in assuming that worst case conditions will require only 156% of the time of best case conditions. The judges are asked to take notice of their own experience in Applicants' counsel trying to reach York, South Carolina, in the midst of what may be a modest snowstorm to Yankee eyes, but which had plainly immobilized the entire vicinity.

Further, Applicants' study naively fails to account for parents going first to their children's schools to pick up their children before evacuating.

Moreover, Applicants' study, by slight of hand, dismisses the major impact of the presence of large transient populations at Carowinds amusement park and Heritage U.S.A. Those populations will take longer to evacuate than the study assumes and will co-congest I-77 with resident traffic.

The fundamental test of the adequacy of an evacuation plan is whether it can be implemented in such a fashion as to effectively avoid or minimize the radiological effects of a radiation release. Absent a real life, real time evacuation drill to test the system,¹⁰ any study presented in support of the adequacy of the emergency plans must be technically valid from a theoretical perspective and based upon assumptions having some relationship to the real world situation to which the study is supposed to apply. This study lacks either basis.

A more realistic estimate of evacuation time for the Catawba Nuclear Station in the South Carolina Piedmont is that evacuation will require a minimum of 33 hours, assuming a conservative 600 vehicles/lane/hour vehicle travel time. Applicants are, thus, unable to provide reasonable assurance of being able to avoid or meaningfully minimize radiation exposure in the event of a radiation release at Catawba.

The Applicants thus fail to meet the requirement of NUREG-0654, Rev. 1, Appendix 4, in that their evacuation time estimates may not be credited by the Commission and fail to meet Commission requirements that it be able to demonstrate the ability of local and state authorities to take effective protective actions.

2. EPC-15 alleges:

The Applicants and the local and state plans fail to provide adequate assurance that effective protective actions can be taken because the provisions in the several plans are inadequate with regards to transportation and related evacuatory activities in the event of an evacuation.

The emergency plans fail, fundamentally, to address the peculiar conditions of the areas surrounding the Catawba Nuclear Station. Large segments of these areas are

¹⁰ This paragraph relating to the necessity for a drill to test the system was not admitted as a substantive claim for relief (see S. Tr. 1095).

rural. Some of them contain lower income communities. The time estimates used by Applicants assume that 10% of families are without vehicles. But in many of these homes, that vehicle is not home during large parts of the day. Often, those homes will have children and elderly people at home without transportation. No census of varying conditions has been done.

Moreover, the plans are premised on using school buses to transport those without their own transportation. School buses in South Carolina are driven by high school students. Even if some public officials were prepared to leave emergency activities in the hands of sixteen year old youths, none would dare send such a child into an evacuation zone. No provision is made for backup drivers. Even if the drivers can be found, in many communities those school buses are kept at the driver's home at night and not at some central motor pool.

Applicants and the local and state planning officials have failed to demonstrate that adequate transportation facilities are available to evacuate the hospitals and nursing homes in the EPZ. Nor do the plans demonstrate that adequate provisions have been made for transporting young children at day-care facilities.

Numerous parents have informed members of Palmetto Alliance that in the event of an evacuation their first response will be to personally pick up their children regardless of paper plans. The state and local plans fail to address this reaction which will slow evacuation and add to confusion.

The experience at Three Mile Island demonstrates that many citizens will not leave in the face of a major threat. Southerners have a special commitment to land and home which no government to date has been able to overcome. Absent a full-scale exercise which demonstrated that these hard-headed Scotch Irishmen are going to leave, no assurance can be had that the public will leave in the event of an evacuation order.¹¹

The emergency plans assume, but do not demonstrate, that adequate buses are available to move schoolchildren out in a timely manner. Multiple bus pickups may be needed.

Evacuation plans which fail to assume that human beings — and not computer modelled facsimiles thereof — are to be evacuated cannot but fail in the test. Applicants and state and local emergency planners are unable to provide assurance that the plans can be effectively implemented to protect the residents.

3. Contention 14 alleges that Applicants' evacuation time estimates are flawed and unreliable due to their failure to account for various factors. Similarly, in Contention 15 the Intervenor alleges deficiencies in the State and local emergency plans concerning evacuation.

4. Testimony on these contentions was presented by the Applicants (Testimony of R.M. Glover and Walter M. Kulash); the State of North Carolina (Testimony of J.T. Pugh, III); the State of South Carolina

¹¹ This paragraph relating to the necessity of a drill to test the system was not admitted as a substantive claim for relief (see S. Tr. 1096).

(Testimony of R. Lunsford); Gaston County, North Carolina (Testimony of Bob E. Phillips); Mecklenburg County, North Carolina (Testimony of Lewis Broome); and York County, South Carolina (Testimony of Phillip S. Thomas). Testimony was also presented by the Staff (Testimony of Thomas Urbanik, II, Concerning the Evacuation Time Estimate Studies for Catawba Nuclear Station). The Intervenor filed no written testimony on Contentions 14 and 15, but relied extensively on cross-examination. Intervenor also relied on the subpoenaed testimony of rebuttal witnesses: Brenda W. Best, J. Elbert Pope, Luther L. Fincher, Jr., Nathaniel Davis, Jr., and James T. Oliphant.

5. Essentially, Intervenor asserts that the evacuation time study prepared for Applicants by PRC Voorhees for the Catawba Nuclear Station cannot be relied on by public authority for making decisions based on the time required to evacuate residents for a number of specific reasons: (a) the study overestimates the flow of traffic on evacuation routes; (b) it does not consider the voluntary evacuation of Charlotte (evacuation shadow phenomenon); (c) it does not give adequate consideration to the evacuation of schools, the number of buses and bus drivers required, and parents picking up their children at school; (d) the study lacks a data base for the estimates concerning work/travel times and, hence, uses erroneous assumptions; (e) it does not adequately address adverse weather considerations; (f) the transient population at Carowinds amusement park and Heritage U.S.A. was not considered; (g) the assumptions used are not valid and the methodology is unsound; and finally, (h) the study uses too high a vehicle/lane/hour capacity, and should assume a 600-vehicle/lane/hour capacity, yielding a minimum evacuation time of 33 hours. Each of these points will be addressed individually.

6. Evacuation time estimates are required by 10 C.F.R. Part 50, Appendix E, § IV and are used for two principal purposes:

- a. to provide decisionmakers during an emergency with knowledge of the length of time required to effect evacuation under various conditions, which allows an informed choice of protective actions (e.g., between in-place sheltering and evacuation); and
- b. to identify those areas or routes in the vicinity of a site where bottlenecks are likely to occur and traffic control would be appropriate.

7. The criteria for judging the acceptability of the evacuation time estimates which are required by 10 C.F.R. Part 50, Appendix E, § IV are set forth in NUREG-0654, Appendix 4. NUREG-0654 discusses several

elements which the NRC and FEMA believe should be included in evacuation time studies. These considerations include: (a) an accounting for permanent, transient, and special facility populations in the plume exposure EPZ; (b) an indication of the traffic analysis method and the method of arriving at road capacities; (c) consideration of a range of evacuation scenarios generally representative of normal through adverse evacuation conditions; (d) consideration of confirmation of evacuation; (e) identification of critical links and need for traffic control; and (f) use of methodology and traffic flow modeling techniques for various time estimates, consistent with the guidance of NUREG-0654, Appendix 4.

8. The Applicants provided an evacuation time estimate study for the Catawba plume exposure pathway EPZ, prepared under contract by PRC Voorhees (PRC), entitled "Catawba Nuclear Station Evacuation Analysis/Evacuation Time Estimates, April 1983" (App. Ex. EP-15, Attach. A). PRC also produced a number of subsequent reports in connection with this evacuation time estimate study including: "Summary of Method for Estimating Evacuation Time for Catawba Nuclear Station EPZ, March 1984"; "Adequacy of Planning for School Population Evacuation, March 1984"; "Assumptions Underlying Departure Times for Evacuation of the Catawba Nuclear Station EPZ, December 1983"; "Evacuation Time Estimates for Carowinds and Heritage U.S.A., March 1984"; and a report entitled "Transport-Dependent Population, April 1984." App. Ex. EP-15, Attach. B-F.

9. The Applicants' study used the PRC EVACPLAN model which was developed specifically for evacuation time estimate studies. The method for computing total evacuation time was the distribution method which is one of the two acceptable approaches outlined in NUREG-0654, Appendix 4. EVACPLAN consists of two major components: The EVACURVE module and the QUEUE module. The EVACURVE module calculates the final departure curves giving the distribution of times at which the vehicle-owning population completes preparations to leave home and enters the road system. The QUEUE module simulates the flow of traffic through the evacuation routes and identifies the location and extent of traffic congestion.

Traffic Flow Rates

10. The first issue (a) raised in Contention 14 is that the evacuation time study overestimates the flow of traffic on evacuation routes. The flow rate used by PRC is 1200 vehicles/lane/hour, which is a figure that is adjusted downward from the actual hourly flow of traffic on a single

lane of surface highway of 1800 vehicles/lane/hour, taken from the 1965 Highway Capacity Manual. This manual was compiled by the Transportation Research Board of the National Academy of Sciences and is the standard reference in the transportation profession for determining capacities. Use of the figure 1200 vehicles/lane/hour assumes a vehicle headway of 3 seconds, reflecting a level of traffic interruption that could be expected in an evacuation assuming the absence of traffic control measures.

11. Staff witness Dr. Thomas Urbanik, II,¹² testified that the capacities suggested by Intervenors in the contention were unreasonably low and not supported by experience or sound technical analysis. The Intervenors did not present a time estimate study of their own, nor an analysis of the study presented by the Applicants. Given the record before us, we have no reason to doubt that the traffic flow rate assumed in the Applicants' study is appropriate.

"Shadow" Evacuation

12. Testimony on the voluntary evacuation of residents of Charlotte outside the EPZ (b) was presented by Applicants. PRC performed two studies related to the evacuation of areas beyond the EPZ, one encompassing the voluntary evacuation of the entire Charlotte area, and the other, the southwest one-third of the city of Charlotte. The results of these studies were set forth in Attachment B to Mr. Kulash's testimony on Contention 11 (expansion of the EPZ boundary) (App. Ex. EP-19). However, we have considered that attachment here, since it is relevant to the impact, if any, on the traffic evacuation time study for the EPZ as currently drawn. That study indicated that impact of this traffic, assuming 100% of the Charlotte residents evacuating voluntarily, could delay EPZ evacuees using the only impacted route, I-77, 1 hour, which would delay completion of the entire EPZ evacuation by 30 minutes. Based on this evidence we find, contrary to the assertion in the contention, that

¹² Dr. Thomas Urbanik, II, is Assistant Research Engineer, Texas Transportation Institute, Texas A&M University, and serves under contract to Battelle Pacific Northwest Laboratories, which is responsible under contract to the NRC for reviewing evacuation time studies of nuclear facilities. Dr. Urbanik was a principal author of NUREG/CR-1745 "Analysis of Techniques for Estimating Evacuation Times for Emergency Planning Zones" November 1980. He also provided input to the development of current guidance for evacuation time estimate studies which appears in Appendix 4 to NUREG-0654, Rev. 1 "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" November 1980. Dr. Urbanik reviewed the initial evacuation time estimate study submittals of approximately 52 operating and near-term nuclear facilities for the NRC in light of NUREG-0654, Rev. 1, the results of which are published in NUREG/CR-1856 "An Analysis of Evacuation Times Estimates Around 52 Nuclear Power Plant Sites" May 1981.

Applicants have, in fact, considered the voluntary evacuation of residents of Charlotte.

Use of School Buses

13. Intervenors allege numerous difficulties with the evacuation of schools (c). Plans for the evacuation of schools, along with an analysis of the adequacy of such planning, were presented in Applicants' testimony. The State of North Carolina plans an early evacuation of children from schools and has adequate buses available to move the students without utilizing multiple bus pickups by bringing buses in from outside the EPZ. The State of South Carolina plans to use the high school student drivers only to pick up students. Phillips for Gaston County pointed out that there are adequate buses so that multiple trips will not be necessary. County employees, volunteer firemen or police could be used to drive the buses in place of the student drivers on return trips. Broome of Mecklenburg County testified that enough buses are available to avoid multiple trips, that these buses are a maximum of 30 minutes away, and only adult bus drivers would be allowed to return to the EPZ, not student drivers. Thomas of York County testified that student drivers might be used for multiple trips to evacuate the particular school they are assigned to, but would be replaced by volunteer firemen for any other evacuation purposes. Backup drivers are also available.

14. Kulash testified that he conducted a study entitled "Adequacy of Planning for School Population Evacuation/Catawba Nuclear Station Emergency Planning Zone," and that this study determined that an adequate number of buses exists to complete the evacuation in less than two trips per vehicle in each county. Dr. Urbanik testified that multiple trips could be conducted within the 4-hour evacuation time estimate due to the fact that a number of the buses are on site, can respond quickly, and can then return.

15. Each of the State and local officials pointed out that their policy is to discourage parents from driving to the schools to pick up their children because the current plans call for relocation of the students directly. Messages instructing parents not to attempt to pick up their children at school are also provided in the Applicants' brochures. Although it is anticipated that some parents will not follow these instructions and would not be prevented from picking up their children, this possibility was accounted for in the Applicants' evacuation time estimates.

16. Based on the record before us, we find that Applicants' evacuation time study has given careful consideration to the evacuation of

schoolchildren, the number of buses and trips required, and the necessity of providing alternative bus drivers (other than student drivers), and adequate planning has taken place to meet the needs identified in this regard.

Assumptions About Habits and Behavior

17. Contention 14 also alleges (d) the lack of a data base for the assumptions presented in the evacuation time estimate study concerning the length of time assumed for workers to return home for their families in preparation for departing the EPZ. Data regarding this concern are contained in Applicants' Exhibit EP-15, Attachment D, at 11.¹³ Moreover, the assumptions of the study were reviewed by the Staff and FEMA and found reasonable (Staff Ex. EP-1, Urbanik at 5; Staff Ex. EP-2, Heard and Hawkins at 27). Work-to-home travel times are based on standardized trip length frequency distributions, as developed from home interview surveys throughout United States urban areas of all sizes. These distributions have proved to be predictable and stable for comparably sized areas. A maximum travel time of 20 minutes was adopted for a worker with both residence and workplace in the EPZ (corresponding to a distance of over 13 miles). The actual work/trip length frequency distribution used in the study assumed a work/trip length of up to 45 minutes; however, the small percentage of trips of between 20 and 45 minutes resulted in inclusion of this percentage within the 20-minute figure. It also assumed that at a length of more than 45 minutes, the driver would not return home or would be denied access to the EPZ. This is part of the distribution function used for preparation times in the EVACURVE module. Additionally, site-specific data compiled by PRC revealed that 85% of the people who work in York County also live in York County, lending further support to the assumptions regarding work/trip frequency distribution used in the Applicants' evacuation time estimate study.

18. One of the assumptions used to establish the work-to-home flow rates was that driver behavior would not be unusual, that is, not characterized by speeding, disregard of traffic regulations or using opposing lanes. Rather, congestion would limit urban speeds to 20 miles per hour (mph), while rural speeds could reach 40 mph. Because the average flow during an evacuation would range from 10 to 28 mph, the actual time is

¹³ Attachment D is entitled, "Assumptions Underlying Departure Times for Evacuation of the Catawba Nuclear Station Emergency Planning Zone," December 1983.

determined by congestion, rather than unusual driver behavior. Dr. Urbanik testified that the assumption of rational driver behavior is based on actual experience in disasters. We find, therefore, that there is a data base for these underlying assumptions, that they are reasonable and that no convincing evidence was presented challenging their adequacy.

Consideration of "Worst Case" Weather

19. With regard to Intervenor's concern (e), we note that Applicants' evacuation time estimate study assumed a reduction in roadway capacity of 40% for adverse weather conditions (App. Ex. EP-15, Kulash at 11). This represents restricted traffic flow due to ice, snow, heavy rain and winds, and traffic not totally stopped. Total blockage of the roadway due to clearing of snow, fallen trees or floods was not considered, as it is expected that average snowfall could accumulate as much as 3-4 inches before the roadways became completely blocked and resulted in a zero flow rate. The percentage reduction in roadway capacity to account for adverse weather remains fairly stable, although the causes could vary. Dr. Urbanik pointed out that if total blockage of roadways occurred due to snow, for example, the time to clear the roads must be added to the evacuation time estimates. The plan must be flexible enough to accommodate various scenarios. Consideration of adverse weather conditions is not intended as a "worst case" scenario, but rather assumes the roadway is still passable, at a reduced flow rate. There is an inherent danger in basing time estimate studies on only worst-case scenarios: it could lead to advising the population to shelter when evacuation is feasible and safer. Moreover, there is an overwhelming probability that any accident would occur during the time periods defined as "normal" or "adverse" weather as defined in Appendix 4 to NUREG-0654. Neither case study presented in the PRC analysis assumes best-case conditions. Normal evacuation already reduces the flow level from 1800 vehicles to 1200 vehicles which represents a reduced level of highway capacity. The adverse weather scenario further reduces this to only 60% of the capacity assumed for normal weather conditions. While this may not be "worst case," neither can either scenario be said to represent optimum conditions. If decisionmakers only had worst-case estimates available to them, they would be denied the flexibility essential to making a realistic determination of what protective action recommendation would best serve the public health and safety. Therefore, we find that the "normal" and "adverse" weather conditions used in the Applicants' evacuation time estimate study are appropriate and provide the best information to emergency planning officials for their decisionmaking. Accordingly,

there is no merit to Intervenor's concern about "worst case" weather conditions.

Transient Populations at Carowinds and Heritage

20. The next point raised by Contention 14, (f), asserts that the transient population at Carowinds amusement park and Heritage U.S.A. has not been considered in the evacuation time estimate study. Peak summer traffic from Carowinds and Heritage U.S.A. was, in fact, considered by PRC, but this study was not submitted as a separate study in the original evacuation time study since this did not impact the time estimates to any significant degree. However, this separate study is contained in Attachment E to Applicants' Exhibit EP-15. The study established that the transient population from both Carowinds and Heritage U.S.A. can be evacuated without lengthening the projected maximum evacuation times. The study was conservative (tending toward longer times) because such peak transient population, which would likely occur on a summer holiday, is assumed at the "critical" time period for working hours during the school year. However, the transient populations at Carowinds and Heritage U.S.A. are at a minimum during the school year during working hours. James Oliphant, Loss Preventions Operations Manager at Carowinds,¹⁴ testified that Carowinds has its own evacuation plan in development. He also stated that the current State plan calls for the evacuation of the park before the general population evacuation, that is, at the alert stage before the sirens are sounded to notify the general population. The entire park could be cleared in 2.5 hours and it would only take 1.5 hours to clear the parking lot. Since the flow out of the parking lot will start as soon as the Carowinds staff begins directing people out of the park, congestion in the parking lot will have dissipated by the time the park itself is completely empty. The plan calls for Carowinds employees to direct traffic out of the parking lots and access routes, but State police have the responsibility to route traffic on the highways. Both Oliphant and Kulash testified that traffic from Carowinds will not back up on I-77 to a degree significant enough to have a major impact on the evacuation time estimates for the general population EPZ. We have no evidence before us to refute this testimony, and are satisfied that sufficient attention is being given to problems of transient traffic by State and local officials.

¹⁴ Mr. Oliphant, whose responsibilities include fire, security, first-aid and safety of Carowinds, was a rebuttal witness called by Intervenor.

Assumptions and Methodology

21. Contention 14 also questions (g) the methodology and assumptions used in the Applicants' evacuation time estimate study. The methodology and assumptions used are set forth in Applicants' Exhibit EP-15, Attachment D. Dr. Urbanik testified that the methodologies used are accepted and proven transportation planning, modeling and operating transportation systems, and are consistent with Appendix 4 of NUREG-0654. There is nothing in the record to indicate that the methodology and assumptions used in the PRC study are unsound, or have no empirical data base. The population figures used in the study are taken from the 1980 U.S. Census, which provides a solid data base. Additionally, the population for special facilities was derived from actual contact with the facilities. In short, the Intervenor has not presented us with any basis from which to question the adequacy of the methodology and assumptions used, nor are we aware of any.

Minimum Evacuation Time

22. Finally, we turn to the question (h) as to what is appropriate to assume as a "minimum" time for evacuation of the Catawba EPZ. The Intervenor asserts that 33 hours is the minimum time that should be assumed. In this regard, we note that Dr. Urbanik, who has the primary responsibility for reviewing time estimates for the NRC, testified that there is not even one site in the U.S. where such an estimate would be reasonable. He pointed out that the general range of general population evacuation time estimates for all sites in the U.S. under normal weather conditions is from a minimum of 1 hour to a maximum of 12 hours. While Dr. Urbanik did not directly address what the time range is under a "worst case" scenario, he testified that a decisionmaker could add the amount of time necessary to clear the roads (e.g., a heavy snow) to the times estimated for adverse weather conditions. We have no reason to find that 33 hours is realistic for the Catawba EPZ. The evacuation time estimates before us for the Catawba EPZ considers various components, including adverse weather, special facility populations, transient populations, evacuation of schoolchildren, and the general population evacuation. The total evacuation times presented in the study range from 4 hours to 6 hours and 15 minutes, including considerations of adverse weather and special facility population evacuation (App. Ex. EP-15, Kulash Attach. A, at 4). We have no evidence to support Intervenor's theory that 600 vehicles/lane/hour is realistic. Dr. Urbanik drove the roadways in the Catawba EPZ and performed independent calculations of volume-to-capacity ratios to determine if any parts of the

network required times longer than those indicated in the Applicants' study, and found the analysis reasonable. The overwhelming evidence in the record before us supports our finding that the minimum time suggested by the Intervenor has no basis.

23. The longer evacuation time raised by the Intervenor involves an old, discredited estimate of the evacuation time for Catawba produced prior to NUREG-0654, which indicates that about 33 hours would be required to evacuate part of the plume EPZ near Rock Hill, South Carolina. This outdated document was apparently prepared under the loose guidance on estimating evacuation times which predated NUREG-0654. Contrary to Intervenor's assertion, none of the emergency planners who testified could recall having reviewed this old time estimate, let alone having endorsed it as accurate.

24. The mere existence of an earlier, conflicting estimate of evacuation time does not in any way cast doubt on the validity of PRC's estimate. Comparing the backgrounds of the two studies leaves no doubt as to which was the more accurate. The 33-hour estimate was based on an unknown method, produced results that cannot be duplicated, and is documented in a single-page letter. No witness was called who could testify to its validity. The 3- to 4-hour estimate, in contrast, is the product of a widely used, generally accepted method approved in NUREG-0654. It is supported by unrefuted expert testimony and is documented in an extensive series of reports. The method and results have been endorsed by independent experts and by State and local emergency management officials.

25. The Intervenor has identified no feature of the earlier estimate that is more reasonable or realistic than the PRC estimate. This Board has heard no evidence that calls into question either the accuracy of the evacuation time estimates produced for the Applicants by PRC or the use of these estimates by the emergency planning officials.

26. As a result of the foregoing, we find that the Applicants' evacuation time estimate study satisfies the criteria set forth in NUREG-0654, Appendix 4, and has given adequate consideration to evacuation of schools, Carowinds and Heritage U.S.A., adverse weather and has used acceptable methodology and assumptions regarding flow rates and people's work and living habits. We are fully satisfied that this time study provides decisionmakers with additional information and a basis on which a decision as to the feasibility of an evacuation could be made in the event of an emergency at the Catawba Nuclear Station. Thus, the Board finds that the allegations in Contention 14 lack merit.

27. Applicants' testimony on Contention 15 was combined with that on Contention 14, and consisted of a panel of witnesses from

Applicants, the State of North Carolina, the State of South Carolina, Gaston County, N.C., Mecklenburg County, N.C., and York County, S.C. FEMA's testimony also addressed this contention. Intervenor filed no written testimony on Contention 15, but relied on cross-examination and testimony of rebuttal witnesses Nathaniel Davis, Jr., James T. Oliphant and Brenda Best.

28. Essentially, EPC-15 asserts that proper provisions have not been made for the evacuation of the transit-dependent population, and the population in special facilities, such as hospitals and nursing homes, due to a possible shortage of buses and bus drivers. The problem of parents picking up their children at school and the evacuation of schoolchildren was addressed in the discussion of Contention 14 and will not be repeated here.

29. Components of the transit-dependent population include households who do not own vehicles, those people in vehicle-owning households who are at home while the family vehicle is away, and the institutional population of schools, nursing homes, hospitals and prisons in the EPZ. Each hospital, nursing home and penal institution in the EPZ was contacted to determine the number of evacuees, and a survey of EPZ residents was conducted to determine the number of household residents who would require transport in an emergency.

30. Pugh of North Carolina testified that while the North Carolina plan anticipates that most people without their own means of transportation will be able to secure transportation from neighbors or friends, nevertheless this planning includes the establishment of pickup points by publicly controlled buses for those in need of this service. Additionally, the State emergency medical services has established agreements with all rescue squads and ambulance services to respond for evacuation of threatened hospitals and nursing homes. Evacuation of day-care centers would be accomplished utilizing the staff of the facilities.

31. In York County, volunteer firemen and rescue squads would be used to evacuate hospitals and nursing homes. School buses would be used to transport those without private vehicles, and these buses would be driven by volunteers and could be supplemented by use of National Guard trucks. While it is true that these school buses are kept at the homes of the student drivers overnight, York County has adequate plans to deal with this contingency. The testimony shows that 250 buses are immediately available in the county, without the resort to these student-driven buses. However, if these buses are subsequently needed, volunteer firemen would then be instructed to either report to the individual bus locations to pick up the buses, or would gather at a central lo-

cation from which they would be taken as a group and let off one by one at the student drivers' homes.

32. The Gaston County plan calls for police officers and the central transport service to pick up the transit-dependent. The one day-care center would also be evacuated by use of the central transportation vans. There is no hospital in the Gaston portion of the EPZ, and the one nursing home has but five residents who would be evacuated by private auto.

33. The Mecklenburg County plan includes provisions for use of the City Department of Transportation buses as a primary source of transportation for the transit-dependent. While student drivers drive school buses in North Carolina, they would only be used to evacuate schoolchildren. If needed for transport of any of the dependent population, adult volunteers (firemen, police, emergency workers) would be used. There are no hospitals within the Mecklenburg County portion of the EPZ, and only one nursing home, which can handle its own needs. The day-care facilities have not indicated any need for transport assistance, with one exception, and a bus will be provided for this center.

34. Thomas of York County testified that the York County plan calls for the use of school buses driven by volunteer firemen to evacuate the transit-dependent. While buses driven by students will be used to evacuate schools, they will not be used for any other purpose. All of the hospitals and nursing homes and day-care centers in the York County portion of the EPZ have been contacted to determine the number of buses required for evacuation.

35. FEMA witnesses testified that each of the State and county plans contains provisions for evacuation of the transit-dependent population using school buses, ambulances and rescue squads.

36. The school bus supply and demand was analyzed in the Applicants' time estimate study in connection with separate studies of evacuation of schools and evacuation of the transit-dependent populations. Both these studies show that an adequate supply of school buses and additional transportation from other sources are available for evacuation of both schools and the transit-dependent population in the Catawba EPZ. We note that only York County anticipates the need for multiple bus trips to evacuate its School Districts 2, 3 and 4, and while this will be carried out by student drivers, any other use of these buses for the remainder of the transport-dependent population will be restricted to volunteer firemen as drivers.

37. Given the record before us, we find nothing in the record to contradict the assertion by both State and local emergency planners that an adequate number of buses and drivers will be available in the event of an emergency at the Catawba Nuclear Station. Identification of the

mobility-impaired and transit-dependent population is in the process of being carried out in North Carolina and South Carolina.

38. We find that, contrary to the assertions in the contention, careful attention has been paid to the needs of the transit-dependent population, including schools, and the Board is satisfied that the plans provide reasonable assurance that effective protective actions can be taken with regard to protection of the transit-dependent population.

39. Finally, regarding the concern that citizens will refuse to leave their homes, no evidence was presented by the Intervenor supporting this assertion. Instead, the record indicates that in emergency situations people follow the instructions of public officials.

40. We find that the emergency response plans developed by the States and counties are adequate and provide reasonable assurance that the EPZ can be safely evacuated. Thus, we find that the allegations in Contention 15 lack merit.

H. Intervenor's Emergency Planning Contention 18 — Adequacy of Local Telephone System

1. EPC-18 alleges that:

In the event of an emergency, local telephone systems are inadequate to handle the immensely increased volume of telephone calls. Since notification of emergency personnel relies upon telephones and since those without vehicles are expected to call for a ride, major parts of the emergency communications system will be effectively knocked out. This applies especially to the notification of school bus drivers as specified in the plan.

2. The appropriate standards and criteria in regard to this contention are NUREG-0654, II.E and II.F. Criterion II.E.2 provides that: "each organization shall establish procedures for alerting, notifying and mobilizing emergency response personnel." Planning Standard II.F provides that: "provisions exist for prompt communications among principal response organizations to emergency personnel and to the public."

3. Applicants presented a panel of witnesses consisting of Stan D. Coleman, Jr., Michael E. Bolch, J.T. Pugh, III, P.R. Lunsford, Bob E. Phillips, Lewis Wayne Broome and Phillip Stevens Thomas. John C. Heard, Jr., and Thomas I. Hawkins testified for FEMA. The Intervenor did not present direct testimony on this contention.

4. In their proposed findings in ¶¶ 3 and 4 on page 186, the Intervenor state:

Much of the concern which is founded upon the inadequacy of the local telephone system appears to be addressed through response by Applicants and the state and local planners who have identified a variety of alternative means including dedicated

lines, various radio equipment, and personal keepers, to accomplish notification of at least the key emergency personnel in the event of an emergency at the facility.

We have remaining concerns, however, regarding effects of the unavailability of the local telephone system on the implementation ability as it relates to the larger number of lesser emergency response workers as well as the members of the general public who, requiring special assistance, would seek to communicate by telephone with emergency management officials.

5. From the above statements we find that certain issues have been adequately addressed by the Applicants' witnesses and thus they are beyond the concern of the Intervenor and are no longer in controversy. These issues are (1) notification of the Station response team, (2) notification of officials of the three counties, and (3) notification of State and local officials. Applicants' witnesses Bolch, Coleman and Lunsford have addressed these aspects of this contention in detail and have found that a variety of communication systems are available for notification (App. Ex. EP-16, Coleman and Bolch at 1-7; Lunsford at 1-2). Their testimony leads us to agree with the Intervenor. We therefore find that the various means of communication other than public telephone lines are adequate for notification of these key emergency personnel in the event of an emergency at Catawba.

6. Remaining concerns of the Intervenor are the availability of the local telephone systems in the event of an emergency to (1) lesser emergency workers and (2) members of the general public who would seek to communicate with emergency management officials.

Notification of Emergency Response Personnel

7. In Gaston County, word of an emergency will be received by telephone or by radio at the county warning point and the county communications center. The warning point is staffed 24 hours a day, 7 days a week; at least two telephone communicators would notify twenty-five county department personnel on a priority basis if an emergency occurs. There is radio communication capability from the EOC to radio-equipped police, fire, ambulances and civil defense personnel (App. Ex. EP-16, Phillips at 1). Persons to be notified are listed in a standard operating procedure at the communications center. These persons would normally be contacted by the telecommunicators. However, in the event that the system became overloaded, radio communication would be used or a police officer would be sent to their residences (Tr. 1440-41, Phillips 5/8/84). Also, Gaston County has acquired a radio for two-way communication with EBS (Tr. 1404, Phillips 5/8/84).

8. In Mecklenburg County, if telephone systems become overloaded, emergency response personnel could be notified in a timely manner by radio, by sending a vehicle or by an emergency EBS announcement (App. Ex. EP-16, Broome at 1). Ten minutes is the maximum estimated time anticipated for notification of the essential personnel to man the Mecklenburg County EOC (*id.* at 2). If emergency management personnel are not in their office, they can be reached by pager or by broadcast to their radio-equipped cars. If they are at home and cannot be reached by telephone, a police car could be sent for them (Tr. 2887-88, Broome 6/5/84).

9. The York County Emergency Operations Plan states that the first person in York County's government to be notified in the event of a radiological emergency at Catawba is the dispatcher at the sheriff's department in Rock Hill (App. Ex. EP-16, Thomas at 1). The dispatcher has a predetermined list of persons to contact which includes the Director of the Emergency Preparedness Agency, people in the law enforcement system, his supervisor, the sheriff, etc. This can be accomplished either by telephone or through radio communication. The Emergency Preparedness Agency Director must in turn call four persons. It is estimated that this will take no longer than 5 to 7 minutes (*id.* at 1-2; Tr. 1423, 5/8/84). No problem is anticipated even if telephone circuits are overloaded in contacting emergency workers since backup methods of communication are available (Tr. 1438-39, Thomas 5/8/84). Backup sources of communication which are available for volunteer firemen, the emergency preparedness director and emergency management support (EMS) personnel are tone and voice pagers. EMS personnel also have walkie-talkies (Tr. 1430, Thomas 5/8/84).

10. The Board finds that in the event that telephone systems in Gaston, Mecklenburg and York Counties become overloaded, there is reasonable assurance that other means of prompt notification of county emergency response personnel will be available.

Transportation-Dependent Persons

11. In the event the telephone systems are overloaded, there are several ways of communicating with transportation-dependent persons. An EBS message would be used that would indicate locations at which people could be picked up. The supplemental mobile system for siren notification would also be available for people who need assistance. Persons needing transportation could contact personnel in these emergency vehicles (App. Ex. EP-16, Broome at 3). Transportation-dependent persons would be told by an EBS message to stand on their front porch or

hang a handkerchief on the door. Also, the Duke information brochure advises transportation-dependent persons to identify themselves to their local emergency management office in advance of an event as to their need for transportation (Tr. 1435-36, 1432, Thomas 5/8/84). Gaston County compiles a list of transportation-dependent persons annually (Tr. 1434, Phillips 5/8/84). In addition to picking up persons on prearranged routes, there would be emergency vehicles on the road looking for people who need transportation (App. Ex. EP-16, Phillips at 5; Tr. 1452-53, Thomas, Phillips and Pugh 5/8/84). In York County, school buses would be utilized to transport transportation-dependent persons. Rural volunteer firemen will serve as school bus drivers to transport these persons. Firemen can be notified by the sheriff's department through their tone and voice pagers (Tr. 1424-25, Thomas 5/8/84). In Gaston County, county vehicles rather than school buses will be used to pick up people who need transportation (App. Ex. EP-16, Phillips at 4-5).

12. From the above, the Board finds that in the event of an emergency there are adequate means of notification of transportation-dependent persons in Gaston, Mecklenburg and York Counties.

Notification of School Bus Drivers

13. Witness Broome testified that overloading of the telephone system would not interfere with notification of school bus drivers in Mecklenburg County because, if school were in session, drivers would be at the schools and would be notified by the tone alert system. If schools were not in session, there would be no problem or concern with school evacuation (App. Ex. EP-16, Broome at 4). Witness Phillips testified that in Gaston County if the schools were in session, to notify drivers he would call the principal of the school. If the schools were not in session, the school buses would not be needed (App. Ex. EP-16, Phillips at 4-5). Witness Thomas indicated that in the event the telephone systems of York County were overloaded, school bus drivers could be notified by the tone alert radios in the schools which would alert personnel to listen to EBS broadcasts. Bus drivers would be at the schools and would be notified by school officials (App. Ex. EP-16, Thomas at 5-6).

14. The Board finds that in the event of an emergency when schools were in session and the telephone system were to become overcrowded, there are adequate provisions for notification of school bus drivers. If schools are not in session, notification of bus drivers is not required except where buses are to be used for transportation-dependent people.

In these instances, the tone-alert and voice pagers can be utilized to contact drivers.

15. After consideration of all evidence bearing on the availability of the local telephone systems in case of an emergency, to lesser emergency workers and members of the general public who need to communicate with emergency management officials, we find that adequate alternate means of notification are available. We find that there is reasonable assurance that the requisite notifications can be accomplished even with overloading of local telephone systems. If there is overloading of the telephone systems, we find that transportation-dependent persons would be able to arrange for, or signal for transportation. Finally, we find that school bus drivers can be notified in a timely manner even though there is overloading of the local telephone systems.

V. CONCLUSIONS OF LAW

The Board has considered all of the evidence submitted by the parties in this proceeding on the emergency planning issues. Based upon a review of that record and the foregoing Findings of Fact the Board concludes that:

1. The emergency plans meet the requirements of 10 C.F.R. § 50.47, and Appendix E to 10 C.F.R. Part 50, as well as the criteria of NUREG-0654, and provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency;

2. The issuance of operating licenses to the Applicants, as conditioned in the Order, will not be inimical to the common defense and security or to the health and safety of the public; and

3. Pursuant to 10 C.F.R. § 2.760a and 10 C.F.R. § 50.57, that the Director of Nuclear Reactor Regulation is authorized to issue to the Applicants, upon making requisite findings with respect to the matters not embraced in this Supplemental Partial Initial Decision, licenses authorizing operation of Catawba Nuclear Station, Units 1 and 2, subject to the satisfaction of the conditions set forth in the Order.

VI. ORDER

Wherefore, It Is Ordered, in accordance with 10 C.F.R. § 2.760a and 10 C.F.R. § 50.57, that the Director of Nuclear Reactor Regulation is authorized to issue to the Applicants, upon making requisite findings with respect to matters not embraced in this Supplemental Partial Initial

Decision, the licenses authorizing the operation of Catawba Nuclear Station, Units 1 and 2, provided that the following conditions are met within 180 days following the initial issuance of an operating license.

1. (a) Applicants' Brochure shall state that high levels of radiation are harmful to health and may be life-threatening and such statement shall be contained within that portion of the brochure that deals with actions to be taken in the event of an emergency; (b) the warning signs and decals shall specify the types of emergencies they cover including nuclear; (c) the warning signs and decals shall notify transients as to where they can obtain local emergency information, as provided in NUREG-0654 Evaluation Criterion II.G.2; and (d) Applicants' emergency plans shall reflect the kinds of locations within the plume exposure EPZ wherein the warning signs and decals and emergency response information will be placed and the procedures employed to assure that sufficient numbers are being distributed to effectively reach the transients, and that the plans be implemented.

2. We require of Applicants that there be comprehensive plans for early notification to Carowinds of a radiological emergency at Catawba and for evacuation of Carowinds. They shall describe the responsibilities of the emergency response organizations of Mecklenburg and York Counties and provide for their efforts to be coordinated among themselves and with Carowinds' officials. Provisions in the plans shall be made to immediately notify patrons and staff of Carowinds at the time of the precautionary closing of the park, of the cause of the emergency. The means to implement the plans shall be made available.

3. Applicants shall fulfill the above conditions to the satisfaction of the Staff, within the time specified above.

Furthermore, not as a condition of the licensing, we direct that: (1) Applicants confirm to FEMA and the Staff that FEMA's finding arising from the February 1984 exercise, that more Gaston County personnel be trained in monitoring and decontamination procedures, has been addressed; and (2) Applicants obtain changes to the South Carolina Emergency Plan which will show the role and responsibilities of the Division of Public Safety in the Office of the Governor of South Carolina in ordering evacuations along with the identification of key individuals by title, and provide copies to FEMA and Staff.

Pursuant to 10 C.F.R. § 2.760(a) of the Commission's Rules of Practice, this Supplemental Partial Initial Decision will constitute the final decision of the Commission forty-five (45) days from the date of issuance, unless an appeal is taken in accordance with 10 C.F.R. § 2.762 or the Commission directs otherwise. (*See also* 10 C.F.R. §§ 2.764, 2.785 and 2.786).

Any party may take an appeal from this decision by filing a Notice of Appeal within ten (10) days after service of this decision. Each appellant must file a brief supporting its position on appeal within thirty (30) days after filing its Notice of Appeal (forty (40) days if the Staff is the appellant). Within thirty (30) days after the period has expired for the filing and service of the briefs of all appellants (forty (40) days in the case of the Staff), a party who is not an appellant may file a brief in support of or in opposition to the appeal of any other party. A responding party shall file a single, responsive brief regardless of the number of appellants' briefs filed (*See* 10 C.F.R. § 2.762(c)).

**THE ATOMIC SAFETY AND
LICENSING BOARD**

**Morton B. Margulies, Chairman
ADMINISTRATIVE LAW JUDGE**

**Dr. Robert M. Lazo
ADMINISTRATIVE JUDGE**

**Dr. Frank F. Hooper
ADMINISTRATIVE JUDGE**

Dated at Bethesda, Maryland,
this 18th day of September 1984.

APPENDIX A

List of Witnesses

Linda Harris Anderson	Director, Chapter Manager of the Rock Hill Chapter of the American Red Cross
Arlene Bowers Andrews	College of Social Work University of South Carolina
Dr. M. Read Bassiouni	Acoustics consultant, Acoustic Technology, Inc.

Brenda Wagnon Best	Schoolteacher, Olympic High School
Mary L. Birch	Systems Engineer, Radwaste Engineering Section, Duke Power Company
Michael E. Bolch	Emergency Preparedness Coordinator, Duke Power Company
Lewis Wayne Broome	Administrative Officer, Charlotte-Mecklenburg Emergency Management Office
Dayne Brown	Chief of the North Carolina Radiation Protection Section, Division of Facility Services
Phillip F. Carter	Director, Community Relations, Duke Power Company
Mary Cartwright	General Manager Public Relations, Duke Power Company
Mark A. Casper Engineering Department, Duke Power Company	Meteorologist for the Design
Marvin Chernoff	Polling Consultant, President, Chernoff Silver Associates
Stan D. Coleman, Jr.	Design Engineer, System Communications Transmission Department, Duke Power Company
Nathaniel Davis, Jr.	Director of Transportation for York School District No. 1
Harold Mason Dickson	Chairman of the York County Council
Dr. Susanna V. Duckworth	Assistant Professor, Winthrop College
Robert F. Edmonds, Jr.	Senior Engineer, Civil/Environmental, Duke Power Company
James E. Fairobent	Meteorologist, Meteorology Section, Meteorology and Effluent Treatment Branch, Division of Systems Integration, Office of Nuclear Reactor Regulation, Nuclear Regulatory Commission

Luther L. Fincher, Jr.	Acting Director for Emergency Management of Charlotte and Mecklenburg County
Dr. Samuel L. Finklea, III	Bureau of Radiological Health, South Carolina Department of Health and Environmental Control
R. Michael Glover	Emergency Response Coordinator, Duke Power Company
Kathleen B. Gordon	Emergency Management Planning Review Committee, Mecklenburg County
James Gregory, Jr.	Planner, South Carolina Emergency Preparedness Division
E. H. Harris, Jr.	Assistant Director for Emergency Response, North Carolina Division of Emergency Management
Thomas J. Hawkins	Emergency Management Program Specialist, Radiological Emergency Planning, FEMA Region IV, Liaison with North and South Carolina
John C. Heard, Jr.	Chief, Technological Hazards Branch, Natural and Technological Hazards Division, FEMA Region IV
Dennis Johnson	Disaster Specialist for the American Red Cross
Walter M. Kulash	Consultant on emergency management planning, Associate vice-president, PRC Engineering
Betty Long	Director of Service to the Armed Forces and Disaster Services for the American Red Cross covering Charlotte/Mecklenburg
Paul R. Lunsford, Sr.	Chief Area Coordinator, Emergency Preparedness Division, Office of the Adjutant General, State of South Carolina

William M. McSwain	Exercise Training Officer, South Carolina Preparedness Division
Major Philip Needham	Divisional Secretary of the Salvation Army for North Carolina and South Carolina
James Edward Neves	Regional Director, State Division of Social Services for the Western Region of North Carolina
James T. Oliphant	Loss Prevention Operations Manager, Carowinds
Bob E. Phillips	Director of the Gaston County Emergency Management Agency
Ruth Wanzer Pittard	Director of Audio-Visual Services, Davidson College
J. Elbert Pope	Sheriff of York County, South Carolina
Thomas E. Potter	Consultant on health and safety aspects of nuclear power, Pickard, Lowe and Garrick, Inc.
Jesse Thomas Pugh, III	Division Director, North Carolina Department of Crime Control and Public Safety, Division of Emergency Management
Jesse L. Riley	Carolina Environmental Study Group
Perry D. Robinson	Emergency Preparedness Specialist, Emergency Preparedness Licensing Branch, Division of Emergency Preparedness, Office of Inspection and Enforcement, Nuclear Regulatory Commission
Philip Layne Rutledge	Market Researcher, Astrovision
Frank B. Sanders	Director, Division of Public Safety, Governor Riley's Office, State of South Carolina
Steven C. Sholly	Technical Research Associate Union of Concerned Scientists

Leonard Soffer	Section Leader of the Accident Risk Section, Reactor Risk Branch, Division of Risk Analysis, Office of Nuclear Research, Nuclear Regulatory Commission
Phillip Steven Thomas	Acting Director of Emergency Preparedness, York County, South Carolina
Judith D. Turnipseed	Public Information Officer, Division of Public Safety, Office of the Governor of South Carolina
Ray Twery	Lecturer in Statistics, Department of Mathematics and Computer Science, University of North Carolina, at Charlotte
Dr. Thomas Urbanik, II	Associate Research Engineer associated with Texas Transportation Institute of the Texas A&M University System

APPENDIX B

List of Exhibits

No.	Description	Tr. Pg. Ident.	Tr. Pg. Rec'd
Applicants' Exhibits			
No. 1	North Carolina Emergency Plans	128	588
No. 2	South Carolina Emergency Plans	128	588
No. 3	Catawba Nuclear Station Emergency Plan	129	588

No. 4	Duke Power Company Crisis Management Plan for Nuclear Stations	129	588
No. 5	Catawba Nuclear Station Emergency Plan brochure, 1984 edition	130	588
No. 6	Catawba Nuclear Station Student Emergency Plan	130	588
No. 7	Applicants' Testimony on Emergency Planning Contentions 1 and 7	141	519
No. 8	Catawba Nuclear Station Emergency Plan brochure, undated	170	588
No. 9	Public Warning Decal	270	270
No. 10	Brochure: "Agriculture and Nuclear Power in South Carolina"	373	588
No. 11	Brochure: "In Time of Emergency, A Citizen's Handbook on Nuclear Attacks and Natural Disasters"	373	588
No. 12	Brochure: "Disasters, What to Do to Protect Yourself"	373	588
No. 13	Applicants' Testimony on Emergency Planning Contention 3	603	603
No. 14	Applicants' Testimony on Emergency Planning Contention 6	883	883
No. 15	Applicants' Testimony on Emergency Planning Contentions 14 and 15	1005	1005
No. 16	Applicants' Testimony on Emergency Planning Contention 18	1343	2809
No. 17	Applicants' Testimony on Emergency Planning Contention 9	1825 1829	1825
No. 18	Nurkin Press Release	1982	1982
No. 19	Applicants' Testimony on Emergency Planning Contention 11	2006	2006
No. 21	Applicants' Testimony on Emergency Planning Contention 8	2809	2809

No. 21A	Letter of 5/30/84 from Ms. Cottingham w/revised pp. 6 and 6A of Harris/Pugh testimony in App. Ex. EP-21	2817	2817
No. 22	Operations Map, Catawba Nuclear Station, of January 1984	Board Order of 6/15/84 assigning exhibit numbers	
No. 23	Ingestion Pathway Map, Catawba Nuclear Station, Sheet 1	Board Order 6/15/84 assigning exhibit numbers	
No. 24	Ingestion Pathway Map, Catawba Nuclear Station, Sheet 2	Board Order of 6/15/84 assigning exhibit numbers	

Intervenors' Exhibits

No. 1	Letter of April 13, 1983, to Jane Lesser	169	
No. 2	Letter from Pugh to Glover dated 6/28/83	395	397
No. 3	Letter from Glover to J. Moore, <i>et al.</i> , dated 4/21/83	401	
No. 4	Letter dated 4/22/83 from Duckworth to Carter	422	
No. 5	Letter dated 8/24/83 from Duckworth to Carter	442	
No. 6	Letter dated 2/8/84 from Duckworth to Carter	443	443
No. 7	"Catawba Information Programs" prepared by Mary Cartwright, dated 8/26/83	467	519
No. 8	"The New Generation," Vol. II, No. 4, December 1983	478	482
No. 9	Chernoff/Silver & Associates Community Issues Survey	493	
No. 10	Community Issues Survey dated 9/83	497	
No. 11	Brochure, "How Much Radiation Do You Receive?"	499	501

No. 12	Letter from Pat Osborne, addressed "Dear Neighbor," dated 5/6/83	571	572
No. 13	Applicants' Answers and Objections to CESG and Palmetto Alliance's First Round of Interrogatories, Questions 7-3 and 7-7; and 3/20 pleading, Applicants' Supplemental Answers	617	
No. 14	"Guidelines and Procedures, American Red Cross Disaster Services, Shelter Management Guide for Trainees"	734	
No. 15	List of Emergency Shelters	821	4504
No. 16	Letter dated 7/16/80 to H.R. Denton, from W.O. Parker, Jr., with 7-page attachment	1163	1165
No. 17	Letter dated 5/7/80 to Divine Savior Hosp. & Rock Hill Convalescent Ctr. from J.W. Hampton	1170	1170
No. 18	Letter dated 10/31/83 to Lee from Lutes	1178	1178
No. 19	Letter dated 11/8/83 to Hendricks from Glover (cover), with attachments of two letters	1180	1182
No. 20	Letter dated 12/2/83 to Hendricks from Glover	1183	1184
No. 21	Letter dated 1/18/83 to McSwain from Thomas	1184	1191
No. 22	Memo PRC Voorhees dated 1/24/83 to Kulash from Lutes, 12-page attachment	1206	1208
No. 23	Interoffice PRC memo 2/4/83 to Lee from Kulash & Lutes, w/attachments	1206	1208
No. 24	Letters dated 2/7/83 from Hager to Phillips, Carroll, Broome, Self and McSwain	1207	1208
No. 25	Letter dated 2/16/83 to Lee from McSwain	1207	1208

No. 26	Letter dated 2/17/83 to Kulash from Edmonds, with attachment	1207	1208
No. 27	Letter dated 3/9/83 to Lutes from Hager, with attachment	1207	1208
No. 28	Memorandum dated 3/17/83 from Carroll Ref, Draft Emergency Evacuation Time Estimate	1208	1208
No. 29	Memorandum dated 3/18/83 from Lee to Tucker, Attn: Glover with PRC 2-page attachment	1208	1208
No. 30	FEMA letter dated 8/9/83 from Woodard to Moore, with 3-page RAC encl.	1601	1602
No. 31	FEMA letter dated 8/18/83 from Woodard to Pugh with 2-page RAC encl.	1601	1602
No. 32	Letter dated 11/16/83 to Woodard from Moore & Pugh	1604	1629
No. 33	Hypothetical Plume Projection Catawba Exercise 0802 hours, 2/16/84	1628	1628
No. 34	Critique Sheet for Controllers/Evaluators, /s/ Morgan, 2 pages	1645	
No. 35	Critique Sheet for Controllers /Evaluators, /s/ Connolly, 3 pages	1646	
No. 36	FEMA letter dated 3/23/84 from Woodard to Pugh, with 1-page RAC encl.	1647	1647
No. 37	FEMA letter dated 3/23/84 from Woodward to Moore, with 1-page RAC encl.	1647	1647
No. 38	Intervenors' Testimony of: Rutledge, Pittard and Andrews	1724 1754	1810
No. 39	Letter dated 12/27/83 to Hampton from Carowinds, emergency plan attached	1917	1918
No. 40	"Carowinds PTL Planning Meeting," 2/1/83	1919	1966
No. 41	Memo dated 3/9/83 from Lutes to Lee	1920	1966

No. 42	Request for Board action on extension of EPZ	1981	1982
No. 43	1980 Population and Population Density	2017	1017
No. 44	Map Core Area of City of Charlotte	2149	2150
No. 45	Document entitled, "1982 High Accident Locations Priority Order"	2159	2159
No. 46	Charlotte All-Hazards Plan, 1982	2162	2162
No. 47	Glover memo to file dated 7/20/82	2165	
No. 48	Testimony of Riley & Twery	2248	2308
No. 49	Testimony of Sholly	2248	2308
No. 50	Map of City of Charlotte	2295	2295
No. 51	Document entitled "Tracking Survey"	4277	
No. 52	Report on Chemical Fire	4442	4442
No. 53	Letter dated 1/31/84 to teachers at schools in Catawba EPZ from S. Isola	4545	4545
No. 54	Announcement on Drills	4550	4550
No. 55	North Carolina Executive Order No. 72 dated 12/14/81	Board Order of 6/15/84 assigning exhibit numbers	

Staff Exhibits

No. 1	Testimony of Urbanik, Concerning Evacuation Time Estimate Studies	1258	1258
No. 2	Testimony of FEMA Witnesses Heard and Hawkins	1463	1463
No. 3	FEMA Interim Findings Report	1468	1468
No. 3A	Memo dated 5/8/84 to Jordan from Krimm	4081	4180
No. 4	FEMA Exercise Report 3/5/84, Catawba Nuclear Station Exercise Feb. 15-16, 1984	1662	
No. 5	Testimony of Soffer, Fairbent and Robinson	2573	2573

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Peter B. Bloch, Chairman
Dr. Oscar H. Paris
Frederick J. Shon**

In the Matter of

**Docket No. 50-155-OLA
(ASLBP No. 79-432-11-LA)**

**CONSUMERS POWER COMPANY
(Big Rock Point Plant)**

September 25, 1984

In this Supplemental Initial Decision, the Licensing Board dismisses four remaining issues and authorizes the issuance of a license amendment.

TECHNICAL ISSUES DISCUSSED

Spent Fuel Pool Water Level Monitors
Containment Pressurization (from spent fuel pool)
Motor-Operated Valves (irrelevant to spent fuel pool)
Emergency Planning Pamphlet (content)
Distribution of Emergency Planning Pamphlet
Cask Drop (adequacy of redundant support system).

SUPPLEMENTAL INITIAL DECISION

(On Four Remaining Issues)

The Initial Decision (On All Remaining Issues) issued in this proceeding on August 29, 1984 (LBP-84-32, 19 NRC 601) inadvertently failed to dispose of four issues dealt with in the 1982 hearing; proposed findings for those issues were filed in 1982. We dispose of those issues in this Supplemental Decision and also correct two typographical errors contained in the Order of the August 29, 1984 Initial Decision.

I. WATER LEVEL MONITORS

In our Memorandum and Order of February 19, 1982, we limited Christa-Maria Contention 8 and O'Neill Contention III.E-2 to several specific genuine issues of fact, one of which was the following:

How reliable are the spent fuel pool water level monitors which applicant is planning to install? Are they qualified for high temperature and humidity?

This issue arose out of the Intervenor's contention that an accident at Big Rock Point similar to the one at Three Mile Island, Unit 2 (which prevented entry into the containment building) might make it impossible to maintain the spent fuel pool in a safe condition.

At the hearing held in this proceeding from June 7 through June 12, 1982, testimony on this issue was submitted by Licensee and the Staff. (Further Testimony of David P. Blanchard on Christa-Maria Contention 8 and O'Neill Contention III.E-2 (Blanchard), ff. Tr. 2024; Joint Testimony of Fred Clemenson and Richard L. Emch Concerning Christa-Maria Contention 8 and O'Neill Contention II.E-2 (sic) Genuine Issues of Fact 1 and 2 (Clemenson/Emch), ff. Tr. 2341.) The Intervenor offered no direct testimony on this issue, and they indicated that they did not take issue with the monitor itself. (Intervenor (sic) Proposed Findings of Fact [on] Christa-Maria Contention 8 and O'Neill Contention III-2 (sic) (Subparts 1, 2, and 3) (Intervenor) at 9.) Intervenor did, however, raise the question of lack of redundancy with respect to the water level monitor. (Intervenor at 9.)

Staff testified that it did not consider the reliability of the water level monitor to be a safety concern because the monitor would play no part in providing makeup water to the pool in the event of a LOCA. (Clemenson/Emch at 8-9.) The remote makeup system operates automatically when the core spray recirculation system operates. (*Id.* at 5; Blanchard at 21-22). Moreover, there are alternate methods by which Licensee can

detect a significant loss of water from the pool should the water level monitor fail. (Clemenson/Emch at 9.) Nevertheless, the water level monitor is qualified for a LOCA environment and is powered by reliable offsite and onsite power systems. (Blanchard at 22-24.)

Conclusion

In view of the foregoing testimony we conclude that the water level monitor would be of limited usefulness in the event of an accident in which ingress to the containment building is impossible. Therefore, it is not a safety concern and redundancy is unnecessary. Moreover, the evidence shows the water level monitor to be adequately reliable.

II. MOTOR-OPERATED VALVES MO-7064 AND MO-7068

Another genuine issue of fact that we recognized in Christa-Maria Contention 8 and O'Neill Contention III.E-2 was the following:

Are motor-operated valves MO-7064 and 7068 necessary to control containment pressurization? Are they qualified for high temperature and high humidity?

Testimony on this issue was presented by the Licensee and by the NRC Staff. (Further Testimony of David P. Blanchard on Christa-Maria Contention 8 and O'Neill Contention III.E-2 (Blanchard), ff. Tr. 2024; Testimony of Paul Shemanski Regarding Christa-Maria 8 and O'Neill Contention II.E-2 (sic) Genuine Issue of Fact 3 (Shemanski), ff. Tr. 2332.) Intervenors presented no direct testimony on this issue but relied on cross-examination to make their case.

The motor-operated valves MO-7064 and MO-7068 control the containment spray which, among other things, controls containment temperature under accident conditions. (Blanchard at 24-25; Tr. 2015.) The containment spray and valves MO-7064 and MO-7068, however, are not necessary to control containment pressurization. The containment is designed to withstand a pressure of 27 psig, and no postulated LOCA can result in containment pressure that high. (*Id.* at 25.) Additional pressure could result from boiling of the spent fuel pool, but we found in our Initial Decision issued on August 29, 1984, that the makeup system would prevent the pool temperature from exceeding 150°F under accident conditions. (Initial Decision, LBP-84-32, 20 NRC at 625.) Thus the pool will never reach boiling temperature. Even if the makeup system were not used, it would take approximately 140 hours for the pool to

reach boiling temperature following loss of coolant. The pressure resulting from a LOCA would fall to near ambient long before the pool could boil, as a result of steam condensation and the cooling effect of the containment sprays; consequently pressure from pool boiling would not add to that resulting from the LOCA. (Blanchard at 25-26.) Finally, Blanchard also testified that both valves were qualified on an interim basis for high humidity and temperature. (*Id.* at 26, 29.)

Staff's witness testified that motor-operated valve MO-7064 is considered by the NRC to be qualified for high temperature and high humidity. Motor valve MO-7068, which is used for iodine washdown and can be used as a backup to MO-7064 if necessary, was to have been qualified by Licensee by June 30, 1982, pursuant to *Petition for Emergency and Remedial Action*, CLI-80-21, 11 NRC 707, 714-15 (1980). (Shemanski at 3-4.) But we take official notice of the fact that the Commission removed the 1982 date, and by a final rule dated September 5, 1984, to become effective upon publication in the *Federal Register*, it established the 1985 deadline set by 10 C.F.R. § 50.49.

The Intervenor's argue that the containment sprays are necessary to condense steam and reduce containment pressure.¹ (Intervenor's at 9-10.) They also argue that the NRC Staff has not fully qualified these valves for high temperature and high humidity. (Intervenor's at 10.) Further, they argue that the valves have not been tested for radiation and thermal aging. (*Id.*) And they allege that MO-7068, which is actuated manually, would not be accessible if the containment were contaminated. (*Id.* at 12.)

Witness Blanchard pointed out that MO-7064 actuates early in an accident before the environment within containment becomes significantly degraded by an accident. (Blanchard at 27 and attachments 2-3 at 90, 97-98.) If it were necessary to use MO-7068 because of a failure of MO-7064, MO-7068 would also be actuated early in the accident. (*Id.* at 27.) Nor would it be necessary to enter the containment to actuate MO-7068; the valve can be actuated from the control room. (*Id.* at 25.)

Conclusions

The Intervenor's' arguments are not supported by the record. The evidence shows that the spent fuel pool will not contribute to containment pressurization and that motor-operated valves MO-7064 and MO-7068

¹ Intervenor's cite Blanchard's testimony at page 25, either overlooking or ignoring the fact that his written testimony was corrected at transcript page 2015. The corrected record does not support the statement that the sprays are needed to reduce containment pressure following a LOCA.

are not necessary to control pressurization. Christa-Maria Contention 8 and O'Neill Contention III.E-2 are dismissed in their entirety.

III. EMERGENCY PREPAREDNESS NOTIFICATION

In its August 6, 1982 Initial Decision concerning the emergency preparedness pamphlet (subcontentions 9(2) and 9(3)), the Board ordered the Licensee to make fifteen modifications to the emergency preparedness pamphlet and also to provide additional evidence on the manner and method for notifying transients in the Big Rock Point plume exposure pathway emergency planning zone (EPZ) of the existence of the emergency plan. (LBP-82-60, 16 NRC 540 (1982).) This information was submitted under affidavit by the Licensee on September 2, 1983, and included: "Response of Consumers Power Company Showing Compliance with the Order of the Licensing Board Regarding the Content and Distribution of the Emergency Preparedness Pamphlet" (CPC Response) dated September 2, 1983; "Affidavit of Phillip B. Loomis" (Loomis Affidavit) sworn to on August 26, 1983; and "Affidavit of Robert W. Grupp" (Grupp Affidavit) sworn to on August 26, 1983; and "Affidavit of Joseph A. Schwartzfisher" (Schwartzfisher Affidavit) sworn to on December 7, 1982.

A. Modifications to the Emergency Planning Pamphlet

The fifteen modifications ordered or approved by the Board in its August 6, 1982 Decision were incorporated into a revised version of the pamphlet which was distributed by mail on October 18, 1982. (Loomis Affidavit at 1-2.) Subsequent to this distribution, Licensee was directed by NRC Region III to delete one of the instructions that the Board had ordered, *viz.*, "[i]f you are asked to evacuate, first put on a dust mask or breathe through a damp handkerchief to filter out any dust in the air." Counsel for the NRC Staff advised the Licensing Board and the parties that the NRC's technical staff viewed this language as technically unsound as a routine measure. Normally evacuation would be ordered as a precautionary measure some time before an actual release of radioactive material might occur. Wearing a dust mask or holding a handkerchief over the nose would, Staff believes, tend to delay evacuation and might interfere with driving and create a safety hazard. Respiratory protective measures should be utilized only upon the specific direction of offsite authorities at the time of an accident; such directions would be issued if radioiodines or particulate material is released, and normally sheltering, rather than evacuation, would be ordered in that situation. (Letter to

the Board from Richard J. Goddard, dated October 22, 1982.) We find Staff's argument persuasive and conclude that the quoted sentence was properly deleted from the pamphlet.

B. Distribution of the Emergency Preparedness Pamphlets to Residents

For the distribution of the pamphlet by mail in October 1982, a mailing list of all residences and businesses in the EPZ was prepared by Professional Business Services of Petoskey with the cooperation of the Utility Department of the City of Charlevoix, the Charlevoix Post Office, and the Petoskey Post Office. (Loomis Affidavit at 2.) The Postmaster of the City of Charlevoix, Mr. Joseph Schwartzfisher, advised Licensee that the October mailing would not be received by many summer residents and suggested that a mailing between mid-July and mid-August would reach virtually all mail customers residing in the EPZ. He also stated that he knew of no persons who were winter-only residents in the Charlevoix area. (Schwartzfisher Affidavit at 2.) Therefore, Licensee carried out a second mailing in mid-July 1983, and it commits to perform such a distribution on an annual basis. (Loomis Affidavit at 2.) We find that the mail distribution and Licensee's commitment to perform such a mail distribution annually are adequate for informing both year-round and summer residents. Further, we find that the absence of winter-only residents eliminates any need for a winter mail distribution.

C. Distribution of the Emergency Preparedness Pamphlets to Transients

Licensee has pursued several means of providing emergency preparedness information to transients. Quantities of the pamphlet were distributed to "transient-attracting" locations, including hotels, motels, restaurants, public buildings, marinas, transportation companies, and airports. (Grupp Affidavit at 3-4.) All but two of the locations cooperated by accepting the pamphlets and arranging for a place to display them. The two uncooperative locations were a service station, whose owner advised Licensee that company policy prohibited the display of noncompany material, and a motel whose owners feared that the knowledge that a nuclear plant was nearby would drive away business. (*Id.* at 5.) Additionally, two more locations declined to accept pamphlets during the second distribution: the U.S. Post Office, which stated that postal regulations prohibited the display of nongovernmental material; and a cafe, which refused for reasons similar to those given by the uncooperative motel. (*Id.*)

The pamphlets have also been distributed to locations beyond the 5-mile EPZ. The Emergency Services Director for Emmet County distributed quantities of the pamphlet to various locations outside the EPZ (a small portion of Emmet County lies within the EPZ), and Licensee provided copies for display at the Pellston and Traverse City airports, which are 30 and 60 miles from Big Rock Point, respectively. (*Id.* at 5-6.) Copies of the pamphlet were also distributed to selected locations in Boyne City, East Jordan, Ironton, Horton Bay, and Walloon Lake. (*Id.* at 6.) Licensee has committed to continue to distribute pamphlets to these locations and to encourage the continued cooperation of the persons to whom they are delivered. (*Id.*)

In addition, Licensee, in cooperation with the Charlevoix County Emergency Services Director, prepared a sticker for distribution to selected locations in the EPZ. The sticker instructs persons who hear a siren to tune their radios to one of the local radio stations designated to broadcast emergency information. (Loomis Affidavit at 3.) The stickers were mailed to all locations in the EPZ likely to attract transients, under cover of a letter from the Emergency Services Director asking the recipient to display the stickers where they would be noticed. (Grupp Affidavit at 30.)

Finally, information concerning the siren notification system has been included on the back of the boat dock permit which is acquired by all boaters who use the public docks in the City of Charlevoix. Similar information will be posted in a display case in Elzinga Park, which is located near the Big Rock Point Plant. (Loomis Affidavit at 4-5.)

We conclude that the Licensee has made a conscientious and effective effort to distribute information that will reach the transient population in the EPZ. Moreover, by distributing the pamphlet information at strategic locations outside the EPZ, Licensee has provided a means of reaching some transients before they reach the EPZ.

D. Conclusion

We find that Licensee has complied with the order of the Board in our August 6, 1982 Decision and with the regulatory principles concerning distribution of emergency planning information to the public. Accordingly, Christa-Maria Contention 9 is dismissed in its entirety.

IV. CASK DROP

Having found that the original wording of O'Neill Contention II.C did not raise any genuine issues of fact, the Board granted summary disposi-

tion of the contention as worded. (LBP-82-8, 15 NRC 299 (1982).) On the basis of information obtained by Intervenor in the course of discovery, however, the Board admitted under II.C the following reworded contention:

Is the spent fuel pool safe from a rupture which might be caused by a drop of a spent fuel transfer cask or of the overhead crane?

The Board also determined, *inter alia*, that there was a genuine issue of material fact as to whether it was necessary for the safety of the enlarged spent fuel pool for 200 gallons per minute (gpm) of makeup water to be available to protect the pool from the consequences of a dropped spent fuel transfer cask or the fall of the crane. That part of the contention dealing with the overhead crane was separated from the cask drop issue and reserved for litigation at the 1983 hearing; it was decided in LBP-84-32 (August 29, 1984). The cask drop issue was litigated during the 1982 hearing and will be decided here.

Based on reasons discussed below, the Board has determined that the testimony supports a finding that there is reasonable assurance that the fuel transfer cask will not drop into the spent fuel pool. Therefore, we need not make a finding on the question of whether it is necessary for 200 gpm of makeup water to be available in the event of a pool rupture caused by a cask drop.

Licensee presented a panel of witnesses consisting of the following persons: Mr. John W. Johnson (Testimony of John W. Johnson (Johnson), ff. Tr. 2419); Mr. Charles R. Norman (Testimony of Charles Norman (Norman), ff. Tr. 2419); Mr. John J. Popa (Testimony of John Popa (Popa), ff. Tr. 2419); and Mr. Davis Mullholand, Jr. (Testimony of Davis Mullholand, Jr. (Mullholand), ff. Tr. 2419).

The NRC Staff also presented a panel of witnesses, consisting of the following: Mr. Fred Clemenson, Mr. Richard L. Emch, Jr., Mr. Ian Sargent, and Mr. Dennis J. Vito (Joint Testimony of Fred Clemenson, Ian Sargent, D.J. Vito, and Richard L. Emch, Jr., Concerning O'Neill Contention II.C (Clemenson, *et al.*), ff. Tr. 2434, at 1-3).

Licensee also offered testimony as rebuttal to a portion of the Staff's testimony, presented by Mr. Mullholand and Mr. Norman (Rebuttal Testimony of Charles R. Norman (Rebuttal), ff. Tr. 2469).

The Intervenor presented no direct testimony on this issue but relied on cross-examination to make their case.

The M.P.R. Analysis² of the redundant support system for the 24-ton spent fuel transfer cask showed that the maximum dynamic loading on the redundant support system, in the event of a failure of the main hoist or primary cask lifting sling, would be less than 150 tons. (Johnson at 10.) The Whiting Corporation evaluation imposed a total dynamic load on the two cask catch mechanisms of 150 tons, or 75 tons per cask catch mechanism. (Norman at 6.) Each cask catch mechanism is connected to the wedge housing plates by two cask catch pins. (*Id.*) The analysis showed that the bending stress on the pins imposed by 37½ tons would exceed the yield strength of the pins. (*Id.* at 7.) Therefore Mr. Norman recommended that Consumers Power replace the pins with pins having a greater diameter and manufactured from stronger material. Consumers Power committed to make that modification. (*Id.*) Mr. Mullholand testified that the modifications would be made prior to the next refueling outage. (Mullholand at 3-4.)

The trolley load girt is bolted to steel angle clips that are riveted to the trolley truck. (Norman at 10.) The analysis performed by Whiting Corporation for this connection showed that the stresses imposed by the postulated load were well within the allowable yield stresses for the rivets. (*Id.*) The maximum shear stress postulated for certain of the bolts, however, exceeded the shear yield strength of the bolts. (*Id.*) Consequently, Mr. Norman recommended that the bolts in question be replaced with bolts having a higher yield strength. Consumers Power committed to make this modification, also. (*Id.* at 11.) The modification would be made prior to the next refueling outage. (Mullholand at 3-4.)

With the exception of the cask catch pins and certain bolts used to connect the load girt to the trolley trucks, the Whiting Corporation analysis showed that the imposition of a dynamic load of 150 tons would not overstress either the cask catch mechanism or the gantry crane at Big Rock Point. (Norman at 13.) Mr. Norman testified that the adoption by Consumers Power of his recommendations with respect to the aforesaid pins and bolts would preclude deformation of either the cask catch mechanism or the gantry crane as a result of the postulated cask drop. (*Id.* at 14.)

Mr. Popa testified on the maintenance program and procedures that are used for the crane and the fuel transfer cask lifting components. (Popa at 3-4.) He also described the training and experience of the maintenance personnel involved in a cask-lifting operation; the procedure involves about ½ of the maintenance crew, many of whom are skilled

² The M.P.R. Analysis was attached as Appendix II to Consumers Power Company's application for a License Amendment.

repairmen familiar with the rigging procedure. (*Id.* at 4, 6.) The 1980 M.P.R. Analysis recommended certain adjustments to and inspections of the cask and its rigging; the adjustments were made immediately, and the inspections have been incorporated into procedures for rigging and checking the cask. (*Id.* at 7.) Because of the training and experience of the personnel and the detailed procedures involved, Mr. Popa believes that there is reasonable assurance that the cask slings will be rigged properly and that the fuel transfer cask will not be dropped. (*Id.* at 8.) Even if a human error were made to cause the lifting sling to fail, however, the safety sling would prevent a cask drop; the safety sling protects against both mechanical failure and failure resulting from human error. (Sargent, Tr. 2443.)

The NRC Staff witnesses testified that Staff had evaluated the fuel transfer cask operation and design and procedures of the crane and had concluded that they complied with NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants." (Clemenson, *et al.*, at 20, 25.) Clemenson also testified that the safety sling, in addition to the lifting sling, was used at Big Rock Point, to preclude the cask from dropping in the event the lifting sling failed. (Clemenson, Tr. 2437.) Mr. Emch testified that the reactor head could be lifted by the crane, but it is not carried over the spent fuel pool and therefore is not a threat to the stored spent fuel. (Tr. 5459-60.) Licensee is restricted from using the fuel shipping cask. (Emch, Tr. 458.) A Staff review of the overall issue of control of heavy loads must be completed before anything heavier than the fuel transfer cask can be moved with the Big Rock Point crane. (Clemenson, *et al.*, at 1-25; Tr. 2440-42; Tr. 2435.)

In their "rebuttal" testimony, witnesses Mullholand and Norman testified that the welding on the crane was at least as good as the welding done today, that the gantry legs meet current design standards as specified in CMAA-(70) for the 75-ton rated load, and that the hoist gearing was adequate for the 75-ton load on the hook. Further, the crane was tested at 130% of its rated load, by lifting the primary steam drums which weigh roughly 100 tons. (Mullholand, Tr. 2472.) This lift met the initial requirement of ANSI B30.2-1976, Article 2-2.2.2. (*Id.*)

Intervenors, in their proposed findings, challenged certain assumptions which they allege were made for the M.P.R. Analysis. (Proposed Findings of Fact and Conclusions of Law on O'Neill Contention II.C: The Cask Drop Issue (Intervenors), September 24, 1982.) They argue that the analysis assumes equal loading on the two cables of the safety sling for a 2.98-inch drop, which would impose a total dynamic load of 148 tons. In an accident, they argue, it is likely that one cable would be

more loaded than the other. They believe that an uneven dynamic loading with a cask drop of more than 2.98 inches "would exceed the design load by at least 8 percent." (Intervenors at 3.) Further, Intervenors maintain that Licensee has failed to meet the requirements of NUREG-0612. (*Id.* at 4.)

The analysis carried out by Mr. Johnson dealt specifically with the possible causes of unequal loading on the sling cable: differences between the two safety slings in the friction between the wedges of the cask catch mechanisms and the safety slings, and differences in the clearance between the wedges of the cask catch mechanisms and the safety slings. (Johnson at 6.) Results of these analyses, which applied the two sources of unequal loading both separately and simultaneously, and which assumed a range of friction values and wedge clearances, indicated that the *maximum* load in the highest loaded cable would be 8% higher than the design load determined in the 1980 M.P.R. Analysis. (*Id.* at 7-8.) Further, Mr. Johnson's written testimony shows the relationship between maximum dynamic load and distance of cask free drop, for minimum and maximum friction effects and for no friction. (Johnson Fig. 6.) Even with a cask free drop of 6 inches, the maximum dynamic load would be less than 200 tons, well below the rated breaking strength (about 230 tons) of the safety sling assembly. (*Id.*)

Conclusion

We conclude that adequate precautions have been taken to prevent a drop of the spent fuel transfer cask when it is hoisted by the crane. Therefore the spent fuel pool is safe from the consequences of such an accident and O'Neill Contention II.C is dismissed.

Order

For all the foregoing reasons and based on consideration of the entire record in this matter, it is, this 25th day of September 1984,

ORDERED:

1. Our Initial Decision (On All Remaining Issues), LBP-84-32, 20 NRC 601 at 699 (1984) is amended so that the phrase "spent fuel pool exceeds the heat generating capacity" (§ 1, line 5) will read "spent fuel pool is insufficient for the heat generating capacity" and so that the phrase "the use of its gantry crane for loads" (20 NRC at 699-700) will read "the use of its gantry crane over the pool for loads."

2. Subject to the conditions set forth in LBP-84-32, as amended by ¶ 1 of this Order, the Director of Nuclear Reactor Regulation is author-

ized to grant to Consumers Power Company its application to amend its license to operate the Big Rock Point Nuclear Power Plant.

3. See LBP-84-32, 20 NRC at 700-01, for Ordering ¶¶ 8 to 11, each of which is applicable to this Order.

**THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

**Dr. Oscar H. Paris
ADMINISTRATIVE JUDGE**

**Mr. Frederick J. Shon
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Herbert Grossman, Chairman
Dr. James H. Carpenter
Dr. Peter A. Morris**

In the Matter of

**Docket No. 50-416-OLA
(ASLBP No. 84-497-04-OL)**

**MISSISSIPPI POWER & LIGHT
COMPANY, *et al.*
(Grand Gulf Nuclear Station,
Unit 1)**

September 28, 1984

In this Memorandum and Order, the Licensing Board dismisses the proceeding upon confirmation of the withdrawal of the only Intervenor.

**MEMORANDUM AND ORDER
(Terminating Proceeding)**

On August 30, 1984, the Licensing Board issued a Show-Cause Order requiring the sole Intervenor, Jacksonians United for Livable Energy Policies (JULEP), to show cause why its contentions should not be dismissed for its failure to prosecute the intervention. JULEP had taken no discovery and had failed to file a status report by August 1, 1984, as ordered by the Board, or thereafter.

On September 20, 1984, the Board received a written confirmation from JULEP of its decision to withdraw from the proceeding, which it had previously expressed to NRC Staff counsel.

The withdrawal of the only intervenor removes both the need and the occasion for evidentiary hearings in this proceeding. There are no longer any matters which the parties wish to resolve in this proceeding and, consequently, there is no issue to be heard by the Board.

Dismissal of this proceeding would be consistent with the Commission's requirements which do not contemplate a hearing on an application for an amendment to an operating license in the absence of any matters in controversy or any request for hearing by interested persons (*see* 10 C.F.R. §§ 2.104, 2.105, 2.714, 50.58(b) and 50.91) and is consistent with the general powers of the presiding officer under 10 C.F.R. § 2.718.

Order

For all of the foregoing reasons and based upon the entire record in this proceeding, it is, this 28th day of September 1984,

ORDERED

That this proceeding, begun with the publication of a notice of opportunity for hearing on October 26, 1983, at 48 Fed. Reg. 49,608, is hereby terminated.

**THE ATOMIC SAFETY AND
LICENSING BOARD**

**James H. Carpenter
ADMINISTRATIVE JUDGE**

**Peter A. Morris
ADMINISTRATIVE JUDGE**

**Herbert Grossman, Chairman
ADMINISTRATIVE JUDGE**

**September 28, 1984
Bethesda, Maryland**

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION

Harold R. Denton, Director

In the Matter of

Docket No. 50-289
(10 C.F.R. § 2.206)

GPU NUCLEAR CORPORATION
(Three Mile Island Nuclear
Station, Unit 1)

September 25, 1984

The Director of the Office of Nuclear Reactor Regulation denies a request filed by Ellyn R. Weiss and Robert D. Pollard on behalf of the Union of Concerned Scientists requesting that the Commission initiate show-cause or further enforcement proceedings with respect to the Three Mile Island Nuclear Station Unit 1 Emergency Feedwater System.

DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206

I. INTRODUCTION

In a petition dated January 20, 1984, the Union of Concerned Scientists (hereinafter referred to as UCS or Petitioner) identified five alleged deficiencies with the Three Mile Island Nuclear Station, Unit 1 (TMI-1) Emergency Feedwater (EFW) system which it sought to have resolved

prior to resumption of power operation at the facility.¹ In addition, the Petitioner contended that in the aggregate, the deficiencies it had identified with the EFW system compromised that system's reliability. In an "Interim Director's Decision Under 10 C.F.R. § 2.206," DD-84-12, 19 NRC 1128, issued on April 27, 1984, the Staff tentatively resolved four of the five issues raised by Petitioner, and deferred resolution of the fifth issue, concerning environmental qualification of the EFW system, as well as the aggregate deficiency issue, pending further review by the Staff. Concurrent with issuance of the Interim Decision, the Commission requested that the Staff provide three categories of information requested by UCS in a letter of February 13, 1984, to the Commissioners. In addition, the Petitioner filed a supplemental petition on May 9, 1984, based on the results of an NRC audit of the Licensee's environmental qualification records. UCS specifically requested that the Commission: (1) direct the Staff to independently verify the existence and technical sufficiency of the Licensee's environmental qualification documentation for all electrical components in the EFW system and all other systems required for proper operation of the EFW system; (2) direct the NRC Office of Investigations (OI) to investigate whether the Licensee made material false statements to the NRC in connection with the environmental qualification program; and (3) direct the NRC Office of Inspector and Auditor (OIA) to investigate whether the Staff provided false or misleading information to the Boards or Commission, or has been "derelict in its duty" with respect to the environmental qualification program at TMI-1. The supplemental petition was referred to the Staff for treatment as part of the pending petition. The Licensee amended its February 24, 1984 response to the January petition by submittals dated March 26, April 26, May 16, and May 31, 1984. The Licensee similarly responded to the supplemental petition pursuant to the Staff's request under 10 C.F.R. § 50.54(f) on June 11, 1984.

The Staff has now completed its review of all alleged EFW system deficiencies cited in the petition and the matters identified in the supplemental petition. Accordingly, this decision: (1) updates with respect to seismic qualification, and otherwise affirms the Interim Director's

¹ UCS identified the following deficiencies with the EFW system in its January 20, 1984 petition:

1. failure of the EFW system to be environmentally qualified
2. failure of the EFW system to be seismically qualified
3. inability of the EFW system to withstand a single component failure
4. inaccuracy of the EFW flow instruments
5. inadequacy of the Main Steam Line Rupture Detection System

See Petition at 1; DD-84-12, 19 NRC at 1128.

Decision; (2) provides the Staff's basis for denying the petition with respect to the environmental qualification and "aggregate" deficiency issues raised by UCS; (3) describes the Staff's disposition of the items of additional relief requested in the supplemental petition; and (4) provides the information requested by UCS in its letter of February 13, 1984.

II. INTERIM DIRECTOR'S DECISION

The Interim Director's Decision provided the Staff's review for three of the five issues identified by the Petitioner with respect to the TMI-1 EFW system: (1) the failure of the EFW system to be seismically qualified, (2) the inability of the EFW system to withstand a single component failure, and (3) the inadequacy of the Main Steam Line Rupture Detection System (MSLRDS).² For each of these alleged deficiencies the Staff concluded, for reasons set forth in the Interim Decision, that the requested action was not warranted at that time. Upon further consideration, the Staff's view with respect to these issues remains as stated in the Interim Decision. In this regard, no new information pertaining to the alleged single component failure and MSLRDS deficiencies has been identified since the time of issuance of the Interim Decision which would persuade me to reach conclusions different from those expressed in DD-84-12.

New information has, however, developed regarding the seismic capability of the EFW system. This new information, described below, generally pertains to assuring operator access to the intermediate building for required manual actions for the interim period of operation until system upgrades are complete, and provides additional support for the previous findings in this area.

Seismic Qualification of the Emergency Feedwater System

The Licensee plans to perform a number of modifications to, among other things, upgrade the seismic capability of the EFW system during

² As explained in the Interim Decision, I declined to consider the Petitioner's request with respect to the accuracy of EFW flow instrumentation, as that issue had been fully explored in the TMI-1 restart proceeding. See DD-84-12, 19 NRC at 1130-31. Moreover, the precise issue raised by the Petitioner, EFW flow instrumentation accuracy, was the subject of responses filed before the Commission, as well as a Board Notification within the context of the restart proceeding. Subsequent to issuance of the Interim Director's Decision, the Commission issued its decision on TMI-1 restart proceeding design issues. See *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit 1), CLI-84-11, 20 NRC 1 (1984). That decision was silent with respect to the flow indicators, leaving undisturbed the Staff's determination, as expressed in Board Notification 84-088, that the existing TMI-1 EFW flow instruments were acceptable. See also DD-84-12, 19 NRC at 1130-31.

the first refueling outage following restart.³ Upon completion of these modifications, the TMI-1 EFW system will be capable of totally remote operation following a safe shutdown earthquake (SSE), even if that SSE should lead to an intermediate building harsh environment due to a postulated failure of any nonseismically qualified high-energy line. To assure EFW system operability following an SSE in the interim, the Licensee, if necessary, would dispatch an operator to the intermediate building to perform local manual actions.⁴ The petition alleges, among other things, that operator access to the intermediate building may not be possible following an SSE because of a harsh environment created by the postulated failure of nonseismically qualified intermediate building systems.

Petitioner specifically postulated the failure of nonseismically qualified vent stacks from safety relief valves (MSV-22A,B) and atmospheric dump valves (MSV-4A,B). Failure of these vent stacks while steam is flowing through them could result in an intermediate building harsh environment that would prevent operator access. The Staff addressed this matter in the Interim Director's Decision and concluded, based primarily on probabilistic arguments, that reasonable assurance existed that intermediate building local manual actions would not be precluded because of a harsh environment resulting from vent stack failure following an SSE for the interim period of operation until system upgrades are complete. *See* DD-84-12, 19 NRC at 1132 (referencing Safety Evaluation of the Office of Nuclear Reactor Regulation Supporting Interim Director's Decision Under 10 C.F.R. 2.206 (Seismic Capability of Emergency Feedwater)). However, in a meeting with the Staff on April 27, 1984, the day of issuance of the Interim Director's Decision, and in its third amended response to the petition, the Licensee committed to install seismically qualified restraints on those vent stacks prior to any restart, thus eliminating any possible concern regarding vent stack failure following a seismic event and the possible resultant intermediate building harsh environment.⁵ The Licensee has since completed installation

³ *See* Letter from H.D. Hukill (GPU) to J.F. Stolz (NRC) (August 23, 1983); Letter from R.F. Wilson (GPU) to D.G. Eisenhut (NRC) (May 10, 1984); Summary of April 27, 1984 meeting with GPU Nuclear regarding the Three Mile Island, Unit 1 Emergency Feedwater System (May 2, 1984).

⁴ *See* Safety Evaluation by the Office of Nuclear Reactor Regulation Supporting Director's Interim Decision Under 10 C.F.R. 2.206 (Seismic Capability of Emergency Feedwater), Three Mile Island Nuclear Station, Unit No. 1 (April 27, 1984).

⁵ *See* Summary of April 27, 1984 meeting with GPU Nuclear regarding the Three Mile Island, Unit 1 Emergency Feedwater System, (May 2, 1984); Licensee's Amended Response to Union of Concerned Scientists' Petition for Show Cause Concerning TMI-1 Emergency Feedwater System (May 16, 1984).

Prior to this commitment, the Licensee had planned for the vent stack modification to be completed during the Cycle 6 refueling outage. In addition, the Licensee committed to upgrade the supports for the EFW pump recirculation lines to seismic class I prior to restart. This modification had previously been scheduled for completion during the Cycle 6 refueling outage. *See id.*

of these seismic restraints and the modification has been inspected and found acceptable by NRC regional inspectors. See Inspection Report 50-289/84-22.

Since the petition addressed only the potential failure of the non-seismically qualified vent stacks, the Interim Decision was directed only to this occurrence. However, there are other nonseismically qualified intermediate building systems whose failure following an SSE could result in a harsh environment. Since the issuance of the Interim Director's Decision, the Staff has continued its review in this regard to evaluate the potential interactions from *all* nonseismically qualified intermediate building systems whose failure following an SSE could create an intermediate building harsh environment.

Of particular concern to the Staff was the nonseismic class I main feedwater line that crosses the intermediate building. Failure of this line during a seismic event would create a harsh environment and prevent access to the intermediate building.⁶ In its Amended Response to Union of Concerned Scientists' Petition for Show Cause Concerning TMI-1 Emergency Feedwater System (May 16, 1984), the Licensee references the TMI-1 Final Safety Analysis Report (Updated Version), which indicates that the maximum intermediate building main feedwater line primary and secondary stress (including deadweight, thermal, internal pressure and seismic stresses) is 46.5% of the stress level at which a high-energy pipe break should be postulated.⁷ However, these calculations were based upon an operating basis earthquake (OBE), which is of lesser severity than an SSE. Consequently, the Licensee subsequently provided, by letter dated June 4, 1984, the results of additional stress calculations indicating that the maximum main feedwater line pipe stress, based on an SSE, is also well within the stress level at which a high-energy pipe break should be postulated. The Staff has reviewed the results of these calculations and is able to conclude that an adequate margin exists for the intermediate building main feedwater line, and accordingly, reasonable assurance exists that the line would withstand an SSE without rupture. In addition, further EFW system upgrades will be completed in the long term which will make operator access unnecessary.

In response to a Staff request, the Licensee also performed similar analyses of the other nonseismic class I intermediate building lines

⁶ Failure of this main feedwater line would also result in intermediate building flooding which would threaten EFW system operability since the EFW system is low in the building. Although arguably not cited by Petitioner as a basis for its request, the Staff has, nevertheless, pursued this matter. See § III, *infra*.

⁷ See also Letter from H.D. Hukill (GPU) to J.F. Stolz (NRC) (April 13, 1984).

whose failure could result in harsh environments.⁸ Staff review of the results of these stress analyses leads to the conclusion that the stresses are within acceptable limits so as to provide reasonable assurance that the nonseismic class I intermediate building lines would withstand an SSE without rupture. Based upon these calculations for intermediate building main feedwater and nonseismic class I lines, the Staff is able to conclude that there is reasonable assurance that a harsh environment in the intermediate building will not result following an SSE. Accordingly, intermediate building operator access for local manual EFW system operation following an SSE would not be precluded for the interim period of operation until system upgrades are complete.

Although not specifically cited as a deficiency by Petitioner, the Staff has also reviewed whether nonseismically mounted intermediate building components or equipment, such as ventilation ducts, could fail following an SSE so as to inhibit operator access to the EFW equipment or otherwise impair EFW system operation. This review included a Staff walkdown of the TMI-1 intermediate building on May 22, 1984, and a later walkdown by the Licensee.⁹ The Licensee, in a July 16, 1984 letter, provides the disposition of the potential deficiencies identified during the walkdowns. That letter also provides some indication of the thoroughness of the walkdown. The two minor modifications identified as necessary by the Licensee during its walkdown (anchoring radiation monitor RMA-2, and replacing ladder mounting bolts) have been completed by Licensee and will be inspected by NRC regional inspectors. Based upon a review of the information provided in Licensee's submittal, and the knowledge gained by the Staff during its walkdown of the TMI-1 intermediate building, the Staff concludes that there is reasonable assurance that operator access to the intermediate building and the vicinity of the EFW system will not be impaired by the failure of nonseismically mounted components and equipment following the occurrence of an SSE for the interim period of operation until system upgrades are complete. Similarly, the Staff concludes that there is reasonable assurance that EFW system operation will not be impaired as a result of an SSE event. Accordingly, the Staff finds that, for the reasons set forth in the Interim Director's Decision and as supplemented herein, no further action need be taken prior to restart with respect to the seismic qualification of the EFW system.

⁸ See Letters from J.F. Stolz (NRC) to H.D. Hukill (GPU) (June 25, July 24, and August 8, 1984) and Letters from H.D. Hukill (GPU) to J.F. Stolz (NRC) (July 16, July 30, and September 7, 1984).

⁹ See Letter from H.D. Hukill (GPU) to J.F. Stolz (NRC) (July 16, 1984).

III. ENVIRONMENTAL QUALIFICATION OF THE TMI-1 EFW SYSTEM

The petition alleges, among other things, that the TMI-1 EFW system is not environmentally qualified as required by NRC regulations. Petitioner's specific concern rests with the environmental qualification of electrical equipment as required by 10 C.F.R. § 50.49.¹⁰ To support its request, Petitioner cites a December 10, 1982 Staff safety evaluation report addressing TMI-1 environmental qualification, a November 5, 1982 technical evaluation report prepared by Franklin Research Center (FRC TER) on the same subject, and two meetings between the Licensee and the Staff, which Petitioner attended, on October 5 and December 16, 1983.¹¹ The petition provides no information that was not previously known to the Staff.

There are three aspects that must be considered in making environmental qualification determinations: (1) defining harsh environments in which electrical equipment may be required to operate, (2) defining which electrical equipment may be required to operate in the harsh environment, and (3) demonstrating that the required equipment is qualified to operate in the harsh environment. Although the petition focuses on the third aspect of environmental qualification cited above,

¹⁰ The petition specifically cites General Design Criterion 4 from 10 C.F.R. Part 50, Appendix A, "Environmental and missile design bases" which applies to structures, systems and components important to safety. However, it is clear from the petition that UCS's concerns rest solely with the environmental qualification of electrical equipment.

In the restart proceeding, the Licensing and Appeal Boards held that the issue of environmental qualification of electrical equipment was removed from the restart proceeding by the Commission's generic rulemaking on the subject. By order dated January 27, 1984 (unpublished), the Commission took review of these decisions. Petitioner's position in response to the January 27 Order was that the Licensing and Appeal Boards erred in these decisions and that the issue of environmental qualification of electrical equipment should be addressed in the restart proceeding. See Union of Concerned Scientists' Brief on the Commission's Review of ALAB-729 (March 19, 1984), at 2-9. Staff's position was that the Licensing and Appeal Boards did not err and that the issue was, in fact, removed by the Commission's generic rulemaking. See NRC Staff's Brief Concerning the Commission's Review of Specific Design Issues in ALAB-729 (March 19, 1984), at 3-13.

By CLI-84-11, dated July 26, 1984, the Commission decided that the generic rulemaking had not entirely removed the issue of environmental qualification from the restart proceeding. The Commission decided that environmental qualification encompassing the environments, locations and equipment with a nexus to the TMI-2 accident is within the proceeding. The Commission therefore directed the Staff to certify that TMI-1 electrical equipment which is required to mitigate small-break loss-of-coolant accidents and loss-of-feedwater transients and which is located in containment and the auxiliary building is environmentally qualified for radiation. Since the TMI-1 EFW system electrical components subject to environmental qualification are located in the intermediate building, and not in containment or the auxiliary building, Petitioner's allegation does not duplicate restart proceeding issues.

¹¹ The safety evaluation and technical evaluation reports were issued under letter dated December 10, 1982. See Letter from J.F. Stolz (NRC) to H.D. Hukill (GPU). The October 5, 1983 meeting is documented by Licensee submittal dated February 10, 1984. See Letter from H.D. Hukill (GPU) to J.F. Stolz (NRC). The December 16, 1983 meeting is documented by Summary of Afternoon Meeting with GPU Nuclear Corporation on December 16, 1983 (December 22, 1983).

the Staff's review led it to address, in varying degrees, all three aspects of environmental qualification for the TMI-1 EFW system. For reasons as set forth below and presented in detail in the attached Safety Evaluation Report dated September 13, 1984, the Staff concludes that the TMI-1 EFW system is environmentally qualified as required by NRC regulations.

Definition of Harsh Environment

In its initial response to the petition,¹² the Licensee stated that:

[T]he intermediate building environmental qualification program has utilized two specific main steam line breaks (24 inch and 12 inch), which produce the most severe environment for electrical equipment. Other breaks in the feedwater lines produce a much less severe environment and are not the basis for qualification.

This statement is correct with respect to intermediate building pressure, temperature and humidity. However, a main feedwater line break in the intermediate building would also create a flooding hazard that would not be provided by a main steam line break. In this regard, in GPU Nuclear Technical Data Report (TDR) No. 250, Rev. 1, "Review of Intermediate Building Flooding Following a Feedwater Line Break in the Intermediate Building of TMI-1," dated January 9, 1984, the Licensee concluded that adequate time may not be available for operator action to mitigate intermediate building flooding from a main feedwater line break before the flood level reaches the EFW pumps, which are the lowest EFW system electrical components not qualified for submergence. The Staff was provided a copy of TDR No. 250 during a March 20-21, 1984 environmental qualification audit¹³ and, by letter dated March 29, 1984, raised this concern with Licensee and also requested additional, clarifying information. The Licensee responded by letter dated April 13, 1984, and subsequently provided "Licensee's Amended Response to Union of Concerned Scientists' Petition for Show Cause Concerning TMI-1 Emergency Feedwater System," dated April 26, 1984, in which the Licensee committed to perform intermediate building modifications that would increase the time available for operator action from approximately 5 minutes to 25 minutes.¹⁴ These modifications have subsequently been

¹² See Licensee's Response to Union of Concerned Scientists' Petition for Show Cause Concerning TMI-1 Emergency Feedwater System (February 24, 1984), attachment at 3.

¹³ A complete discussion of the purpose of the file audits is provided below and in the attached Safety Evaluation (not published).

¹⁴ These modifications had previously been planned for the Cycle 6 refueling outage. See Letter from H.D. Hukill (GPU) to J.F. Stolz (NRC) (August 23, 1983).

completed by the Licensee,¹⁵ and will be inspected by NRC regional inspectors. The Staff considers the 25-minute time frame to be adequate time for an operator to diagnose the event and take the necessary mitigating actions. Neither the petition nor the Staff's review identified any other areas for concern with respect to the definition of intermediate building harsh environments.

Electrical Equipment Required to Operate in Harsh Environment

With respect to defining which EFW electrical equipment would be required to operate in a harsh environment, and therefore would be subject to the requirements of 10 C.F.R. § 50.49, the Staff requested that the Licensee provide such a list during a March 8, 1984 meeting.¹⁶ The Licensee provided a working list for Staff use during the March 20-21 environmental qualification file audit and subsequently presented and discussed a list at an April 27, 1984 meeting with the Staff.¹⁷ At the April meeting the Staff expressed certain reservations as to the methodology used by Licensee to develop the list and shortly thereafter requested Licensee to provide clarification.¹⁸ The principal Staff concerns focused on (1) whether the Licensee had used a systematic approach in developing the list, and (2) whether the Licensee had properly documented its review, particularly with respect to the bases for excluding equipment from environmental qualification. This issue was further discussed with the Licensee during the May 7-8, 1984 environmental qualification file audit. During these discussions it became apparent that the Licensee's methodology for identifying equipment subject to environmental qualification may not have given adequate consideration to electrical equipment from nonsafety-related systems whose operation may be needed for, or whose spurious operation might jeopardize, operation of a safety-related system.¹⁹ With respect to emergency feedwater, the methodology did not consider whether certain interfacing main steam or condensate system (nonsafety-related) components would be required to operate to assure EFW system operability for the events in

¹⁵ See Letter from H.D. Hukill (GPU) to J.F. Stolz (NRC) (August 1, 1984).

¹⁶ See Summary of Meeting with GPU Nuclear Corporation on Environmental Qualification (March 19, 1984).

¹⁷ See Summary of April 27, 1984 Meeting with GPU Nuclear Regarding the Three Mile Island, Unit 1 Emergency Feedwater System (May 2, 1984).

¹⁸ See Letter from D.G. Eisenhut (NRC) to H.D. Hukill (GPU) (May 3, 1984).

¹⁹ The Staff viewed these deficiencies as programmatic ones not limited to the EFW system. This information prompted the Staff's May 25, 1984 letter to the Licensee requesting information on the overall TMI-1 environmental qualification program.

question. The Licensee fully addressed this matter and provided additional information in its response to the Staff's May 3, 1984 letter.²⁰

Upon review, the Staff concluded that the Licensee had identified those electrical components of the EFW system required to be environmentally qualified, with the exception of the Licensee's exemption of condensate system valves from environmental qualification (i.e., COV-14A,B and COV-111A,B). The Staff would require that these valves be environmentally qualified, because operation of these valves in a harsh environment may be necessary as backup to postulated single failures. The Staff subsequently advised the Licensee of its position, and the Licensee agreed to include the valves in its environmental qualification program.²¹

Therefore, based upon the review activities described above, the Staff concludes that Licensee's environmental qualification program encompasses that electrical equipment located in a harsh environment whose operation may be necessary to assure EFW system operability in a harsh environment. A complete list of components is provided in the attached safety evaluation (not published).²²

Qualification of Electrical Equipment

The third and final aspect of the Staff's review, and the true focus of the petition's environmental qualification allegation, addresses the issue of whether the specific electrical equipment subject to environmental qualification has been adequately demonstrated to remain operable in the prescribed harsh environment, and whether adequate documentation of any such demonstration exists.²³ The petition draws heavily from the Franklin Research Center technical evaluation report (FRC TER) which contained a number of environmental qualification issues that were unresolved at the time of its issuance in November 1982. The Staff was continuing its review of the Licensee's resolution of the FRC TER deficiencies at the time of receipt of the petition.

²⁰ See Letter from R.F. Wilson (GPU) to D.G. Eisenhut (NRC) (May 10, 1984).

²¹ See Letter from J.F. Stolz (NRC) to H.D. Hukill (GPU) (June 25, 1984), and Letter from H.D. Hukill (GPU) to J.F. Stolz (NRC) (August 6, 1984).

²² The Staff's activities did not, however, include a rigorous review of whether Licensee had adequately identified equipment at the subcomponent level (e.g., the identification of splices, terminal blocks and motors within a valve operator). The petition makes no allegations in this regard and the Staff identified no basis for pursuing this matter during its review.

²³ In the most fundamental sense, a component is considered environmentally qualified if (1) it has been successfully tested for a harsh environment (e.g., pressure, temperature, radiation, chemical spray) that is more severe than what it would see in the plant and (2) a similarity is established between the tested component and the component installed in the plant.

To address this allegation the Staff performed an initial audit of the TMI-1 EFW system environmental qualification files on March 20-21, 1984. Audit results were provided to the Licensee by letter dated April 25, 1984.²⁴ As described in the April 25 letter, the Staff concluded that the files did not adequately demonstrate environmental qualification of EFW system electrical components and that the deficiencies were both general in nature and component-specific. The Licensee endeavored to address the deficiencies and the Staff subsequently performed a second audit on May 7-8, 1984, with similar results. Additional audits were performed on May 24, June 25, and August 6, 1984. Comments were provided to the Licensee at the conclusion of each audit session.²⁵ Based upon the findings from the August 6, 1984 audit, the Staff is able to conclude that the TMI-1 environmental qualification files adequately demonstrate the environmental qualification of EFW system electrical equipment.

The specific details of the audits and file deficiencies are described in the attached safety evaluation. However, two components warranting special mention are the converters for the EFW flow control valves. The Licensee had initially proposed a justification for continued operation for these components since no qualification testing data were available.²⁶ The justifications were based upon probabilistic arguments and the availability of feed-and-bleed cooling as a backup for core cooling.²⁷ At the March 8, 1984 meeting, the Staff advised the Licensee that it could not accept the proposed justification without substantial additional review. The Licensee subsequently committed to replace the converters with environmentally qualified components,²⁸ and regional inspectors have verified that this modification is complete. Other required equipment replacements, as described in the safety evaluation, have been verified by regional inspectors. See Inspection Report 50-289/84-22.

In view of the foregoing discussion, the Staff concludes for reasons set forth above, that the appropriate harsh environments are defined, that the electrical equipment essential for EFW operation is properly identified, and that adequate documentation exists to demonstrate the

²⁴ See Letter from J.F. Stolz (NRC) to H.D. Hukill (GPU) (April 25, 1984).

²⁵ Audit notes were provided to the Petitioner in a letter from J.F. Stolz (NRC) to E.R. Weiss (UCS) (August 7, 1984).

²⁶ See Licensee's Response to Union of Concerned Scientists' Petition for Show Cause Concerning TMI-1 Emergency Feedwater System (February 24, 1984).

²⁷ The feed-and-bleed core cooling mode does not rely upon the steam generators for decay heat removal. The Staff believes that there is a high probability that feed and bleed is a viable means of core cooling, but it has not been reviewed from the standpoint of a design basis event.

²⁸ See Licensee's Amended Response to Union of Concerned Scientists' Petition for Show Cause concerning TMI-1 Emergency Feedwater System (March 26, 1984).

qualification of all essential equipment. Adequate actions have been taken to assure that the TMI-1 EFW system is environmentally qualified in accordance with NRC regulations. No further action need be taken before restart.

Notwithstanding this conclusion, however, the Staff's initial audit findings regarding the unacceptability of the Licensee's environmental qualification files for EFW components, and the deficiencies identified in Licensee's methodology for identifying components required to be qualified, raised questions as to the adequacy of Licensee's overall environmental qualification program. Therefore, the Staff, by letter dated May 25, 1984, requested that the Licensee reaffirm the adequacy of its overall environmental qualification program in several specific areas.²⁹ The Licensee's response is pending.³⁰ However, with respect to the environmental qualification of electrical equipment within the scope of the TMI-1 restart proceeding (equipment required to mitigate small-break loss-of-coolant accidents and loss-of-feedwater transients) the Commission has directed the Staff to certify such equipment with respect to radiation. See CLI-84-11, *supra*. Thus, in addition to the environmental qualification required by the Commission under the restart proceeding, the Staff is continuing its 10 C.F.R. § 50.49 environmental qualification review for TMI-1, which will include further auditing, on an expedited basis.³¹ Should the Staff develop information from these audits indicating further action with respect to the TMI-1 environmental qualification program is necessary, appropriate action would be taken at that time.

IV. THE SUPPLEMENTAL PETITION

By supplemental petition dated May 9, 1984 (supplemental petition), the Petitioner requested further relief in connection with the EFW system. UCS based its request upon information contained in the Staff's April 25, 1984 letter to the Licensee expressing concerns regarding the environmental qualification of the TMI-1 EFW system as a result of the findings of the first TMI-1 environmental qualification file audit. See § III, *supra*. Petitioner compares this information with previous information and statements in correspondence and points out apparent inconsistencies and contradictory statements that it attributes to both the Licen-

²⁹ See Letter from D.G. Eisenhut (NRC) to H.D. Hukill (GPU) (May 25, 1984).

³⁰ The Staff expects to receive a response from the Licensee in October 1984.

³¹ Environmental Qualification file audits are routinely performed for nuclear power plants in the licensing phase. The Staff plans to conduct similar audits for all operating reactors.

see and the NRC Staff.³² Based upon these apparent inconsistencies, Petitioner requests three additional specific items of relief:

1. As a precondition to restart, the staff should be directed to independently verify that documentation exists *and* that it is technically sufficient to demonstrate environmental qualification of each and every electrical component in the emergency feedwater system and in every other system required for proper operation of the emergency feedwater system.
2. The Office of Investigations should be directed to immediately investigate whether GPU has made material false statements to NRC in connection with the environmental qualification program. Because this issue bears directly on GPU's competence and integrity, the investigation should be completed before a vote on restart.
3. The Office of Inspector and Auditor should be directed to investigate and determine whether the NRC Staff has provided false or misleading information to the Boards or to the Commission, or has been derelict in its duty in connection with the issue of environmental qualification in TMI-1.

See Supplemental Petition at 10-11.

With respect to the first request, the Staff, by virtue of the review activities described herein and in the attached safety evaluation, has performed the independent verification requested by Petitioner and concluded that the documentation is technically sufficient to demonstrate the environmental qualification of each electrical component in the EFW system and in every other system required for proper operation of the EFW system. Accordingly, the first request has been substantially satisfied by the review activities undertaken by the Staff.

In considering Petitioner's second request, the technical Staff reviewed the documentation related to the Licensee's environmental qualification program and identified certain statements made by Licensee in connection with the TMI-1 environmental qualification program which the Staff believed to be invalid. These statements were forwarded to the Office of Investigation (OI). After reviewing the statements identified by the technical Staff, OI initiated an evaluation to determine whether the matter warrants a full investigation. Accordingly, the Staff has satisfied Petitioner's request to the extent that OI is examining the TMI-1 environmental qualification issue. Should OI decide to conduct a

³² By filing dated July 31, 1984, Petitioner responds to an earlier Licensee response regarding the supplemental petition. In this filing Petitioner notes apparent inconsistencies between Licensee's response to the supplemental petition and other correspondence and information. Petitioner appears to have provided this filing to reinforce its earlier allegations since it explicitly requests no additional relief. However, the filing does imply that the Staff should expand its audit activities beyond the EFW system. The Staff intends to conduct this review as explained in § III, *supra*.

full investigation of the matter, the Staff would take appropriate action based upon the results of that investigation.

Upon its receipt, the supplemental petition was referred to the Office of Inspector and Auditor to determine whether the Staff acted improperly with respect to the issue of equipment qualification at TMI-1. This action essentially satisfies the Petitioner's request.³³

V. AGGREGATE DEFICIENCIES

Background

Each of the five basic deficiencies alleged in the petition have either been addressed herein or in the Interim Director's Decision. However, in its January 20 petition, UCS further contends that "one or more of the identified deficiencies, when viewed individually, would not necessarily pose an 'intolerable risk'," but that "[i]n the aggregate . . . [the deficiencies] thoroughly compromise the reliability of" the EFW system. Petitioner provides further clarification of its aggregate deficiencies concern in its letter of May 1, 1984 directed to the Director, Office of Nuclear Reactor Regulation. The Petitioner described its concern as depending "largely upon the findings regarding the specific EFW deficiencies; to the extent that the specific deficiencies we note in the petition are borne out, the point about the 'aggregate effect' is strengthened and vice versa. Therefore, the major issue is certainly whether the specific deficiencies we cite exist and/or have been corrected."

To properly focus the Petitioner's concern about aggregate deficiencies, a brief review of Staff's findings regarding each of the five alleged basic deficiencies is necessary. First, as discussed in this Decision, the Staff concludes herein that the TMI-1 EFW system is environmentally qualified. Second, the Staff concluded in the Interim Director's Decision that there are no MSLRDS deficiencies. Third, as the Staff concluded in Board Notification BN 84-088, dated April 24, 1984, the EFW flow instrumentation is sufficiently accurate for its intended purpose. Fourth, as stated in the Interim Director's Decision, the TMI-1 EFW system may be susceptible to single failures which could, for certain accidents, prevent it from performing its intended safety function. Fifth, the Staff concluded in the Interim Director's Decision as modified herein, that the TMI-1 EFW system would be capable of performing its intended

³³ It should be noted that a request for an investigation by OIA of internal NRC personnel matters does not fall squarely within the class of requests contemplated by 10 C.F.R. § 2.206. Section 2.206 permits interested members of the public to request initiation of enforcement proceedings with respect to any license.

safety function following an SSE, but that conclusion relies, in part, upon operator access to the intermediate building for local manual actions. Accordingly, the valid deficiencies to be considered in a review for aggregate deficiencies are (1) potential EFW system single-failure vulnerabilities, and (2) EFW system seismic limitations to the extent that intermediate building access for local manual action may be necessary.

There is also a time element to the aggregate deficiencies issue. That is, Licensee is committed to upgrading the EFW system after one cycle of operation. *See* § VI, *infra*. This upgrade will correct both the potential single-failure vulnerabilities and the seismic limitations. The possibility of aggregate deficiencies poses, therefore, a concern only for one cycle of operation. The issue then becomes one of whether, in light of potential single-failure vulnerabilities and seismic limitations, the TMI-1 EFW system would be capable of performing its intended safety function for the one cycle of operation until such time as system upgrades are complete.

The Staff believes that the specific review of each individual deficiency as presented herein and in the Interim Director's Decision, which was performed in accordance with normal review practice, has shown that an aggregate deficiency does not exist in the EFW system. The following description is provided, nevertheless, to explain the basis for the Staff's conclusion and to conveniently summarize the capabilities and limitations of the TMI-1 EFW system expected at the time of restart.

The Staff has reviewed, using current licensing criteria, those event or accident scenarios necessary to determine the integrated effect of all valid EFW system deficiencies within the scope of the petition. For example, Staff reviews of the EFW system for seismic and environmental qualification acceptability concurrently considered postulated single failures for each of these reviews. These reviews also included, where appropriate, the potential interaction from other intermediate building systems such as postulated failures that could cause a harsh environment or a seismic failure that would adversely affect the EFW system function. In that Staff reviews have included limiting accident scenarios and the potential effects of failures and interactions, the Staff reviews provide a basis for assessing the overall capability of the EFW system in an aggregate sense. The conclusion of these reviews is that the TMI-1 EFW system, as configured at the time of restart, will be capable of performing

its intended safety function for the one cycle of operation, i.e., until the system upgrades are complete.³⁴

The event scenarios of interest are seismic events, and intermediate building high-energy line breaks which expose EFW system single-failure vulnerabilities and also create harsh environments. Although the Staff has concluded herein that the TMI-1 EFW system is environmentally qualified, that issue was nevertheless considered in these scenario reviews so as to provide a means of verifying that all components required for EFW system operation (i.e., EFW system components as well as components from other systems) that could be subjected to an intermediate building harsh environment were identified and included in the environmental qualification program. Moreover, each event was analyzed individually as prescribed by Staff licensing criteria. Associated consequences, such as a harsh environment resulting from a high-energy line break, were assumed with the initiating event. A concurrent random single failure was also assumed.

With respect to intermediate building high-energy line breaks, the Staff considered whether operability of the EFW system could be affected by common-mode component failures due to harsh environments. With respect to seismic events, the principal concern of the Staff was whether the failure of nonseismically qualified intermediate building component(s) could create intermediate building environments during seismic events which would preclude operator access to perform required local manual actions.

EFW System Response During High-Energy Line Breaks

All four main steam lines and one of the two main feedwater lines transit the intermediate building. The intermediate building also houses all active EFW system components that could be subjected to a harsh environment. As indicated in the Interim Director's Decision, a non-mechanistic rupture of either the intermediate building main steam line or main feedwater line would create an event in which the EFW system must operate and a harsh environment for the EFW. Therefore, the possibility of potential common-mode failures due to a harsh environment must be considered. As noted in § III, *supra*, all electrical components situated in the intermediate building whose operability is essential

³⁴ The Staff acknowledges that the differences between the EFW system at the time of restart versus after the cycle 6 refueling do present a difference in system reliability which might, if compounded in many small ways, give rise to an aggregate concern of the kind suggested in the petition. However, the aggregate deficiencies in this instance include only two of the many circumstances in which the EFW system could be called upon to function, and the Staff considers these instances of compounded effect to be acceptable. See § VI, *infra*.

for proper operation of the EFW system are environmentally qualified. In particular, the Staff notes that the electric motor-driven EFW pumps, the EFW pump suction and the discharge cross-connect valves, the EFW flow control valves and the EFW flow indicators are qualified for an intermediate building harsh environment. All intermediate building condensate or main steam system electrical components required to operate to assure EFW initiation and operation following a nonmechanistic intermediate building main steam or feedwater line break are environmentally qualified. The Staff further notes that the failure of any unqualified main steam, condensate and/or EFW system electrical components due to an intermediate building harsh environment from a main steam line or feedwater line break will not jeopardize EFW system operation.

If a postulated concurrent single random failure of the flow control valve in the EFW feedwater header to the opposite steam generator were to occur in this situation, the EFW system could be rendered ineffective.³⁵ The Staff considers this to be an acceptable situation for one cycle of operation as a result of the interim modifications described in the Interim Director's Decision. *See* DD-84-12, 19 NRC at 1133-34. *See also* § VI, *infra*. Therefore, the Staff concludes that the aggregate deficiencies of the TMI-1 EFW system will not jeopardize system operability due to harsh environments following an intermediate building main steam or feedwater line rupture.

EFW System Response During Seismic Events

The Staff previously concluded in the Interim Director's Decision that reasonable assurance exists that the TMI-1 EFW system would be able to perform its intended safety function following the occurrence of a safe shutdown earthquake (SSE) and concurrent single active failure. *See* DD-84-12, 19 NRC at 1131-32. In reaching that conclusion, the Staff concluded that there is also reasonable assurance that required local manual actions would not be precluded by an intermediate building harsh environment resulting from a postulated failure of nonseismic portions of other systems, namely, the vent stack relief valves (MSV-22A,B) and the atmospheric dump valves (MSV-4A,B) for the interim period of Cycle 5 operation. However, as described in § II, *supra*, the Licensee has installed seismically qualified restraints on those vent stacks, thus eliminating any concern regarding vent stack failure.

³⁵ Occurrence of the postulated event would not, however, necessarily mean that the affected steam generator must be isolated. In this regard, the TMI-1 abnormal transient operator guidance (ATOG) program contains provisions for feeding an affected steam generator under certain circumstances.

Based upon the Licensee's action and the additional seismic interaction review set forth in § II, *supra*, the Staff is able to conclude that there is reasonable assurance that no intermediate building high-energy lines will fail during an SSE, and that operator access to perform required local manual actions to assure EFW system operability for the interim period of operation until system upgrades are complete is therefore assured.

In that Staff reviews have included the applicable accident scenarios coupled with both potential effects of failures and interactions, the Staff reviews provide an adequate basis for assessing the capability of the EFW system in an aggregate sense. Based upon these reviews, the Staff finds there is reasonable assurance that the TMI-1 EFW system will perform its intended safety function for the postulated events within the scope of the petition, with one exception. The exception involves the postulated situation of a main steam line or main feedwater line break accident requiring isolation of the affected steam generator compounded by the worst-case single random failure. This exception has been previously addressed in the Interim Director's Decision and found acceptable for one cycle of operation. *See also* § VI, *infra*. Therefore, the Staff's previous conclusion regarding the acceptability of the TMI-1 EFW system for the interim period of operation until such time as system upgrades are complete remains unchanged, and the Staff contemplates no further action prior to restart.

VI. PETITIONER'S LETTER OF FEBRUARY 13, 1984

By letter to the Commission dated February 13, 1984, the Petitioner, among other things, recommended that the Commission direct the Staff to answer three specific questions regarding the TMI-1 EFW system. The Commission subsequently requested that the Staff respond to these questions when it considered the Petitioner's request for relief.³⁶

The first question posed by UCS asked the Staff to:

Identify each specific aspect of the TMI-1 EFW system which does not comply or is not *known* to comply with the regulations applicable to systems important [sic] to safety (including safety-grade, safety-related, and engineered safety feature systems).

At the time of licensing of TMI-1, EFW systems were not considered safety-related systems. Consequently, relatively few regulations and

³⁶ See Memorandum from S.J. Chilk (NRC) to W.J. Dircks (NRC) (April 24, 1984).

standards applied.³⁷ Moreover, the applicability of regulations, absent any backfitting requirements, is established at the time of plant licensing. Within this framework, the TMI-1 EFW system complied with all regulations and standards applicable to that system, and this continues to be the case today. However, EFW systems are now considered safety-related such that EFW systems for new plants must meet safety-related system criteria in accordance with the Staff's Standard Review Plan (NUREG-0800).³⁸ In this regard, the Staff has reviewed the TMI-1 EFW system, as it will be configured at the time of restart. This review identified that the TMI-1 EFW system does not meet the regulations applicable to plants currently being licensed in one respect.³⁹ That is, the TMI-1 EFW system, as configured at the time of restart, will not meet the single-failure criterion for certain events.⁴⁰

Specifically, the TMI-1 EFW system at the time of restart will have a single flow control valve in each of the feedwater headers to the two steam generators.⁴¹ Therefore, for those events which may, under certain circumstances, require isolation of one steam generator, such as a main steam line break, steam generator tube rupture or a feedwater line break, failure of the flow control valve to open in the EFW header to the intact steam generator could result in an inability to deliver emergency feedwater flow for decay heat removal through the intact steam generator. Further, a single failure in the Integrated Control System (ICS), which currently controls the EFW flow control valves, could also result in an inability to deliver EFW flow by preventing the flow control valves from opening. Evaluation of these deficiencies is discussed in the response to Question 2, *infra*.

The second question raised by UCS asks that:

³⁷ See also Safety Evaluation by the Office of Nuclear Reactor Regulation Supporting Interim Director's Decision Under 10 C.F.R. 2.206 (Seismic Capability of Emergency Feedwater), Three Mile Island Nuclear Station, Unit No. 1 (April 27, 1984.)

³⁸ See NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," July 1981, § 10.4.9. Standard Review Plans provide guidance for the Office of Nuclear Reactor Regulation Staff responsible for the review of applications to construct and operate nuclear power plants. A system in conformance with the Standard Review Plan is generally considered to also be in conformance with the applicable regulations.

³⁹ The Staff had previously performed and submitted into testimony such a review during the TMI-1 Restart Proceeding. See NRC Staff Supplemental Testimony of J. Wermiel and J. Curry Regarding Emergency Feedwater System Reliability (Board Question 6). TMI-1 Restart Proceeding Transcript (TR) at 16,718. The Staff notes that the TMI-1 EFW system currently complies with 10 C.F.R. § 50.49 (Environmental Qualification of Electrical Equipment) by virtue of the fact that Licensee has completed replacement of certain components and performed intermediate building flooding modifications as described in § III, *supra*.

⁴⁰ See 10 C.F.R. Part 50, Appendix A, Criterion 44.

⁴¹ This discussion was previously provided in the Interim Director's Decision, but it is repeated here nevertheless for completeness. See Interim Director's Decision Under 10 C.F.R. § 2.206, DD-84-12, 19 NRC at 1133-34.

[F]or each deficiency or potential deficiency identified in response to item 1 above, explain whether and why the Staff believes that TMI-1 can be operated without undue risk to public health and safety before correction of the deficiency or potential deficiency.

The Staff has been aware of the system deficiencies identified in response to UCS Question 1 for some time, and the issue has been fully explored during the restart proceeding. The Staff considers the TMI-1 EFW system to be acceptable, provided that certain short-term modifications are completed prior to restart.⁴² Among these modifications is a change in failure mode for the flow control valves. These valves will fail so as to permit full EFW flow on either loss of instrument air or loss of control power.⁴³ Further, a separate remote manual control station independent of the ICS has been provided in the control room. This modification will permit the operator to remotely open the EFW flow control valves should they fail closed due to an ICS malfunction. The flow control valves could also be manually opened locally by means of a handwheel.⁴⁴

In the long term, the Licensee will install redundant EFW flow control and block valves and provide safety-grade automatic steam generator level control by no later than the first refueling outage following restart (Cycle 6 refueling).⁴⁵ Completion of these modifications prior to startup following Cycle 6 refueling is a specific Board-imposed condition from the restart proceeding.⁴⁶ The Licensee is also performing a number of additional long-term EFW system modifications beyond those described

⁴² See NUREG-0680, "TMI-1 Restart," June 1980 and Supplement 3 to NUREG-0680 (April 1981).

⁴³ The restart proceeding record shows that the flow control valves fail to the mid position on loss of control signal. However, by filing dated March 26, 1984, counsel for Licensee indicated that the existing flow control valve converters would be replaced with environmentally and seismically qualified converters by June 1984, and that with these new converters the flow control valves would fail to the open position on loss of control power.

⁴⁴ In accordance with a decision of the Atomic Safety and Licensing Board, the TMI-1 operating license will be conditioned to require that an auxiliary operator be dispatched to the EFW flow control valve area, upon any EFW auto-start condition, until the EFW system is made fully safety-grade. See *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit 1), ALAB-729, 17 NRC 814, 833 (1983). Admittedly, access would most probably be precluded following an intermediate building high-energy line break.

⁴⁵ See Summary of April 27, 1984 Meeting with GPU Nuclear Regarding the Three Mile Island, Unit 1 Emergency Feedwater System, Docket 50-289 (May 2, 1984), and Letter from R.F. Wilson (GPU) to D.G. Eisenhower (NRC) (May 10, 1984).

⁴⁶ See *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit 1), LBP-81-59, 14 NRC 1211, 1363, 1373, ¶¶ 1036, 1037, 1059 (1981); NUREG-0680, at C8-36 and Supplement 3, at 36-38; *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit 1), LBP-82-27, 15 NRC 747 (1982) and Staff's Response to Licensing Board's Directive to Report Details of its Enforcement Plan in the Form of a Supplemental Initial Decision (February 1, 1982).

above.⁴⁷ These additional modifications are generally intended to improve EFW system reliability pursuant to NUREG-0737, Items II.E.1.1 "Auxiliary Feedwater System Evaluation" and II.E.1.2 "Auxiliary Feedwater System Automatic Initiation and Flow Indicator" and to alleviate the need to rely upon compensatory operator action to assure system operability following a seismic event.

The Petitioner's third question focuses on the need for modifications after one cycle of operation. UCS asks that:

[F]or each deficiency or potential deficiency which the Staff believes need not be corrected before the first refueling outage after restart, explain why that deficiency ever needs to be corrected. In other words, if the Staff believes that the plant can be operated without undue risk to public health and safety until the first refueling, why would modifications be needed to assure public health and safety after the first refueling?

The Staff concludes that the short-term modifications cited above provide reasonable assurance that the TMI-1 EFW system will be adequately reliable to protect the public health and safety. The Staff further concludes that the long-term modifications (Cycle 6 modifications) will provide an additional improvement in safety. This approach of short- and long-term modifications is consistent with general Staff practice regarding safety improvements insofar as the short-term modifications provide an acceptable means for addressing a safety concern for the interim period of time until the preferred, long-term solution can be designed and implemented.⁴⁸ Specifically, with respect to the single-failure vulnerabilities of the flow control valves, the Staff considers the short-term modification to be acceptable essentially because the valves have been modified so that they fail open, permitting full flow, on either a loss of control signal or air. Upon completion of the long-term modification, however, the availability of redundant flow control valves to each steam generator will permit continued flow of emergency feedwater even with an assumed single failure. Similarly, the short-term control system modifications provide an acceptable means of mitigating the consequences of an ICS failure, while the long-term modification will result in a control system that will not be disabled by a single failure.

⁴⁷ See Summary of April 27, 1984 Meeting with GPU Nuclear Regarding the Three Mile Island, Unit 1 Emergency Feedwater System, Docket 50-289 (May 2, 1984), and letter from R.F. Wilson (GPU) to D.G. Eisenhut (NRC) (May 10, 1984).

⁴⁸ The thrust of Petitioner's Question 3, and the Staff's response thereto, generally parallel the respective parties' positions on this matter in the TMI-1 restart proceeding. The Staff's position in that proceeding was upheld by the Licensing Board and Appeal Board. See NRC Staff Testimony of Denwood F. Ross, Jr. Relative to the Sufficiency of the Proposed Additional Requirements (Board Question 2), Tr. 15,555; LBP-81-54, *supra*, 14 NRC at 1364, ¶ 1138 (1981). See generally ALAB-729, *supra*.

VII. CONCLUSION

The Staff has determined that it is unnecessary to institute show-cause or further enforcement proceedings with respect to the TMI-1 EFW system. The Petitioner's request to initiate such proceedings is denied. As described in this Decision and the Interim Director's Decision, DD-84-12, *supra*, the Staff has determined that the TMI-1 EFW system is environmentally qualified, that there is reasonable assurance with respect to single-component failures that the system will be adequately reliable to perform its intended safety function, and that the main steam line rupture detection system (MSLRDS) is adequate. As the Staff has maintained in the restart proceeding, it views the existing EFW flow instruments to be acceptable. The Staff has also determined that, with the interim compensatory measures instituted by the Licensee, there is reasonable assurance that the EFW system would remain operable following a safe shutdown earthquake (SSE). Upon considering in the aggregate those EFW system deficiencies identified by the petition, the Staff has determined that the TMI-1 EFW system, as configured at the time of restart, will be capable of performing its intended safety function for the one cycle of operation until the system upgrades are complete.

Accordingly, the Staff contemplates no further action with respect to the EFW system prior to restart. Moreover, the Staff has substantially satisfied the requests made by Petitioner in its supplemental petition by conducting detailed audits of the TMI-1 environmental qualification file, and identifying and referring to the Office of Investigation statements in the Licensee's submittals the Staff views to be invalid. The Staff by this Decision, has also provided to Petitioner the information requested in Petitioner's letter of February 13, 1984.

A copy of this Decision will be provided to the Secretary for the Commission's review in accordance with 10 C.F.R. § 2.206(c).

Harold R. Denton, Director
Office of Nuclear Reactor
Regulation

Dated at Bethesda, Maryland,
this 25th day of September 1984.

[The attachment has been omitted from this publication but may be found in the NRC Public Document Room, 1717 H Street, NW, Washington, DC 20555.]

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Nunzio J. Palladino, Chairman
Thomas M. Roberts
James K. Asselstine
Frederick M. Bernthal
Lando W. Zech, Jr.

In the Matter of

Docket No. 50-416

**MISSISSIPPI POWER & LIGHT
COMPANY
MIDDLE SOUTH ENERGY, INC., and
SOUTH MISSISSIPPI ELECTRIC
POWER ASSOCIATION
(Grand Gulf Nuclear Station,
Unit 1)**

October 25, 1984

To avoid giving the erroneous impression that by designating its full-power authorization for the Grand Gulf facility a "license amendment" (to a previously issued facility license authorizing low-power operation) it intended to create new hearing rights under § 189a of the Atomic Energy Act of 1954, as amended, the Commission orders the Staff to replace the "license amendment" with a separate full-power license.

ORDER

On June 16, 1982, the Nuclear Regulatory Commission (NRC or Commission) issued a Facility Operating License authorizing operation of the Grand Gulf Nuclear Station, Unit 1, at up to 5% power. On August 31, 1984, the NRC authorized that facility to operate at full

power by issuing what was entitled "Amendment No. 13 to Facility Operating License." Jacksonians United for Livable Energy Policies (JULEP) on October 1, 1984, challenged issuance of that amendment in the United States Court of Appeals for the District of Columbia Circuit. That challenge has brought to the Commission's attention the semantic problem created by labelling the authorization to operate at full power as a "license amendment."

Mississippi Power & Light Company applied for an operating license in 1978, and the NRC at that time noticed the application and the opportunity for interested persons to request a hearing. 43 Fed. Reg. 32,903 (July 28, 1978). The Commission in authorizing operation at full power did not intend to issue a license amendment which could be viewed as creating new hearing rights under § 189a of the Atomic Energy Act. Rather, the Commission in authorizing full-power operation intended no more than final issuance of the operating license originally requested and noticed in 1978. To avoid potential confusion in this area, the Commission has decided to direct the NRC Staff to replace the prior document entitled "Amendment No. 13 to Facility Operating License" with a separate full-power operating license.¹ This Order explains the basis for the Commission's action.

I. BACKGROUND

The NRC published notice of receipt of an application from Mississippi Power & Light Company for full-power operating licenses for the Grand Gulf Nuclear Station, Units 1 and 2, on July 28, 1978. In that notice, the Commission stated that it would consider issuance of the operating licenses upon, among other things, "a finding by the Commission that the application for the facility licenses, *as amended*, complies with the requirements of the Atomic Energy Act of 1954 . . . and the Commission's regulations . . .," and that "any person whose interest may be affected by this proceeding may file a petition for leave to intervene." 43 Fed. Reg. 32,903, 32,904 (emphasis added).

No hearing was requested, and the application was processed in accord with the procedures for handling uncontested cases. The NRC Staff reviewed the application and provided regulatory guidance to the Applicant. Moreover, necessary changes were made to the application to ensure that the regulatory requirements were met. On June 16, 1982,

¹ The full-power license changes none of the technical requirements in the amended low-power license, except that it incorporates the regulatory exemptions which were granted separately. See note 7, *infra*.

the NRC determined that the necessary requirements for low-power operation had been satisfied, and accordingly issued Facility Operating License NPF-13, authorizing operation of Unit 1 up to and including 5% of full power (the so-called "low power" license). The NRC at the time it issued that license was still reviewing the application for operation above 5% of power, i.e., the uncontested proceeding initiated by the original application was still under way.

After receiving this low-power license the Licensee commenced fuel loading and achieved initial criticality in August 1982. Numerous problems, including discrepancies in the surveillance procedures and technical specifications, were subsequently identified. This led to a series of inspections and reviews extending over a period of 2 years. See DD-84-21, 20 NRC 788 (1984), for a general background discussion of these events. It became apparent during this time period that changes to the low-power license were required.² Some of those changes were required solely to continue operation and testing at low power, while others were required for later full-power operation. The NRC determined that those changes required solely for low-power operation were in fact amendments to the existing low-power license that required notice and an opportunity for hearing under § 189 of the Atomic Energy Act.³ However, those required only for later full-power operation were considered to be changes to the original application, and as such covered by the 1978 notice.⁴ Hence, those latter changes, although termed "li-

² The low-power license was not suspended or revoked during this time period, although the plant remained shut down for much of the time.

³ Two amendments were noticed. Specifically, License Amendment 10 involved substantive changes to the technical specifications to redefine the operability requirements for high pressure core spray, to reflect a post-low-power license design change on RIIR jockey pumps, and to permit one-time exceptions to certain surveillance requirements so that the plant could start up and operate at low power before performing certain required tests. These changes were necessary to permit restart and operation under the low-power license.

License Amendment 12 involved technical specification changes which were simply corrections of errors, changes for nomenclature consistency, and changes to conform erroneous technical specifications to the approved facility design. In retrospect, these changes were encompassed by the original full-power operating license application notice, and this amendment need not have been noticed.

⁴ Four amendments were not noticed because they related to the full-power application. Specifically, Amendments 7, 8, and 9 involved simple corrections to typographical errors, changes to make nomenclature consistent, and changes to conform erroneous technical specifications to the actual facilities' design as proposed in the operating license application and as reviewed and approved by the NRC Staff. These changes to correct inadvertent and unintended errors or ambiguities in the license were covered by the original 1978 notice.

Amendment 11 modified a license condition involving control room leakage so as to approve an initial control room leakage test, but required further testing and analysis to support or establish a proper allowable control room leak rate for operation under a full-power license. Because this modified license condition and the information required by it resulted from, was a part of, and was necessary for completion of, the review for a full-power license, it was encompassed by the original 1978 notice.

cense amendments" and made to the low-power license, rather than the full-power application, were not noticed.⁵

The Commission on July 31, 1984, determined that Mississippi Power & Light's application for a full-power license met the applicable statutory and regulatory requirements, and therefore authorized issuance of a full-power license. Since a low-power license had been issued 2 years earlier, however, the NRC followed the earlier pattern established in this case and amended that low-power license to authorize full-power operation, rather than issuing a separate full-power license. It is that act which is the focus of this Order and to which the Commission will now turn.

II. AUTHORIZATION TO OPERATE AT FULL POWER

It is apparent from the above discussion that the Commission's action in authorizing full-power operation did no more than culminate the process begun on July 28, 1978, by issuance of the notice of receipt of an operating license application (43 Fed. Reg. at 32,903). That notice had informed all interested persons that the Commission would consider issuance of a full-power operating license if it found that the application, as amended in the review process, complied with the statutory and regulatory requirements. Hence interested persons were on notice that the final license would differ from the original application, and changes to the application did not create new hearing rights.

The Commission, once it determined the regulatory requirements had been met, could, therefore, have granted the application as amended simply by issuing a full-power license. Indeed, issuing a separate full-power license would have been consistent with past Commission practice in this area. For the 2 years following the Three Mile Island accident, the Commission, rather than amending existing low-power licenses, issued separate full-power licenses. However, after several such cases it was decided that there was no need to issue two separate licenses. Accordingly, the Commission for the past few years has simply "amended" the existing license by dropping the low-power limitation and authorizing full-power operation.

In the present case, in accordance with that process, once the review of the application for a full-power license was completed, the Commis-

⁵ Amendments 1-6 to the low-power license were issued prior to the enactment of the notice requirements imposed by the Sholly Amendments of the Atomic Energy Act. In accordance with the practices in effect at the time, since the amendments involved "no significant hazards consideration" they were issued without pre-notice and without regard to whether they were required for low-power or full-power operation.

sion dropped the low-power limitation and authorized full-power operation by "amending" the existing low-power license. However, in neither this case nor any other similar case was there a need for, or an intent to, issue a license amendment as such which might arguably create new hearing rights under § 189. All that was necessary, and all that was intended, was to end the ongoing uncontested proceeding for a full-power license by granting the application, as amended, for that license.

The Commission now recognizes that the prior practice of first issuing a low-power license and then a separate full-power license may have been the better and less confusing practice. While the language of § 189a requires an appropriate notice and opportunity for hearing on an actual amendment to a power reactor operating license, designation of the authorization to operate at full power as a "license amendment" could needlessly create confusion by giving the erroneous impression that new hearing rights were created when full-power operation was authorized. To avoid any such confusion, the Commission has decided to direct the NRC Staff to issue the full-power license for Grand Gulf, Unit 1, as an entirely separate matter from issuance of the low-power license. This should make it clear that the authorization to operate at full power is simply the culmination of the uncontested proceeding begun and noticed in 1978.⁶ As a generic matter the Commission intends to develop a policy statement to further clarify the treatment to be given the relationship between low-power and full-power licenses.

The Commission therefore directs the NRC Staff to replace Amendment No. 13 to the low-power license with a separate full-power license containing the same terms and conditions as Amendment 13 and the existing underlying license.⁷ The separate full-power license, upon issuance, will supersede the low-power license.

⁶ The same rationale applies to the earlier amendments which were not noticed because they were part of the full-power application. Those amendments are now part of the full-power operating license, however, and hence need not be further addressed.

⁷ The Commission, on the same day it issued Amendment No. 13, granted Mississippi Power & Light Company several exemptions from regulatory requirements. 49 Fed. Reg. 35,448 (September 7, 1984). Those exemptions were also granted as part of the review of the initial application for a full-power license. The NRC Staff, having already made the necessary findings justifying the grant of these exemptions, should therefore simply incorporate those exemptions into the full-power license, and issuance of that license will supersede the order granting the exemptions.

The Commission notes in this regard that it recently issued a decision which departed from past Staff practice both with regard to the standards for granting exemptions and the circumstances where exemptions are required. *Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), CLI-84-8, 19 NRC 1154 (1984). However, the Commission subsequently stated that the *Shoreham* decision for the near term was only to apply to the particular circumstances of that case, and that the NRC Staff should develop a comprehensive exemption policy as a generic matter. Thus while this generic reexamination is under way, the Staff should continue its practice of granting exemptions only after making the findings required by 10 C.F.R. § 50.12 and documenting the information supporting its determination.

Commissioners Roberts and Zech dissent from this decision. Their dissenting views are attached.

It is so ORDERED.

For the Commission

SAMUEL J. CHILK
Secretary of the Commission

Dated at Washington, D.C.,
this 25th day of October 1984.

DISSENTING VIEWS OF COMMISSIONERS ROBERTS AND ZECH

We have disapproved issuance of this Order only because we view the action that it directs the Staff to take to be totally unnecessary. Issuance of a replacement license that does not alter, in any way, the licensee's authority to operate the facility is to assign greater importance to form than to regulatory substance. There is absolutely nothing involved in this Order which even remotely relates to the protection of the public health and safety.

The full-power operating authorization which was issued on August 31, 1984, was the culmination of the overall licensing action which was initiated by a notice of opportunity for hearing given on July 28, 1978 (43 Fed. Reg. 32,903). Neither JULEP nor any other person sought to invoke in a timely manner the administrative remedies which were provided by that notice.

Issuance of the full-power authorization under these circumstances, regardless of the form of the authorization, did not provide, and need not have provided, an additional opportunity for hearing.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Nunzio J. Palladino, Chairman

In the Matter of

Docket No. 50-322-OL-4

LONG ISLAND LIGHTING
COMPANY
(Shoreham Nuclear Power
Station, Unit 1)

September 21, 1984

The Chairman of the NRC, finding that the standards for disqualification have not been met, denies on the merits and as untimely a motion filed by intervenors to the Shoreham licensing proceeding that sought his recusal.

MEMORANDUM

I. INTRODUCTION

On June 5, 1984, counsel for Suffolk County and the State of New York, parties to the Shoreham operating license proceeding, filed a "Request for Recusal and, Alternatively, Motion for Disqualification" in which they alleged improper intervention on my part in the conduct of that proceeding. The request asked that I recuse myself from participating in the Shoreham proceeding. The events which underlie the Suffolk/New York request I described in detail on May 17, 1984, in congressional testimony,¹ a copy of which I appended to my June 20 Memorandum to the Parties, and which I incorporate by reference here. I shall discuss those events further in § II.B of this Memorandum.

*Decided too late to be published in the September Issuances.

¹ *Hearings Before the Subcomm. on Energy and Environment of the House Comm. on Interior and Insular Affairs*, 98 Cong., 2d Sess., May 17, 1984.

On June 18, 1984, the Applicant, Long Island Lighting Company (LILCO), filed a response to the Suffolk/New York request. On June 20, in my Memorandum to the Parties, I requested the comments of the NRC Staff on the request, and I also stated my decision not to participate in any Commission deliberations on adjudicatory matters in the Shoreham proceeding until such time as I made a decision on the recusal request. The NRC Staff filed its response on July 12, 1984.²

I have studied all the filings and have given them careful consideration. I have also had the benefit of the accounts of underlying events provided by Judges Miller, Bright, Johnson and Cotter in their responses to recusal requests. Those responses are part of the public record of this proceeding.

My conclusion is that I see nothing in the filings of the parties, or in the underlying facts, which demonstrates that I should take myself out of the proceeding. I therefore consider it my obligation to resume my adjudicatory functions in this case.

I recognize that I could have decided to recuse myself from this proceeding as a matter of discretion. I cannot deny that the preparation of a detailed response to the recusal request has been a time-consuming burden, at a time when the Commission's health and safety responsibilities have demanded continuing attention. Moreover, it may be argued that to recuse myself would remove the shadow of doubt in some persons' minds about the propriety of the Shoreham proceeding, and perhaps thereby obviate some legal challenges to the ultimate outcome of the proceeding, whatever that outcome may be.

To my mind, such considerations could not justify my recusing myself from this case. First of all, I believe firmly that the responsibilities of a Commissioner are not optional. On the contrary, they are duties owed to the public in thorny and time-consuming cases as well as in easy ones. Indeed, it is in controversial cases in which it is most incumbent on Commissioners to take a stand and make the difficult decisions that are the essence of a Commissioner's job.

Second, once the facts are set forth, and various misstatements of fact in the recusal request are pointed out, as is done in § II.B, I do not believe that a reasonable observer would continue to entertain doubts about my impartiality. Moreover, under the present circumstances, for me to recuse myself would not relieve public doubt but rather increase it, by appearing to give credence to an accusation that aims baseless charges of impropriety not just at me, but also at a variety of licensing

² I have also received the *amicus curiae* brief of the Atomic Industrial Forum.

board judges, NRC Staff members, Commission lawyers, and other public servants, who have earned no such aspersions on their integrity.

Finally, for me to recuse myself would set a precedent that could seriously damage the ability of any NRC Chairman, now or in the future, to stay on top of the Commission's work, to monitor the agency's activities, and assure that the Staff and the Commission discharge their responsibilities in an efficient and timely fashion. My recusal could be seen as support for a position I consider unsound and destructive of the agency's effectiveness — namely, that for a Chairman to exercise the managerial functions mandated under the Energy Reorganization Act and the NRC Reorganization Plan of 1980 is both illegal and improper.

In § II of this Memorandum, I describe my reasons for finding that the Suffolk County/New York State disqualification request fails on its merits to demonstrate that I have committed any impropriety in this proceeding, either in reality or appearance. In § III, I describe my reasons for finding that the disqualification request, in addition to being devoid of merit, is so flagrantly untimely and so barren of any excuse for its untimeliness as to warrant its rejection on that basis as well.

II. SUMMARY AND ANALYSIS OF THE SUFFOLK COUNTY/NEW YORK STATE DISQUALIFICATION REQUEST

The June 5, 1984 disqualification request filed by Suffolk County and New York State bases its claim of impropriety on a number of allegations, strung together into what purports to be a chain of cause and effect. The gist of Suffolk/New York's claim is that as of March 16, 1984, it was entirely settled, as a result of a February 22 Licensing Board decision, that no low-power license could be issued to Shoreham until hearings had been completed on the contentions related to diesel generators. According to Suffolk/New York, I then intervened personally (apparently in response to an approach by LILCO's Chairman) to bring about the following: major violations of the rules against *ex parte* contacts; a complete reversal of position by the NRC Staff on the diesel issue; the replacement of the Licensing Board with a new, more pliant Licensing Board, with "scheduling conflicts" cited as a pretext; and finally, a decision favoring LILCO from the new Licensing Board.

The Suffolk County/New York State filing paints a lurid picture of a large number of public servants, including licensing board judges, the General Counsel and his deputy, and a variety of NRC Staff officials, all seemingly ready and willing at my behest to violate solemn obligations under the law. Read superficially, or by one without knowledge of the facts, the indictment may seem damning indeed; but closer reading, and

a review of the facts, reveal that inaccuracies and misrepresentations permeate the Suffolk/New York filing. It is appropriate, therefore, to look at Suffolk/New York's claims in some detail, for on examination it becomes apparent that the claimed "chain of impropriety"³ is a fiction, founded on a seriously distorted account of the status of the proceeding as it stood in mid-March 1984.

A. Summary of the Suffolk County/New York State Allegations

The Suffolk County/New York State allegations may be summarized as follows:

(1) that as of March 16, 1984, the issue of the Shoreham TDI diesels had been "settled"⁴ by a February 22, 1984 Licensing Board Order holding that litigation of the diesel issue must precede any grant of a license to operate Shoreham at low power; the NRC Staff had taken the "unequivocal position"⁵ that the diesel issue had to be resolved prior to any low-power licensing of Shoreham; LILCO "had not appealed from or sought reconsideration of" the Board's February 22 ruling;⁶ and "nothing in the public record suggested"⁷ that LILCO would propose any other avenue for obtaining a low-power license short of full litigation of the diesel generator issue.

(2) that on February 24, *Newsday* reported that LILCO's Chairman, William J. Catacosinos, had met with the Commissioners; on March 9, in a letter to LILCO shareholders, Dr. Catacosinos stated his belief that "there now seems a greater understanding among federal, state and county officials of the crisis the company faces"; the notes taken by Judge Cotter at the March 16 meeting include the statement "[s]ays will go bankrupt if 12/84 I.D. [Initial Decision of Licensing Board]"; and the "greater understanding" of federal officials to which Dr. Catacosinos referred was thus making itself felt in the March 16 meeting through the office of the NRC Chairman.⁸

(3) that on March 16, 1984, I met with the Executive Director for Operations, the General Counsel, the Deputy General Counsel, the Atomic Safety and Licensing Board Panel Chairman, the Executive Legal Director, other Staff officials, and my own personal staff, and in

³ Request at 32.

⁴ *Id.* at 4.

⁵ *Id.* at 8.

⁶ *Id.* at 11.

⁷ *Id.* at 14.

⁸ *Id.* at 10-11.

violation of the NRC's *ex parte* rules, discussed the merits of the Shoreham licensing proceeding.

(4) that after March 16, I had further discussions with my staff and the Executive Director for Operations on the subject of licensing delays at Shoreham.⁹

(5) that on March 20, 1984, I circulated to the other Commissioners a memorandum which (a) "purported to report"¹⁰ on the March 16 meeting, but failed to mention that ideas for expediting the Shoreham proceeding were discussed; (b) proposed that the Commission consider a proposal, which I had asked the Office of General Counsel to develop, for expedited hearings on the diesel issue or other proposals for low-power operation of Shoreham; (c) included a projected Licensing Board decision date of December 1984 (absent Commission intervention), while failing to report "that the 'delay' estimate for Shoreham was based on LILCO's estimate, not the NRC's, and that the staff disagreed with LILCO's estimate";¹¹ and (d) specifically requested that the NRC Staff, a party in the Shoreham proceeding, respond to the memorandum and prepare a paper outlining steps to deal with the supposed delays.

(6) that on the same day, March 20, LILCO filed an "unprecedented proposal" making "essentially the same arguments for a low power license that the Brenner Board had previously rejected,"¹² and asking neither for a waiver of, nor an exemption from, General Design Criterion 17.

(7) that on March 22, my legal assistant read to Judge Cotter over the telephone a "working paper," prepared in my office, which dealt with LILCO's March 20 request and inaccurately represented that it was *the Commission's* wish to have the matter litigated and decided by May 9, 1984.¹³

(8) that Judge Cotter responded on the following day, March 23, with a proposed Commission order which: (a) provided for expedited consideration of LILCO's motion and a decision on the merits, and thus "prejudged the very question at issue: whether LILCO's proposal was a challenge to GDC 17 that had to be rejected outright";¹⁴ (b) proposed to replace the Brenner Board, "which on February 22, 1984, had dealt LILCO a setback, . . . four days *before* the Brenner Board advised Judge

⁹ *Id.* at 17.

¹⁰ *Id.* at 15.

¹¹ *Id.* at 16.

¹² *Id.*

¹³ *Id.* at 17-18.

¹⁴ *Id.* at 19.

Cotter that it had a potential schedule conflict due to the judges' involvement in the *Limerick* proceeding";¹⁵ and (c) proposed, in light of LILCO's "enormous financial investment," a schedule for Board action which Judge Cotter himself described as "brutally tight" and "definitely not recommended."¹⁶

(9) that the NRC Staff responded to LILCO's motion with an "abrupt and *complete reversal*"¹⁷ (emphasis in the original) of its prior position on low-power operation.

(10) that even if Judge Cotter's March 30 appointment of a new Licensing Board (chaired by Judge Miller) to "hear and decide" LILCO's low-power motion was, as claimed, his own idea, that idea was developed at my request, I was informed prior to the appointment, and moreover, Judge Cotter's notes "reveal that there was 'concern' with Judge Brenner" expressed at the March 16 meeting.¹⁸

(11) that on March 30, the same day that the Miller Licensing Board was established, it "decided to expedite the proceeding"¹⁹ — before it had had time to review the pleadings and the record and make a "reasoned and independent judgment"²⁰ whether to expedite the proceeding.

(12) that after oral argument on April 4 on the LILCO motion (including argument on the issue of "whether there was a basis to expedite the proceeding"),²¹ the Miller Board on April 6 "adopted the position urged by the Staff in its March 30 filing and by Judge Cotter in his March 23 draft order,"²² by ruling that LILCO could operate Shoreham without onsite power, provided that safety findings suggested by the NRC Staff were made. The Miller Board's April 6 decision (unpublished), according to Suffolk/New York thus "provided the final link in the chain which began at the Chairman's March 16 meeting";²³ moreover, in deciding to expedite consideration of LILCO's motion, it took a position consistent with that of my office's working paper, the Staff, and Judge Cotter's draft order of March 23, and it adopted time frames with a "striking similarity" to those in Judge Cotter's draft order. The foregoing demonstrates, according to Suffolk/New York, that the March 16 meeting was:

¹⁵ *Id.* (Emphasis in original.)

¹⁶ *Id.*

¹⁷ *Id.* at 22.

¹⁸ *Id.* at 24.

¹⁹ *Id.* at 25.

²⁰ *Id.*

²¹ *Id.* at 27.

²² *Id.*

²³ *Id.*

[a] planning session to figure out how to get around the lawful rulings of the Brenner Board. Its purpose was improper; its discussion was improper; and the actions of NRC personnel that followed it were improper. Each of these personnel acted as a link in a chain of impropriety that commenced in the Chairman's office on March 16.²⁴

B. Analysis of the Suffolk County/New York State Allegations

In the preceding section of this Memorandum, I described in a twelve-paragraph summary the essentials of the assertions and allegations made by Suffolk County and New York State in their disqualification request. In the section which follows, I will use the same format to respond, paragraph by paragraph, to Suffolk/New York's substantially inaccurate account.

(1) Central to the allegations of Suffolk County and the State of New York is their seriously misleading description of the status of the Shoreham proceeding as of March 16. Contrary to their assertions, the Brenner Board's February 22 Order had *not* "settled" the diesel issue; the Staff had *not* declared that resolution of the diesel issue must precede low-power operation; a LILCO low-power proposal was expected by the parties, including Suffolk County, and the Board had *not* foreclosed the grant of a low-power license to Shoreham. As I shall describe below, the Suffolk/New York account is wholly at odds with reality, as reflected in the statements on the public record of Suffolk's own counsel, Judge Brenner, and others.

What the Brenner Board ruled, in its orally delivered Order of February 22, 1984, was that a license based on "reasonable assurance that the TDI diesel generators can reliably be depended upon" was not possible without first litigating contentions related to the diesel generators.²⁵ The Board's Order (which included responses to clarifying questions posed by counsel), made clear that though operation could not be authorized on the submissions then before the Board, LILCO would not be precluded from filing a proposal for allowing operation under a theory that did not involve reliance on the TDI diesels. Judge Brenner stated that the Board's ruling "would not preclude LILCO from proposing other methods by which LILCO believes the standards of 50.57(c) could be met, short of litigation of Contentions 1, 2, and 3 [the diesel generator

²⁴ *Id.* at 32.

²⁵ Transcript of the Conference of the Parties, February 22, 1984, at 21,617. References to this transcript, which forms part of the record of the operating license proceeding, will hereinafter be indicated by "Tr."

contentions] on the merits. Or possibly seeking some sort of waiver under 2.758 or other procedures.” Tr. 21,616.

The Board was emphatic that it was “up to LILCO” to develop and submit such a proposal. Tr. 21,617. With regard to the nature of such a proposal, the Board commented that “while someone could imagine different things in combination, we do not know what is feasible or what LILCO would seek to propose.” Tr. 21,617. When LILCO’s counsel sought reassurance that “the Board is not foreclosing other ways to low power?” Judge Brenner replied, “[t]hat’s right but you are going to have to propose something” Tr. 21,631. To a further question whether the Board’s Order might preclude a particular type of proposal, Judge Brenner replied, “[n]o, it does not preclude anything. It is solely based on what was before us” Tr. 21,631. Thus it is simply not true that the Brenner Board’s February 22 Order had “settled” the issue of the need for an onsite emergency power source, or the schedule for a possible decision on low-power operation.

Likewise, it is flatly inaccurate of Suffolk/New York to claim that “as of February 22, the NRC staff had taken the unequivocal position” that resolution of the diesel issue was necessarily a prerequisite to issuance of a low-power license. The transcript of the February 22, 1984 Conference of the Parties makes clear that while the Staff believed that what LILCO had proposed as of that date was insufficient, it had not ruled out the possibility that LILCO could nevertheless satisfy the regulatory requirements for low-power operation. Staff counsel stated explicitly that it was “quite possible” that “they [LILCO] do not need diesels at all.” Tr. 21,513. He added that Staff could not, however, make such determinations until it received a formal submission from LILCO, and that “we want to see what LILCO gives us.” *Id.* Staff counsel told that Board that it was “very difficult to answer your questions until we get that submission from LILCO.” *Id.* The context makes plain that Staff was fully expecting LILCO to file such a submission.

The Staff was not the only party expecting such a submission from LILCO, and saying so on the public record. Suffolk/New York’s claim that “[n]othing in the public record suggested that LILCO would file such a proposal”²⁶ is belied by the statements on the public record of *Suffolk’s own counsel*. At the February 22 Conference of Parties, Mr. Alan Dynner, counsel for Suffolk County, stated:

²⁶ Request at 7.

So what is being asked here, by *LILCO's proposal, which it will apparently — it intends to make sometime in the near future* — to have inadequate diesels for low-power operation.

(Emphasis added.) Tr. 21,521.

Even more striking, in view of Suffolk/New York's condemnation of the procedures followed in this case, is the following statement, also by Mr. Dynner, in the same conference:

The County's point of view, we would expect that such a proposal by LILCO, if it wishes to make it in the proper context, *would involve a separate proceeding.*

(Emphasis added.) Tr. 21,518.

Moreover, when the LILCO motion was filed, Suffolk County, in its "Preliminary Views on Scheduling Regarding LILCO's New Motion," filed March 26, 1984, noted that the Board's February 22 Order "did not preclude LILCO from later filing a proposal to obtain a low-power license for Shoreham *without* relying upon the EDGs [emergency diesel generators]." (Emphasis in the original.)²⁷ Suffolk described the motion as "the type of proposal which this Board envisioned to require an entirely separate collateral proceeding."²⁸ This further underscores that Suffolk foresaw both a LILCO low-power proposal and the need for a separate proceeding.

The Suffolk/New York charges against me are thus based on what the public record shows to be a seriously distorted account of where the proceeding stood on March 16, 1984. The accusation that I intervened in March to alter a "settled" Board decision on operation of Shoreham is belied by a public record which makes clear that already in February, the Board and the parties regarded the question of low-power operation as far from settled. The charge that in March I brought about a "complete reversal" of the Staff's position is belied by a public record which demonstrates that already in February, the Staff was open-minded on the question of low-power operation of Shoreham. The assertion that there was nothing in the public record to suggest that LILCO would seek early approval of low-power operation is belied by a public record which shows that already in February, Suffolk County's own counsel was expecting such a motion to be filed shortly.

Although an understanding of these distortions is sufficient by itself to make the bulk of the charges against me evaporate, I think it important to proceed through a systematic analysis of the rest of the Suffolk/

²⁷ "Suffolk County's Preliminary Views on Scheduling Regarding LILCO's New Motion" at 1.

²⁸ *Id.* at 3.

New York claims, in order to make fully clear that I have committed no improprieties, and that I have in no way prejudged the issues in the Shoreham proceeding.

(2) The Suffolk/New York account of the meeting with Dr. Catacosinos is also misleading. Dr. Catacosinos paid a brief get-acquainted call on all of the Commissioners on February 23. Dr. Catacosinos did not discuss any aspect of the Shoreham proceeding with me, nor did he discuss LILCO's financial difficulties, in our approximately 5-minute conversation.²⁹

Suffolk/New York's charge that Dr. Catacosinos' March 9, 1984 letter to LILCO stockholders is evidence that he had influenced me in favor of Shoreham is frivolous. (That letter, according to Suffolk/New York, asserted that "federal, state, and county" officials showed "greater understanding" of LILCO's problems.) Although Suffolk/New York are correct in stating that a February 24, 1984 *Newsday* article reported that Dr. Catacosinos had met with the Commissioners, they omit to mention the title of the article: "Three Senators Offer Measures to Help LILCO Out of Crisis." (The article also described a meeting between Dr. Catacosinos and the Secretary of Energy, and a letter from Dr. Catacosinos to the Secretary of the Treasury, seeking relief from provisions of the tax laws.) Thus at least three "federal officials" (U.S. Senators) were on record as supporting relief for LILCO's financial difficulties, and the inference which Suffolk/New York seek to draw — that the mention of "federal officials" was a reference to me — is without foundation.

Finally, the fact that I was concerned, as I readily acknowledged in my testimony before Congress,³⁰ lest NRC's failure to make timely decisions be the cause of Shoreham's going under, is hardly evidence of

²⁹ In a recent search of my files, responding to a Freedom of Information Act appeal, a followup letter from Dr. Catacosinos was found. I reproduce it in its entirety:

February 28, 1984

Dear Chairman Palladino:

I am writing to express my appreciation for your taking the time to meet with me on Thursday.

As you are aware, the vast majority of LILCO's current problems are related, either directly or indirectly, to the future of our Shoreham Nuclear Power Station.

As I am sure is obvious, our highest priority is to operate a safe, reliable and efficient power station, and to do so as soon as is consistent with appropriate safety considerations.

Sincerely,

/s/ W.J. Catacosinos

I understand that identical letters were received by at least three other Commissioners. I regard this letter as no more than a courtesy note.

³⁰ Testimony at 5, 11.

improper communications from anyone. LILCO's financial difficulties with Shoreham were common knowledge, discussed in congressional hearings and amply covered in the press.³¹ My desire to assure that NRC processes be timely and efficient was not a prejudgment as to what the outcome of the Shoreham proceeding should be.

(3) My March 16, 1984 meeting with the Executive Director for Operations, the General Counsel, the Deputy General Counsel, the Executive Legal Director, Judge Cotter, and others, was a meeting to discuss the licensing status of a number of plants, in advance of a congressional hearing at which I expected to be asked questions about delays in the licensing process.

As I stated in my congressional testimony, the March 16 meeting had its origin in a meeting held the previous day with representatives of the Office of Policy Evaluation (OPE) and the Office of General Counsel (OGC) to discuss potential licensing delays at a number of facilities. At that March 15 meeting, there was a consensus that these delays warranted a broader discussion, to include the Executive Director for Operations and his staff, the General Counsel and his deputy, and the Chairman of the Atomic Safety and Licensing Board Panel.³² It should be noted that, as I described in my testimony, Congress has repeatedly made clear its disapproval of unwarranted licensing delays, and that, under § 2(b) of NRC Reorganization Plan No. 1 of 1980, the Chairman is the "principal executive officer of the Commission, . . . responsible to the Commission for assuring that the Executive Director for Operations and the staff of the Commission . . . are responsive to the requirements of the Commission in the performance of its functions."³³ Thus to the extent that licensing delays at various plants might be attributable to the NRC Staff's performance of its functions, it was my responsibility to identify deficiencies and see that they were addressed.

At the March 16 meeting, the status of Shoreham was of particular interest to me, since a week before, on March 9, the Executive Director for Operations had informed the Commission that, based on the Licensee's estimates,³⁴ a licensing delay of 9 months was projected, whereas

³¹ The *Newsday* article cited in the Suffolk/New York request is one example: *Three Senators Offer Measures to Help LILCO Out of Crisis*, Feb. 24, 1984.

³² Testimony at 8-9.

³³ 45 Fed. Reg. 40,561 (1980).

³⁴ The Staff also provides the Commissioners with weekly memoranda on the status of plants under construction in which both licensees' estimated completion dates and the Staff's estimated completion dates are included. The weekly memorandum of March 6, 1984, indicated that the Staff projected a construction completion date for Shoreham 2 months later than LILCO's estimate. Under either estimate, the gap between facility completion and a decision on operation was substantial. The April 24, 1984 memorandum which Suffolk/New York cite was part of this series. All these memoranda were addressed to all Commissioners.

the Commission had informed the Congress as recently as January 25, 1984, also based on the Licensee's estimates, that no licensing delay was projected for Shoreham. (The other plant for which the March 9 memorandum projected a licensing delay was Limerick.)

In the portion of the meeting that dealt with Shoreham, there was no violation of the *ex parte* rules, because there was no discussion of the merits of the issues in controversy; rather, the discussion was of status, scheduling, and of the procedures by which the proceeding might be moved along.

As I stated in my testimony, there was discussion — initiated, I believe, by OGC — of the possibility of holding an expedited hearing on the question of low-power operation of Shoreham. I would note that the Executive Legal Director recalls that he pointed out, during that discussion, that the same Board Chairman who was presiding over the Shoreham operating license proceeding was also presiding over another active case.³⁵ (That case was Limerick.) It is worth stressing that none of the lawyers present indicated any *ex parte* problems with any part of the discussion.

(4) With regard to further discussions of Shoreham, after the meeting on March 16, I had a number of discussions with my personal staff of the problem of delays at Shoreham and elsewhere. I recall only one conversation, perhaps 2 or 3 minutes long, in which I discussed Shoreham at all with anyone from the NRC Staff. That conversation took place on March 21, after the Executive Director for Operations and I returned from a congressional hearing. Mr. Dircks, Mr. Norman Haller (my Executive Assistant), and I were present. I recall Mr. Dircks commenting, in essence, that the problem of delay at Shoreham was not within the Staff's power to correct, but was now a matter for the Commission and the Boards to resolve. I recall no discussion of the merits of the issues in the proceeding in this very brief exchange.

(5) There is no validity to the suggestion that my March 20 memorandum concealed anything from my fellow Commissioners, or that it presented misleading information of any kind. The memorandum reported to the Commissioners that I had held a status and scheduling meeting on March 16 with the "staff, OGC, OPE, and Tony Cotter" to discuss actual and potential delays at Shoreham, Limerick, and other plants. The memorandum also stated that I had asked the Office of General Counsel to provide a paper to the Commission "soon" on a proposal for expediting the Shoreham proceeding. In context, it was implicit that my request to OGC had been made at the March 16 meeting, and that our

³⁵ Joint Affidavit of William J. Dircks and Guy H. Cunningham, III, at 3.

discussion included consideration of how scheduling changes might reduce or avert actual and potential delays. Certainly I did not seek to conceal the substance of the meeting from my colleagues.

Suffolk/New York's claim that my memorandum of March 20 to the other Commissioners failed to report "that the 'delay' estimate for Shoreham was based on LILCO's estimate, not the NRC's, and that the Staff disagreed with LILCO's estimate," is without merit. First, the other Commissioners *already knew* that the 9-month delay estimate came from LILCO, since the estimate appeared in a March 9 memorandum, addressed to all Commissioners, in which the EDO stated explicitly: "Therefore, *based on the applicant's estimate*, there will be a nine-month licensing delay." (Emphasis added.) Likewise, the Staff's April 24 memorandum (discussed in note 34, above) was also addressed to all Commissioners. Thus the suggestion that in my March 20 memorandum I withheld relevant information from my fellow Commissioners is without foundation, since I knew that they were receiving the same Staff memoranda I was receiving.

(6) It is hard to square Suffolk/New York's claim that the LILCO motion made "essentially the same arguments for a low power license that the Brenner Board had previously rejected"³⁶ with Suffolk's March 26, 1984 filing before the Licensing Board, in which it stated:

The Motion is a voluminous, new proposal for low power operation of Shoreham, based upon complex technical factual information and *novel legal arguments never before presented to the County or this Board*. (Emphasis added.)³⁷

Suffolk County further stated:

The LILCO Motion obviously is an entirely new and radical change from LILCO's initial application for a low power license.³⁸

There is no merit in Suffolk/New York's apparent belief that it is highly significant that the LILCO motion sought neither a waiver under 10 C.F.R. § 2.758 nor an exemption under 10 C.F.R. § 50.12(a), in proposing a legal theory for low-power operation. Suffolk/New York neglect to mention two crucial points. First, it was never assumed by the Brenner Board or the parties that the only pathways LILCO might propose were those two regulations. Suffolk County itself recognized that the LILCO proposal might take any of various forms. Once again, the

³⁶ Request at 16.

³⁷ "Suffolk County's Preliminary Views on Scheduling Regarding LILCO's New Motion" at 2.

³⁸ *Id.* at 11.

proof of this is to be found in the words of Suffolk's own counsel, who at the February 22 Conference of the Parties said:

From the County's point of view we can, of course, object to any motion they wish to file for a waiver of regulations, or a change in the FSAR, or waiver of specifications, or a motion to proceed to obtain a low power license on the grounds, as I understand the argument, that diesels which have not been proven to be reliable can nevertheless be used in a low power license because the demands and requirements for public safety may be less.

Tr. 21,517. Judge Brenner's statements in the same Conference of the Parties, cited above under § II.B.1, also indicate that the Board had not decided what procedural form LILCO's motion would be required to take.

Suffolk/New York also fail to mention that the particular legal theory advanced by LILCO was rejected by me and all other Commissioners when we addressed its merits in our Order of May 16, 1984 (CLI-84-8, 19 NRC 1154).

(7) The charge that my legal assistant incorrectly purported to speak for the Commission as a whole, in talking with Judge Cotter, is baseless. When he read the draft "working paper" to Judge Cotter on March 22, he was not purporting to represent the views of the Commission, but rather was seeking to obtain Judge Cotter's reaction to a possible approach that I might propose for Commission consideration. Judge Cotter's public statement of August 1, 1984, confirms that he was under no misapprehension on this point.³⁹

(8) With regard to Suffolk/New York's assertions regarding Judge Cotter's draft order of March 23, the following comments are in order:

- (a) Judge Cotter's draft order was drafted by him on his own initiative, not mine, and he has discussed it in his response to the request for his disqualification. There is, therefore, no need for me to discuss it in any detail here. I would add, however, that I did not read Judge Cotter's order as prejudging the factual issues (i.e., the safety of the plant if operated as proposed by LILCO) or the legal issue of whether satisfactory resolution of the factual issues would permit a low-power license for Shoreham.
- (b) The Suffolk County/New York State request suggests that Judge Cotter could not have learned of the potential scheduling conflict between the Shoreham and Limerick Boards until 4

³⁹ Statement of B. Paul Cotter, Jr., at 6.

days after his March 23 draft order; in fact, his awareness of that scheduling conflict appears plainly *in the March 23 document itself*. On page 8, under the heading "Some Considerations," Judge Cotter stated that the Shoreham and Limerick Licensing Boards were among seven Boards "committed to hearings or partial or initial decision writing in April and May."⁴⁰

- (c) Again, Judge Cotter is in a better position than I to respond to criticisms of the March 23 draft order, and he has done so in his statement of August 1. I sent the draft order to the Office of General Counsel for its evaluation on March 27. Soon thereafter,⁴¹ Judge Cotter advised my office and OGC that he was considering the appointment of a new board to act on the LILCO motion, in view of the scheduling conflict between the Shoreham and Limerick Boards, and on March 30, a new board was established.

(9) Contrary to the Suffolk/New York assertion, the position taken by the NRC Staff in response to the LILCO motion was not only not an "abrupt and complete reversal" of the Staff's previous position, it was not a reversal at all. What is more, Suffolk counsel knows this. As indicated under (1), above, the Staff told the Licensing Board on February 22 that it would respond to any specific LILCO motion when such a motion was filed, and that it did not rule out the possibility of low-power operation with no diesels available. Suffolk counsel's awareness of the Staff's position is a matter of record. In the Conference of the Parties on February 22, Mr. Dynner, counsel for Suffolk County, referred to the Staff's position:

We do not know of cases where diesels have been waived or as Mr. Reis [NRC Staff counsel] has said, *where diesels may not even be required at all*. Maybe there are such cases out there and maybe LILCO will cite them when they make their proposal, if they make their proposal. . . . I think our responses will have to wait and see what LILCO comes up with and if they come up with something, we will have our experts look at it and we will be in a position to respond.

(Emphasis added.) Tr. 21,549-50. To this Judge Brenner commented: "You sound a lot like the staff on that answer." Tr. 21,550.

⁴⁰ Judge Cotter, in his August 1 statement, states that he had been monitoring the Shoreham-Limerick scheduling conflict since around September 1983, and had been checking periodically with Judge Brenner, who was Chairman of both boards.

⁴¹ Judge Cotter's statement indicates that he advised my legal assistant of his intention in this regard on March 28, 1984.

(10) With regard to Suffolk/New York's assertions regarding Judge Cotter's Order of March 30 (which established a new Licensing Board, empowered to act on LILCO's motion), the following comments are appropriate. Judge Cotter has explained in his August 1 statement that he believed that a failure to act by him would mean the *de facto* denial by the agency of the request for expeditious treatment.⁴² It does not appear to me that Judge Cotter's order, which aimed at making it possible for the NRC to act on the motion expeditiously, in any sense prejudged whether the motion should be granted on its merits. Moreover, as noted above, Suffolk County had stated at the February 22 Conference of the Parties its expectation that the LILCO motion would entail a separate proceeding. Tr. 21,518.

The decision to appoint the new board was Judge Cotter's. The idea was not developed at my request, but it was certainly consistent with my view that the Shoreham proceeding should be handled with efficiency and expedition. My office was informed by Judge Cotter of his intent to appoint a new Board, and I see nothing inappropriate about his so informing me.

Finally, I recall no one at any time suggesting that the substance of Judge Brenner's decisions was or should be a reason for creating a new Board. Also, the Executive Legal Director recalls pointing out at the March 16 meeting that the Shoreham licensing proceeding and another active case were both assigned to the same Board Chairman (Judge Brenner).⁴³

(11) The fact that the "Notice of Oral Arguments" was issued the same day that the Miller Board was established does not support, as Suffolk County and New York State imply, an inference of improper influence or of prejudgment in favor of an expedited proceeding. As I read the Miller Board's Order of March 30, 1984, it was not, as Suffolk County and New York State claim, a decision to "expedite the proceeding," but rather a decision to receive filings and hear oral argument on issues raised by the motion. Indeed, the title of the order is "Notice of Oral Arguments."

Where a motion requests that a proceeding be expedited, it is no more improper for a board to schedule a prompt oral argument on that motion than it is for a court to schedule prompt argument on a request

⁴² Judge Cotter's statement indicates that he based this judgment on two factors: an expression of doubt by Mr. Reamer of my office that the Commissioners could take action on the LILCO motion sooner than April 5 or April 12, and verification by the Brenner Board that its scheduling commitments made it unable to consider the motion. Statement of B. Paul Cotter, Jr., at 8.

⁴³ Dircks & Cunningham Affidavit at 3.

for emergency relief. In neither case has the decisionmaker thereby shown a prejudice in favor of the motion itself.

In the present case, one of the issues raised by the motion was the scheduling of any proceeding. Indeed, the County and State concede as much, for they note in their request that one of the issues argued on April 4 was "whether there was a basis to expedite the proceeding."⁴⁴

(12) Contrary to Suffolk/New York's claim, the Miller Board's April 6 Decision was not the product of any "chain of impropriety" instigated by me at the March 16 meeting or elsewhere. It is certainly true that at the March 16 meeting I expressed the view that the Shoreham proceeding should be handled with efficiency and expedition, but I was not prejudging the issues in controversy. My office's working paper was a further expression of my interest in expedition, but again it prejudged nothing.

I had occasion to address the question of prejudgment of the Shoreham proceeding in response to a March 28, 1984 letter from Chairman Edward Markey of the Subcommittee on Oversight and Investigations of the Committee on Interior and Insular Affairs. In that letter, Chairman Markey asserted that my March 20 memorandum had prejudged the merits of the Shoreham proceeding, and urged me to retract my suggestions for expediting the proceeding; otherwise, he said, it was "imperative" that I recuse myself from it altogether.⁴⁵ In my reply, dated April 5, I said:

I have not prejudged the merits of the Shoreham licensing proceeding in any respect, nor does my March 20, 1984 memorandum contain any suggestion that I have prejudged it, in reality or in appearance. My recommendation that the Commission consider options for an expedited hearing on the diesel problem, so that a low power decision might be possible, implies no judgment how the diesel generator problem should be resolved. Moreover, to assume that there will be a resolution of the emergency planning issue says nothing about how that issue might be resolved: the issue could be resolved either in granting or denying the Shoreham license.

The Administrative Procedure Act (APA) requires that agency licensing proceedings be conducted both with due regard for the rights of all the parties and completed "within a reasonable time." Since the Commission has supervisory responsibility over all of its adjudications, it is entirely in keeping with the spirit of the APA that I, as Chairman, suggest measures designed to assure that the Commission complies with both these statutory requirements. That is all that my March 20, 1984 memorandum attempts to do.

⁴⁴ Request at 27.

⁴⁵ This letter was one of several in which Chairman Markey took exception to particular actions related to the Shoreham proceeding. *See also* Chairman Markey's letters of April 12, April 24, and May 10, 1984.

Finally, it must be pointed out that for Suffolk County and the State of New York, the history described in their request ends on April 6, 1984. This is perhaps understandable, for when the April 6 Order came before me on the merits, on May 16, 1984, I voted to reject its legal holding.

In sum, the theory advanced by the Suffolk County/New York State disqualification request does not hold water. The individual elements of the supposed "chain of impropriety" turn out on examination to be flawed by misstatements, errors, and omissions. Joining them into a "chain" only compounds and magnifies the distortions of fact and interpretation. I do not believe that I committed any impropriety, nor do I believe that a reasonable observer, once acquainted with the actual facts, which are a matter of record, would question my impartiality in this proceeding. Accordingly, I find that the legal standards for recusal from Commission proceedings, which follow the statutory standards, have not been met.⁴⁶

That is not to say that an observer who did not know the facts, and who was not aware of the circumstances, might not be swayed by the mass of allegations in the disqualification request, if that observer were to accept those allegations at face value. But the standard for disqualification is not how artfully a motion can distort the public record; rather, the standard relates to reality, and to the perception of reality by an informed, disinterested, reasonable observer.

I recognize that the argument may be made that merely by filing their request, Suffolk County and the State of New York have created sufficient uncertainty that public concerns for the integrity of the process might suggest my voluntarily recusing myself. I reject that approach. First, I believe any such uncertainty is removed when one examines the actual record. Moreover, the public has an interest in knowing that the decisionmakers who make crucial health and safety decisions are persons of integrity, and that they appreciate the importance of the duties they owe to the public. Under these circumstances, to recuse myself could appear to give credence not only to the charges against me, but also to

⁴⁶ The standard applicable in the federal courts, and applied by the NRC as well, is that a judge shall disqualify himself in any proceeding in which "his impartiality may reasonably be questioned." 28 U.S.C. § 455(a). The courts have made clear that this is an objective standard. One court has said that a judge faced with a disqualification request should consider "how his participation in a given case looks to the average person on the street; . . . disqualification should follow if the reasonable man, were he to know all the circumstances, would harbor doubts about the judge's impartiality." *Potashnick v. Port City Construction Co.*, 609 F.2d 1101 (5th Cir.), cert. denied, 449 U.S. 820 (1980). See also *Hall v. Small Business Administration*, 695 F.2d 175 (1983); *Houston Lighting and Power Co. (South Texas Project, Units 1 and 2)*, CLI-82-9, 15 NRC 1363, 1365-67 (1982); *Cinderella Career and Finishing Schools v. FTC*, 425 F.2d 583 (D.C. Cir. 1970).

unwarranted and unfounded accusations directed at a large number of individuals — licensing board judges, NRC Staff members, and other NRC personnel — whom I consider to be persons of dedication and integrity. This I will not do. In my view, the public has every reason for confidence in the integrity and devotion to duty under the law of the men and women who make the decisions affecting the public's health and safety in the field of nuclear energy.

For the reasons stated above, I decline to recuse myself from this proceeding.

III. TIMELINESS

In the preceding section of this memorandum, I have explained my reasons for determining that the allegations in the Suffolk County/New York State request do not, on their merits, warrant my recusal from the Shoreham proceeding. Although it is therefore not strictly necessary for the disposition of this request that I go on to consider whether the request was timely, I do so because I strongly believe that the issue deserves public airing. For in my view, the timing of the Suffolk/New York request regrettably presents all too vivid an example of the type of problems which Congress and the courts have sought to prevent through the requirement that recusal requests be timely filed.

The recusal request before me was submitted on June 5, 1984, by counsel for Suffolk County and the Governor of New York. It was presented as a formal filing in the Shoreham adjudication, and as such, was served on all the parties. Once it was filed, I withdrew temporarily from Commission deliberations and decisions concerning Shoreham. Under the circumstances, I thought it appropriate that I address and resolve the question of my recusal before participating in further Commission consideration of Shoreham-related matters.⁴⁷

The Suffolk County/New York State request came 55 days after the Suffolk County Executive, Peter F. Cohalan, wrote to me on April 11, 1984, to protest what he termed my "personal intervention in the Shoreham licensing proceeding," which in his view had resulted in a "mockery of due process." It is worth examining that letter in some detail, since in virtually every particular — save only the request for my recusal or disqualification — it prefigures the formal recusal request which came

⁴⁷ See my Memorandum to the Parties, June 19, 1984. In the interval between the filing of the recusal request and the issuance of that Memorandum, I abstained from participating in the only Shoreham-related matter to come before the Commission. See unpublished Order of June 8, 1984 (separate statement).

55 days later. Mr. Cohalan's letter cited, among other things: my March 20 memorandum to the Commissioners on licensing delays; my March 16 meeting with NRC Staff members, Judge Cotter, and others; Judge Cotter's Order of March 30, establishing a new Licensing Board under Judge Miller; the April 6 Order of the Miller Board; the alleged change of position on the diesel issue by the NRC Staff; my meeting with the LILCO Board Chairman; and my purported intent to "aid LILCO's efforts to gain access to Wall Street money markets."

Mr. Cohalan characterized my actions in the following terms:

Mr. Chairman, the inevitable inference to be drawn from these events is that your meeting with LILCO's Board Chairman, your expression of interest to "expedite" the Shoreham proceeding when meeting with Mr. Cotter and the NRC Staff on March 16, and your March 20 memorandum proposing "expedited" treatment of LILCO's low power license request signalled the Licensing Board Judges and the Staff to shift gears; they were now to rush forward and issue a low power license for Shoreham, despite the effect this would have on the concerns for safety expressed by Suffolk County and New York State. The Licensing Board and Staff, in turn, took your signal as a marching order. And without any justification, they "expedited" the Shoreham proceeding so faithfully that the Board is now poised to issue a low power license for Shoreham. . . .

Mr. Cohalan's letter, which was not served by him on the parties to the Shoreham proceeding,⁴⁸ did not request my recusal or disqualification; rather, it requested that I and my fellow Commissioners take action to disestablish the Miller Licensing Board, and to direct the Staff and the Licensing Board that the Shoreham proceeding should *not* be expedited except under specified circumstances.

I do not find any substantial difference between the allegations in the June 5 recusal request and those in Mr. Cohalan's letter, sent 55 days earlier. To be sure, the June 5 request includes references to a few documents, notably Judge Cotter's notes, which were not in the possession of Suffolk County and New York State in early April. But even if one were to accept the Suffolk County/New York State interpretation of those documents (which interpretation I reject), they would serve merely to support the same allegations, about the same events, which Mr. Cohalan had made in his April 11 letter.

There can be no doubt that the attorneys for Suffolk County and New York State had obtained by April all the information they needed to form the basis of a disqualification motion, since on April 23, they asked

⁴⁸ In accordance with procedures for handling *ex parte* communications, the letter was placed in the Shoreham docket file and served on the parties by the NRC's Docketing and Service Branch.

the United States District Court for the District of Columbia to disqualify me, as well as Judges Miller, Bright, Johnson, and Cotter, from the Shoreham proceeding.⁴⁹ In their amended complaint, filed April 26, 1984, they made essentially the same allegations contained in Mr. Cohalan's letter of April 11. In its response, the NRC pointed out that although the Commission's regulations explicitly provide for the filing of disqualification motions (at 10 C.F.R. § 2.704(c)), Suffolk County and the State of New York had not even attempted to invoke the prescribed procedure.⁵⁰

Despite having the correct procedural course pointed out to them by this NRC filing, counsel for Suffolk County and the State of New York continued to stay their hand. Meanwhile, the Deputy County Executive of Suffolk County, Frank R. Jones, wrote to the Commissioners on April 27, renewing the April 11 request and adding a request for the disqualification (or alternatively, the voluntary recusal) of Judges Miller, Bright, Johnson, and Cotter, and of me.⁵¹ The letter, which urged promptness on the Commission "in the strongest possible terms," stated: "As a follow-up to this request, on which the County urges prompt Commission action, the County's counsel have been instructed to serve on the named individuals additional *formal* papers." (Emphasis added).

It thus appears that counsel's delay in filing the disqualification request — a delay for which no explanation has even been offered — was more than mere dawdling. It seems also to have been contrary to the instructions of Suffolk County officials, who recognized that additional formal filings by counsel were required. Not until almost 6 weeks after the date of Mr. Jones' letter was the formal request for my disqualification filed; almost 8 weeks passed before the disqualification of Judges Miller, Bright, Johnson, and Cotter was requested.

It is well established in the case law on the timeliness of disqualification motions that such requests must be filed at the earliest moment after the moving party obtains knowledge of the facts demonstrating a basis for disqualification. *United States v. Patrick*, 542 F.2d 381, 390 (7th Cir. 1976), *cert. denied*, 430 U.S. 931 (1977); *Duffield v. Charleston Area Medical Center*, 503 F.2d 512, 515-16 (4th Cir. 1974).

⁴⁹ *Cuomo v. NRC*, Civil Action No. 84-1264. The court's temporary restraining order, issued April 25, 1984, hinged on scheduling matters, and did not address the disqualification request.

⁵⁰ Memorandum in Support of Defendants' Motion to Dismiss the Complaint (April 27, 1984), at 15 n.1.

⁵¹ Copies of this letter, unlike the April 11 letter, were sent by Suffolk County to the other parties to the proceeding.

In assessing whether a disqualification request is timely, reviewing courts look not only at the period of time which elapsed between the receipt of the underlying information and the filing of the request; they also consider what if anything was going on during that period in the trial or administrative proceeding at issue. Where trial has not begun, or is in abeyance, a lengthy delay in filing may do little or no practical harm, but where a proceeding is actively under way, with issues actually being decided by the decisionmaker whose participation is challenged, even a short delay may be destructive.

Courts are most disposed to find a disqualification motion untimely when it appears that the moving party obtained the information forming the basis for its motion but then held back while it speculated on whether the decisionmaker was likely to decide the case in its favor. This is especially true where the moving party has filed motions with the court or agency that gave it the opportunity to "sample the temper of the court before deciding whether or not to file" a claim of bias.⁵² *Peckham v. Ronrico Corp.*, 288 F.2d 841, 843 (1st Cir. 1961). As the U.S. Court of Appeals for the Third Circuit wrote in *Smith v. Danyo*, 585 F.2d 83 (1978):

The judicial process can hardly tolerate the practice of a litigant with knowledge of circumstances suggesting possible bias or prejudice holding back, while calling upon the court for hopefully favorable rulings, and then seeking recusal when they are not forthcoming.

585 F.2d at 86.

In such situations, requiring timeliness is not mere procedural nit-picking. On the contrary, it is a matter of preserving the integrity of the adjudication. Without watchfulness on the part of courts and agencies, cynical litigants could use disqualification motions to manipulate the outcome of the judicial or administrative process. As one court has put it:

It may be said, of course, that it is inconsistent with the interests of justice in most cases to reject any motion purely on the basis of procedural technicalities. But our courts have long recognized that in this sensitive area of claimed partiality on the part of a Judge, strict construction of the statutory provisions is essential to prevent abuse and to insure the orderly functioning of the judicial system.

Bumpus v. Uniroyal Tire Co., 385 F. Supp. 711, 713 (1974).

⁵² Courts also scrutinize carefully any claim by a moving party that the motion's untimeliness should be excused because evidence forming the basis of the motion developed cumulatively. In such cases, courts will be particularly strict in assuring that the motion was filed at the earliest possible moment after the necessary information was obtained. *Duplan Corp. v. Deering Milliken, Inc.*, 400 F. Supp. 497, 510 (1975).

The tardiness of Suffolk County and the State of New York in filing their disqualification motion might be more excusable if the proceeding had been in an inactive phase during the 55-day period from Mr. Cohalan's letter of April 11 to the June 5 date of the motion. This was hardly the case. On the contrary, during that period Shoreham was the subject of intense activity before the Commission. Between those dates, the Commission met thirteen times to discuss the Shoreham proceeding. No other single topic was the subject of so many meetings during that period.

Those meetings included: an April 23 discussion, lasting almost 3 hours, of whether the Licensing Board's disposition of substantive and procedural issues in the low-power proceeding warranted involvement at that time by the Commissioners; discussions on April 26 and April 27 of a proposed Commission order in the proceeding; an April 30 meeting to affirm such an order; oral argument before the Commission on May 7, involving both substantive and procedural issues; Commission discussions on May 9 and 10 of the issues which had been in dispute at the May 7 argument; two meetings on May 10 and a third on May 16 to review a draft Commission order addressing those issues; a May 16 meeting to affirm the order; a discussion on May 22 of substantive issues certified to the Commission by the Appeal Board; and on May 31, a meeting to affirm a Commission order on those certified questions.

All of those thirteen meetings involved, directly or indirectly, consideration of views and proposals submitted by Suffolk County and the State of New York. The most striking example is the oral argument held before the Commission on May 7, 1984.⁵³ At oral argument, the substantive legal issue of the applicability of the General Design Criteria to LILCO's proposal to operate Shoreham at low power was central; procedural issues (notably the scheduling issue, which is at the heart of the disqualification motion) were also addressed by the parties.

One might imagine that Suffolk County and the State of New York would have been reluctant to have these crucially important issues argued before, and adjudicated by, a decisionmaker whom they considered to be biased against them. Yet the formal objection to my participation remained in counsel's hip pocket. In their 42-page pre-argument submission, dated May 4, 1984, Suffolk County and the State of New York did not even mention the issue of my disqualification, although that filing did state Suffolk County's view that Judges Miller, Bright, and Johnson should be replaced in the event that further hearings were

⁵³ The Order setting forth the issues for decision and scheduling the oral argument was issued on April 30, 1984.

ordered. At oral argument, counsel for Suffolk County and the State said not a word on the subject of my disqualification or recusal. Nor did the County or the State mention the issue in their joint supplemental filing, submitted on May 10, 1984. Only after the Commission issued its decision,⁵⁴ by a 3-2 vote in which I formed part of the majority on the question of whether to disestablish the Miller Board, did the County and the State see fit to revive the issue, and at last bring their accusations of impropriety into the adjudicatory proceeding.

With the proceeding in so active a phase, and with Commissioners meeting so frequently on issues in dispute, it was especially essential for the County and the State to file their disqualification request expeditiously. As I mentioned earlier, when the formal request for my disqualification or recusal finally arrived, I withdrew from consideration of adjudicatory matters related to Shoreham pending my decision on the request. If, as early as April, Suffolk County and the State of New York sincerely believed my conduct to have been so improper as to destroy the procedural integrity of this proceeding, then it is beyond my comprehension that for almost 2 months, they should have permitted me to participate in meeting after meeting, deliberation after deliberation, and decision after decision, when at any time they could have brought the disqualification issue to a head through a single filing.

Under these circumstances, I find the Suffolk County/New York State request to be untimely, and seriously so. To do otherwise would be a disservice to the Commission and its processes, since it would serve notice on litigants that the Commission's processes may be abused with impunity. I feel a strong institutional concern — as opposed to accusations against me personally, which “go with the territory” — to assure that untimely disqualification motions do not become a device for manipulating the NRC's adjudicatory process.

⁵⁴ CLI-84-8, *supra*.

IV. CONCLUSION

For the reasons set forth in this memorandum, the request for recusal is **DENIED**.

NUNZIO J. PALLADINO
Chairman

Dated at Washington, D.C.,
this 21st day of September 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Christine N. Kohl, Chairman
Dr. W. Reed Johnson
Howard A. Wilber

In the Matter of

Docket No. 50-382-OL

LOUISIANA POWER & LIGHT
COMPANY

(Waterford Steam Electric
Station, Unit 3)

October 2, 1984

The Appeal Board defers ruling on intervenors' motion to reopen the record on the issue of the adequacy of safety-related concrete construction at Waterford, pending receipt of certain information that it requests from the NRC staff.

RULES OF PRACTICE: REOPENING OF RECORD

A successful motion to reopen the record of an adjudicatory proceeding must be timely, address a significant safety or environmental issue, and show that a different result might have been reached had the newly proffered material been considered initially. It must also present more than bare allegations. *Louisiana Power & Light Co. (Waterford Steam Electric Station, Unit 3)*, ALAB-753, 18 NRC 1321, 1324-25 (1983).

RULES OF PRACTICE: REOPENING OF RECORD

A newspaper article alone does not provide a basis for reopening a closed adjudicatory record. *Id.* at 1324-25.

RULES OF PRACTICE: REOPENING OF RECORD

At a minimum, new material in support of a motion to reopen a closed record must be set forth with a degree of particularity in excess of the basis and specificity requirements contained in 10 C.F.R. 2.714(b) for admissible contentions. Such supporting information must be more than mere allegations; it must be tantamount to evidence. And, if such evidence is to affect materially the previous decision, it must possess the attributes set forth in 10 C.F.R. 2.743(c) defining admissible evidence for adjudicatory proceedings (i.e., it must be relevant, material, and reliable). *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-775, 19 NRC 1361, 1366-67 (1984). See also *id.* at 1367 n.18.

RULES OF PRACTICE: REOPENING OF RECORD (BURDEN OF PROOF)

The burden of satisfying the requirements for reopening a closed record is on the proponent of the motion and is a "heavy" one. *Kansas Gas and Electric Co.* (Wolf Creek Generating Station, Unit No. 1), ALAB-462, 7 NRC 320, 338 (1978).

BOARD NOTIFICATION: RESPONSIBILITIES OF STAFF

At a minimum, the staff has a duty to submit to an adjudicatory board by way of a Board Notification any information that is clearly relevant to a matter pending before the board. Such notification should be timely and include a discussion of its relevance.

RULES OF PRACTICE: STAFF WITNESSES (ASSIGNMENT)

As a general matter, the NRC's Executive Director for Operations determines which staff personnel testify at hearings. See 10 C.F.R. § 2.720(h)(2)(i).

APPEARANCES

Carole H. Burstein, New Orleans, Louisiana, for Joint Intervenors Oystershell Alliance and Save Our Wetlands, Inc.

Bruce W. Churchill, Washington, D.C., for Applicant Louisiana Power & Light Company.

Sherwin E. Turk for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

Last December in ALAB-753, 18 NRC 1321 (1983), we denied Joint Intervenor's motion to reopen the record in this operating license proceeding on their original Contention 22 concerning safety-related concrete construction at Waterford.¹ Joint Intervenor's had claimed that hair-line cracks and associated water seepage in the concrete basemat on which Waterford is built, discovered in May 1983, raised questions about the integrity of the plant's design and safe operation of the facility. After review of several reports and analyses submitted by applicant Louisiana Power & Light Company (LP&L)² and the NRC staff, we concluded that "the cracking and related moisture do not now present a significant safety concern respecting the integrity of the foundation mat at Waterford 3." *Id.* at 1328 (footnote omitted). We went on, however, to endorse the staff's recommendation of "a surveillance program to assure the continued validity of this conclusion." *Ibid.*

Several days after issuing ALAB-753, we received Joint Intervenor's "Amended and Supplemental Motion to Reopen Contention 22."³ LP&L and the staff oppose the motion. As explained below, we are unable to dispose of this motion on the basis of the material now before us. Hence, we defer our ruling, pending receipt of additional information we request from the staff.

1. We explained in ALAB-753 that a successful motion to reopen must be timely and address a significant safety or environmental issue. It must also show that a different result might have been reached had the newly proffered material been considered initially. We stressed as well the need for more than bare allegations, and we observed that a

¹ At the same time we dismissed another motion for lack of jurisdiction and completed our sua sponte review of the Licensing Board's partial initial decision on the adequacy of applicant's emergency planning brochure, LBP-83-27, 17 NRC 949 (1983). In an earlier decision, we resolved all issues raised on appeal from the Licensing Board's principal decision in this proceeding. See ALAB-732, 17 NRC 1076 (1983).

² Specifically, two reports by Harstead Engineering Associates, Inc.: Harstead Report No. 8304-1 (Sept. 19, 1983) and Report No. 8304-2 (Oct. 12, 1983).

³ Apparently this motion, filed December 12, 1983, and ALAB-753, issued December 9, crossed in the mail. No party contests our jurisdiction to decide the December 12 motion.

newspaper article alone does not provide a basis for reopening a closed adjudicatory record. *Id.* at 1324-25.⁴ The burden of satisfying these requirements is on the proponent of a motion to reopen and it is a "heavy" one. *Kansas Gas and Electric Co.* (Wolf Creek Generating Station, Unit No. 1), ALAB-462, 7 NRC 320, 338 (1978).

There is little doubt that Joint Intervenors' motion itself fails to meet this standard. The entire pleading consists of one paragraph, in which Joint Intervenors allege that the applicant and staff studies on the basemat cracking "rely on falsified documents." Joint Intervenors merely direct our attention to an attached article from the December 10, 1983, edition of *Gambit* (a New Orleans weekly newspaper) as providing support for their charge. We recognize that the motion, as filed, was intended as a supplement to Joint Intervenors' earlier motion on basemat cracking, which, presumably unbeknown to Joint Intervenors, had already been denied. *See* note 3, *supra*. We thus construe the pleading generously and do not expect it to stand fully on its own. But even viewed as a supplementary filing, the motion lacks an explanation of the safety significance of the attached *Gambit* article. It is simply served up to us as *res ipsa loquitur*.

The article, however, does not speak for itself. It contains ostensibly serious charges but very little else in the way of specifics. For instance, the article begins with a reference to "massive deficiencies in records detailing potential flaws in the construction of the foundation." Ridenhour, *Records Inspections Blocked at Waterford III*, *Gambit*, Dec. 10, 1983, at 21 (hereafter *Gambit*). It then lists the categories of record keeping irregularities: missing documents, some of which have been replaced by "phony" documents; other documents that have been altered; "possible forged signatures" on safety inspections of, primarily, cadwelds;⁵ the absence of proper certification for numerous construction inspectors; and failures to follow approved procedures and criteria for accepting completed work. *Id.* at 22. *Gambit* claims that "[s]ome or all of these deficiencies were found in nearly every records 'package' " — namely, those involving the compaction of the soil and crushed shell

⁴ We subsequently addressed this matter further in another proceeding:

At a minimum, therefore, the new material in support of a motion to reopen must be set forth with a degree of particularity in excess of the basis and specificity requirements contained in 10 C.F.R. 2.714(b) for admissible contentions. Such supporting information must be more than mere allegations; it must be tantamount to evidence. And, if such evidence is to affect materially the previous decision (as required by the Commission), it must possess the attributes set forth in 10 C.F.R. 2.743(c) defining admissible evidence for adjudicatory proceedings. Specifically, the new evidence supporting the motion must be "relevant, material, and reliable."

Pacific Gas and Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-775, 19 NRC 1361, 1366-67 (1984) (footnote omitted). *See also id.* at 1367 n.18.

⁵ A cadweld is a splice between two pieces of the reinforcing steel bars found within concrete.

base, placement of waterstops, cadwelds, and concrete pouring. *Ibid.* The article identifies its two principal sources, both former supervisors of the records review team of Ebasco Services Incorporated (Waterford's architect-engineer), and notes the opinion of one that "Waterford's problems are worse than those he saw" at Zimmer, a (now-terminated) nuclear plant in Ohio plagued by quality assurance deficiencies. *Ibid.*

The article goes on at length to repeat these charges again and again in several sidebars, but conveys virtually no more specific information that would permit a realistic appraisal of the safety significance of such record keeping irregularities.⁶ Nor does the article's repetition make true the broader allegation of a connection between the basemat cracking and the documentation deficiencies. We highlight this not as journalistic criticism but by way of an elucidation of what Joint Intervenors' motion to reopen lacks. To be sure, as did an earlier *Gambit* report, the December 10 article "suggest[s] a basis for further inquiry." ALAB-753, *supra*, 18 NRC at 1325. Joint Intervenors themselves should have at least attempted such a pursuit in order to supply the necessary foundation for their motion.

Thus, if we had nothing more before us than Joint Intervenors' motion and convincing replies in opposition, we would likely be compelled to find that the request to reopen does not raise a significant safety issue and thus would deny the motion. This case, however, presents the unusual (if not unique) situation where the material filed in opposition to a motion to reopen raises more questions than it answers. Specifically, the staff's reply, in conjunction with other recent staff statements and action concerning Waterford, precludes us from determining whether a significant safety issue inheres in Joint Intervenors' motion. Our dilemma can be resolved, we think, by deferring our ruling on the motion and seeking supplementary and clarifying information from the staff.⁷

2. The staff's answer to Joint Intervenors' motion is extremely tentative and conditional. Although it urges us to deny the motion, it concludes:

In sum, the civil/structural allegation review team has identified certain items relating to the base mat as *having potential safety significance*, and *further efforts on the part of the Applicant are required to satisfactorily resolve* these matters. However, the Staff

⁶ E.g., the location of the cadwelds that have inspection reports with "forged" signatures.

⁷ In view of the seven additional months the staff required to produce its reply to Joint Intervenors' motion, we take this step reluctantly — recognizing, however, that it presents the only satisfactory way of proceeding at this point.

believes that to the extent that these items relate to the base mat, they are *likely to be resolved* in a satisfactory manner and will not be found to have any safety significance; accordingly, these items are considered to be confirmatory in nature. Further, *subject to the satisfactory resolution of these items*, the Staff believes that the manner in which the base mat was constructed has not rendered the design assumptions invalid. *Pending satisfactory completion of these items*, the civil/structural allegation review team has concluded that the issues which it reviewed concerning the foundation base mat do not raise a significant safety or environmental issue.

NRC Staff's Answer (Aug. 7, 1984) at 5-6 (citations and footnotes omitted; emphasis added). *See id.*, Affidavit of Robert E. Shewmaker at 13-15. The staff's conclusions concerning the review of the basemat *design* (as opposed to construction) are similarly tentative. *See id.* at 6-7. We are unable to decide an adjudicatory matter on the basis of such speculative statements.

A number of inconsistencies and discrepancies in the various documents submitted to us in connection with Joint Intervenor's motion further illustrate the problem. Foremost are the staff's conflicting statements on the alleged irregularities in inspector certification records. In a recent letter to LP&L, the staff stated that it had found that four of the five inspectors from the firm responsible for Waterford's concrete construction (J.A. Jones) "failed to meet the applicable certification requirements related to relevant experience." Noting that this involved "safety-related activities," the staff found that "the fact that [the inspectors] may not have been qualified to perform such inspections, renders the quality of the inspected construction activities as indeterminant [sic]." Accordingly, the staff requested LP&L to review its records and to demonstrate either the qualifications of each such inspector or the impact on safety of such inspector's work. Letter from D.G. Eisenhut to J.M. Cain (June 13, 1984), Enclosure at 7-8 (hereafter "Eisenhut Letter").⁸ But in its filing before us, the staff states that "this situation

⁸ This important document was provided to us by letter from staff counsel, dated June 15, 1984. While we appreciate counsel's efforts, this is precisely the sort of information that the staff itself should have submitted to us promptly and directly by way of a Board Notification. We are at a loss to understand why we were not thus served (as were the parties to this proceeding) with a document so clearly relevant to the matter pending before us. While in some instances there may be legitimate dispute as to the need and propriety of invoking the Board Notification procedure, this is not one of them.

LP&L is expected to provide the staff with responses to the 23 areas of concern addressed in the Eisenhut Letter. By our comments here on Board Notifications, it should be clear that we expect the staff to apprise us of any information it receives that is relevant to the basemat issue before us. We note, in this regard, our receipt on September 28, 1984, of Board Notification No. BN-84-158 (Sept. 26, 1984). This Board Notification consists solely of a 171-page transcript of an August 17, 1984, meeting between the staff and LP&L (and accompanying viewgraphs) concerning the 23 matters raised in the Eisenhut Letter. We view BN-84-158 as both untimely and wholly unsatisfactory in content. Provision of this transcript without any summary or discussion of its relevance to the specific matters pending before us is on the same footing as Joint Intervenor's submission of the *Gambit* article without benefit of any explanation. *See pp. 1090-91, supra.*

cannot be associated with any specific item of safety significance" and does "not appear to have had any impact on the quality of the base mat." Staff's Answer, *supra*, Shewmaker Affidavit at 12. The quality of safety-related construction cannot be *both* indeterminate *and* lacking in safety significance. It is incumbent on the staff to clarify its position.⁹

A similar inconsistency is apparent in the staff's position(s) on the soil backfill at Waterford. The Eisenhut Letter states that the records for the in-place density test of backfill in Area 5 are missing. It characterizes these documents as "important because the seismic response of the plant is a function of the soil densities." It therefore directs LP&L to review all soil package records "for completeness and technical adequacy" and, where records are missing, to verify by testing and analysis that soil conditions do not impair the structural capability of the plant under seismic loads. Eisenhut Letter, *supra*, at 6. In its filing with us, the staff acknowledges that the matter of these missing soil backfill documents "leaves open a question as to the adequacy of backfill placement and compaction." Nonetheless, it states that it "does not believe that the fact that soil records are missing will have any impact on plant safety, due to the limited soil volumes involved and the absence of any reason to believe that compaction results were obtained in those areas which were significantly different from the compaction results reflected in other records." Staff's Answer, *supra*, Shewmaker Affidavit at 11. No mention is made of the records' importance for the plant's seismic response capability, stressed in the Eisenhut Letter. *See id.*, Shewmaker Affidavit at 13-15.¹⁰

Other parts of the material presented to us and relied on by the staff raise unanswered questions. For example, according to the BNL Review (*see* note 10, *supra*), the basemat cracking discovered in May 1983 "is

⁹ The integrity of the concrete inspection program is, of course, critical to the quality assurance program and safety of the facility. That this is so is evident from the report of the staff's principal consultant on Waterford's concrete construction, Robert E. Philleo, which relies on "the high degree of inspection on the project." Memorandum from L.C. Shao to D. Crutchfield (May 21, 1984), Enclosure at 2 (hereafter "Philleo Evaluation") (attached to NRC Staff's Motion for Additional Extension of Time (June 14, 1984)).

¹⁰ On a related point, the staff asked the Brookhaven National Laboratory (BNL) to perform a structural analysis of the Waterford basemat. BNL's overall conclusion is that the safety margins in the design of the basemat are adequate. It recommends, however, that the analyses in several areas be refined. Included are the (i) dynamic coupling between the reactor building and the basemat for seismic stresses resulting from the vertical earthquake input, and (ii) the dynamic effects of lateral soil/water loadings. BNL "Review of Waterford III Basemat Analysis" (July 18, 1984) at 14-17, 27 (hereafter "BNL Review"). The staff agrees with BNL's recommendations but believes that such "confirmatory" analyses need not be completed until restart following the first refueling outage at the facility. The staff is satisfied with this schedule because BNL's experts believe the additional analyses are not likely to change significantly the existing results. Staff's Answer, *supra*, Affidavit of James P. Knight at 21-23. But because some "important" documentation on backfill relevant to seismic response is missing, we question whether BNL's and the staff's temporary satisfaction with existing analyses is well-founded. Further, we wonder whether the refined analyses can be performed without the missing information.

most probably caused by dead loads acting on elements already cracked due to normal thermal and shrinkage effects.” BNL Review, *supra*, at 12. These cracks “would be expected to have occurred after construction of the superstructure, but before placement of the backfill.” *Id.* at 11. In reaching this conclusion, BNL disagrees somewhat with the earlier analysis of the Harstead Reports (*see* note 2, *supra*), which attributed the cracking solely to “‘benign’” factors, like shrinkage, differential soil settlement, and temperature changes. *Id.* at 3, 4. *See* ALAB-753, *supra*, 18 NRC at 1326-28. The staff has reviewed BNL’s conclusion and embraces it as a “reasonable explanation of the cracking that has been observed in the base mat.” Staff’s Answer, *supra*, Knight Affidavit at 11. What neither BNL nor the staff explains, however, is why the cracks were not discovered before May 1983. Assuming that the backfill has been in place for some time,¹¹ the cracking as explained by BNL’s analysis should have been wider and therefore more evident prior to placement of the backfill.

The staff’s presentation to us also reveals possible gaps in its overall consideration of the allegations raised by Joint Intervenors’ motion and the *Gambit* article. None of the affidavits attached to the staff’s reply to the motion and none of the other documents previously submitted to us reflect that the staff interviewed the two primary sources for the *Gambit* article. *See* p. 1091, *supra*. After the staff completed its review of, for example, the cadweld records, one would expect the staff to have made some contact with at least one of the individuals identified in the article for the purpose of determining if the information uncovered by the staff fully addresses the individual’s expressed concern.¹² Perhaps the staff did so, but it has not informed us of that fact.

Nor has the staff informed us of the current views of the two individuals (Drs. John S. Ma and Raman Pichumani) upon whose affidavits it relied in opposing Joint Intervenors’ first motion to reopen on basemat cracking. *See* ALAB-753, *supra*, 18 NRC at 1327-28. The staff makes passing reference to their original views and notes that new information subsequently came to light that required further evaluation. Staff’s Answer, *supra*, Knight Affidavit at 2-6. It is reasonable to expect some

¹¹ Our assumption may well be invalid. The BNL Review (at 11) simply refers to “a period before dewatering was stopped and before the backfill was placed when a substantial portion of the superstructure was in place,” but does not give a date. We would expect, however, the backfill to have been placed at least several years ago.

¹² One such pertinent inquiry would be whether the various “nonconformance reports” reviewed by the staff (and LP&L and its consultants) reflect all of the irregularities alleged by the *Gambit* sources.

statement from Drs. Ma and Pichumani as to what effect, if any, that further evaluation has on the position they espoused earlier.¹³

Similarly, the current views of the staff's independent concrete consultant, Robert E. Philleo, would be useful. As stated above at note 9, the staff submitted Mr. Philleo's evaluation of the adequacy of the basemat's construction in June 1984. Since then, nondestructive testing (NDT) of the basemat has been performed and the preliminary results obtained. The staff requested its other consultant, BNL, to reevaluate its earlier analysis on the basis of the NDT results. Staff's Answer, *supra*, Affidavit of Morris Reich, et al. The staff should do likewise with regard to the Philleo Evaluation, especially inasmuch as the staff relies on Mr. Philleo's earlier, pre-NDT conclusions. See *id.*, Shewmaker Affidavit at 9-10.

We also note an apparent discrepancy in the analysis submitted as an attachment to Applicant's Answer to Joint Intervenor's Amended and Supplemental Motion (Jan. 13, 1984). Appendix II to Report No. 8304-3 (Jan. 9, 1984), prepared by Harstead Engineering Associates (see note 2, *supra*), contains information about cadweld tensile strength tests. Cadweld No. 2W120 is shown as located in concrete production (or pour) area 16. But according to Appendix I of the same document (at C-6), area 16 contains *no* cadwelds.¹⁴ This discrepancy may be insignificant or in the nature of a typographical error; or perhaps we have misread the document. But given that the allegations before us concern record keeping irregularities and their possible effect on basemat integrity, we believe it is important that any such discrepancies be accounted for to the maximum extent possible. We thus request the staff to review this matter and to determine if the discrepancy noted is indicative of broader problems with the reliability of the data supplied to Harstead by LP&L's contractors.

3. The staff should provide us with its responses to our inquiries and any other relevant information¹⁵ by no later than *November 14, 1984*. We recognize that the staff's review in some of these areas is ongoing, but we believe six weeks is an adequate time for this response. If it is

¹³ We recognize that, as a general matter, the NRC's Executive Director for Operations (EDO) determines which staff personnel testify at hearings. See 10 C.F.R. § 2.720(h)(2)(i). In this instance, the EDO made the determination that Drs. Ma and Pichumani would "testify" (in affidavit form) on the basemat cracking issue. We seek now simply an updating of their views in light of the further analyses performed on that same subject.

¹⁴ This is denoted by "NS" ("no mechanical splice in this pour," per Appendix I at C-2) for Document No. 11 (cadweld locations, per Appendix I at C-1). In this connection, we find somewhat surprising that, on the basis of our interpretation, there are no cadwelds in eight adjacent sections of the basemat. See Harstead Report No. 8304-3, Appendix I at C-6, C-7.

¹⁵ E.g., the Task Force report mentioned in Staff's Answer, *supra*, Shewmaker Affidavit at 3. See also note 8, *supra*.

not, however, we expect the staff so to inform us and to provide us with a *realistic* date as to when it can supply the information we need to rule on Joint Intervenors' motion. Any party may file a reply to the staff's submission (properly supported by affidavits) within three weeks thereafter.

It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the
Appeal Board

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Alan S. Rosenthal, Chairman
Gary J. Edles
Howard A. Wilber

In the Matter of

Docket No. 50-322-OL-4
(Low Power)

LONG ISLAND LIGHTING
COMPANY
(Shoreham Nuclear Power
Station, Unit 1)

October 5, 1984

The Appeal Board determines that the Commission has not deprived it of jurisdiction to review the Licensing Board's disposition of the intervenors' physical security contentions in this operating license proceeding, and dismisses, as interlocutory, intervenors' appeal of the Licensing Board decision denying certain of those contentions.

NUCLEAR REGULATORY COMMISSION: IMMEDIATE
EFFECTIVENESS REVIEW

Normally the Commission does not undertake an immediate effectiveness review of a licensing board initial decision in an operating license proceeding unless the decision authorizes facility operation at greater than five percent of rated power. *See* 10 C.F.R. 2.764(f)(1).

NUCLEAR REGULATORY COMMISSION: IMMEDIATE EFFECTIVENESS REVIEW (EFFECT ON APPEAL BOARD JURISDICTION)

Commission immediate effectiveness reviews have no bearing upon the exercise by an appeal board of the general appellate review authority in 10 C.F.R. Part 50 proceedings that is conferred by 10 C.F.R. 2.785(a). 10 C.F.R. 2.764(g). If the Commission desires to preclude or to limit the exercise of that authority in a particular Part 50 proceeding, it must — and does — say so expressly. *See, e.g., Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), CLI-79-8, 10 NRC 141, 147 (1979); *id.*, CLI-81-19, 14 NRC 304, 305 (1981); *id.*, CLI-81-34, 14 NRC 1097, 1098 (1981).

RULES OF PRACTICE: INTERLOCUTORY APPEALS

The Commission's rules of practice bar appeal of an interlocutory order that does not dispose of a major segment of a proceeding, or terminate the participational rights of a party. 10 C.F.R. 2.730(f). *See Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-731, 17 NRC 1073, 1074-75 (1983), *quoting Toledo Edison Co.* (Davis-Besse Nuclear Power Station), ALAB-300, 2 NRC 752, 758 (1975), and *citing Houston Lighting & Power Co.* (Allens Creek Nuclear Generating Station, Unit No. 1), ALAB-635, 13 NRC 309, 310-11 (1981). By way of contrast, see *Kansas Gas and Electric Co.* (Wolf Creek Generating Station, Unit 1), ALAB-784, 20 NRC 845 (1984).

APPEARANCES

Martin Bradley Ashare, Hauppauge, New York, and **Herbert H. Brown and Lawrence Coe Lanpher**, Washington, D.C., for the intervenor Suffolk County, New York.

Fabian G. Palomino, Albany, New York, for the intervenor State of New York.

MEMORANDUM AND ORDER

Before us is a notice of appeal filed on October 1, 1984, by intervenors Suffolk County and the State of New York from a September 19, 1984

unpublished order of the Licensing Board in the low-power phase of this operating license proceeding. In that order, the Board denied certain revised contentions advanced by those intervenors that were addressed to the physical security of the Shoreham facility.

The notice of appeal set forth the intervenors' uncertainty respecting whether (1) given "the current procedural posture of this proceeding," such a notice was necessary at this time; and (2) if so, it should have been filed with us or, instead, the Commission. We have examined those questions in reverse order. For the reasons that follow, we conclude that the Commission has not divested us of jurisdiction to review the Licensing Board's disposition of the intervenors' physical security contentions. We further conclude, however, that the appeal must be dismissed as premature.

1. On more than one recent occasion, the Commission has undertaken to review directly (i.e., without intermediate Appeal Board consideration) Licensing Board action in this low-power phase of the proceeding. In CLI-84-8,¹ for example, the Commission reversed a Licensing Board order to the extent that the order held that General Design Criterion 17 was not applicable to low-power Shoreham operation.² In that connection, the Commission took note of the fact that the applicant had expressed an intent to seek an exemption under 10 C.F.R. 50.12(a) from the GDC 17 requirements. It added that any Licensing Board decision authorizing the grant of such an exemption "shall not become effective until the Commission has conducted an immediate effectiveness review."³

Thereafter, in an unpublished July 18 memorandum and order entered on the intervenors' motion for directed certification of a June 20 Licensing Board order, the Commission provided guidance to that Board with respect to the standard governing the admission of new contentions in the adjudication of the applicant's exemption request.⁴ Still later, in CLI-84-16,⁵ the Commission established a briefing schedule for its review of a Licensing Board order entered two days earlier with respect to the first two portions of the applicant's low-power testing program.

¹ 19 NRC 1154 (1984).

² That Criterion, found in 10 C.F.R. Part 50, Appendix A, is concerned with the availability of onsite and offsite electric power systems for nuclear generating facilities.

³ CLI-84-8, *supra*, 19 NRC at 1156. The procedure for immediate effectiveness reviews of licensing board initial decisions is detailed in 10 C.F.R. 2.764. Normally, the Commission does not undertake such a review in an operating license proceeding unless the initial decision authorizes facility operation at greater than five percent of rated power. See 10 C.F.R. 2.764(f)(1).

⁴ On August 20, the Commission denied the applicant's motion for reconsideration of its July 18 order.

⁵ 20 NRC 799 (1984).

In none of these orders, however, did the Commission announce that it was removing us entirely from the appellate review chain. That being so, we see no warrant for the Licensing Board's transmission of its September 19 order "directly to the Commission for appropriate action." The Board took that step because it believed the order to be within at least the "spirit" of "the Commission's reserved jurisdiction in CLI-84-8."⁶ But, as noted above, all that the Commission "reserved" in CLI-84-8 was its conduct of an immediate effectiveness review of any section 50.12(a) exemption that the Licensing Board might grant to the applicant. It is clear from the terms of 10 C.F.R. 2.764(g) that Commission immediate effectiveness reviews have no bearing upon the exercise by an appeal board of the general appellate review authority in 10 C.F.R. Part 50 proceedings that is conferred by 10 C.F.R. 2.785(a). Rather, if the Commission desires to preclude or to limit the exercise of that authority in a particular Part 50 proceeding, it must — and does — say so expressly.⁷

2. The September 19 order is plainly interlocutory. Its sole effect is to preclude the litigation of intervenors' physical security contentions in the low-power phase of the proceeding. It neither concludes the phase nor disposes of a major segment of it.⁸ Similarly, it does not terminate the participational rights of either Suffolk County or New York.⁹ In the circumstances, the Rules of Practice bar an appeal from the September 19 order at this time.¹⁰ Instead, the intervenors "must await the Licens-

⁶ September 19 order at 4.

⁷ For example, when the Commission instituted the special Part 50 proceeding concerned with the restart of Unit 1 of the Three Mile Island facility, it explicitly reserved to itself all authority to dispose of appeals from licensing board decisions. *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), CLI-79-8, 10 NRC 141, 147 (1979). Subsequently, the Commission determined that the length and complexity of the record developed before the Licensing Board dictated that initial appeals on the merits be heard by an appeal board. CLI-81-19, 14 NRC 304, 305 (1981). At the same time, however, the Commission decided to reserve for itself any decision that would authorize the restart of Unit 1. Accordingly, in so many words it stripped the Appeal Board of the power to consider applications for a stay pending appeal of any Licensing Board decision in the proceeding. CLI-81-34, 14 NRC 1097, 1098 (1981).

⁸ See *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-731, 17 NRC 1073, 1074-75 (1983), quoting from *Toledo Edison Co.* (Davis-Besse Nuclear Power Station), ALAB-300, 2 NRC 752, 758 (1975).

⁹ *Ibid.* By way of contrast, see *Kansas Gas and Electric Co.* (Wolf Creek Generating Station, Unit 1), ALAB-784, 20 NRC 845 (1984), in which the Licensing Board's dismissal of an intervenor's sole contention had the necessary effect of bringing to an end the participation of that party in the proceeding.

¹⁰ 10 C.F.R. 2.730(f); *Seabrook*, *supra*, 17 NRC at 1075.

ing Board's initial decision before presenting [their] grievance for appellate consideration."¹¹

Appeal dismissed.

It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the
Appeal Board

¹¹ *Seabrook, supra*, 17 NRC at 1075, citing *Houston Lighting & Power Co.* (Allens Creek Nuclear Generating Station, Unit No. 1), ALAB-635, 13 NRC 309, 310-11 (1981).

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Alan S. Rosenthal, Chairman
Gary J. Edles
Howard A. Wilber

In the Matter of

Docket No. 50-322-OL

**LONG ISLAND LIGHTING
COMPANY
(Shoreham Nuclear Power
Station, Unit 1)**

October 31, 1984

The Appeal Board affirms the initial decision rendered by the Licensing Board in this operating license proceeding, LBP-83-57, 18 NRC 445 (1983), with the exception of three matters that are remanded to the Licensing Board: (1) the question whether the plant may be operated pending resolution of a specified unresolved safety issue; (2) resolution of certain issues associated with housekeeping; and (3) the issue of environmental qualification of electrical equipment. Additionally, the Appeal Board vacates as unnecessary a condition imposed by the Licensing Board requiring the applicant to adopt a particular definition of the regulatory term "important to safety."

QUALITY ASSURANCE: REQUIREMENTS (APPLICABILITY)

The quality assurance requirements contained in 10 C.F.R. Part 50, Appendix B or their equivalent do not automatically apply to "important to safety" structures, systems and components of a nuclear power plant.

ATOMIC ENERGY ACT: COMMISSION'S AUTHORITY

The Atomic Energy Act of 1954, as amended, makes clear the Commission's authority to regulate all items contained in a nuclear power plant in order to protect the public health and safety. *See* 42 U.S.C. 2201(i).

ENFORCEMENT ACTIONS: LICENSEE OBLIGATIONS AND COMMITMENTS

The NRC expects licensees to adhere to their obligations and commitments and will not hesitate to issue appropriate orders to make sure that such commitments are met. 10 C.F.R. Part 2, Appendix C, § IV.E.

SAFETY SYSTEMS: SYSTEMS INTERACTIONS

There is no express regulatory premise for requiring a single study directed exclusively to systems interactions at nuclear power plants. *See generally Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-728, 17 NRC 777, 810-11 (1983). But, an applicant must demonstrate that safety systems are not compromised because of their interrelationship with nonsafety or other safety systems.

UNRESOLVED SAFETY ISSUES: NRC STAFF'S OBLIGATION

Where there is a generic unresolved safety issue (USI) involving a discerned safety problem, the staff is obliged to explain why the USI does not stand in the path of construction permit or operating license issuance. *See Virginia Electric and Power Co.* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-491, 8 NRC 245, 247-48 (1978) and *Gulf States Utilities Co.* (River Bend Station, Units 1 and 2), ALAB-444, 6 NRC 760, 775 (1977).

QUALITY ASSURANCE: REVIEW (AUDIT REQUIREMENTS)

Criterion XVIII of Appendix B to 10 C.F.R. Part 50 requires that a comprehensive system of planned and periodic audits be carried out to verify compliance with and determine effectiveness of the Appendix B quality assurance program. Random-sampling statistical methodology, however, is not mandated by this requirement.

QUALITY ASSURANCE: REVIEW

Quality assurance review involves two separate, yet interrelated, inquiries, i.e., whether deficiencies have been uncovered and corrected, and whether a generic problem exists that could affect the confidence in the safety of the facility. *See Union Electric Co. (Callaway Plant, Unit 1), ALAB-740, 18 NRC 343, 346 (1983).*

ATOMIC ENERGY ACT: SAFETY FINDINGS

Error-free construction of a nuclear power plant is not mandated for licensing. Rather, the Atomic Energy Act of 1954, as amended, and the Commission's implementing regulations require a finding of reasonable assurance that, as built, the facility can and will be operated without endangering the public health and safety. *Ibid.*

ADJUDICATORY BOARDS: RESPONSIBILITIES (QUALITY ASSURANCE ISSUES)

In examining claims of quality assurance deficiencies, an adjudicatory board must consider the implication of those deficiencies in terms of safe plant operation. *Ibid.*

ADJUDICATORY BOARDS: RESPONSIBILITIES (QUALITY ASSURANCE ISSUES)

In reviewing quality assurance, an adjudicatory board must be satisfied not only that construction defects have been corrected but that there has been no overall breakdown of quality assurance. *See ibid.* Numerous imperfections, even if minor, may be indicative of a more widespread or generic quality assurance problem. .

QUALITY ASSURANCE: DEFICIENCIES

Not every violation of a quality assurance implementing manual or procedures constitutes a violation of 10 C.F.R. Part 50, Appendix B. *See* 10 C.F.R. Part 2, Appendix C, § IV.A.

QUALITY ASSURANCE: REQUIREMENTS (RECORDS)

Criterion XVIII of 10 C.F.R. Part 50, Appendix B does not establish requirements for the maximum amount of time allowed in tracing the

data used in design calculation, but requires simply that records be identifiable and retrievable.

QUALITY ASSURANCE: REQUIREMENTS (ORGANIZATION)

Criterion I of 10 C.F.R. Part 50, Appendix B requires that the persons and organizations performing quality assurance functions have sufficient authority and organizational freedom to identify quality problems; initiate, recommend, or provide solutions; and verify implementation of solutions.

RULES OF PRACTICE: APPELLATE REVIEW

Mere demonstration that a licensing board erred is not sufficient to warrant appellate relief. *Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Units 1 and 2), ALAB-443, 6 NRC 741, 756 (1977). The complaining party must demonstrate actual prejudice — i.e., that the ruling had a substantial effect on the outcome of the proceeding. *Louisiana Power and Light Co.* (Waterford Steam Electric Station, Unit 3), ALAB-732, 17 NRC 1076, 1096 (1983).

LICENSING BOARDS: EXPEDITION AND THOROUGHNESS

Under the Commission's rules of practice, an adjudicatory board must use its powers to assure that the hearing is focused upon the matters in controversy and that the hearing process is conducted as expeditiously as possible, consistent with the development of an adequate decisional record. 10 C.F.R. Part 2, Appendix A, § V. Adjudicatory boards may impose time limits on cross-examination, require parties to pursue certain matters first, or limit evidentiary material to that information that is genuinely the subject of controversy.

LICENSING BOARDS: RESPONSIBILITIES (RESOLUTION OF ISSUES)

Certain matters may be left to the staff for post-hearing resolution where hearings would not be helpful and the adjudicatory board can make the findings requisite to issuance of a license. *Consolidated Edison Co. of New York* (Indian Point Station, Unit No. 2), CLI-74-23, 7 AEC 947, 951 (1974).

REGULATORY GUIDES: APPLICATION

Regulatory guides do not set out mandatory regulatory requirements. Methods and solutions different from those set out in the guides can be acceptable if they provide a basis for the findings requisite to the issuance of a license. *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), ALAB-698, 16 NRC 1290, 1299 (1982), *rev'd in part on other grounds*, CLI-83-22, 18 NRC 299 (1983).

REGULATORY GUIDES: APPLICATION

Seismic design response spectra set forth in Regulatory Guide (Reg. Guide) 1.60 are designed for applicability at essentially any location in the country and may be unnecessarily conservative for some plants. "Design Response Spectra for Seismic Design of Nuclear Power Plants," Reg. Guide 1.60 (Rev. 1) (Dec. 1973).

ADJUDICATORY BOARDS: RESOLUTION OF ISSUES

The mere pendency of confirmatory staff analyses regarding litigated issues does not automatically foreclose board resolution of those issues.

ATOMIC ENERGY ACT: HEARING REQUIREMENTS

Section 189 of the Atomic Energy Act, 42 U.S.C. § 2239, which provides parties with an opportunity for a hearing, does not preclude the adoption of procedures for written cross-examination.

ADMINISTRATIVE PROCEDURE ACT: EVIDENCE (WRITTEN)

The Administrative Procedure Act (APA), 5 U.S.C. § 556(d), expressly authorizes agencies in certain licensing cases to adopt procedures for the submission of all or part of the evidence in written form as long as the parties are not prejudiced.

ADMINISTRATIVE PROCEDURE ACT: EVIDENCE (CROSS-EXAMINATION AND REBUTTAL)

The APA does not give parties an unlimited right to submit rebuttal evidence and conduct cross-examination. Rather, these rights are bounded by a need for a full and true disclosure of the facts. *Ibid.*

TECHNICAL ISSUES DISCUSSED:

Safe Shutdown Earthquake;
Quality Assurance Requirements;
Important to Safety and Safety-Related;
Turbine Bypass System;
Reactor Core Isolation Cooling (RCIC) System;
Standby Liquid Control (SLC) System;
High Water Level Trip;
Rod Block Monitor (RBM);
Reactor Water Cleanup (RWCU) System;
Systems Interaction;
Unresolved Safety Issue (USI) A-17 (Systems Interaction);
USI A-47 (Control System Failures);
Probabilistic Risk Assessments (PRA);
Event Tree/Fault Tree Methodology of a PRA;
Housekeeping;
Control of Calculations;
Separation of Electrical Cables;
Quality Assurance Organization;
Water Hammer;
Environmental Qualification;
Post-Accident Monitoring;
Passive Mechanical Valve Failure;
Anticipated Transient Without Scram (ATWS);
ASME Code;
Single Failure Criterion;
Scram;
Seismic Design;
Earthquake Motion (displacement, velocity, acceleration);
Seismic Response Spectrum;
Mark II Containment;
Vacuum Breakers;
Design Basis Loads;
Containment Leakage Tests;
Safety Relief Valves (SRVs) (Two-Stage and Three-Stage SRVs).

APPEARANCES

Lawrence Coe Lanpher, Washington, D.C. (with whom **Herbert H. Brown** and **Karla J. Letsche**, Washington, D.C., were on the brief), for Suffolk County, New York.

Ben Wiles, Albany, New York (with whom **Gerald C. Crotty** and **Jonathan Feinberg**, Albany, New York, were on the brief), for the State of New York.

T.S. Ellis, III, **W. Taylor Reveley, III**, **James N. Christman** and **Anthony F. Earley, Jr.**, Richmond, Virginia, for the Long Island Lighting Company.

Bernard M. Bordenick and **Edwin J. Reis** (with whom **David A. Repka**, **Richard J. Rawson** and **Robert G. Perlis** were on the brief) for the Nuclear Regulatory Commission staff.

Scott E. Slaughter and **Peter S. Everett**, Washington, D.C., and **Anthony F. Earley, Jr.**, Richmond, Virginia, filed a brief for the Utility Safety Classification Group as amicus curiae.

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DECISION

Before us are appeals from a partial initial decision rendered by the Licensing Board designated to preside over all matters in this operating license proceeding other than offsite emergency planning and low power operation. LBP-83-57, 18 NRC 445 (1983).¹ In a comprehensive decision, the Board resolved all issues in favor of the applicant, Long Island Lighting Company (LILCO), with three exceptions. First, the record was reopened to admit portions of a new contention proposed by intervenor Suffolk County relating to excessive vibration and cylinder head cracking in the diesel generators that provide onsite emergency power.² Second, LILCO was required to supplement the record with regard to the testing of check valve internal parts.³ Third, the record was held open with regard to one aspect of the operation of the residual heat removal system. The Board found that the information in the record on this issue was insufficient to determine whether a design modification would be necessary or whether this issue would be resolved on a generic or a Shoreham-specific basis.⁴

In the Board's view, however, only the diesel generator issue was serious enough to preclude the issuance of a license for operation of Shoreham at low power (i.e., at levels up to five percent of rated power).⁵ On March 24, 1984, LILCO filed a "Supplemental Motion for Low Power Operating License" seeking an exemption under 10 C.F.R. § 50.57(c) to allow operation at low power pending resolution of the questions pertaining to the failure of the diesel generators during operational testing. A separate board was established to resolve the issues raised by the motion.⁶

¹ The Licensing Board's decision consists of two principal portions, a narrative opinion that appears in volume 18 of the NRC issuances, and a separate set of findings of fact. (We shall refer to these findings as FF, with a parallel reference to the page number of the Board's unpublished slip opinion.) In another proceeding we criticized this bifurcation because it is repetitious and has a potential for creating internal inconsistencies. *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-781, 20 NRC 819, 823 n.2 (1984); ALAB-776, 19 NRC 1373, 1375 n.4 (1984). Moreover, the format made it somewhat difficult for us at times to tie the Board's reasoning to its evidentiary findings. Additionally, the Board's separate findings, which contain some material not included in its opinion, are not published in the NRC issuances. Although the findings are part of the Board's decision and are available for consideration on review, and in the public document room, they will not be conveniently available to the general public. We deem this highly undesirable.

² LBP-83-57, *supra*, 18 NRC at 464 n.8.

³ *Id.* at 466-67, 636-37.

⁴ *Id.* at 517-18.

⁵ *Id.* at 467, 637.

⁶ In a decision issued on October 29, 1984 (LBP-84-45, 20 NRC 1343), that Board authorized the Director of Nuclear Reactor Regulation after making the findings required by 10 C.F.R. 50.57(a) to issue to LILCO a low-power testing license.

LILCO, the State of New York, Suffolk County, New York, and the Shoreham Opponents Coalition appealed from the Board's decision.⁷ As discussed below, LILCO's appeal is limited to a single issue, i.e., the Board's imposition of an operating license condition based upon its acceptance of the NRC staff's definition of the regulatory term "important to safety." With our permission, the Utility Safety Classification Group, an organization consisting of thirty-nine electric utility companies who own over half of the operating or planned commercial reactors in the country, filed a brief as amicus curiae urging reversal of the Licensing Board's decision with respect to this definition. New York's appeal is likewise limited to a single issue, i.e., authorization of low power operation in the absence of assurance that an adequate level of offsite emergency preparedness will be developed at Shoreham. Suffolk County's appeal is directed to the Board's disposition of a wide range of issues.⁸

Last April, following appellate briefing and oral argument, we certified to the Commission three questions.⁹ First, we asked whether the terms "important to safety" and "safety-related" should be deemed synonymous for the purpose of establishing an acceptable quality assurance program in accordance with General Design Criterion (GDC) 1 of Appendix A and Appendix B to 10 C.F.R. Part 50. Second, we sought Commission guidance as to how the resolution of that question should be applied in this proceeding. Finally, we asked whether some form of environmental evaluation under the National Environmental Policy Act (NEPA) is a precondition to issuance of a license for low power operation in this proceeding. We indicated that we would await the Commission's disposition of these matters before addressing the other issues now pending on appeal.¹⁰

The Commission responded to the certified questions in an opinion issued on June 5.¹¹ The Commission concluded, first, that the question of the definition of "important to safety" required further consideration; accordingly, it set in motion procedures looking toward resolution of the question through the notice and comment process. Second, it instructed us to proceed in the interim "on a case-by-case basis in accordance with

⁷ The Shoreham Opponents Coalition did not file its own exceptions or brief. Rather, it joined in the exceptions and brief filed by Suffolk County. See letters of James B. Dougherty, Shoreham Opponents Coalition, to the Appeal Board (Oct. 17, 1983 and Dec. 23, 1983).

⁸ The NRC staff and, except as noted above, LILCO support the Board's result.

⁹ ALAB-769, 19 NRC 995 (1984).

¹⁰ *Id.* at 1007 n.34.

¹¹ CLI-84-9, 19 NRC 1323 (1984).

current precedent. *Cf. Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit 1), ALAB-729, 17 NRC 814 (1983).¹² Lastly, it determined that NEPA does not require preparation of an environmental impact statement or any other form of environmental evaluation on the proposal to issue a low power license for the Shoreham facility.¹³ We invited the parties to comment on the Commission's opinion insofar as it offered guidance which we must apply in arriving at our decision. Comments were received on July 6.

We now turn to a resolution of the issues on appeal. Like the Licensing Board, we decide those issues essentially in the applicant's favor. We do, however, remand three relatively minor matters to the Board: (1) the question whether the plant may be operated pending resolution of Unresolved Safety Issue A-47, as discussed in section II(D); (2) resolution of certain issues associated with housekeeping, as discussed in section III, and (3) the issue of the environmental qualification of electrical equipment, as discussed in section IV(B).

We first examine LILCO's appeal and the application of the Commission's guidance concerning the definition of "important to safety" to the pending proceeding. In sections II and III we deal with Suffolk County's arguments regarding systems interaction and quality assurance. In section IV we dispose of the County's remaining challenges to the Licensing Board's decision.¹⁴ Finally, we consider New York's appeal in section V.

I. "IMPORTANT TO SAFETY"

All nuclear power plants classify structures, systems, or components according to their safety significance. At Shoreham, certain structures, systems, and components are identified as "safety-related."¹⁵ That term is derived from Appendix B to 10 C.F.R. Part 50 and Appendix A to 10 C.F.R. Part 100.

Appendix B establishes quality assurance requirements for the design, construction, and operation of those structures, systems, and components "that prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public."¹⁶ The

¹² *Id.* at 1325.

¹³ *Id.* at 1326.

¹⁴ The Commission's June 6 opinion is wholly dispositive of Suffolk County's argument regarding the need for a further environmental evaluation.

¹⁵ The term "safety-grade" is frequently used interchangeably with "safety-related." See *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), ALAB-729, 17 NRC 814, 874 n.280 (1983), *aff'd in principal part*, CLI-84-11, 20 NRC 1 (1984).

¹⁶ 10 C.F.R. Part 50, Appendix B, Introduction.

Appendix B requirements apply to “all activities affecting the *safety-related functions*”¹⁷ of such structures, systems, and components. These safety functions are more specifically set forth in Appendix A to 10 C.F.R. Part 100. According to Appendix A, “safety-related” structures, systems, and components are those that must remain functional in the event of a Safe Shutdown Earthquake¹⁸ to assure:

- (1) [t]he integrity of the reactor coolant pressure boundary,
- (2) [t]he capability to shut down the reactor and maintain it in a safe shutdown condition, or
- (3) the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the guideline exposures of ... [Part 100].¹⁹

In order to comply with what it perceived to be the Commission’s requirements, LILCO classified all Shoreham structures, systems, and components as either “safety-related” or “nonsafety-related.” Only the former are subject to a quality assurance program designed to satisfy all Appendix B requirements.

Appendix A to 10 C.F.R. Part 50, which sets forth the general design criteria for nuclear power plants, contains yet another term: “important to safety.” According to the introduction to that Appendix, structures, systems, and components “important to safety” are those “that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public.”²⁰ In LILCO’s view, there are no “important to safety” structures, systems, and components that do not fall within the classification “safety-related.” Moreover, LILCO does not interpret General Design Criterion (GDC) 1, which provides that “[a] quality assurance program shall be established and implemented” for structures, systems, and components that are *important to safety*, as imposing any requirements in addition to those contained in Appendix B. Rather, LILCO believes that GDC 1 is satisfied by the Appendix B quality assurance program that it applies to all safety-related items.

¹⁷ *Ibid.* (emphasis added).

¹⁸ The Safe Shutdown Earthquake for a particular site is that earthquake “which produces the maximum vibratory ground motion for which certain structures, systems, and components [must be] designed to remain functional,” based upon a consideration of “the maximum earthquake potential.” 10 C.F.R. Part 100, Appendix A, § III(c).

¹⁹ *Ibid.* See *id.* at §§ VI(a)(1), VI(b)(3). The Commission recently repeated, in effect, this definition of safety-related structures, systems and components as part of its new rule on environmental qualification of electrical equipment. See 10 C.F.R. § 50.49(b)(1).

²⁰ 10 C.F.R. Part 50, Appendix A, Introduction.

In its Contention 7B, Suffolk County, joined by the State of New York and the Shoreham Opponents Coalition, challenged LILCO's classification scheme.²¹ Those intervenors asserted, and continue to claim on appeal, that the "important to safety" category includes structures, systems, and components contained in, but is broader in scope than, the "safety-related" category. Without specifically identifying those structures, systems, and components deemed to be "important to safety" albeit not "safety-related," the intervenors maintain that they too had to be covered by a quality assurance program essentially equivalent to that required by Appendix B.²²

The NRC staff agrees that an "important to safety" class exists and it includes items that are not "safety-related."²³ Unlike the intervenors, however, the staff believes that LILCO has fulfilled all requirements applicable to "important to safety" structures, systems, and components.²⁴

A. Licensing Board Resolution

The Licensing Board agreed with the intervenors and staff that, as applied to the classification of structures, systems, and components, the term "important to safety" is broader than "safety-related."²⁵ But the Board parted company with the intervenors at that point. It found that, notwithstanding utilization of a two-tier classification scheme ("safety-related" and "nonsafety-related"), LILCO had complied with the Commission's quality assurance requirements because it provided the structures, systems, and components in the Shoreham design with quality assurance "commensurate with the items' importance to safety."²⁶ The Board nonetheless imposed a license condition requiring that LILCO "adopt and implement" the definition of important to safety as determined by the Board.²⁷

²¹ Contention 7B concerns the classification scheme used for the quality assurance program and the assessment of potential interactions among plant systems. Systems interaction is discussed in section II, *infra*.

²² See Suffolk County Brief in Support of Appeal of Licensing Board Partial Initial Decision (Dec. 23, 1983) (hereafter Suffolk Brief) at 3-11; Suffolk County Response to Appeal Board Order of June 7, 1984 (July 6, 1984) (hereafter Suffolk Reply Brief) at 3-4.

²³ NRC Staff's Brief in Opposition to "Suffolk County Brief in Support of Appeal of Licensing Board Partial Initial Decision" and "LILCO's Brief on Appeal" (March 9, 1984) (hereafter Staff Brief) at 12-38.

²⁴ *Id.* at 39-42.

²⁵ LBP-83-57, *supra*, 18 NRC at 546. See ALAB-729, *supra*, 17 NRC at 876 ("nothing in the regulations supports [the] assertion that the term 'important to safety' must be read as equivalent to 'safety[related]' . . .").

²⁶ LBP-83-57, *supra*, 18 NRC at 546.

²⁷ *Id.* at 546, 635.

B. Commission Guidance

Both LILCO and Suffolk County challenged the Licensing Board's disposition of this issue. Our review of the matter led us to find that "the existing regulations [were] too varied and the historic industry and agency practice too diverse simply to set forth what we perceive to be the proper interpretation of the regulations."²⁸ Accordingly, on April 23, 1984 we certified the following questions to the Commission:

1. Are the terms "important to safety" and "safety-related" to be deemed synonymous for the purpose of establishing an acceptable quality assurance program in accordance with GDC 1 of Appendix A and Appendix B to 10 C.F.R. Part 50?
2. How should the outcome of Question 1 be applied to the operating license application proceeding before us?²⁹

As earlier noted, the Commission responded by taking steps toward institution of rulemaking on this issue.³⁰ Pending the outcome of the rulemaking, we are to apply "current precedent." In this regard, the Commission confirmed the Licensing Board's determination that, under current precedent, "'important to safety' applies to a larger class of equipment than the term 'safety-related.'"³¹ But "this does not mean," the Commission stated, "that there is a pre-defined class of [important to safety] equipment Rather, whether any piece of equipment has a function 'important to safety' is to be determined on the basis of a particularized showing of clearly identified safety concerns for the specific equipment"³²

C. Analysis

In view of the foregoing, what remains for our consideration is whether the Licensing Board correctly determined the quality assurance requirements for "important to safety" systems, structures, and components and LILCO's compliance with those requirements. Additionally, we must determine the appropriateness of the Board's license condition that requires LILCO to adopt the proper definition of "important to safety." For the reasons discussed below, we affirm the Licensing

²⁸ ALAB-769, *supra*, 19 NRC at 1000.

²⁹ *Id.* at 1010.

³⁰ See p. 1111, *supra*.

³¹ CLI-84-9, *supra*, 19 NRC at 1325.

³² *Ibid.*

Board's finding that LILCO has complied with the Commission's regulations with respect to its treatment of "important to safety" equipment. We additionally conclude that the license condition imposed by the Board is no longer necessary in light of the Commission's guidance. Therefore, that condition is vacated.

1. *Adequacy of Quality Assurance*

The principal system components for the Shoreham nuclear plant and the quality assurance classification of each are listed in Table 3.2.1-1 of LILCO's Final Safety Analysis Report (FSAR), which contains design criteria and quality standards for the plant.³³ In addition to identifying those structures, systems, and components that LILCO considers to be subject to the quality assurance requirements of Appendix B (i.e., that come within the applicant's "safety-related" category), the table identifies various industry codes and other requirements that LILCO applies to both its safety-related and nonsafety-related components.³⁴ Beyond the requirements identified in the FSAR, standards for nonsafety-related equipment are contained in technical specifications approved by the NRC.³⁵ Finally, under Commission regulations and staff guidance, LILCO, like all other utility permittees and licensees, has been required to apply "upgraded"³⁶ quality assurance to certain items — for example, fire protection systems that, although not performing a safety-related function, are worthy of special treatment.³⁷

In addition, the reactor vendor and principal architect/engineer for Shoreham, General Electric and Stone and Webster Engineering Corporation (Stone and Webster), respectively, apply their own quality assurance treatment to all items produced for Shoreham. General Electric requires an essentially identical degree of *engineering* quality assurance for

³³ Tr. fol. 4346 at 170 (Burns, *et al.*). See also Tr. fol. 1114, Exh. 2, for revisions to this FSAR table.

The FSAR is reviewed by the staff against specific criteria provided by the Standard Review Plan (SRP) (NUREG-0800). While the primary focus of the SRP is safety-related items, other items that the staff believes must meet certain criteria are also addressed. Staff Brief at 30-31.

³⁴ FSAR Table 3.2.1-1. See also Tr. fol. 4346 at 41 (Burns, *et al.*).

³⁵ Technical specifications include surveillance requirements and conditions that limit operation of the plant when certain specified systems become unavailable. See, e.g., Tr. fol. 4346, LILCO Attachment 8.

³⁶ Upgraded quality assurance refers to a range of requirements that are imposed depending upon the particular structure, system, or component involved and the degree of its importance. See Board Notification 84-011 (Jan. 18, 1984) for a generic letter sent by the staff to all licensees and applicants that indicates that the staff intends to continue, as in the past, the practice of imposing additional quality assurance requirements on important to safety items, commensurate with their safety importance. See, e.g., 49 Fed. Reg. 26,036, 26,041 (1984) where the staff has been directed to provide guidance on the application of selected sections of Appendix B to nonsafety-related equipment utilized during the response to an anticipated transient without scram (ATWS) event.

³⁷ See 10 C.F.R. Part 50, Appendix R for fire protection requirements.

all structures, systems, and components, independent of safety classification.³⁸ Insofar as their procurement or manufacture is concerned, non-safety-related items are otherwise afforded quality assurance treatment in varying degrees, based upon an evaluation of their importance.³⁹ Even for such structures, systems, and components, however, most of the 10 C.F.R. Part 50, Appendix B criteria are addressed.⁴⁰ Similarly, while not applying Appendix B to items which it deems to be nonsafety-related, Stone and Webster does have some quality assurance procedures for such items.⁴¹ For example, all nonsafety-related systems, structures, and components are designed, procured, constructed, and tested in accordance with applicable industry codes and standards.⁴²

(a) *Requirements*

Suffolk County's dissatisfaction with LILCO's quality assurance classification scheme is two-fold. The County agrees with the Licensing Board that LILCO must recognize and apply quality assurance to an "important to safety" category that is distinct from the safety-related class.⁴³ According to the County, besides failing to identify separately and specifically "important to safety" equipment,⁴⁴ LILCO does not have an appropriate quality assurance program under GDC 1 for any items that would fall into this category.⁴⁵ The County, therefore, urges us to overturn the Licensing Board's finding that adequate quality assurance was applied notwithstanding the definitional error by LILCO.⁴⁶

More particularly, the County argues that GDC 1⁴⁷ requires, for "important to safety" items, a quality assurance program containing planned and systematic actions composed of written policies, procedures, and instructions, and specifying the organizations involved.⁴⁸ As the County sees it, the FSAR, technical specifications, and supplier qual-

³⁸ Tr. fol. 4346 at 42 (Burns, *et al.*).

³⁹ *Ibid.*

⁴⁰ *Id.* at 43.

⁴¹ *Id.* at 44.

⁴² *Id.* at 47.

⁴³ Suffolk Brief at 3; LBP-83-57, *supra*, 18 NRC at 546. *See also* CLI-84-9, *supra*, 19 NRC at 1325.

⁴⁴ Suffolk Brief at 10-11.

⁴⁵ *Id.* at 4-11.

⁴⁶ *Id.* at 4-5.

⁴⁷ 10 C.F.R. Part 50, Appendix A, GDC 1 states in relevant part (emphasis added):

A *quality assurance program* shall be established and implemented in order to provide adequate assurance that [important to safety] structures, systems, and components will satisfactorily perform their safety functions.

⁴⁸ Suffolk Brief at 7-10.

ity assurance programs described above do not so qualify but, rather, amount to “an *ad hoc* endeavor”⁴⁹ in violation of the implicit requirements of GDC 1.

In support of its argument, the County points to the requirements contained in 10 C.F.R. Part 50, Appendix B.⁵⁰ The introduction to that appendix states that the term “quality assurance” used “in this appendix . . . comprises all those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service.”⁵¹ Further, Criterion II of the appendix specifies that a quality assurance program under that appendix “shall be documented by written policies, procedures, or instructions . . . [applied to] identif[ied] . . . structures, systems, and components . . . [and carried out by identified] organizations”

We find the County’s reasoning to be without merit. By their literal terms, the provisions of Appendix B relied on by the County only apply to quality assurance programs for the *safety-related* items covered by Appendix B. There are no similar requirements contained in Appendix A to Part 50 pertaining to “important to safety” equipment. Further, the County points to no other authority, and we are aware of none, that would require that degree of formality for the “important to safety” quality assurance program.

Additional support for not extending the Appendix B requirements to the quality assurance program required by GDC 1 for “important to safety” equipment is contained in the Commission’s June 6, 1984 response to our certified questions. There, the Commission stated that there is not

a pre-defined class of equipment at every plant whose functions have been determined by rule to be “important to safety” Rather, whether any piece of equipment has a function “important to safety” is to be determined on the basis of a particularized showing of clearly identified safety concerns . . . , and the requirements of . . . GDC 1 must be tailored to the identified safety concerns.⁵²

The Commission’s guidance indicates the regulations are to be flexibly applied, with variation depending on specific safety concerns. For these reasons, we agree with the Licensing Board that a separate quality assurance program akin to an Appendix B program, including written proce-

⁴⁹ *Id.* at 8.

⁵⁰ *Id.* at 7-8.

⁵¹ 10 C.F.R. Part 50, Appendix B, Introduction.

⁵² CLI-84-9, *supra*, 19 NRC at 1325.

dures and identification of all “important to safety items,” is not required.⁵³

(b) LILCO's Quality Assurance Program

According to the County, LILCO's quality assurance treatment of nonsafety-related items was deficient in that LILCO misclassified a number of systems in FSAR Table 3.2.1-1. We consider each of these systems in turn.

(i) Turbine Bypass System

The turbine bypass system is used to pass partial steam flow to the condenser during normal startup and shutdown and following a turbine trip or load rejection.⁵⁴ The turbine bypass valves are designed to open automatically in the event of a turbine trip or load rejection in order to reduce the pressurization rate of the reactor.⁵⁵ At the hearing below, the County pointed to this system as an example of a system that, because relied upon in whole or in part to mitigate accidents or transients, should be classified as “safety-related.”⁵⁶ On appeal, the County modified its position to assert that the turbine bypass system need not be treated as “safety-related” but, rather, exemplifies the need for a separate “important to safety” category.⁵⁷

The short answer is that the County's current concern has been satisfied. Under the Commission's recent guidance, an “important to safety” class that is broader than the safety-related category must be recognized by LILCO. Nonetheless, not every structure, system, or component need be upgraded to safety-related status. In this connection, we have undertaken a review on our own initiative of the adequacy of the classification and quality assurance applied to this system.

We agree with LILCO and the staff that the turbine bypass system need not be treated as safety-related.⁵⁸ Accident analyses indicate that failure of the system in the event of generator load rejection or turbine

⁵³ See LBP-83-57, *supra*, 18 NRC at 558-59 (adopting conclusion of *Three Mile Island*, ALAB-729, *supra*, that GDC 1 contemplates gradations of quality requirements); *id.* at 560, 561 (no requirement for a list of “important to safety” systems exists). See also App. Tr. 39-40, where counsel for the County acknowledged the difficulty with creating a generic list of all “important to safety” items for all plants.

⁵⁴ Tr. fol. 4346 at 146 (Burns, *et al.*).

⁵⁵ *Ibid.*

⁵⁶ Tr. fol. 1114 at 39-40 (Goldsmith, *et al.*).

⁵⁷ Suffolk Brief at 14.

⁵⁸ Tr. fol. 4346 at 147-48 (Burns, *et al.*); Tr. fol. 6357 at 27 (Speis, *et al.*).

trip would not result in fuel damage.⁵⁹ The main turbine bypass valves, however, play a role, along with other valves, in relieving the pressure in the event of a feedwater control failure.⁶⁰ Therefore, some importance must be attributed to this system. Even so, should there be a simultaneous failure of the turbine bypass system, the Level 8 trip (*see* pp. 1122-23, *infra*) and the feedwater controller, only a minor amount of damage to a few fuel rods might occur.⁶¹ This would not pose an undue risk to public health and safety. Thus, the system need not meet the more stringent requirements for safety-related items.

Although the entire turbine bypass system is not considered to be "safety-related," the steam lines leading to the turbine bypass valves meet Appendix B quality assurance requirements.⁶² Further, turbine bypass valves and the turbine generator electrohydraulic control system are subject to the quality assurance program of the supplier, General Electric.⁶³ Additionally, LILCO has proposed a technical specification requiring periodic surveillance to confirm operability of the system.⁶⁴ In these circumstances, we believe the system is subject to quality assurance requirements commensurate with its intended function.

(ii) Reactor Core Isolation Cooling System

The reactor core isolation cooling (RCIC) system can provide core cooling water during reactor shutdown in the event of a failure of the main feedwater system.⁶⁵ The RCIC system may also be used to supplement the high pressure coolant injection (HPCI) system.⁶⁶ The County asserted before the Licensing Board that the RCIC system should have been treated as a safety-related system.⁶⁷

⁵⁹ FSAR at 15A-11 (§ 15A.1.1.5), 15A-16 (§ 15A.1.2.5). LILCO witness Edward T. Burns also indicated that any effect of a failure of the turbine bypass valves to open in the event of a generator load rejection or turbine trip would be minor. Tr. fol. 4346 at 146-47 (Burns, *et al.*).

⁶⁰ FSAR Table 15A.1.7-1.

⁶¹ Tr. fol. 6357 at 24 (Speis, *et al.*).

⁶² Tr. fol. 1114, Exh. 2 (FSAR Table 3.2.1-1) at 13; Tr. fol. 4346 at 147 (Burns, *et al.*).

⁶³ Tr. fol. 4346 at 148 (Burns, *et al.*). *See* pp. 1116-17, *supra*, for a description of General Electric's quality assurance program.

⁶⁴ Tr. fol. 4346, Attachment 8, at 3/4 3-102 to 3-103 and 3/4 7-36. *See also* NUREG-0420, Safety Evaluation Report (April 1981) (hereafter Staff Exh. 2A) at 7-18 to 7-19. To the extent we rely upon the proposed technical specifications, they must be finally adopted by LILCO prior to the issuance of a full-power license.

⁶⁵ Tr. fol. 4346 at 143 (Burns, *et al.*).

⁶⁶ *Ibid.*

⁶⁷ Tr. fol. 1114 at 39-40 (Goldsmith, *et al.*). *Cf.* Tr. fol. 6357 at 25 (Speis, *et al.*) (notwithstanding the staff witnesses' statement that the RCIC system is safety-related, they explain that only that portion of the system necessary to perform a safety function should be treated as safety-related); *see also* Tr. 7485-86 (Hodges).

The RCIC system is not directly relied upon in the accident analyses presented in the FSAR.⁶⁸ It is, however, considered a backup for the HPCI system in the event of a control rod drop accident.⁶⁹ Additional backup utilizing safety-related equipment is provided by the combination of the automatic depressurization system (ADS) and low pressure coolant injection (LPCI) or core spray systems.⁷⁰ It is questionable whether the RCIC system is an essential backup given the availability of these other systems. Nonetheless, as shown in Table 3.2.1-1 of the FSAR, the principal components of the RCIC system are subject to the quality assurance requirements of Appendix B.⁷¹ Moreover, the technical specifications proposed for the facility require that the RCIC system undergo periodic surveillance to ensure its operability.⁷² For these reasons, we believe that the RCIC system has been designed, constructed, and will be operated under quality standards commensurate with its function.

(iii) Standby Liquid Control System

The Standby Liquid Control (SLC) system is a diverse, backup reactivity control system, capable of shutting the reactor down from rated power to cold conditions in the event that an insufficient number of control rods are inserted.⁷³ The FSAR states:

The standby liquid control system is a special safety system and is maintained in a standby status whenever the reactor is critical and at all times when it is possible to make the reactor critical.⁷⁴

The County claimed⁷⁵ below that the FSAR and the Safety Evaluation Report (SER) do not demonstrate that the SLC system is properly designed, classified, and qualified. Further, the County asserts that the system should be classified as safety-related.⁷⁶

⁶⁸ Tr. 4813 (Robare); FSAR, Chapter 15.

⁶⁹ Tr. 4813 (Robare); FSAR Appendix 7A at 7A-34, 7A-35.

We note that those portions of the RCIC system used to mitigate the effects of a control rod drop accident meet most of the safety-related design requirements. Tr. 4814 (Robare).

⁷⁰ Staff Exh. 2A at 6-41 to 6-42; 7-10 to 7-11.

⁷¹ Tr. fol. 1114, Exh. 2, at 7; Tr. fol. 4346 at 144 (Burns, *et al.*).

⁷² Tr. fol. 4346, Attachment 8, at 3/4 7-10 to 7-11, 3/4 3-42 to 3-46. *See also* note 64, *supra*.

⁷³ Tr. fol. 4346 at 159 (Burns, *et al.*).

⁷⁴ FSAR (Rev. 5, March 1977) at 4.2-84.

⁷⁵ Tr. fol. 1114 at 48, 51.

⁷⁶ The SER for Shoreham lists the SLC system as a "[s]ystem[] required for safe shutdown." Staff Exh. 2A at 7-9 to 7-10. It is clear, however, from the FSAR and testimony of LILCO and staff witnesses that the system is only used as a backup for a type of event that is not considered a design basis accident. *See* Tr. 4881-82 (Robare, Dawes); Tr. fol. 6357 at 24-25 (Speis, *et al.*); FSAR at 4.2-84.

(Continued)

Inasmuch as this system does not perform a safety-related function described in Appendix A to Part 100, it is not required to meet all of the qualification requirements for such systems.⁷⁷ LILCO does regard the SLC system as a backup that could be considered to have some safety significance.⁷⁸ Consequently, all of the equipment essential for injecting boron solution into the reactor is built to safety-related standards, including Appendix B quality assurance requirements.⁷⁹ Non-essential equipment, including the tank heater system, is designed to lesser standards.⁸⁰ Further, the proposed technical specifications for the facility require the system to undergo periodic surveillance to ensure its operability.⁸¹ We conclude, therefore, that the SLC system has been accorded quality assurance treatment commensurate with its intended function.⁸²

(iv) High Water Level (Level 8) Trip of Main Turbine and Feedwater Pumps

The feedwater control system employs a reactor vessel high water level trip ("Level 8 trip") that terminates feedwater flow and trips the turbine in the event of a feedwater controller failure.⁸³ Were the Level 8 trip to fail, the water level would increase until either (1) manual operator action was taken, or (2) wet steam began to enter the turbine, causing vibrations that, in turn, would bring about a trip.⁸⁴ The County points to the Level 8 trip as another example of a system that should be classified as safety-related.⁸⁵

Further, only a portion of the system would be called upon to perform in such circumstances and that portion is covered by safety-related requirements. Tr. 7485 (Kirkwood); Tr. fol. 6357 at 24 (Speis, *et al.*). See also note 79 and accompanying text, *infra*.

⁷⁷ See Tr. fol. 6357 at 24-25 (Speis, *et al.*) (notwithstanding its general statement that the SLC system is safety-related, the staff explains that its views apply only to portions of the system).

⁷⁸ Tr. 4880, 4901 (Robare).

⁷⁹ Tr. fol. 4346 at 160 (Burns, *et al.*); Tr. 4888 (Robare); Tr. fol. 6357 at 24 (Speis, *et al.*); Tr. fol. 1114, Exh. 2 (Table 3.2.1-1), at 3-4.

⁸⁰ Tr. fol. 4346 at 160 (Burns, *et al.*). The County was concerned about the maintenance of the liquid temperature to ensure that the boron remains in solution. See Tr. 1680-81 (Goldsmith). The heaters for this purpose are not primarily relied upon, but are used only when the ambient temperature of the reactor building is too low. Tr. fol. 4346 at 160 (Burns, *et al.*). Further, the solution temperature is monitored so that an alarm will sound if the temperature falls below a pre-set value. *Ibid.* Finally, the proposed technical specifications for Shoreham require the solution temperature to be checked every 24 hours. *Id.*, Attachment 8, at 3/4 1-19. These provisions are adequate to ensure that the temperature of the boron solution is maintained despite lower standards applied to the heater system.

⁸¹ Tr. fol. 4346, Attachment 8, at 3/4 1-19 to 1-20. See note 64, *supra*.

⁸² The SLC system is covered by recently promulgated regulations aimed at reducing the risk from anticipated transients without scram (ATWS) events. 49 Fed. Reg. 26,038 (1984). See section IV(D), *infra*. As a result, the system may have to meet additional requirements not as yet developed by the staff. See 49 Fed. Reg. at 26,040-41.

⁸³ Tr. fol. 4346 at 145 (Burns, *et al.*); Staff Exh. 2A at 7-19.

⁸⁴ Tr. fol. 4346 at 145 (Burns, *et al.*).

⁸⁵ Tr. fol. 1114 at 40 (Goldsmith, *et al.*).

Analyses show that a Level 8 trip failure would not have a significant impact on the transient severity.⁸⁶ Thus, the trip does not perform a safety function⁸⁷ and need not be considered safety-related.

Nevertheless, the Level 8 trip is assumed by the FSAR Chapter 15 transient analysis to operate in the event of failure of the feedwater controller.⁸⁸ LILCO, therefore, has taken steps to assure the reliability of the system. For example, the quality assurance applied to the Level 8 trip instrumentation is equal or very close to that prescribed by Appendix B.⁸⁹ Additionally, a technical specification that requires periodic surveillance to assure operability of the trip has been proposed.⁹⁰ In light of its limited effects in the event of failure, we believe that the Level 8 trip has received appropriate attention.

(v) Rod Block Monitor

Together with the local power range monitor (LPRM) and the reactor manual control (RMC) systems, the rod block monitor (RBM) is designed to prohibit the erroneous withdrawal of a control rod and thus to prevent local fuel damage.⁹¹ The RBM will initiate a rod block signal to the RMC system to stop drive motion during the worst single rod withdrawal error.⁹² Before the Licensing Board, the County cited the RBM as another example of a system which should have been, but was not, classified as safety-related.⁹³ On appeal, the County no longer contends that the RBM need be treated as safety-related, but argues that it demonstrates the need for an "important to safety" classification that is broader in scope than the safety-related category.⁹⁴ As we have seen, the Commission has adopted that position. Because the County does not identify any quality assurance deficiencies with regard to this system, its concern must be deemed satisfied.⁹⁵

⁸⁶ Tr. fol. 4346 at 145 (Burns, *et al.*). As noted earlier, even if a feedwater controller failure occurred together with a failure of the Level 8 trip and turbine bypass system, at most the result would be only a small degree of fuel rod damage, insufficient to cause undue risk to the public health and safety. *See* p. 1120, *supra*.

⁸⁷ Tr. 4820 (Robare).

⁸⁸ Tr. fol. 4346 at 145 (Burns, *et al.*).

⁸⁹ Tr. 4821 (Robare).

⁹⁰ Staff Exh. 2A at 7-19. *See* note 64, *supra*.

⁹¹ Tr. fol. 4346 at 141 (Burns, *et al.*).

⁹² *Ibid*.

⁹³ Tr. fol. 1114 at 40 (Goldsmith, *et al.*).

⁹⁴ Suffolk Brief at 14.

⁹⁵ The RBM is subject to the quality assurance requirements of Appendix B. *See* FSAR at 7.6-62, § 7.6.2.5.5. In addition, LILCO indicated that "full safety system criteria" are applied to the signal sent by the LPRM to the RBM. Tr. fol. 4346 at 142 (Burns, *et al.*); *see also* Tr. 4796-98 (Robare). The RMC

(Continued)

(vi) Reactor Water Cleanup System

The Reactor Water Cleanup (RWCU) system continuously removes a small amount of water from the reactor coolant system for purification and then returns the water via a feedwater system injection line.⁹⁶ The County cites portions of the RWCU system listed in Table 3.2.1-1 of the FSAR as examples of improper classification by LILCO.⁹⁷

The RWCU system serves no safety function.⁹⁸ But a portion of that system, up to and including the outermost containment isolation valve in the suction lines, is part of the reactor coolant pressure boundary.⁹⁹ Under the traditional criteria used to determine safety-related items, only this portion of the system need be, and is, classified by LILCO as safety-related.¹⁰⁰ The remainder of the system can be isolated from the reactor by motor-operated valves and check valves¹⁰¹ and, thus, need not be considered safety-related.¹⁰² We agree with LILCO that the RWCU system has been properly classified for its intended function.¹⁰³

2. License Condition

After concluding that there is a distinction between the terms "safety-related" and "important to safety," the Licensing Board imposed a condition upon the Shoreham operating license. Insofar as the classification and qualification of structures, systems, and components is concerned, the condition obligates LILCO to "acknowledge[] and adopt[]" the Board's definition of the term "important to safety."¹⁰⁴ The Board concluded, however, that despite its incorrect usage of the terms,

system, however, is not designed to full safety system standards even though LILCO does believe it to be of high quality. Tr. fol. 4346 at 143 (Burns, *et al.*). Regardless, these systems do not have to be safety-related because failure of the rod block function would result in only minor (if any) damage to a few fuel rods with no significant threat of radioactive release. *Id.* at 141; Tr. 4787-88, 4797 (Robare).

⁹⁶ Tr. fol. 4346 at 164 (Burns, *et al.*).

⁹⁷ Tr. fol. 1114 at 24-25 (Goldsmith, *et al.*).

⁹⁸ Tr. fol. 4346 at 165 (Burns, *et al.*).

⁹⁹ *Id.* at 164.

¹⁰⁰ *Ibid.* See p. 1113, *supra*.

¹⁰¹ Tr. fol. 4346 at 164 (Burns, *et al.*).

¹⁰² It is true, as the County notes, that additional components of the RWCU system are classified as Quality Group C, "safety-related" under Regulatory Guide 1.26, in a separate classification scheme designed to satisfy that regulatory guide. See Tr. fol. 1114 at 25. Nonetheless, we agree with the staff that these components need not be subject to the Appendix B QA program. Tr. fol. 6357 at 13-14 (Speis, *et al.*). In this instance, the regulatory guide does not provide an accurate measure of the necessary QA treatment. Moreover, as we discuss *infra*, regulatory guides are not binding standards.

¹⁰³ The classification of other systems (e.g., the water level indication system) challenged by the County at the hearing either was not pursued on appeal or is questioned for purposes other than quality assurance treatment, such as system interaction analysis, which is discussed *infra* at section II. Nevertheless, we have reviewed the record concerning these systems and conclude that they have been subject to quality assurance requirements commensurate with their intended functions.

¹⁰⁴ LBP-83-57, *supra*, 18 NRC at 563. See also *id.* at 635.

LILCO has met all Commission requirements and modifications would not be likely to result from the condition.¹⁰⁵ Although it thought changes were unlikely, the Licensing Board perceived two reasons for the condition:

- (1) [to] confirm the Commission's regulatory authority over [structures, systems and components] and related activities beyond those which are safety-related, and
- (2) to assure, as a regulatory requirement, the continuation by LILCO of the application of quality assurance [to] important to safety [structures, systems, and components] and related activities, commensurate with their safety function.¹⁰⁶

The staff originally was satisfied that the Licensing Board's condition requiring adoption of an "important to safety" classification was appropriate.¹⁰⁷ We have since been advised by the staff that it believes that the Commission's recent recognition of this separate quality assurance class in CLI-84-9¹⁰⁸ obviates the need for the license condition.¹⁰⁹ Similarly, LILCO is of the view that, given CLI-84-9, no license condition is necessary either to confirm NRC regulatory authority or ensure LILCO's compliance.¹¹⁰

For its part, Suffolk County did not present to us its views on the effect that CLI-84-9 might have on the need for the license condition. We assume, therefore, that the County stands by its original appellate position that the license condition is not only necessary but does not go far enough in requiring LILCO to apply the definitional distinction between "important to safety" and "safety-related."¹¹¹ Presumably, the County would have us impose additional requirements upon LILCO. In particular, it seeks to have LILCO identify all "important to safety" structures, systems, and components, and then modify all plant documents to reflect this change. It then wants LILCO to produce evidence of a quality assurance program for all items in the "important to safety" category.¹¹²

In light of the Commission's guidance, we agree with the staff and LILCO that the license condition imposed by the Board is no longer

¹⁰⁵ *Id.* at 563.

¹⁰⁶ *Id.* at 563-64.

¹⁰⁷ Staff Brief at 60-71.

¹⁰⁸ *Supra*, 19 NRC at 1323.

¹⁰⁹ NRC Staff Response to Order of June 7, 1983 Allowing Comments on the Application of CLI-84-9 (July 6, 1984) (hereafter Staff Response) at 5-7.

¹¹⁰ LILCO's Views on CLI-84-9 (July 6, 1984) at 5-6.

¹¹¹ Suffolk Brief at 11-17.

¹¹² *Id.* at 12-13.

necessary. By its decision in CLI-84-9, the Commission clearly exercised its authority to regulate other than safety-related items. Further, the Commission's authority to regulate all items contained in a nuclear power plant in order to protect the public health and safety is made clear by the Atomic Energy Act of 1954, as amended.¹¹³ The license condition, therefore, adds nothing to the authority of the Commission to regulate in this area.

As to the second purpose ascribed to the condition — to assure continued application of quality assurance to "important to safety" items — other means of enforcement exist. LILCO's commitment to continue to apply certain quality assurance measures to "important to safety" equipment appears in its FSAR.¹¹⁴ The FSAR constitutes part of a license application upon which a license approval is based. As stated in 10 C.F.R. Part 2, Appendix C, § IV.E, the "NRC expects licensees to adhere to any obligations and commitments . . . and will not hesitate to issue appropriate orders to make sure that such commitments are met." No further assurance is required.¹¹⁵

For these reasons, the license condition imposed by the Licensing Board is no longer warranted and, accordingly, is vacated.

II. SYSTEMS INTERACTION

The subject of systems interaction was introduced into this case as part of a broad contention (7B) that was crafted by the Licensing Board from related contentions proffered by the intervenors.¹¹⁶ The contention read as follows:

LILCO and the [s]taff have not applied an adequate methodology to Shoreham to analyze the reliability of systems, taking into account systems interactions and the classification and qualification of systems important to safety, to determine which sequences of accidents should be considered within the design basis of the plant, and if so, whether the design basis of the plant in fact adequately protects against every such sequence. In particular, proper systematic methodology such as the fault-tree and event-tree logic approach of the IREP program or a systematic failure modes and effect analysis has not been applied to Shoreham. Absent such a methodological approach to defining the importance to safety of each piece of equipment, it is not

¹¹³ See section 161(i), 42 U.S.C. 2201(i).

¹¹⁴ Tr. fol. 20,654, LILCO Exh. 70, at Insert "A"; Tr. 21,071; Tr. 21,119. See also LILCO's Reply Brief (March 2, 1984) at 12 n.10.

¹¹⁵ In fact, the license condition has the potential for causing difficulty. First, a potential conflict could arise between the condition and the Commission's ultimate resolution of the matter in its rulemaking. Second, it might convey the impression that, absent such a condition, the Commission would lack regulatory authority over other than safety-related items at a particular facility.

¹¹⁶ LBP-82-19, 15 NRC 601, 604 (1982).

possible to identify the items to which General Design Criteria 1, 2, 3, 4, 10, 13, 21, 22, 23, 24, 29, 35, 37 apply, and thus it is not possible to demonstrate compliance with these criteria.¹¹⁷

The Licensing Board found, as a threshold matter, that there is no direct, explicit NRC regulatory requirement for LILCO to perform a single, comprehensive systems interaction analysis for Shoreham.¹¹⁸ Based on the numerous and diverse studies bearing on systems interaction actually performed by LILCO,¹¹⁹ the Board concluded:

We are persuaded that despite the County's position to the contrary, LILCO has far exceeded any regulatory requirements for systems interaction analysis and that the totality of these analyses, although not performed as a dedicated, single exercise, nevertheless represents the equivalent of such an exercise, performed in a thoroughly professional manner. The County has failed to identify any systems interaction that has not been considered and has failed to identify any structure, system or component that is improperly classified.¹²⁰

The Board recognized that systems interaction is listed as one of the "Top 20" so-called Unresolved Safety Issues (known as USI A-17) and that progress toward resolution of A-17 had been delayed.¹²¹ The Board nevertheless agreed with the staff that there is no undue risk to the public associated with operation of Shoreham pending resolution of the item.¹²² Further, the Board found that "the [s]taff position on USI A-47 [a specific systems interaction, discussed at pp. 1135-37], is acceptable, i.e., the [s]taff will review the analyses to be supplied by LILCO . . . to assure that they do not represent an undue risk to the public health and safety."¹²³ As a result, the Board concluded that this part of the contention must fail.¹²⁴

The County objects to the Licensing Board's conclusions regarding the applicant's search for adverse systems interactions at Shoreham.¹²⁵ In particular, according to the County, the Board erred in concluding that (1) there is no direct explicit regulatory requirement for LILCO to conduct a systematic systems interaction analysis for Shoreham, and (2) the County failed to identify any systems interaction that had not been

¹¹⁷ *Id.* at 611.

¹¹⁸ LBP-83-57, *supra*, 18 NRC at 549.

¹¹⁹ These analyses are listed by the Board at 18 NRC 551-53.

¹²⁰ *Id.* at 553.

¹²¹ FF J-143 (slip opinion at 511).

¹²² LBP-83-57, *supra*, 18 NRC at 554.

¹²³ *Id.* at 555.

¹²⁴ *Ibid.*

¹²⁵ Suffolk Brief at 18.

considered.¹²⁶ The County also objects to the Licensing Board's treatment of Unresolved Safety Issues A-17 and A-47.¹²⁷ We address these arguments below.

A. Regulatory Requirements and Systems Interaction Studies

The County argues that there is a requirement under Commission regulations that applicants systematically assess their reactor designs for potentially adverse systems interactions.¹²⁸ "Such an assessment," the County maintains, "while perhaps not a single study, must be sufficiently comprehensive to provide confidence that all serious potential interactions have in fact been identified."¹²⁹ The County points to Appendix A to 10 C.F.R. Part 50 and one of our *North Anna* decisions¹³⁰ as support for its position.

The County acknowledges that there is no express regulatory premise for requiring a single study directed exclusively to systems interactions at nuclear power plants.¹³¹ As the Licensing Board noted, there is also no uniformly recognized definition of "systems interaction" or any generally accepted methodology for conducting studies of systems interaction.¹³² This is not to say, of course, that potential systems interaction problems may be left unaddressed. There is general agreement that an applicant must "provide assurance that the independent functioning of safety systems is not jeopardized by preconditions in the plant design (particularly dependencies hidden in supporting and interfacing systems) that cause faults to be dependent."¹³³ In other words, an applicant must demonstrate that safety systems are not compromised because of their interrelationship with nonsafety or other safety systems.

As the Licensing Board additionally observed, there are various techniques for evaluating systems interactions, each with its own strengths and weaknesses, and the most effective way to identify potential systems

¹²⁶ *Ibid.*

¹²⁷ *Id.* at 28-43.

¹²⁸ *Id.* at 22-25.

¹²⁹ *Id.* at 25.

¹³⁰ *Virginia Electric and Power Co.* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-491, 8 NRC 245 (1978).

¹³¹ Suffolk Brief at 22-25. See generally *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-728, 17 NRC 777, 810-11 (1983).

¹³² LBP-83-57, *supra*, 18 NRC at 548.

¹³³ *Ibid.* See Tr. fol. 6357 at 34-35 (Speis, *et al.*). Systems interaction is defined by LILCO as a subset of dependent failures whereby one system or component interacts with a second system or component in such a way that it may affect the function of the second system or component. Tr. 5018-19 (Kascsak). We consider the above definition of systems interaction sufficient for our use in this decision.

interaction problems is through a combination of various techniques.¹³⁴ At issue is the thoroughness and efficacy of the numerous studies related to systems interaction performed by LILCO and others that were discussed at the hearing.¹³⁵

The County condemns the studies because they “do not constitute systematic analyses performed *for the purpose of identifying* potential adverse systems interactions and incorporating those data into LILCO’s classification scheme.”¹³⁶ The Licensing Board was satisfied, however, that systems interaction problems were adequately analyzed to assure that the Shoreham design protects the public from credible accidents despite the lack of a single comprehensive analysis.¹³⁷ So are we.

As noted earlier, the Board reviewed a wide variety of evaluations pertaining to systems interaction. The County insists that we should question the value of two studies because they failed to identify the potential interaction (known in this proceeding as the “Michelson concern”) resulting from a reactor vessel water level sensing line break.¹³⁸ These two studies are the water level measurement error analysis performed by General Electric in 1981 (GE Study)¹³⁹ and the Shoreham probabilistic risk assessment (PRA) performed by Science Applications Incorporated. The County focuses particularly on the PRA. In its view, the PRA’s methodology was deficient and, additionally, its results were not analyzed to identify or assess potential adverse interactions.¹⁴⁰ Specifically, the County argues, first, that the PRA failed to detect a sensing line break. Moreover, it submits that the PRA was not a systems interaction analysis because it was not undertaken for that purpose and did not consider several external initiating events and their potential impact on interactions.¹⁴¹ Finally, it asserts that there is no persuasive evidence that potential adverse systems interactions that may have been identified in the Shoreham PRA have been addressed in any systematic way by LILCO.¹⁴²

We do not consider these studies or LILCO’s overall systems interaction review fatally flawed. The Shoreham PRA was designed to identify systematically postulated accident sequences and the failures which can

¹³⁴ FF J-39 (slip opinion at 476).

¹³⁵ See FF J-51 to J-141 (slip opinion at 480-510).

¹³⁶ Suffolk Brief at 25-26 (emphasis in original).

¹³⁷ LBP-83-57, *supra*, 18 NRC at 576.

¹³⁸ Suffolk Brief at 26. See our discussion of this potential interaction (the Michelson concern), *infra*.

¹³⁹ Tr. 5329 (Robare).

¹⁴⁰ Suffolk Brief at 26.

¹⁴¹ *Id.* at 27.

¹⁴² *Id.* at 28.

cause them.¹⁴³ Although we believe the PRA should have detected the sensing line break, we are satisfied that this failure does not undermine the entire study. The sensing line break problem was omitted from the PRA because its frequency of occurrence was underestimated by the analysts performing the study.¹⁴⁴ This would not automatically affect other aspects of the study. Perhaps more importantly, a basic purpose of employing a battery of analyses is to ensure that genuine problems will be uncovered despite a failure in an individual analysis. The sensing line break problem was separately analyzed by LILCO and General Electric and found not to be significant.¹⁴⁵

We agree with the County that a PRA is not equivalent to a systems interaction study. Nevertheless, a PRA will identify systems interactions if it employs the event tree/fault tree methodology.¹⁴⁶ This methodology was used at Shoreham.¹⁴⁷

Plant walkdowns were used both to develop the event tree/fault tree models¹⁴⁸ and to identify potential independent multiple system failures (i.e., systems interactions).¹⁴⁹ The County argues generally that the walkdowns were limited and not performed in a manner designed to search comprehensively for potential interactions.¹⁵⁰

In this connection, the County pointed below to the fact that the walkdowns at Shoreham were on a smaller scale than those performed at the Diablo Canyon and Indian Point plants.¹⁵¹ The evidence indicated, however, that the County's comparison is inappropriate. The purpose of the walkdowns in the Shoreham PRA was to identify system dependencies and interfaces which could disable multiple systems.¹⁵² The systems

¹⁴³ Tr. fol. 4346 at 87 (Burns, *et al.*).

¹⁴⁴ Tr. 6171 (Burns). See also Tr. fol. 4346 at 120-21 (Burns, *et al.*).

¹⁴⁵ Tr. 6176-77 (Burns, Kascsak). As earlier noted, the County also criticizes the GE water level measurement error analysis for its failure to detect a sensing line break. Tr. fol. 4346 at 64 (Burns, *et al.*). That study was not intended to analyze such a break.

¹⁴⁶ Tr. fol. 4346 at 71 (Burns, *et al.*). The plant event trees delineate the accident sequences leading to core damage. The fault trees are used to assess the failure probability for each function or system displayed as a branch point in the event trees. Hence, the event trees should account for intersystem dependencies given a representative spectrum of initiating events while dependencies on common support systems should be accounted for in the fault trees. *Id.* at 72.

¹⁴⁷ *Id.* at 87. We note that the disagreement among the parties concerning the definitions of the terms "important to safety" and "safety-related" does not affect the determination of the acceptability of the Shoreham PRA. The PRA methodology disregards labels such as "safety-related" and "nonsafety-related" and evaluates the performance of systems entirely on their engineered or reliability merits. *Id.* at 73. Consequently, the analysis considers interactions between safety-related systems and between safety-related and nonsafety-related systems. *Id.* at 100; Tr. 5897 (Kascsak).

¹⁴⁸ Tr. fol. 4346 at 101 (Burns, *et al.*).

¹⁴⁹ *Id.* at 102.

¹⁵⁰ Suffolk Brief at 27.

¹⁵¹ See Suffolk County's Proposed Opinion, Findings of Fact, and Conclusions of Law in the Form of a Partial Initial Decision (Jan. 31, 1983) at 73-74, 248-50.

¹⁵² Tr. fol. 4346 at 102 (Burns, *et al.*).

interaction study at Diablo Canyon had a different purpose. It consisted of an extensive walkdown of plant systems searching for potential failures of non-seismic qualified structures, systems, and components that could affect the functioning of safety-related equipment.¹⁵³ Moreover, according to the staff, the Diablo Canyon study had gone beyond the regulatory requirements with respect to the single failure criterion.¹⁵⁴ Similarly, the Indian Point study was designed to identify and to evaluate seismic-initiated interactions and employed methods and criteria akin to those used at Diablo Canyon.¹⁵⁵ A significant part of the Indian Point walkdown effort involved either the verification or re-creation of system drawings as a result of the age of the plant.¹⁵⁶ In sum, we believe that the Shoreham effort is sufficiently different from the studies conducted at Diablo Canyon and Indian Point to prohibit a direct comparison of the length of the walkdowns at each plant.¹⁵⁷

The County also argues that the Shoreham PRA is deficient because it excluded certain external events such as fire, sabotage, and earthquakes.¹⁵⁸ These exclusions were reasonable. At the time the Shoreham PRA was initiated, published studies had generally concluded that external events were not a dominant contributor to risk.¹⁵⁹ In addition, the ability to assess seismic and other external effects was a developing technique and had not been demonstrated to be manageable.¹⁶⁰ The exclusion of certain external events from the Shoreham PRA does not render the study deficient. It does mean, however, that this exclusion must be taken into account when determining whether the Shoreham PRA satisfies any requirement that may be forthcoming for a comprehensive systems interaction study.

Finally, the County contends that there is no showing that potential adverse systems interactions that may have been identified in the PRA have been systematically addressed. Specifically, it claims that the LILCO PRA review process “appeared to focus on whether there were any unusual risk outliers, accident sequences, or probabilities identified

¹⁵³ Tr. fol. 6357 at 38 (Speis, *et al.*). The Diablo Canyon study required 55 staff-years of effort for the development of the methodology and system for documenting and keeping track of interactions identified and analyzed. Tr. 7313 (Conran). LILCO’s witnesses characterized the Diablo Canyon study as a “brute force method” and did not believe that the walkdown would identify dynamic or hidden dependencies. Tr. 6117-18 (Joksimovich); Tr. 6151 (Burns).

¹⁵⁴ Tr. 7156, 7524 (Conran).

¹⁵⁵ Tr. fol. 6357, Attachment on Indian Point-3 Meeting Summary at 7. *See also* Tr. 7524 (Conran).

¹⁵⁶ Tr. 7515-18 (Conran).

¹⁵⁷ Although we find nothing in the County’s presentation or the record to undermine the adequacy of the Shoreham walkdowns, we note that the PRA is still being reviewed by the staff. *See* Tr. 6656 (Thadani).

¹⁵⁸ Tr. fol. 4346 at 82 (Burns, *et al.*).

¹⁵⁹ Tr. 5653-54 (Burns); Tr. fol. 4346 at 82-83 (Burns, *et al.*).

¹⁶⁰ Tr. 5658 (Burns). *See also* Tr. fol. 4346 at 82 (Burns, *et al.*).

at Shoreham that were not common to other similar plants.”¹⁶¹ We can find no fault with LILCO’s review of the PRA.

LILCO witness Robert M. Kasczak explained that the reviewers look at the unacceptable interactions identified by the fault trees and event trees and evaluate how particular sequences contribute to the failure of a system or lead to an unsafe condition.¹⁶² If the trees indicate that the plant will not respond as designed, LILCO investigates in more detail.¹⁶³ While LILCO looked at Shoreham in light of the experience of other plants,¹⁶⁴ we see nothing in the record to suggest that its overall PRA review looked *only* at those potential problems at Shoreham that were different from those at other plants.

At the time of the hearing, LILCO indicated that the PRA was in draft form and undergoing peer review.¹⁶⁵ Although some interactions that could disable multiple systems had already been identified, these are of such low probability that they do not pose a significant risk to the public.¹⁶⁶ Other potential adverse systems interactions (or other design weaknesses) are being (or will be) addressed by LILCO and the staff. For example, Mr. Kasczak indicated that, as a result of the review process, two design changes were already planned and two other specific analyses were underway.¹⁶⁷

B. Alleged Failure to Identify a Serious Systems Interaction Problem

The Board found that the County had failed to identify any systems interaction that had not been considered. The County contends that, to the contrary, it did provide a concrete example of a serious adverse interaction between systems to support its claim that the design process and methodology for Shoreham are deficient.¹⁶⁸ In this regard, the County points to the interaction between the reactor protection and feedwater control systems, which is colloquially known in this proceeding as the “Michelson concern.”

The facts surrounding the analysis of the Michelson concern are essentially uncontroverted. The reactor protection and feedwater control sys-

¹⁶¹ Suffolk Brief at 28.

¹⁶² Tr. 5846-48 (Kasczak).

¹⁶³ Tr. 5873 (Kasczak).

¹⁶⁴ Tr. fol. 4346 at 103-04 (Burns, *et al.*).

¹⁶⁵ *Id.* at 107.

¹⁶⁶ *Id.* at 108.

¹⁶⁷ Tr. 5843-45, 5849-53, 6199-200 (Kasczak). *See also* Tr. 6191-94 (Burns).

¹⁶⁸ Suffolk Brief at 18.

tems share instrument sensing lines that monitor reactor vessel water level, and both would be affected by a break in a common sensing line. Such a break could result in a false high water level signal — causing the feedwater control system to reduce feedwater flow rate and, at the same time, eliminating redundancy in the automatic protection system.¹⁶⁹ General Electric has been aware of the common point between these systems for many years.¹⁷⁰ In January 1982, an NRC staff office released a report that described this potential systems interaction. While not deeming the problem of immediate concern, the staff nonetheless believes that it needs to be addressed.¹⁷¹ LILCO claims that the Shoreham design largely precludes the potential interaction; in any event, it argues, established means are available to accommodate any interaction problem that may occur.¹⁷² Essentially, operator action could mitigate any interaction problem.¹⁷³ The staff has determined that there is adequate time for any necessary operator action and, as a consequence, the plant is safe.¹⁷⁴ The County argues that permitting the interaction to remain without a design solution over the years is unacceptable.¹⁷⁵

The Licensing Board carefully reviewed the Michelson concern and endorsed the staff's judgment that current regulatory requirements and procedures are sufficient to provide reasonable assurance of adequate protection of the public health and safety.¹⁷⁶ We too have reviewed the record and cannot agree with the County that the treatment of the Michelson concern illustrates that a serious interaction problem has been overlooked. The Michelson concern has been known for some time. The five examples of interaction problems associated with that concern noted by the County as evidence of a failure to address the issue were, in fact, listed in the January 1982 staff report¹⁷⁷ and were analyzed for Shoreham.¹⁷⁸ A fully acceptable solution has been devised. We do not agree that the failure to design a 100 percent effective preventive or the need to rely on operating procedures¹⁷⁹ warrants a conclusion that serious

¹⁶⁹ Tr. fol. 5373, SC Exh. 1 at 10.

¹⁷⁰ Tr. 5559-60 (Ianni); Tr. 5585, 5588 (Robare).

¹⁷¹ Tr. fol. 5373, SC Exh. 1 at 10. While this interaction can result in the loss of redundancy in the automatic feature of the protection system, the staff does not suggest that the plant design fails to meet any regulatory requirements. Tr. 6895 (Rossi).

¹⁷² LILCO's Reply Brief at 15-16. *See also* Tr. fol. 4346 at 157-58 n.39 (Burns, *et al.*); Tr. 4847-48 (Robare).

¹⁷³ Tr. 5362 (Robare); Tr. fol. 6357 at 31 (Speis, *et al.*).

¹⁷⁴ Tr. 6893 (Rossi).

¹⁷⁵ Suffolk Brief at 20-22.

¹⁷⁶ FF J-540 to J-606 (slip opinion at 653-84).

¹⁷⁷ *See* Tr. fol. 5373, SC Exh. 1 at Appendix A.

¹⁷⁸ FF J-597 (slip opinion at 680-82).

¹⁷⁹ Operators at Shoreham are trained to recognize this event and take proper action. Tr. 5375-76 (McGuire).

systems interactions have gone unaddressed. As a consequence, a review of the Michelson concern does not alter our judgment that systems interactions were adequately considered.

C. Unresolved Safety Issue A-17

As previously noted, there is no explicit NRC requirement for a comprehensive systems interaction analysis of each plant design. Licensing requirements, however, are founded on a defense-in-depth principle and include provisions for design features such as physical separation and independence of redundant safety systems.¹⁸⁰ These design features are supplemented by NRC staff review procedures that assign primary responsibility for review of various technical areas and safety systems to specific groups within the staff. (For example, the acceptability of the facility's containment systems would be addressed by the branch in the Office of Nuclear Reactor Regulation specifically concerned with such systems.) It was this division of responsibility among several staff entities that led the NRC's Advisory Committee on Reactor Safeguards to recommend that the staff give attention to the evaluation of safety systems from a multidisciplinary viewpoint to ensure the identification of potentially adverse systems interactions.

In the wake of this recommendation, the staff initiated Task A-17 in 1977.¹⁸¹ While that task is categorized as an "unresolved safety issue," it does not focus upon a particular safety problem (such as the cracking of feedwater nozzles in boiling water reactors (Task A-10)). Rather, it is a generic study to confirm that the current safety criteria and NRC review procedures provide an acceptable level of independence and redundancy for systems required for safety.¹⁸²

While the study has not been completed, there has been no indication to date that current NRC review procedures and safety criteria are inadequate to assure that the effects of potential systems interactions are within the design-basis envelope of the plants.¹⁸³ More specifically, the staff believes that, even though the study is important and should be completed promptly, those procedures and criteria would identify most, if not all, of the safety-significant interactions and, thus, provide rea-

¹⁸⁰ Staff Exh. 2A at B-9 and B-10.

¹⁸¹ *Id.* at B-10.

¹⁸² *Ibid.*; Tr. fol. 20,810 at 5 (Mattson, *et al.*).

¹⁸³ Tr. fol. 20,810 at 5 (Mattson, *et al.*).

sonable assurance that the facility under scrutiny can be operated without undue risk to the public health and safety.¹⁸⁴

Given the staff's view of the matter, together with the numerous completed systems interaction-related studies having specific application to Shoreham (*see* p. 1127, *supra*), the Licensing Board concluded that plant operation need not be precluded pending the completion of the staff's A-17 confirmatory study.¹⁸⁵ We agree. True, as the County points out, one staff witness, James H. Conran, supported its claim that there had been insufficient progress made in the A-17 efforts.¹⁸⁶ But, whether or not the staff should have attached a greater priority to the completion of the project, the fact remains that A-17 is not directed to the remedy of a specific determined safety hazard (e.g., feedwater nozzle cracking). Instead, to repeat, its purpose is to confirm the adequacy of existing review procedures and criteria. At this juncture, there is no concrete suggestion of inadequacy; this being so, we see no reason why the mere possibility that the A-17 project might ultimately disclose a weakness in a procedure or criterion should stand in the way of licensing Shoreham operation now. In this regard, at any particular time the staff presumably has a number of its regulatory directives and processes under re-examination. The pendency of such a re-examination should not preclude the issuance of an operating license in circumstances where reasonable assurance otherwise exists that the facility can be safely operated.¹⁸⁷

D. Unresolved Safety Issue A-47

Another unresolved safety issue concerns the potential for control system failures or malfunctions interfering with the use of safety equipment in the event of an accident or transient.¹⁸⁸ Until recently, systematic evaluations of control system designs had not been performed to

¹⁸⁴ Tr. fol. 6357 at 36-37 (Speis, *et al.*); Tr. fol. 20,810 at 5-6 (Mattson, *et al.*); Tr. 20,862-63 (Thadani).

¹⁸⁵ LBP-83-57, *supra*, 18 NRC at 550.

¹⁸⁶ Suffolk Brief at 31 n.15.

¹⁸⁷ *Cf. Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), CLI-84-11, 20 NRC 1, 16 (1984) (operation of the plant need not be held up pending resolution of the staff's generic systems interaction program). We need add only that the County's cause is not advanced by its reliance upon *Virginia Electric and Power Co.* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-491, 8 NRC 245, 247-48 (1978) and *Gulf States Utilities Co.* (River Bend Station, Units 1 and 2), ALAB-444, 6 NRC 760, 775 (1977). Those decisions impose an obligation upon the staff to explain why a generic unresolved safety issue does not stand in the path of construction permit (*River Bend*) or operating license (*North Anna*) issuance. Both, however, were written in the context of unresolved safety issues involving discerned safety problems requiring solutions. As noted in the text above, we do not regard A-17 as fitting that description. In any event, as also indicated in the text, we are satisfied with the staff and Licensing Board explanation as to why Shoreham licensing need not await the completion of the A-17 study.

¹⁸⁸ Staff Exh. 2A at B-15.

determine the effect of control system problems in such circumstances.¹⁸⁹ Therefore, the staff initiated an investigation of such potential interactions, known as USI A-47.¹⁹⁰ Because the effects of control system failures may differ from plant to plant, it is not possible to develop universal solutions to any potential problems.¹⁹¹ Rather, the purpose of USI A-47 is to define generic criteria that will be used for plant-specific studies and to review the adequacy of current control system licensing requirements.¹⁹²

For Shoreham, no specific evaluation of the control system design has been performed.¹⁹³ As we mentioned, systems interactions in general have been studied and to date no undue risk to public health and safety has been discovered (*see* p. 1127, *supra*). The Licensing Board concluded that the ongoing activities associated with USI A-47 were not an obstacle to its operating license authorization.¹⁹⁴ Rather, as the Board saw it, staff review of the matter outside the adjudicatory arena will be adequate.¹⁹⁵

Contrary to the determination of the Licensing Board, the County asserts that LILCO must complete the studies contemplated by USI A-47 prior to the authorization of a license for Shoreham.¹⁹⁶ In this regard, the County would have LILCO complete two evaluations requested by the staff.¹⁹⁷ Further, the County claims that the results of these studies must be made a part of the adjudicatory record.¹⁹⁸ We agree.

True enough, this issue bears some similarity to USI A-17 (*see* pp. 1134-35, *supra*). Like USI A-17, there has been no showing of a "discerned safety problem."¹⁹⁹ At the time of the hearing, the staff knew of "no specific control system failures or actions at Shoreham or any other plant which would lead to undue risk to the health and safety of the public."²⁰⁰ Further, staff witness C.E. Rossi testified that serious consequences, not included in those already analyzed for the plant, were

¹⁸⁹ Tr. fol. 6357 at 43, 44 (Speis, *et al.*).

¹⁹⁰ *Id.* at 44; FF J-208 (slip opinion at 538).

¹⁹¹ Staff Exh. 2A at B-15.

¹⁹² *Ibid.*; FF J-210 (slip opinion at 539).

¹⁹³ Tr. fol. 6357 at 44 (Speis, *et al.*).

¹⁹⁴ LBP-83-57, *supra*, 18 NRC at 555.

¹⁹⁵ *Ibid.*

¹⁹⁶ Suffolk Brief at 41, 43.

¹⁹⁷ *Id.* at 40-41. The staff has requested that LILCO perform evaluations of (1) the effect of power supply, sensor and sensor impulse line failures on several control systems and (2) the effect of high energy line breaks on control systems. Tr. 7440 (Rossi).

¹⁹⁸ Suffolk Brief at 41, 42.

¹⁹⁹ *See* note 187, *supra*, and cases cited.

²⁰⁰ Tr. fol. 6357 at 44 (Speis, *et al.*).

of “low probability.”²⁰¹ Moreover, the staff indicated in its SER that should such control system failures occur, they would not result “in serious events . . . or conditions” beyond the capability of safety systems.²⁰²

There are, however, significant differences between this issue and USI A-17. One notable difference is that in-depth studies have not been performed to verify the staff’s expectations in connection with A-47.²⁰³ Importantly, the staff took the position before the Licensing Board that before it could make the reasonable assurance finding necessary for the issuance of a license, it was requiring more information from LILCO.²⁰⁴

We, like the staff, do not have sufficient information to conclude that the ultimate resolution of USI A-47 will have no significance for Shoreham. That may well be the case, as some of the staff’s testimony indicates. But, without additional analyses, we cannot be sure. Further, the County is entitled to test the basis of any conclusion regarding this matter, in the same manner as any other litigable issue. For these reasons, we remand the questions raised by USI A-47 to the Licensing Board for further consideration in light of any additional information developed by LILCO or the staff.

III. QUALITY ASSURANCE

A. Background

Four contentions concerning quality assurance (QA) at Shoreham were admitted by the Licensing Board for litigation. Contention SC/SOC 12 charged that LILCO has failed to comply with Appendix B to 10 C.F.R. Part 50 because (1) the QA program for the design and installation of structures, systems, and components for Shoreham was not conducted in a timely manner, and (2) there was a pattern of QA breakdowns at Shoreham. Referring to alleged failures in several areas, Suffolk County argued in Contention SC 13 that the description of the operational quality assurance program for Shoreham does not comply with 10 C.F.R. § 50.34(b)(6)(ii) and Appendix B. Contention SC 14 asserted that the NRC staff’s Inspection and Enforcement (I&E) program has not adequately verified that LILCO’s QA program has been implemented in accordance with 10 C.F.R. § 50.34(a), paragraph 7, and Appendix

²⁰¹ Tr. 7456 (Rossi).

²⁰² Staff Exh. 2A at B-15.

²⁰³ *Ibid.*

²⁰⁴ Tr. fol. 6357 at 45 (Speis, *et al.*).

B. In Contention SC 15, the County claimed that the Shoreham QA program involved inadequate review and physical inspection to verify compliance with Appendix B and, as a result, a statistically valid audit of QA documentation of physically inspectable structures and components should be performed.²⁰⁵

The quality assurance portion of the hearing consumed fifty-five days and generated a massive record. The findings of fact of the Licensing Board extended over 500 pages in the slip opinion. The Board reached specific conclusions regarding numerous areas of controversy. It summarized its conclusions as follows:

Design, construction and installation at Shoreham have been affected by the long period of construction and the changing requirements of the AEC and NRC during this period. Stepping back from the details of errors made, we have focused on the overall performance of LILCO and the [s]taff at Shoreham. Our perception is that neither has been perfect, nor could it have been with realistic use of resources. Nor is perfect performance expected by the Commission. We do conclude, however, that both LILCO and the [s]taff have had effective programs for identifying and correcting deficiencies. We also conclude that LILCO's and the [s]taff's programs for operation of Shoreham meet the Commission's requirements and will provide adequate protection of the health and safety of the public.²⁰⁶

The County objects to a number of the Board's underlying findings. We address these objections below.²⁰⁷

B. Technical Issues

1. *Compliance of the QA Program with 10 C.F.R. Part 50, Appendix B*

Criterion XVIII of Appendix B to 10 C.F.R. Part 50, dealing with audit requirements, provides, in relevant part, that

[a] comprehensive system of planned and periodic audits shall be carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program.

In its brief, the County argues that Criterion XVIII requires the use of a random-sampling statistical methodology in the selection of items to be audited and that such a methodology is feasible.²⁰⁸ Because LILCO does

²⁰⁵ These contentions are stated in their entirety at FF K-1 to K-4 (slip opinion at 847-50).

²⁰⁶ LBP-83-57, *supra*, 18 NRC at 580-81.

²⁰⁷ The County does not categorize its arguments according to individual contentions. We have structured our decision essentially to parallel the County's brief.

²⁰⁸ Suffolk Brief at 43.

not use such a methodology, the County contends that an audit program has not been established that complies with Criterion XVIII.²⁰⁹

Auditing within LILCO's quality assurance program does not involve a 100 percent review of quality assurance items and records.²¹⁰ According to LILCO, the audit process is not a product acceptance activity and, consequently, not every work product was examined.²¹¹ Audits were, instead, "aimed primarily at assessing the process of engineering and the process of building the plant. . . ."²¹² Samples were selected based on the auditor's specific knowledge of the area; the auditor was allowed flexibility in pursuing more important items.²¹³ LILCO did not consider random sampling to be effective.²¹⁴

The County submitted below, and reasserts on appeal, that, for accurate extrapolation of the audit results to those activities not audited, the audit program must employ a statistical methodology in making its sample selection.²¹⁵ The Licensing Board did not explicitly reject that assertion but concluded that audits acceptable for nuclear power plant applications need not provide the type of "mathematical rigor" the County sought.²¹⁶ The Board observed:

We do need to conclude that the QA program in general meets NRC requirements and, despite whatever lack of mathematical rigor there may be in sampling and overall evaluation, there remains reasonable assurance of no undue risk to the health and safety of the public. This we do, not on the basis of individual noncompliances or lack of rigor, but on the basis of the sum of all factors that contribute to acceptable design, construction and operation. These factors include NRC requirements, professional experience, organization and management, training and procedures and continuing dedication by all concerned.²¹⁷

The County contends that the Board's conclusion is not consistent with the requirements of Criterion XVIII. In its judgment, standing alone LILCO's audits must verify compliance with all aspects of the QA program and determine its effectiveness.²¹⁸ According to the County, the Board's consideration of "all factors" is not acceptable.²¹⁹

²⁰⁹ *Id.* at 44.

²¹⁰ Tr. 12,406 (Eifert).

²¹¹ *Ibid.*

²¹² *Ibid.*

²¹³ Tr. 12,420 (Burns); Tr. 12,446-47 (Eifert).

²¹⁴ Tr. 12,413 (Eifert).

²¹⁵ Suffolk Brief at 44.

²¹⁶ LBP-83-57, *supra*, 18 NRC at 584.

²¹⁷ *Id.* at 584-85.

²¹⁸ Suffolk Brief at 46.

²¹⁹ *Ibid.*

Periodic and planned audits must verify all aspects of the quality assurance program. Contrary to the County's view, however, audits conducted in compliance with Criterion XVIII are not intended to verify every QA *record* or *item* through extrapolation of the audit results. In conformity with standard industry usage, LILCO employed the term "audit" to mean a "documented activity performed in accordance with written procedures or checklists to verify by examination or evaluation of objective evidence that applicable elements of the quality assurance program have been developed, documented, and effectively implemented in accordance with specified requirements."²²⁰ At Shoreham, auditors primarily review the work process in light of their familiarity with various mechanisms that can cause problems, the disciplines that actually performed the work, and the technical guidance that is available to those disciplines.²²¹

In our opinion, Criterion XVIII requires the performance of audits to ensure that the quality assurance program as a whole has been effectively implemented. Rather than attempting to verify the accuracy of every QA item or record, the *audit* process determines whether the overall quality assurance program is providing adequate control over activities affecting quality. (This is to be distinguished from quality assurance *inspection* activities, which are in the nature of product acceptance, as the Licensing Board recognized.)²²² To comply with Criterion XVIII, LILCO must identify the activities within the QA program and organize the audit process around these activities.²²³ Furthermore, it must conduct audits of all activities on a regular basis. This, in fact, is what LILCO has done.²²⁴ As a result, we find that it has satisfied Criterion XVIII.

As mentioned previously, the Licensing Board considered other factors (such as "NRC requirements, professional experience, organization and management, training and procedures and continuing dedication by all concerned") in arriving at its ultimate finding of reasonable assurance of adequate safety despite the lack of a statistical sampling audit program. The County complains that such reliance on "other factors" is impermissible because a valid audit must either undertake a 100 percent assessment or develop a methodology from which reliable extrapolations to the entire plant may be made.²²⁵ The County misinterprets the

²²⁰ LILCO Exh. 21 at 23 (Alexander, *et al.*). See generally ANSI/ASME NQA-1-1983, "Quality Assurance Program Requirements for Nuclear Facilities," at 5.

²²¹ Tr. 12,428-31 (Eifert).

²²² See FF K-186 to K-189 (slip opinion at 921-23).

²²³ Tr. 12,410-11 (Eifert).

²²⁴ See, e.g., LILCO Exh. 21 at 25-31, 112-13, 168-69, and 174-75 (Alexander, *et al.*).

²²⁵ Suffolk Brief at 46.

Board's opinion. The Board relied on these "other factors" — properly, in our view — in reaching its overall conclusion that safety can be assured. It also found — specifically — that the audit program was acceptable even though random sampling techniques were not used. In our opinion, the Board reasonably found, in this latter connection, that judgment sampling in the conduct of audits is consistent with the requirements of Criterion XVIII.²²⁶

2. *Implementation of LILCO's QA Program*

The Licensing Board concluded that LILCO has implemented its QA program in accordance with 10 C.F.R. Part 50, Appendix B and that the program has been effective.²²⁷ The County disagrees.²²⁸ Its position centers on its belief that the Board erred in interpreting the QA regulatory requirements.²²⁹ We find no error in the Board's analysis.

(a) *Classifying a QA Deficiency*

According to the County, the Licensing Board improperly concluded that, even if proven, deficiencies should not be considered significant unless they can be linked to actual or potential safety defects. As we understand the County's argument, every deficiency, however minor, reflects an attitude or lack of discipline that undermines confidence that the QA program has been successful. We have reviewed the Licensing Board's approach and find it fully consistent with Commission regulations and governing precedent.

Quality assurance review involves two separate, yet interrelated, inquiries, i.e., whether deficiencies have been uncovered and corrected, and whether a generic problem exists that could affect the confidence in the safety of the facility. As we observed in our *Callaway* decision:

It would . . . be totally unreasonable to hinge the grant of an NRC operating license upon a demonstration of error-free construction. Nor is such a result mandated by either the Atomic Energy Act of 1954, as amended, or the Commission's implementing regulations. What they require is simply a finding of reasonable assurance that, as built, the facility can and will be operated without endangering the public health and safety. . . . Thus, in examining claims of quality assurance deficiencies,

²²⁶ LBP-83-57, *supra*, 18 NRC at 611. In light of our determination, we need not reach the question whether the Board correctly resolved in LILCO's favor the issue of feasibility of random sampling.

²²⁷ *Id.* at 580-81.

²²⁸ Suffolk Brief at 48.

²²⁹ *Id.* at 49.

one must look to the implication of those deficiencies in terms of safe plant operation.

Obviously, this inquiry necessitates careful consideration of whether all ascertained construction errors have been cured. Even if this is established to be the case, however, there may remain a question whether there has been a breakdown in quality assurance procedures of sufficient dimensions to raise legitimate doubt as to the overall integrity of the facility and its safety-related structures and components. A demonstration of a pervasive failure to carry out the quality assurance program might well stand in the way of the requisite safety finding.²³⁰

The Licensing Board considered, individually, numerous audit and surveillance findings relative to construction of the Shoreham facility.²³¹ It found the identified deficiencies to be minor, readily correctable, and posing no concern about the adequacy of the Shoreham design, construction or installation.²³² We find no fault with the Board's approach. Contrary to the County's suggestion, all deficiencies need not be treated alike when evaluating the efficacy of a QA program. Obviously, problems genuinely affecting the safety of the plant must be cured before the plant can be permitted to operate. Indeed, Criterion XVI of Appendix B requires specific actions in the event that "significant" deficiencies are identified.²³³ Thus, in determining whether significant defects have been uncovered and corrected the Licensing Board should — indeed must — make a judgment respecting the importance of particular defects.

We do not mean to suggest that minor defects may be disregarded. In reviewing quality assurance, after all, a licensing board must be satisfied not only that construction defects have been corrected but that there has been no overall breakdown in quality assurance procedures. In this connection, numerous imperfections, even if minor, may, as the County suggests, be indicative of a more widespread or generic quality assurance problem. That is quite different, however, from the County's position that no QA deficiencies can be considered minor.

(b) Defining a QA Violation

The County argues that the Licensing Board "compounded its error in classifying certain QA/QC deficiencies as 'minor,' etc., by failing to rule

²³⁰ *Union Electric Co. (Callaway Plant, Unit 1)*, ALAB-740, 18 NRC 343, 346 (1983).

²³¹ See generally LBP-83-57, *supra*, 18 NRC at 586-601.

²³² See *id.* at 601.

²³³ Criterion XVI of Appendix B requires, in part:

Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition.

correctly regarding what constitutes a QA/QC violation or noncompliance in the first place.”²³⁴ The Board determined that not every violation of an internal quality assurance program procedure uncovered by LILCO or Stone and Webster (S&W) auditors represented a violation of Appendix B.²³⁵ In the County’s view, any failure to comply with the requirements of a QA manual, operating procedure or other document implementing a portion of the QA program constitutes a violation of Appendix B.²³⁶ We agree with the Board’s approach.

Criterion XVI of Appendix B recognizes that deficiencies will occur, and establishes requirements for their identification and correction. Further, Criterion XVIII requires the reaudit of deficient areas. Thus, it is clear that the mere identification by an applicant of a deficiency as part of an audit conducted in accordance with its QA program does not *per se* constitute a violation of the Commission’s regulations. That is not to say that a violation of an applicant’s QA manual, operating procedures or other QA document may not, if sufficiently serious, constitute a violation of Appendix B. But, contrary to the County’s argument, not *every* violation of implementing manuals or procedures constitutes an Appendix B violation. Indeed, the Commission’s enforcement practice is as follows:

Because the NRC wants to encourage and support licensee initiative for self-identification and correction of problems, NRC will not generally issue a notice of violation for a violation that meets all of the following tests:

- (1) It was identified by the licensee;
- (2) It fits in Severity Level IV or V;
- (3) It was reported, if required;
- (4) It was or will be corrected, including measures to prevent recurrence, within a reasonable time; and
- (5) It was not a violation that could reasonably be expected to have been prevented by the licensee’s corrective action for a previous violation.²³⁷

The examples set out in the County’s brief are consistent with this enforcement practice and the Board’s approach.²³⁸

²³⁴ Suffolk Brief at 58.

²³⁵ FF K-309 (slip opinion at 978).

²³⁶ Suffolk Brief at 59-60.

²³⁷ 10 C.F.R. Part 2, Appendix C, § IV.A.

²³⁸ Tr. 16,730 (Higgins). The current staff method for defining violations includes five severity levels with Severity Level I being the most severe and Level V the least severe. Tr. 13,815 (Eifert). These levels are roughly distinguished as follows: Levels I and II — very significant regulatory concern, Level III — significant concern, Level IV — less serious but more than minor concern, and Level V — minor safety significance. Tr. 17,119 (Higgins). See 10 C.F.R. Part 2, Appendix C, § III.

(c) Specific Areas of QA Program Implementation

The County contends that the Licensing Board erred in its consideration of specific deficiencies related to LILCO's QA program.²³⁹ To support its argument, the County discusses three examples which it believes demonstrate the error in the Board's conclusion that LILCO effectively implemented its QA program. We address the County's examples separately.

(i) Housekeeping

During the construction and operation of nuclear power plants, utilities are required by the Commission's regulations to ensure that activities affecting quality are accomplished under controlled conditions such as adequate cleanliness.²⁴⁰ At Shoreham, LILCO has established housekeeping procedures to minimize the accumulation of dirt and debris in all areas of the plant.²⁴¹ To the extent they cover areas involving safety-related equipment, those procedures are part of the implementation of Appendix B requirements.²⁴²

There has been a history of poor implementation of housekeeping procedures at Shoreham. From a staff inspection in 1979 through the Readiness Assessment Team (RAT) inspection in January 1983, continuing inadequacies in housekeeping were identified.²⁴³ These shortcomings persisted despite notices of violation issued by the staff, commitments for improvement by LILCO, and meetings between the staff and LILCO management. Finally, during the RAT inspection, the staff determined that housekeeping was still not acceptable, and it issued Confirmatory Action Letter (CAL) 83-01 on January 19, 1983.²⁴⁴

In response to that letter, LILCO agreed to undertake a series of actions to resolve the housekeeping problems:

²³⁹ Suffolk Brief at 61.

²⁴⁰ Criterion II of Appendix B states, in part:

Activities affecting quality shall be accomplished under suitably controlled conditions. Controlled conditions include the use of appropriate equipment; suitable environmental conditions for accomplishing the activity, such as adequate cleanliness; and assurance that all prerequisites for the given activity have been satisfied.

²⁴¹ Tr. 11,925 (Kelly, Arrington, Museler).

²⁴² Tr. 11,926 (Museler).

²⁴³ The details of these problems are given at FF K-706 (slip opinion at 1142-43); K-724 (slip opinion at 1149); K-731 (slip opinion 1151-52); K-741 (slip opinion at 1155); K-751 (slip opinion at 1159-60).

²⁴⁴ Tr. 20,009 (Greenman); Staff Exh. 12; Confirmatory Action Letters are documents confirming an applicant's agreement to take certain actions to remove significant concerns about health and safety, safeguards or the environment. 10 C.F.R. Part 2, Appendix C, § 1.E(4).

(a) A general clean-up of the major buildings in the plant will be conducted on at least a weekly basis. Additional craft personnel will be assigned full-time to housekeeping duties until [p]lant readiness is acceptable to NRC inspectors. Fifty additional laborers have already been dedicated full-time to this process.

(b) Specific eating areas were established in the [p]lant even within zone 5 areas which normally permit eating and smoking.

(c) Specific verbal instructions have been and will continue to be provided to [p]lant personnel and to all manual construction personnel regarding housekeeping policies.

(d) Inspections have been and will be conducted of all areas by LILCO management personnel and these inspections will be documented.

(e) Field quality assurance will monitor these additional activities as part of their normal surveillance program.

(f) LILCO has initiated weekly Monday morning walking tours of the reactor building, control building, and screenwell with the following personnel generally in attendance:

1. Manager of Construction and Engineering;
2. General Superintendent of Construction;
3. Safety Supervisor (head of [p]lant clean-up program);
4. NRC Resident Inspector; and
5. Field Quality Assurance Manager.²⁴⁵

In light of these recent staff and LILCO actions concerning housekeeping, and the staff's assertion that none of the housekeeping issues had safety implications, the Board found that the housekeeping problems had been adequately resolved.²⁴⁶

Before us, the County contends that the repeated housekeeping deficiencies illustrate lack of compliance with Appendix B.²⁴⁷ According to the County, the repetitive nature of the deficiencies demonstrates not only that proper corrective action was not implemented, but also that it is not possible to depend on commitments by LILCO management.²⁴⁸ As a result, the County would have us find that the Board erred in relying upon LILCO's commitments in response to the Confirmatory Action Letter regarding housekeeping.²⁴⁹

²⁴⁵ Tr. fol. 19,757 at 21-22 (Museler, *et al.*). In three weekly tours conducted subsequent to these measures, improvements in housekeeping were noted, although additional efforts were considered necessary. Tr. 20,051-52 (Higgins); Tr. fol. 19,757 at 22 (Museler, *et al.*).

²⁴⁶ LBP-83-57, *supra*, 18 NRC at 598-99.

²⁴⁷ Suffolk Brief at 65-66.

²⁴⁸ *Ibid.*

²⁴⁹ *Id.* at 66. The County also argues that the Confirmatory Action Letter cannot be relied upon because it was not permitted to present evidence on the letter. *Id.* at 66-67. This argument is actually part of the County's assertion that the Board below erred in prohibiting the County from presenting direct testimony regarding the RAT inspection. We discuss that overall assertion in section III(C), *infra*.

We agree with the County that, given LILCO's past lack of diligence in correcting housekeeping deficiencies at Shoreham, the Licensing Board erred in finding the matter had been adequately resolved. It may well turn out that LILCO will totally fulfill the commitments it made in response to the Confirmatory Action Letter. In the circumstances, however, we do not believe that the Board justifiably could terminate its consideration of the housekeeping issue on the strength of an assumption to that effect. Rather, the Board should have kept the issue open to await LILCO's further actions to ensure that housekeeping problems no longer existed. Accordingly, we shall remand this phase of the proceeding to the Licensing Board and require the staff to certify to the Board that LILCO has met its commitments and is maintaining an appropriate level of cleanliness. The Board shall review the staff's certification and determine whether compliance has been achieved.²⁵⁰

(ii) Control of Calculations

A second example of the Licensing Board's error with respect to QA compliance, according to the County, concerns the Board's treatment of calculation deficiencies, particularly related to the "ready traceability" of data.²⁵¹ Ready traceability involves the ability to identify the source of the data, as well as the computer program (if any) employed in performing particular calculations.²⁵² As a result of a review of audits of Stone and Webster's Shoreham engineering project by its Engineering Assurance Division since 1973, twenty-nine deficiencies concerning ready traceability have been identified in audit observations.²⁵³ The Licensing Board discussed this issue as follows:

S&W [Stone and Webster] asserted that there always was traceability, but that in S&W's own view there was not positive ("ready") traceability of the kind that S&W

²⁵⁰ We take into account the staff's assessment that none of the identified housekeeping deficiencies posed a safety problem. Nonetheless, we believe strict compliance with the actions set out in CAL 83-01 is necessary to ensure that deficiencies with safety significance do not arise in the future. In this connection, at oral argument, the County made clear that it did not believe that housekeeping problems justified denial of a license. Rather, it sought only to guarantee that items important to safety have been maintained in a clean condition. App. Tr. 103-07. Although the County was somewhat unsatisfied with the staff's monitoring of cleanliness and sought an audit by some independent, outside auditors approved by the Licensing Board, App. Tr. 104, we are confident that our requirement that the Board approve a staff certification will be sufficient to guarantee that housekeeping receives proper attention from the LILCO management.

²⁵¹ Suffolk Brief at 67.

²⁵² Tr. 13,323-24; 13,332-33 (Eifert).

²⁵³ LILCO Exh. 24, Tr. fol. 13,320; SC Exh. 51; SC Exh. 53, Tr. fol. 10,726. An "audit observation" is defined in the Stone and Webster Quality Assurance Program Manual as "[a] description of each program deficiency in sufficient detail to assure that corrective action can be effectively carried out by the audited organization." LILCO Exh. 21, Attachment 5 at III-4.

procedures required. In some instances it took as much as 10 hours to find the input for a given analysis. The observations did not indicate that the input used was incorrect or that the calculation reviewer failed to review the corrections of the input. Nevertheless, S&W, through its audit program, ensured that action was taken to correct the conditions identified by each observation in this category We conclude that any deficiencies in this area had no adverse impact and have been satisfactorily corrected.²⁵⁴

The County asserts that the Licensing Board failed to “come to grips with” the QA implications of these deficiencies.²⁵⁵ According to the County, these deficiencies “are not simply items of ‘minor’ concern . . . whose significance/insignificance can be resolved just by determining whether there has been correction or a potential, identifiable safety impact.”²⁵⁶ Based on the repeated failures of Stone and Webster to comply with its procedures for ready traceability, the County maintains that LILCO’s QA program was not effective in implementing the requirements of Criterion V of Appendix B or in taking necessary corrective and preventative action.²⁵⁷

In advancing this line of argument, the County acknowledges that the “ready traceability” problems have not caused safety defects.²⁵⁸ It nonetheless would have us find that the existence of these deficiencies reveals some inadequacy in the Shoreham QA effort. This is not necessarily so. Appendix B, after all, does not establish requirements for the maximum amount of time allowed in tracing the data used in design calculations. Criterion XVII, Quality Assurance Records, requires simply that records be “identifiable and retrievable.” Stone and Webster personnel were always able to trace the data, although in some instances it took as long as ten hours to find the input for a given analysis.²⁵⁹ Thus, there was traceability, but not as prompt as required by Stone and Webster internal procedures.²⁶⁰ We are unprepared to condemn LILCO’s QA program as a result of an effort (not completely successful as of the time of the hearing) to establish a strict system for traceability. In our opinion, applicants and licensees should be encouraged to improve on the general re-

²⁵⁴ LBP-83-57, *supra*, 18 NRC at 587.

²⁵⁵ Suffolk Brief at 68.

²⁵⁶ *Ibid.*

²⁵⁷ *Id.* at 71. Criterion V, Instructions, Procedures, and Drawings, of Appendix B states:

Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

²⁵⁸ Suffolk Brief at 69.

²⁵⁹ Tr. 10,540 (Eifert).

²⁶⁰ Tr. 10,540-41 (Eifert).

quirements of Appendix B. Given the acknowledged lack of any genuine safety shortcoming resulting from the "ready traceability" issue, we find no fault with the QA program in this regard.

Apart from this issue, the County suggests generally that failure to follow rules for the control of calculations can lead to safety concerns.²⁶¹ The County asserts that "there were a number of calculation audit findings, resulting from failure to follow procedural requirements, which clearly had potential to affect safety."²⁶² The Licensing Board specifically reviewed those findings, however, and determined that the deficiencies in this area had been satisfactorily resolved. The Board concluded

that deficiencies identified in this area were minor and were readily corrected without impact on the adequacy of the Shoreham design, construction and installation.²⁶³

We also have reviewed the audit findings and agree with the Board's conclusion. The findings appear to identify deficiencies that one would expect to occur in an engineering project of this magnitude extending over a decade.

(iii) Electrical Separation

In the construction of a nuclear power plant, electrical cables must be separated sufficiently to ensure that a failure in one system does not prevent power from being supplied to a redundant safety system. Maintaining sufficient separation has been an on-going problem at Shoreham.²⁶⁴ The Licensing Board considered this matter and stated:

Noting the lack of current problems in electrical separation and LILCO's several programs in this area, the Board finds LILCO to comply with Commission requirements.²⁶⁵

²⁶¹ Suffolk Brief at 70.

²⁶² *Ibid.* As an example, the County refers to a problem with large bore pipe supports that resulted in the reperformance of 1800 design calculations with modifications made to about one percent of those supports. *Id.* at 70 n.34. LILCO determined that the primary cause for the need to reperform the calculations was adjustment made to pipe supports during installation. Tr. 10,640-41 (Eifert). Even though some supports were modified following the recalculations, none had lost their entire design safety margin. Tr. 10,641-42 (Museler). While the County did not specify any other audit findings that it believed had the potential to affect safety, LILCO testified that, where necessary, the disclosures contained in the audit findings led to corrective and preventative action. Tr. 13,383-84 (Eifert).

²⁶³ LBP-83-57, *supra*, 18 NRC at 587.

²⁶⁴ See, e.g., SC Exh. 89B at 4-8; SC Exh. 105, Appendix A; SC Exh. 108, Appendix A; Staff Exh. 8 at 25.

²⁶⁵ LBP-83-57, *supra*, 18 NRC at 601.

On appeal, the County argues that the Board failed to respond to the question whether LILCO complied with QA requirements for electrical separation.²⁶⁶ As a result of electrical separation concerns at Shoreham, the County asks us to conclude that LILCO did not implement its QA program in a timely and effective manner.²⁶⁷

Adequate separation of electrical cables is a complex area that has been difficult for all nuclear power plants.²⁶⁸ The staff observed that the Shoreham facility manifested a “little bit higher . . . level of problem” in this area than the average plant.²⁶⁹ A major reason was the effort by LILCO to implement Regulatory Guide 1.75, which provides guidance for electrical separation.²⁷⁰ According to the staff, applicants implementing this guide during construction (as LILCO has done) would likely have had similar problems.²⁷¹

We believe that the problems regarding electrical separation have been resolved and are not indicative of a breakdown of LILCO’s QA program. Over the extended period of plant construction, certain requirements will inevitably change to reflect increased knowledge and experience of designers and regulators. Electrical separation in particular has undergone considerable re-analysis since the early 1970s. LILCO has had a difficult time in this area but appears to have implemented successfully the final separation criteria.²⁷²

In the circumstances, we find that LILCO has complied with Criterion II of 10 C.F.R. Part 50, Appendix B by implementing a QA program with respect to electrical separation in a timely and effective manner. It might also be noted that LILCO has agreed to perform partial reinspection of electrical cables as part of an agreement between the parties to resolve another contention.²⁷³ The agreement also includes a provision for a 100 percent inspection if a certain number of deficiencies are identified.²⁷⁴

²⁶⁶ Suffolk Brief at 71-72.

²⁶⁷ *Id.* at 72-75. The County refers to Criterion II of 10 C.F.R. Part 50, Appendix B as a basis for the requirement that the QA program should be implemented in a timely manner. That criterion states, in part:

The applicant shall establish at the earliest practicable time, consistent with the schedule for accomplishing the activities, a quality assurance program which complies with the requirements of this appendix.

²⁶⁸ Tr. 16,969-70 (Gallo); Tr. 17,161 (Narrow).

²⁶⁹ Tr. 16,969-70 (Gallo).

²⁷⁰ Tr. 16,582 (Gallo).

²⁷¹ *Ibid.*

²⁷² Tr. 16,936-37; 16,970-71 (Higgins).

²⁷³ See Resolution of SC Contention 31/SOC Contention 19(g) — Electrical Separation, Tr. fol. 18,596 at 5.

²⁷⁴ See Amendment to “Resolution of SC Contention 31/SOC Contention 19(g) — Electrical Separation,” Tr. fol. 17,818.

3. *Quality Assurance Organization*

The LILCO operational quality assurance organization is separated into an onsite Operational Quality Assurance (OQA) Section and an off-site Quality Assurance (QA) Department.²⁷⁵ The onsite OQA Section is headed by the OQA Engineer, who reports to the Plant Manager. The Plant Manager, in turn, reports to the Vice President, Nuclear. The off-site QA Department is headed by the QA Manager, who reports directly to the Vice President, Engineering. The QA Manager has authority to develop and direct the overall QA program for Shoreham but has no functional or administrative authority over the onsite OQA Engineer. One of the functions of the QA Department, however, is to audit the performance of the OQA Section.²⁷⁶

Criterion I of 10 C.F.R. Part 50, Appendix B requires, generally, that the persons and organizations performing quality assurance functions have sufficient authority and organizational freedom to identify quality problems; initiate, recommend, or provide solutions; and verify implementation of solutions. To that end, those persons and organizations are to report to a management level such that the required authority and organizational freedom are provided. In Contention 13, the County asserted that LILCO's operational quality assurance program did not comply with Criterion I. It argued at the hearing that the operational quality assurance organization did not enjoy sufficient independence.

The Licensing Board rejected the County's argument. In assessing the independence of the operational QA function, the Board considered not merely the organizational structure but all aspects of the operational QA program, including oversight by various groups within LILCO. The Board concluded that LILCO's overall program for operational QA provides sufficient organizational freedom and independence from cost and schedule concerns.²⁷⁷

The County continues on appeal to press its argument that the LILCO organizational structure is unacceptable.²⁷⁸ Several considerations, however, convince us that the LILCO operational QA organization has sufficient authority and organizational freedom to satisfy Criterion I of Appendix B. First, the Commission has indicated that there is no need for the rigid separation of quality assurance personnel from individuals having significant responsibility for work performance that is advocated

²⁷⁵ LILCO Exh. 21, Attachment 4, sections 1.2.7, 1.2.19 and 1.2.22, and Exhibits (Figures) 1.1 and 1.2.

²⁷⁶ Tr. 12,718; 12,796-97; 14,902 (Muller); Tr. 20,224-25 (Capton).

²⁷⁷ LBP-83-57, *supra*, 18 NRC at 584-85.

²⁷⁸ Suffolk Brief at 82-87.

by the County.²⁷⁹ Further, the LILCO organizational structure meets the current staff and industry guidance for providing the necessary freedom and independence for quality assurance personnel.²⁸⁰ Finally, and most significant, while the onsite OQA Engineer reports to the Plant Manager, the OQA Section is audited by the offsite QA Department. This audit program, along with oversight by other organizational entities within and outside LILCO, provides us with confidence that the LILCO operational quality assurance personnel will have adequate independence from cost and schedule concerns.²⁸¹ Contrary to the County's assertion that outside audits and oversight would only detect influence after the fact, we believe that this continuing surveillance of the OQA Section would provide a substantial incentive for proper action by those quality assurance personnel initially.

C. Procedural Issues

The County asserts that various Board procedural rulings prejudiced its ability to present its case. We have reviewed each of the County's charges. In doing so, we start from the proposition that a mere demonstration that the Board erred is not sufficient to warrant appellate relief.²⁸² "The complaining party must demonstrate actual prejudice — *i.e.*, that the ruling had a substantial effect on the outcome of the proceeding."²⁸³ In each instance we seriously doubt that any error was committed. More importantly, we are convinced that the County has totally failed to demonstrate actual prejudice.

1. The County objects generally to the time limits placed on its cross-examination. Despite the limits, the quality assurance portion of the hearing lasted fifty-five days and involved consideration of scores of County exhibits. Even the County's counsel characterized the hearings as "undeniably long . . . undeniably detailed."²⁸⁴ During the hearing, the

²⁷⁹ See 40 Fed. Reg. 3210C (1975); 39 Fed. Reg. 13,974 (1974).

²⁸⁰ The NRC Standard Review Plan (NUREG-0800) and Revision 2 of Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation)," accept the LILCO organizational structure. Tr. 20,220-23 (Gilray); Tr. 14,837-38 (Muller). Revision 2 of Regulatory Guide 1.33 endorses American National Standards Institute Standard N18.7-1976, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants," with certain exceptions not relevant here. Tr. 14,837-38 (Muller).

²⁸¹ This independent surveillance of the OQA Section was essential to the staff's acceptance of the LILCO organizational structure. Tr. 20,187-88 (Gilray).

²⁸² *Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Units 1 and 2), ALAB-443, 6 NRC 741, 756 (1977).

²⁸³ *Louisiana Power and Light Co.* (Waterford Steam Electric Station, Unit 3), ALAB-732, 17 NRC 1076, 1096 (1983).

²⁸⁴ App. Tr. 113.

County was admonished by the Board to pursue its best points first²⁸⁵ and we must assume that the County did so. While the Board clearly did not accord the County an unfettered right to cross-examine, our review of the record reveals no genuine prejudice flowing from the Board's limitations. We note, moreover, that despite the limits, in only two instances did the County make an offer of proof following a curtailment of cross-examination.²⁸⁶ In one case, the offer related to issues that were ultimately settled by agreement among the parties.²⁸⁷ In the other case, involving document control and alleged deficiencies concerning the storage of items in the wrong areas, the County does not attempt to explain how its offer of proof relates to the Board's substantive findings on these issues. Thus, we are hard pressed to see how the Board's limitation genuinely affected the County's case.

2. The County complains that the Board impermissibly required it to restructure its cross-examination plan. Following the first day of highly general foundation examination by the County's counsel, which went largely uninterrupted, the Board urged the County to proceed immediately to that portion of its cross-examination plan that involved the actual examples of quality assurance breakdowns and implementation deficiencies. In the Board's view, any additional foundation questioning could be better pursued after the "nitty-gritty" was revealed.²⁸⁸ Although the County did not strenuously object to the Board's proposal at the time,²⁸⁹ it now asserts that a presiding officer should not be "permitted to interfere" with a party's structure of its cross-examination absent "a clear abuse in the conduct of that examination."²⁹⁰ The County cites no authority for its view, however, and we know of none. On the contrary, the Commission's rules direct the Board to use its powers

to assure that the hearing is focused upon the matters in controversy among the parties and that the hearing process for the resolution of controverted matters is conducted as expeditiously as possible, consistent with the development of an adequate decisional record.²⁹¹

²⁸⁵ See, e.g., Tr. 11,319-21 (Judge Brenner).

²⁸⁶ See Suffolk County Offer of Proof (OQA), SC Exh. 79 (Nov. 9, 1982) and Suffolk County Offer of Proof, SC Exh. 78 (Nov. 5, 1982).

²⁸⁷ See LILCO's Reply Brief at 58. See also Joint Status Report on SC Contention 13(a) (OQA Procedures) (June 20, 1983).

²⁸⁸ See Tr. 10,260-61 (Judge Brenner).

²⁸⁹ Counsel asked for, and received, a recess in order to prepare for the more detailed examination. See Tr. 10,265: "If you want me to go to the nitty-gritty, to go through these audits and some other things that establish the pattern, which I am willing to do, I'm not prepared to do so immediately. I think I can be prepared to do so tomorrow morning. . . ." See generally Tr. 10,264-74.

²⁹⁰ Suffolk Brief at 77.

²⁹¹ 10 C.F.R. Part 2, Appendix A, § V.

Given that the County's contentions were directed principally to alleged breakdowns in the implementation of the quality assurance program at Shoreham, the Board reasonably required the County to pursue those matters first. The County was not deprived of an opportunity to return to more general matters at a later stage and it has not shown how the Board's action in any way prejudiced its case.

3. The County complains that the Board's requirement that it "state precisely, in advance, which audit findings it would pursue and, in addition . . . , state exactly what [its] theory was with respect to those audit findings" is a departure from ordinary NRC hearing practice.²⁹² We fail to see that any error was committed or harm done.

Numerous LILCO and Stone and Webster audits were marked for identification as County exhibits during the course of the hearing.²⁹³ Before the hearing began, LILCO and the County agreed to exchange information as to which audits would be used during cross-examination, so that the witnesses could become familiar with them. Apparently as a result of continuing identification by the County of new documents to be used during cross-examination, LILCO asked the Board to direct the County to prepare some statement explaining how each group of audit findings bears on the County's contentions regarding alleged breakdowns in quality assurance.²⁹⁴ The Board did so, and the County complied.²⁹⁵ The County does not indicate that it objected to the Board's ruling or how it has been prejudiced by it. Given the extensive audit findings the County sought to examine by way of cross-examination, we cannot conclude that the Board abused its discretion in requiring the County to explain in some detail which audit findings it would examine, and why.²⁹⁶

4. The County argues that the Board improperly denied it the right to introduce certain audit reports into evidence. In this connection, the County directs our attention to hearing transcript pages 10,286-89 where, it claims, "the Board refused admission of particular audits into evidence" but required, instead, that the County "go through each audit finding which the County believed supported its case."²⁹⁷ Its complaint is without merit.

²⁹² Suffolk Brief at 77.

²⁹³ See, for example, SC Exhs. 51 and 56. Each of these exhibits collects 30 or more separate audit reports which, together, comprise hundreds of pages.

²⁹⁴ See LILCO's Motion for Further Board Direction on the Conduct of QA Cross-Examination (Oct. 5, 1982) at 15.

²⁹⁵ See Suffolk County Submittal of QA/QC Information (Oct. 11, 1982).

²⁹⁶ Indeed, the County concedes that, given the highly technical nature of the subject matter, "to some extent, it is appropriate that witnesses know the areas of intended cross-examination so that there can be proper preparation." Suffolk Brief at 77 n.40.

²⁹⁷ *Id.* at 78.

The County, over the applicant's objection, sought to introduce four exhibits which embrace forty-three separate audits, comprising hundreds of pages of exhibit material. It wanted the exhibits introduced into evidence in their entirety in advance of cross-examination. The Board, instead, directed the County to conduct its cross-examination first, and reserved the right to rule on the admissibility of the exhibits following cross-examination. We see nothing wrong in the Board's approach. In our judgment, the Board was under no obligation to allow the introduction of masses of undigested information but was entitled to limit the evidentiary material to those portions of the audit reports that were genuinely the subject of controversy.²⁹⁸

5. The County challenges the Board's decision to limit its presentation concerning the Readiness Assessment Team (RAT) inspection to cross-examination and the filing of proposed findings.²⁹⁹ The Board denied the County's request to present a witness to address the inspection results. The Board explained:

The purpose of the inquiry is limited to finding out what the results of the inspection mean, what the staff found and what LILCO's explanation, if any, is for these matters. We don't need another party coming in and telling us what the facts are. We will get the facts in terms of understanding the County's view of the significance of the items. We have had extensive testimony. We will be able to apply these items to that testimony. And that in fact is the very purpose of having these other examples of applying it to the framework of testimony we have. And the County will be able to cross examine and write findings on it. It is just an area that is highly unlikely that we will make any efficient headway with yet another comment on it. We will have the record from LILCO and the [s]taff.³⁰⁰

The County asserts "that it was gross, reversible error for the Licensing Board to permit testimony by two parties, both of whom had previously stated that the allegations of [its] Contentions 12-15 were not true and then to deny the same right to present testimony by the one party who had sponsored those contentions, namely Suffolk County."³⁰¹

The RAT inspection was a special, unannounced team inspection of the Shoreham plant conducted in January 1983 by members of the NRC's Region I staff. The inspection was performed to determine the

²⁹⁸ The County contends that five weeks of cross-examination was insufficient because of the Board's refusal to admit audits that were not specifically addressed. Suffolk Brief at 78. The Licensing Board, however, did allow the County to group audit findings. See, e.g., Tr. 11,360. As a result, we believe the County was provided adequate time to present its best case.

²⁹⁹ See 18 NRC at 611-14. FF K-1041 (slip opinion at 1277).

³⁰⁰ Tr. 19,534-35 (Judge Brenner).

³⁰¹ Suffolk Brief at 80.

status of operational readiness of the Shoreham facility.³⁰² The inspection report became available as the extensive quality assurance hearing was drawing to a close. As far as we can tell, the Board's purpose in entertaining testimony regarding the RAT inspection was to determine whether its conclusions called into question the evidence already in the record.³⁰³ This purpose appears to be roughly compatible with the County's objectives.³⁰⁴ Counsel for the County characterized its purpose for presenting a witness as follows:

[I]t would be our intent, if we were permitted to file supplemental testimony, it would be focused. It would be, as it is stated, supplemental testimony. I think it would help at the hearing in terms of keying people into what the County would like to examine into.³⁰⁵

There is always a potential for prejudice when a board opens the door to new evidence but allows only some of the parties to enter. In the instant case, however, the County appeared interested in presenting affirmative testimony as a means of outlining its areas of concern, rather than presenting additional factual information. As the Board correctly noted, the results of the RAT inspection and LILCO's response to it were matters uniquely within the knowledge of staff or LILCO witnesses. At oral argument, the County acknowledged that it did not intend to address the facts; it argues, however, that it intended to offer expert opinion on what the facts mean.³⁰⁶ To some degree, such argument could easily be presented in its proposed findings. We cannot ignore, however, that its argument to the Licensing Board suggested only that it wished to outline areas for exploration rather than introduce new, affirmative expert analysis. In such circumstances, the Board quite reasonably concluded that the County's concerns could be amply put forth in its proposed findings. Thus, we see no error in the Board's decision.

Even more important, the County simply alleges an error on the Board's part without demonstrating that the error — if it was an error — was genuinely prejudicial. The County acknowledges that it made no offer of proof in connection with any affirmative expert testimony it

³⁰² Staff Exh. 13, cover letter.

³⁰³ Tr. 18,816: "[W]e are here to put all of the evidence together and we can put in what . . . [earlier inspections] said along with what we hear from other witnesses, including perhaps the more correct witnesses for the RAT inspection; that is, the staff and maybe LILCO witnesses who are familiar with the details of that inspection." (Judge Brenner).

³⁰⁴ Tr. 18,814: "[I]t seems to us . . . that the inspection report makes some determinations in the very areas that were examined and conclusions drawn upon by Torrey Pines with respect to the QA/QC program, which is what this trial is all about." *See generally* Tr. 18,812-20 (Miller).

³⁰⁵ Tr. 19,444-45 (Miller).

³⁰⁶ App. Tr. 113.

would have put forward.³⁰⁷ In the circumstances, any procedural error that may have occurred was plainly harmless.

IV. MISCELLANEOUS TECHNICAL ISSUES

A. Water Hammer

As the Licensing Board explained, "water hammer" is engineering jargon used to describe the pressure changes that result from a sudden change in the velocity of liquid through a pipe.³⁰⁸ As the Board also noted, the term was used expansively in this proceeding to include as well transients involving steam (steam hammer) and two-phase flow (e.g., water entrainment in steam lines).³⁰⁹ No one disputes the need to prevent water hammer, reduce its occurrence, and mitigate its effects. The County acknowledges that LILCO witnesses testified that industry experience with water hammer has been taken into account in the Shoreham design, plant procedures, training, and test programs.³¹⁰ It argues, however, that such consideration is too general so there is no basis to believe that there will be any significant improvement at Shoreham over the experience depicted in the so-called EG&G Report tabulating industry water hammer experience over a twelve year period.³¹¹ The Licensing Board disagreed.

We have reviewed the Board's decision and the underlying record and can find no support for the County's allegation. Among other things, LILCO's witness testified, without serious challenge, that the events described in the EG&G Report were reviewed, that none of the water hammer types was new, and that Shoreham had been adequately designed to guard against the problem.³¹² Furthermore, a staff witness testified that findings and recommendations dealing with design as developed in the Quadrex Report,³¹³ which evaluated the data in the EG&G Report, were incorporated at Shoreham.³¹⁴ Moreover, the Licensing Board

³⁰⁷ App. Tr. 116.

³⁰⁸ FF A-3 (slip opinion at 281).

³⁰⁹ LBP-83-57, *supra*, 18 NRC at 469.

³¹⁰ See R. Chapman, D. Christensen, R. Dafoe, O. Hanner, M. Wells, "Compilation of Data Concerning Known and Suspected Water Hammer Events in Nuclear Power Plants," NUREG/CR-2059 (May 1982) (hereinafter EG&G Report).

³¹¹ Suffolk Brief at 99.

³¹² Tr. 2335-A to 2335-E (Fortier, Hodges).

³¹³ R. Uffer, S. Banerjee, F. Buckholz, M. Frankel, M. Kasahara, L. Miller, A. Silvester, "Evaluation of Water Hammer Events in Light Water Reactors," NUREG/CR-2781 (July 1982).

³¹⁴ Tr. 2113-14 (Hodges).

found that water hammer was a condition explicitly considered in developing Shoreham's operating procedures³¹⁵ and means to prevent and mitigate water hammer events are included in operator training.³¹⁶ In sum, if design information is implemented and procedures are followed, water hammer is not likely to be a problem at Shoreham.

B. Environmental Qualification and Post-Accident Monitoring

Section 50.49 of 10 C.F.R. requires that certain electrical equipment be environmentally qualified, i.e., it must be able to withstand events such as design basis accidents. As far as pertinent here, LILCO must demonstrate the environmental qualification of (1) all nonsafety-related electrical equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions by safety-related electrical equipment (10 C.F.R. § 50.49(b)(2)), and (2) certain post-accident monitoring equipment (10 C.F.R. § 50.49(b)(3)). Suffolk County raised two interrelated contentions concerning compliance with 10 C.F.R. § 50.49. First, it claimed that LILCO failed to comply with the environmental qualification requirements of 10 C.F.R. § 50.49(b)(2). Second, the County argued that LILCO failed to comply with 10 C.F.R. § 50.49(b)(3) because it did not meet the requirements of Regulatory Guide 1.97, Rev. 2.³¹⁷ We treat these claims together. The Licensing Board rejected both. With one minor exception, we affirm.

1. Section 50.49(b)(2) Compliance

Because 10 C.F.R. § 50.49(b)(2) did not become effective until after hearings began on this issue,³¹⁸ the LILCO environmental qualification program does not explicitly identify any nonsafety-related equipment that might interact adversely with safety-related equipment.

The County claims that, as a consequence, LILCO cannot be in compliance with the Commission's regulations. "The logical first step in complying with Section 50.49," the County asserts, "is the preparation of a list of all electrical equipment at Shoreham that is important to safety. Following such preparation, the items can be evaluated to determine if they meet the criteria set forth in section 50.49, and if they do,

³¹⁵ FF A-12 (slip opinion at 284-85).

³¹⁶ FF A-14 (slip opinion at 285).

³¹⁷ "Instrumentation for Light-Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident" (Dec. 1980).

³¹⁸ See LBP-83-57, *supra*, 18 NRC at 538.

they must be included in the Shoreham EQ program.”³¹⁹ LILCO argues, to the contrary, that electrical equipment identified by section 50.49(b)(2) is typically either classified as safety-related or otherwise isolated by design so as not to prevent accomplishment of safety functions.³²⁰ The NRC staff agrees.³²¹

The Licensing Board suggested that the staff should articulate criteria that applicants would use when identifying specific nonsafety-related equipment that must be qualified under section 50.49(b)(2).³²² Nevertheless, it agreed with LILCO that the Shoreham design did preclude interactions between safety-related and nonsafety-related equipment.³²³

As noted earlier, section 50.49(b)(2) requires each applicant to establish a program for qualifying such nonsafety-related equipment “whose failure . . . could prevent satisfactory accomplishment of safety functions. . . .” While the preparation of a list of equipment as suggested by the County and recommended by the Board would plainly be one method of complying with the regulation, we agree with the Board’s conclusion that LILCO’s approach is equally satisfactory. As the Board pointed out, LILCO and staff witnesses testified that, for newer plants such as Shoreham, equipment of the type identified by section 50.49(b)(2) is either classified as safety-related or otherwise designed so as not to prevent the accomplishment of necessary safety functions.³²⁴ Thus, there should be no nonsafety-related equipment that could compromise the functioning of safety-related equipment. It follows, therefore, that there would be no equipment to be included in a section 50.49(b)(2) list. Such an approach satisfies the requirements of 10 C.F.R. § 50.49.

The County argues, in addition, that LILCO’s design approach, even if conceptually valid, is untested, that the staff has no basis for reviewing it, and that there can thus be no assurance that it will satisfy the requirements of section 50.49. As LILCO points out, however, various analyses were performed to provide assurance that there were no unacceptable interactions between safety-related and nonsafety-related electrical equipment.³²⁵ At the hearing, the County’s witness challenged LILCO’s assertion by pointing to certain nonsafety-related equipment that he be-

³¹⁹ Suffolk Brief at 103.

³²⁰ LILCO’s Reply Brief at 95.

³²¹ Staff Brief at 95.

³²² LBP-83-57, *supra*, 18 NRC at 539.

³²³ *Ibid.*

³²⁴ *Id.* at 538-39; FF I-14, I-15, I-16 (slip opinion at 444-45).

³²⁵ LILCO’s Reply Brief at 95 n.87. *See also* Tr. 19,653-54 (Kascsak).

lieved should be included in the environmental qualification program because their failure could mislead an operator. On cross-examination, however, it was demonstrated that such equipment need not be included because, in each case, there was redundant, series or diverse instrumentation that would prevent misleading information being provided to the operator. We have reviewed the record and agree with the Licensing Board's determination that the LILCO and staff testimony has not been effectively undermined.³²⁶

Although the Board was prepared to resolve the contention regarding nonsafety-related equipment in LILCO's favor, it nonetheless recognized that documentation of the Shoreham environmental qualification program was incomplete in two respects. First, the final scope of the environmental qualification program for nonsafety-related equipment had not yet been determined. Second, the staff had not completed its review of the Shoreham plant.³²⁷ The gist of the County's argument is that completion of such review is a prerequisite to a definitive finding that LILCO has complied with section 50.49 and that only the Board can make such finding.³²⁸

All parties recognize that certain minor matters may be left to the staff for post-hearing resolution where hearings would not be helpful and the Board can "make the findings requisite to issuance of the license."³²⁹ The disagreement arises as to whether the issues left for post-hearing resolution are of the type that must be reserved for board resolution.³³⁰ Except in one respect, we think the answer is no.

Because the LILCO program could not have explicitly included formal qualification of nonsafety-related equipment at the time it was developed, LILCO was to submit to the staff a list of any equipment which must comply with 10 C.F.R. § 50.49(b)(2). Such list was to include equipment whose failure under postulated accident conditions could mislead the operator and thereby prevent satisfactory accomplishment of certain safety functions.³³¹ But the Licensing Board found, with support in the record, that there would be little or no nonsafety-related equipment at Shoreham that could prevent the satisfactory accomplishment of safety functions by safety-related equipment because all nonsafety-related electrical equipment will be *either* upgraded to be environ-

³²⁶ LBP-83-57, *supra*, 18 NRC at 539; FF I-19, I-20, I-21 (slip opinion at 446-47).

³²⁷ LBP-83-57, *supra*, 18 NRC at 543.

³²⁸ Suffolk Brief at 104-06.

³²⁹ *Consolidated Edison Co. of New York* (Indian Point Station, Unit No. 2), CLI-74-23, 7 AEC 947, 951 (1974) (footnote omitted).

³³⁰ *Id.* at 951-52.

³³¹ LBP-83-57, *supra*, 18 NRC at 636.

mentally qualified or isolated from safety-related equipment.³³² As we read the Board's decision, the staff is being asked simply to confirm that LILCO has either upgraded or properly isolated nonsafety-related equipment so that no nonsafety-related equipment falls within the section 50.49(b)(2) category. In our judgment, such confirmation does not constitute an improper delegation of decisional responsibility over adversary issues from the Board to the staff.

Nonetheless, the Board also observed that there may be "a small number of items which must be included in the qualification program."³³³ If so, LILCO would need to justify interim operation before environmental qualification. In such circumstances, the County would be entitled to address this matter. In a note to the parties served last August, the staff indicated that LILCO had submitted any necessary identification of equipment under section 50.49(b)(2) and that this matter "has been resolved by LILCO to the satisfaction of the NRC staff."³³⁴ It is unclear, however, whether the staff's approval rests on its confirmation that there is no equipment that needs to be qualified or a substantive determination that LILCO has properly justified interim operations. As a consequence, we require the staff to advise the Licensing Board (with copies of its filing served on all parties) whether any equipment falls into the section 50.49(b)(2) category and, if so, the basis for the staff's approval. The Licensing Board shall review the staff's submission and take such further action as it deems necessary.

2. Section 50.49(b)(3) Compliance

Certain post-accident monitoring equipment must be environmentally qualified in accordance with 10 C.F.R. § 50.49(b)(3). Specific guidance concerning the types of variables to be monitored is provided in Regulatory Guide (Reg. Guide) 1.97, Rev. 2, and a schedule for implementing that guide is set out in SECY-82-111,³³⁵ adopted by the Commission in 1982.³³⁶ At the hearing, the County contended that LILCO was not in compliance with Reg. Guide 1.97 for two reasons: first, that regulatory

³³² *Id.* at 538-39, 543-44; FF 1-14, 1-15, 1-16, (slip opinion at 444-45). See also Tr. 19,529 ("It is our belief . . . [that] [t]here would be no equipment in that [10 C.F.R. § 50.49(b)(2)] category for Shoreham.") (LILCO witness Kascsak); Tr. 19,510-11 ("It is a general opinion that the list in item [(b)(2)] should be very small or nonexistent. And that is because of the way Class [1E] equipment is normally defined.") (Staff witness Noonan).

³³³ LBP-83-57, *supra*, 18 NRC at 544.

³³⁴ Note to Attached Service List from Bernard M. Bordenick (August 7, 1984), transmitting Memorandum for Edwin Reis, from A. Schwencer, "Shoreham License Conditions" (July 30, 1984) at 2.

³³⁵ "Requirements for Emergency Response Capability" (March 11, 1982).

³³⁶ See FF H-8 (slip opinion at 420).

guide had not yet been implemented by the staff so there was no staff position on whether LILCO was in compliance; second, four specific variables would not be properly monitored. The Board acknowledged that it had to decide the issues presented by the County in the absence of staff testimony on their technical merits.³³⁷ Nevertheless, it did not see that lack of information as an obstacle to decision. Rather, it reviewed the evidence submitted by LILCO and the County and concluded that the post-accident monitoring equipment would achieve the purposes stated in the regulatory guide for the four variables in question.³³⁸

The County does not seriously challenge the Board's technical resolution of the issue.³³⁹ Rather, it contends that the Board should have found that the issue was not ripe for litigation because the staff had failed to complete its work.³⁴⁰ It claims, in this connection, that LILCO's "commitment" to comply with Reg. Guide 1.97 is an insufficient basis for the Board's decision. We uphold the Board's determination.

We do not find the staff's failure to implement Reg. Guide 1.97 or to review Shoreham's post-accident monitoring capability to be an obstacle to the Board's resolution of the issue. To begin with, SECY-82-111 provides that Reg. Guide 1.97 compliance need not be accomplished before fuel loading. Thus, such compliance is not a precondition to issuance of the Board's decision. Moreover, regulatory guides do not set out mandatory regulatory requirements. Methods and solutions different from those set out in the guides can be acceptable if they provide a basis for the findings requisite to the issuance of a license.³⁴¹ In the instant case, based on the evidence in the record, the Licensing Board concluded that LILCO satisfied the purposes stated in the regulatory guide for each of the four items which were the subject of the County's contention.³⁴² The Board's substantive conclusion is unchallenged. We have reviewed the record and find no basis for upsetting the Board's decision.

³³⁷ LBP-83-57, *supra*, 18 NRC at 533.

³³⁸ *Id.* at 535.

³³⁹ Suffolk County argues generally that there is insufficient information to permit the conclusion that LILCO will adequately comply. Suffolk Brief at 121. The County fails to support its argument in this respect, however.

³⁴⁰ *Id.* at 120-21.

³⁴¹ *Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit No. 1)*, ALAB-698, 16 NRC 1290, 1299 (1982), *rev'd in part on other grounds*, CLI-83-22, 18 NRC 299 (1983).

³⁴² LBP-83-57, *supra*, 18 NRC at 535.

C. Passive Mechanical Valve Failure

Suffolk County is concerned about the possibility that undetected failures will occur in valves used in various Shoreham safety-related systems. On appeal, the County makes three principal points. First, it maintains there should be a comprehensive failure analysis of all safety-related valves. Such analysis is necessary, the County claims, chiefly for two reasons: there have been repeated valve failures and there is no better way to justify requests for deviation from valve testing frequency requirements. Second, it asserts that, absent such analysis, all safety-related valves should have position indicators. Third, it contends that the Board improperly construed the single-failure criterion embodied in the Commission's regulations. We affirm the Board's determination.

The Board found, with support in the record, that the safety-related valves were constructed to appropriate codes and standards and are highly reliable.³⁴³ The analysis recommended by the County does not represent standard industry practice and is not required by Commission regulations.³⁴⁴ The County concedes as much³⁴⁵ but argues that the experience at other plants justifies the type of comprehensive analysis it seeks. The Board carefully scrutinized the one historical example of supposed unreliability pointed to by the County — namely, the failure of main steam isolation valves at Brunswick Unit 2. It concluded that the valve failures were caused primarily by plant-specific maintenance problems at the Brunswick plant, and that, in any event, the failures were detectable.³⁴⁶ We agree.

Section 50.55a of 10 C.F.R. requires valve testing to satisfy the requirements of the ASME Boiler and Pressure Vessel Code section XI. The Code prescribes a three month testing interval for valves.³⁴⁷ Nonetheless, deviations from Code requirements are permitted.³⁴⁸ In our judgment, and contrary to the County's assertion, comprehensive analysis of all valves is not needed to justify departures from valve testing frequencies. Such deviations require technical justification which must be evaluated by the staff. While we are inclined to agree with the County that a comprehensive analysis of the type it seeks could provide some additional information, the County has not demonstrated that the current deviation approval procedure is faulty or unsatisfactory or that a

³⁴³ *Id.* at 483.

³⁴⁴ FF C-19 to C-21 (slip opinion at 312).

³⁴⁵ Suffolk Brief at 107.

³⁴⁶ LBP-83-57, *supra*, 18 NRC at 484.

³⁴⁷ Tr. 3656 (Fortier).

³⁴⁸ Tr. 3635 (Fortier); Tr. 3929 (Kirkwood). *See also* 10 C.F.R. § 50.55a(a)(2).

comprehensive analysis would result in a significant improvement over existing practices.

The Board thoroughly evaluated the County's argument about the need for position indicators, and rejected it.³⁴⁹ We can add little to the Board's analysis. The Board noted that many safety-related valves have position indicators, and that the others either cannot accommodate them (but nonetheless have some other mechanism for detecting failure) or are sufficiently reliable not to warrant them.³⁵⁰ The County's witness did not suggest that such indicators were essential, but merely desirable.³⁵¹ We do not believe that the County has undermined the Board's findings regarding the need for position indicators.

Finally, the County challenges the Board's approval of LILCO's application of the so-called single failure criterion. That criterion provides:

A single failure means an occurrence which results in the loss of capability of a component to perform its intended safety functions. Multiple failures resulting from a single occurrence are considered to be a single failure. Fluid and electric systems are considered to be designed against an assumed single failure if neither (1) a single failure of any active component (assuming passive components function properly) nor (2) a single failure of a passive component (assuming active components function properly), results in a loss of the capability of the system to perform its safety functions.²

² Single failures of passive components in electric systems should be assumed in designing against a single failure. The conditions under which a single failure of a passive component in a fluid system should be considered in designing the system against a single failure are under development.³⁵²

Generally speaking, the single failure criterion requires that fluid and electric systems remain functional even if there is a single failure of a component.

LILCO witness Raymond E. Fortier described the application of the single failure criterion for fluid systems at Shoreham as follows:

First, the fluid systems are designed for a single failure of active components. Also, fluid systems are designed for single failure of passive components such as pump seals, valve stem seals, and measuring devices . . .³⁵³

LILCO claims that such design satisfies the regulations with respect to the single failure criterion.³⁵⁴ The County contends, however, that the

³⁴⁹ LBP-83-57, *supra*, 18 NRC at 484-86. FF C-35 to C-40 (slip opinion at 317-19).

³⁵⁰ FF C-35 to C-37 (slip opinion at 317-18).

³⁵¹ See Tr. 3725 ("I think I would feel better if they all had them.") (Bridenbaugh).

³⁵² 10 C.F.R. Part 50, Appendix A, Definitions and Explanations.

³⁵³ Tr. 3633.

³⁵⁴ Tr. 3634 (Fortier).

criterion requires that fluid systems remain functional where there is a failure in an active component *and it is also assumed* that there is a passive failure that cannot be detected via periodic testing or functional observation.³⁵⁵ The Licensing Board rejected this interpretation of the criterion.³⁵⁶ We affirm.

To begin with, the Board's interpretation is consistent with the language of Appendix A, which requires, with one exception, assumption of the failure of a single active component or a single passive component, but not both simultaneously. The County's interpretation would transform the rule essentially into a "double failure" criterion, i.e., the failure of an active component along with the assumed failure of a passive component.³⁵⁷ Moreover, as the Licensing Board observed, the County could not point to any study or example supporting its interpretation of the single failure criterion.³⁵⁸ In such circumstances, we have no basis for upsetting the Board's interpretation.

D. Anticipated Transient Without Scram

A scram is the shutting down of a nuclear reactor, either automatically or manually by the reactor operator. At times, events will occur that should produce a scram, but do not. An anticipated transient without scram (ATWS) occurs when the reactor trip system — or scram system — fails to operate as required and the reactor consequently does not

³⁵⁵ Suffolk Brief at 109. An active component is one which requires mechanical movement to perform its safety function. A passive component is not required to have such movement to perform its function. Failure of a valve to open upon receipt of an initiation signal would be an example of an active failure. Leakage from a valve stem would constitute an example of a passive failure. Tr. 3640-41 (Fortier).
³⁵⁶ LBP-83-57, *supra*, 18 NRC at 482.

³⁵⁷ See *ibid.* See also Tr. 3561-62 (Minor).

³⁵⁸ FF C-21 (slip opinion at 312). The County contends that its proposed approach "is a methodology that has been used in electrical system evaluation," citing to testimony at pp. 3562 and 3574 of the transcript. See Suffolk Brief at 109-10. The testimony does not support that assertion. The County's witness conceded that he could point to no specific examples when his interpretation had been employed and was able to suggest only "the likelihood that some plants have considered at least portions of this type of analysis in conducting their PRA analysis . . . , and considering certain failure mechanisms in their safety systems that would probably get into the assumption of certain valve failures." Tr. 3573-75 (Minor). Similarly, the County claims that "even LILCO's witness confirmed that a limited number of passive failures should be assessed along with a single active failure," citing to testimony at p. 3648 of the transcript. Suffolk Brief at 109. We disagree with the County's reading of the testimony. As we construe it, the witness testified that the conditions under which a single failure of a passive component in a fluid system should be considered have not been established. That does not relieve an applicant, however, of the obligation for considering passive failures in the design of a facility. LILCO did so by analyzing the three most likely passive failures, i.e., pump seals, valve stem leakage, and measuring devices. Tr. 3648 (Fortier). We do not understand the witness to suggest that LILCO undertook anything analogous to a "double failure" analysis of the type advocated by the County. See generally Tr. 3634 (Fortier). In any event, neither the County nor its witness has demonstrated that its interpretation has been applied as a regulatory requirement.

shut down. Some ATWS events obviously have serious safety significance.³⁵⁹

In 1981 the Commission proposed various modifications looking to the prevention or mitigation of ATWS events.³⁶⁰ At the same time, it noted that certain changes — installation of a recirculation pump trip on boiling water reactors (BWRs) and changes in operating procedures and operator training, for example — were already underway, and found that there were no substantial safety risks in operating over the next two or four years while additional changes were being implemented.³⁶¹ Recently, the Commission made its ATWS rule final.³⁶² It has required the installation or modification of certain equipment and has recommended the establishment of a reliability assurance program to enhance the effectiveness of the reactor trip system.³⁶³

At issue on the appeal is whether LILCO has taken adequate measures to protect the public pending full implementation of the requirements set out in the Commission's final rule. The County claims that the Board erroneously concluded that LILCO has taken such measures. Specifically, the County argues that the Board did not demonstrate why the interim measures are a sufficient substitute for a redundant, automated standby liquid control (SLC) system; that it did not have sufficient evidence to find that the interim measures are satisfactorily implemented; and that it did not adequately explain why it rejected several of the County's concerns.³⁶⁴ We have reviewed the Board's decision and find no fault with its determinations.

The County believes, first and foremost, that General Design Criterion 20 of 10 C.F.R. Part 50, Appendix A has not been met in that no interim measures are sufficient to compensate for the lack of an automatically initiated and totally redundant SLC system that meets the single failure criterion. The need for such system was considered by the Commission — and rejected — during the course of the rulemaking.³⁶⁵ That being so, there is no basis for concluding that such system is needed as an interim measure.

³⁵⁹ See 46 Fed. Reg. 57,521 (1981).

³⁶⁰ *Ibid.*

³⁶¹ *Id.* at 57,522.

³⁶² See 49 Fed. Reg. 26,036 (1984).

³⁶³ *Id.* at 26,038-41.

³⁶⁴ Suffolk Brief at 110.

³⁶⁵ The final rule requires installation of an automatically initiated SLC system only if the plant were already designed and built to include that feature. There is no requirement for a redundant system for any facility. See 49 Fed. Reg. at 26,042-45.

Shoreham interim operating procedures for mitigating the consequences of an ATWS were based on guidance developed by General Electric and reviewed by the NRC staff.³⁶⁶ The Licensing Board found these procedures adequate.³⁶⁷ The County claims that there was insufficient evidence to show that the interim measures are acceptable. Principally, it argues that the staff testimony indicating approval of the interim measures is unreliable because the staff witness did not personally evaluate the Shoreham ATWS procedures.³⁶⁸

We reject the County's claims. Although the staff witness was not responsible for the formal staff evaluation of Shoreham's ATWS procedures, he nonetheless reviewed the Shoreham ATWS submittal³⁶⁹ and was familiar with, and approved, the criteria used to evaluate the interim procedures.³⁷⁰ Moreover, it is evident from the decision that the Board itself reviewed the procedures in detail.³⁷¹ In the circumstances, the County has failed to undermine the Board's conclusion that the interim measures are acceptable.

The County also argues that the Board failed to address specific recommendations that the County believes would improve ATWS protection. As we discussed, the Licensing Board specifically found the current procedures to be satisfactory³⁷² and we must therefore assume that it found additional modifications unnecessary. Nevertheless, we have reviewed the County's suggestions and find them unpersuasive.

First, the County contends that the ATWS procedures should be revised to require immediate verification of sodium pentaborate injection.³⁷³ Plainly, the prompt injection of sodium pentaborate is important to slow the chain reaction and thus lower the power level in the reactor in the event of an ATWS. But there is no need to single out this item for separate and immediate verification. Verification of all "Immediate Operator Actions" is required in Step 4.1 of the ATWS procedure.³⁷⁴ Moreover, all operators are trained to look for expected results of any action they have just initiated.³⁷⁵

³⁶⁶ LBP-83-57, *supra*, 18 NRC at 500.

³⁶⁷ *Id.* at 503-04.

³⁶⁸ Suffolk Brief at 111. The County also asserts that certain criteria upon which the staff based its review were not part of the record. *Ibid.* The County fails to explain this assertion. We note that ATWS criteria are contained in section 15.3 of the SER. See Tr. fol. 9255. Thus, we are unable to conclude that the County's assertion is correct or, if true, is significant.

³⁶⁹ Tr. 8967, 8983 (Hodges).

³⁷⁰ Tr. 8966 (Hodges).

³⁷¹ LBP-83-57, *supra*, 18 NRC at 500-02; FF D-6 to D-12 (slip opinion at 339-44).

³⁷² LBP-83-57, *supra*, 18 NRC at 503-04.

³⁷³ Suffolk Brief at 111-12.

³⁷⁴ See Attachment 1 to Tr. fol. 8870 (Calone, *et al.*).

³⁷⁵ Tr. 9029, 9035 (Calone).

The County urges that the operator be instructed to raise the water level above the top of the active fuel.³⁷⁶ This instruction is already provided in the ATWS procedure as an immediate operator action under certain conditions and as a final plant condition, and the need to keep the fuel covered with water is also listed in the discussion section of the procedure.³⁷⁷

The County contends that the procedures should be modified to require that the SLC system achieve about eighty-six gallons-per-minute flow.³⁷⁸ This requirement was adopted by the Commission as part of the final rule. The implementation date remains open, however, pending further Commission guidance.³⁷⁹ In light of the other steps to be taken on an interim basis, we see no need to compel adoption of these procedures in advance of any timetable the Commission may establish generally.

The County claims that the current procedures are ambiguous and that the operator should be explicitly directed first to attempt to scram the reactor manually.³⁸⁰ The Licensing Board found no ambiguity in the procedures,³⁸¹ and we agree. As the Board explicitly found, the first three immediate operator actions, as set out in the procedures, are to arm and depress the manual scram pushbutton, place the mode switch in shutdown, and verify that all rods are inserted.³⁸² In short, the operator is instructed first to scram the reactor manually. If the reactor does not scram at that stage, the operator would need to take certain further steps, described in the procedures as conditional immediate operator actions. It is these actions that the County appears to believe are ambiguous. It argues, in this connection, that LILCO's witness testified that an operator would decide to initiate the SLC system pumps without attempting other means of manually scrambling the reactor.³⁸³ We disagree with the County's reading of the testimony. As we read it, operators would *concurrently* undertake further efforts to scram the reactor manually while initiating the conditional immediate operator actions, such as starting the SLC system pumps. The Board found, based on the evidence, that the possibility of misleading instructions is eliminated in training and that this arguable ambiguity does not cause problems in

³⁷⁶ Suffolk Brief at 111.

³⁷⁷ See Attachment 1 to Tr. fol. 8870 at 3-5 (Calone, *et al.*).

³⁷⁸ Suffolk Brief at 111.

³⁷⁹ 49 Fed. Reg. at 26,045.

³⁸⁰ Suffolk Brief at 112.

³⁸¹ See LBP-83-57, *supra*, 18 NRC at 501; FF D-6 (slip opinion at 339-40).

³⁸² FF D-6 (slip opinion at 340).

³⁸³ Suffolk Brief at 112-13.

practice.³⁸⁴ It suggested — but did not require — that this aspect of the procedure nonetheless be clarified by LILCO in consultation with the staff, and we endorse both its suggestion and its refusal to require such clarification as a condition of the license.

Suffolk County believes that the ambiguities and omissions it perceived in the emergency procedures raise broader questions about the adequacy of the operator training for ATWS events.³⁸⁵ In particular, the County appears concerned that the staff did not specifically review the ATWS training. It is true that the training itself was not reviewed. Rather, the staff will rely on the operator testing to verify that training has been satisfactory.³⁸⁶ Nonetheless, LILCO testified about training procedures and, relying on such testimony, the Board found training adequate to protect the public.³⁸⁷ Nothing in Suffolk County's highly general allegations warrants overturning the Board's determination.

Finally, the County contends that, because there is a ten-minute rule of thumb applied to the design of safety-related systems used to mitigate accidents, LILCO improperly relies on an operator taking action within forty seconds of an ATWS event. The County asserts that LILCO should perform an analysis of the effects of delaying manual initiation of the SLC system for ten minutes after the onset of a severe ATWS event.³⁸⁸

We see no need for such analysis. First of all, the ten-minute rule of thumb is not a requirement but is merely an assumption used in analyzing certain transients for design purposes.³⁸⁹ Moreover, the record shows that the procedures are adequate. LILCO's witness testified that there will be several alarms that will alert the operator that a scram is imminent or has occurred.³⁹⁰ The "immediate actions" incorporated in the emergency shutdown procedure call for a manual scram and verification of a rapid neutron flux decrease.³⁹¹ The ATWS is therefore recognizable within seconds of occurrence, and the operator will continue to attempt manual insertion of the control rods until the threshold for SLC system initiation is reached. Such sequence should not require ten minutes for operator action. Nor are there other demands on the operator that would

³⁸⁴ LBP-83-57, *supra*, 18 NRC at 501.

³⁸⁵ Suffolk Brief at 114.

³⁸⁶ Tr. 8968 (Hodges).

³⁸⁷ LBP-83-57, *supra*, 18 NRC at 503; FF D-13 (slip opinion at 344-45).

³⁸⁸ Suffolk Brief at 113.

³⁸⁹ See Tr. 9239 (Eckert).

³⁹⁰ Tr. 9065 (Calone).

³⁹¹ Applicant Exh. 6, Tr. fol. 1699.

take priority over SLC system initiation.³⁹² As a consequence, we find the current procedures acceptable and see no need to employ a "ten-minute" requirement.

E. Seismic Design

The effects of the vibratory ground motion of an earthquake must be considered in the engineering design of a nuclear power plant.³⁹³ Earthquake motion is described in terms of displacement (the distance a point on the ground moves); velocity (the speed at which the point moves); and acceleration (the rate at which that velocity changes). In order to determine the effect of these motions on a nuclear power plant and the adequacy of the structural design, a "response spectrum" is developed. A response spectrum is defined in the regulations as

[A] plot of the maximum responses (acceleration, velocity or displacement) of a family of idealized single-degree-of-freedom damped oscillators against natural frequencies (or periods) of the oscillators to a specified vibratory motion input at their supports.³⁹⁴

As we noted in our *Diablo Canyon* opinion, response spectra tend to have jagged peaks and valleys which are evened out when the spectra are combined for engineering analysis and design purposes. When so "smoothed" they are sometimes called "design response spectra."³⁹⁵

Reg. Guide 1.60³⁹⁶ was issued by the staff in 1973 to provide the industry with an acceptable methodology for defining these design response spectra. As we have noted earlier, regulatory guides do not constitute regulatory requirements.³⁹⁷ With regard to design response spectra, in fact, the staff encourages that they be developed on a site-specific basis rather than by application of the spectra reflected in the guide, and may even request site-specific spectra for certain sites.³⁹⁸

Such site-specific spectra were developed for Shoreham (before, it might be noted, Reg. Guide 1.60 was issued).³⁹⁹ They differ in some respects from the spectra that would be obtained from application of

³⁹² Tr. 9031 (Calone).

³⁹³ See 10 C.F.R. Part 100, Appendix A, § VI(a)(1).

³⁹⁴ 10 C.F.R. Part 100, Appendix A, § III(i).

³⁹⁵ *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-644, 13 NRC 903, 924 n.40 (1981), *review declined*, CLI-82-12A, 16 NRC 7 (1982).

³⁹⁶ "Design Response Spectra for Seismic Design of Nuclear Power Plant," Reg. Guide 1.60 (Rev. 1) (Dec. 1973).

³⁹⁷ See note 341 and accompanying text, *supra*.

³⁹⁸ Tr. 4184-85 (Rothman).

³⁹⁹ See FF E-21 to E-22 (slip opinion at 353-54).

Regulatory Guide 1.60. In particular, the Safe Shutdown Earthquake (SSE) design response spectrum at certain frequencies is less conservative than that developed using Regulatory Guide 1.60. Following its review, the Board concluded that the Shoreham SSE design response spectrum was developed in accordance with the Commission's regulations and is adequately conservative.⁴⁰⁰

The County does not identify deficiencies in the analysis actually employed at Shoreham. Rather, it argues that Part 100, Appendix A of the Commission's regulations requires the SSE spectrum to define the maximum vibratory accelerations predicted for a facility and that, to the extent the site-specific SSE spectrum is less conservative than that set out in Reg. Guide 1.60, LILCO has failed to demonstrate that the site-specific SSE spectrum is sufficiently conservative.⁴⁰¹ The Board found that it was inappropriate to compare the spectra produced by the site-specific methodology and Reg. Guide 1.60.⁴⁰² We agree.

All of the witnesses who testified on the issue explained that there was neither any need for nor any merit in comparing the site-specific spectrum with that contained in Reg. Guide 1.60.⁴⁰³ The SSE spectrum derived for Shoreham reflects actual site characteristics. Reg. Guide 1.60 spectra are designed for applicability at essentially any location in the country and are unnecessarily conservative for Shoreham.⁴⁰⁴ The County in effect advocates that we require compliance with site-specific criteria or Reg. Guide 1.60, whichever is more conservative. We do not believe that the Commission's regulations contemplate such an approach.

F. Mark II Containment

Contention 21 related to alleged deficiencies in Shoreham's primary containment.⁴⁰⁵ As to one part of the contention — regarding the operation of the residual heat removal system in the steam condensing mode — the Board retained jurisdiction to review a staff analysis before making a decision whether to permit Shoreham to operate at power

⁴⁰⁰ LBP-83-57, *supra*, 18 NRC at 506-10.

⁴⁰¹ Suffolk Brief at 115-16.

⁴⁰² LBP-83-57, *supra*, 18 NRC at 509.

⁴⁰³ See Tr. 4176 (staff witness Rothman); Tr. 4178 (applicant witness Wong); Tr. 4140 (applicant witness Lucks). The County presented no witnesses on this issue.

⁴⁰⁴ *Id.* at 4178, 4184 (Wong, Lucks). This is because the Shoreham site has a deep soil profile. Reg. Guide 1.60 includes data from sites that have rock or shallow soil profiles, which tend to attenuate the effect of earthquakes less than deep soil. Tr. 4179-84 (Lucks); Tr. fol. 3970 at 6 (Wong).

⁴⁰⁵ See LBP-83-57, *supra*, 18 NRC at 511; Suffolk Brief at 117.

levels in excess of five percent of rated power.⁴⁰⁶ But it was satisfied that it could reach a decision on all other aspects of the contention.

The County challenges this determination in view of the pendency of several additional staff reviews. It asserts that the relevant issue is whether, before completion of these reviews, there is adequate information on which the Board could have based its decision.⁴⁰⁷ In the County's view, "the absence of complete analyses and review of those analyses result in an insufficient basis for a licensing decision."⁴⁰⁸ Although agreeing with the County's statement of the issue, we disagree with its conclusion respecting it. There may be circumstances in which staff analyses must be reviewed by a licensing board before any final decision is reached.⁴⁰⁹ None of the illustrations offered by the County, however, presents such a situation.

We agree with the Licensing Board's conclusion that the mere pendency of confirmatory staff analyses regarding litigated issues does not automatically foreclose board resolution of those issues. As we noted in connection with our discussion of post-accident monitoring in section IV(B), certain matters may be left to the staff for post-hearing resolution where the Board can make the findings requisite to issuance of the license. With this guideline in mind, we now turn to the County's examples.

1. Vacuum breakers are devices installed between the suppression pool (wetwell) and the upper zone (drywell) of the primary containment. They are designed to equalize pressure between the two areas.⁴¹⁰ Two problems arose in connection with the vacuum breakers, and modifications were made to resolve both. The Board concluded that such modifications were acceptable.⁴¹¹ Nonetheless, LILCO is undertaking additional measures to strengthen further the valve component of the vacuum breakers. Qualification of the redesigned valve has not yet been completed, however, and the County insists that no final determination regarding vacuum breakers can be made until all modifications have been reviewed.

We believe the Board reasonably resolved this matter in LILCO's favor at this stage. The staff reviewed and accepted the modifications and generic qualification testing of the vacuum breakers when the initial

⁴⁰⁶ LBP-83-57, *supra*, 18 NRC at 520.

⁴⁰⁷ Suffolk Brief at 118.

⁴⁰⁸ *Ibid.*

⁴⁰⁹ See, e.g., *Three Mile Island*, *supra*, 17 NRC at 885-88.

⁴¹⁰ Tr. 9827 (Eltawila).

⁴¹¹ LBP-83-57, *supra*, 18 NRC at 516-17; FF F-31 to F-36 (slip opinion at 373-75).

changes were made. The staff concluded, and the Board agreed, that the plant could then operate safely. The fact that additional modifications are contemplated does not undermine that conclusion. As staff witness Eltawila observed:

Let me make it clear right now that if Shoreham decided to go right now without any additional tests, they can go based on our assessment of what we did for Susquehanna. So the additional modification that Shoreham is doing is nice, but it's not necessary at this time The valve was tested with some modification and it performed satisfactorily, so the additional modification that is contemplated right now will improve the valve performance.⁴¹²

2. John Humphrey, a former General Electric employee, raised a number of concerns related to the Mark III containment design. Twenty-two of them are potentially applicable to the Mark II containment used at Shoreham.⁴¹³ The staff made a preliminary assessment of these concerns. It concluded, however, and the Board agreed, that only one of the twenty-two concerns, i.e., operation of the residual heat removal system when in the steam condensing mode, had potential safety significance. As to it, there was insufficient information to analyze the effect of the discharge from the relief line.⁴¹⁴ The Board retained jurisdiction to review that item. In doing so, it accepted the staff's additional conclusion that there would be no erosion in the safety margin that already exists at Shoreham resulting from any of the other "Humphrey concerns."⁴¹⁵ The County does not contradict that conclusion. In these circumstances, we find no merit in the County's argument that the mere pendency of staff reviews prevents resolution of the issue.

3. During the course of its testing program for the Mark III containment, General Electric identified certain loss-of-coolant accident (LOCA) loads that had not been included in the original design review of the Mark II containment.⁴¹⁶ In 1975, the staff required each Mark II owner to reassess its containment design in view of this new information.⁴¹⁷ The amplified response spectra (ARS) that were generated from the reassessment were compared with those developed for the plant's design basis loads.⁴¹⁸ Had the revised spectra fallen completely within the design basis, that would have definitively demonstrated that

⁴¹² Tr. 9826-27.

⁴¹³ FF F-37 (slip opinion at 376).

⁴¹⁴ FF F-38 to F-43 (slip opinion at 376-79).

⁴¹⁵ FF F-38 (slip opinion at 376); Tr. 9856-57 (Fields).

⁴¹⁶ LBP-83-57, *supra*, 18 NRC at 512.

⁴¹⁷ *Id.* at 511-12.

⁴¹⁸ FF F-64 (slip opinion at 386).

all structures and components were embraced within the original design.⁴¹⁹ At some frequencies, however, the ARS produced in the confirmatory assessment turned out to be higher than the design basis response spectra.⁴²⁰ But it does not automatically follow that the design of the structures, systems and components is inadequate. LILCO's witness testified that such difference was not significant because the newly developed spectra did not result in the loads for which the plant was actually designed being exceeded.⁴²¹ The staff reviewed the reassessment insofar as it concerned the piping systems and supports (and, as far as we can tell from the testimony, has no difficulty with the analyses). It had not yet completed its review of the equipment, however.⁴²²

The Board, without awaiting completion of the staff's review, accepted LILCO's conclusion, upon analysis, that the plant design (including the equipment) could fully accommodate the newly developed spectra.⁴²³ The County does not challenge the substance of that determination. It argues simply that the Board should have awaited completion of the staff's work. The staff is satisfied with the Board's resolution of the issue and tells us that the confirmatory analysis is unlikely to indicate any problems.⁴²⁴ Given the uncontroverted evidence in the record offered by LILCO, and the staff's judgment regarding the expected outcome of its review, we believe that the Board's resolution of the issue is reasonable.

4. As part of the confirmatory analysis of the Mark II containment, LILCO selected some thirty piping systems in the plant as a representative sample.⁴²⁵ The Board examined the sample and concluded that there was no evidence to contradict LILCO's testimony that the piping systems it selected are representative.⁴²⁶ Presumably out of an abundance of caution, however, the staff asked LILCO to perform a 100 percent evaluation of all piping systems attached to three locations on the containment wall. The staff testified that it regarded the further analysis as confirmatory because it had not seen any piping system stresses or support loads which exceeded or failed the code allowables.⁴²⁷ The Board found that no additional analysis was necessary, and concluded that LILCO had adequately demonstrated the safety of the piping. In so doing, it rejected the County's suggestion that LILCO perform a 100 percent reanalysis of

⁴¹⁹ Tr. 9973 (Malovrh).

⁴²⁰ FF F-65 (slip opinion at 386).

⁴²¹ See *ibid.*; Tr. 9973-76 (Malovrh).

⁴²² Tr. 9972-73 (Terao); Tr. 9973-75 (Malovrh).

⁴²³ LBP-83-57, *supra*, 18 NRC at 525-26.

⁴²⁴ Staff Brief at 114. See also NUREG-0420 (Supp. 3) (SER) (Feb. 1983) at 3-1.

⁴²⁵ FF F-66 (slip opinion at 387).

⁴²⁶ LBP-83-57, *supra*, 18 NRC at 526.

⁴²⁷ FF F-67 (slip opinion at 387).

all piping.⁴²⁸ We believe there is ample evidence in the record to support the Board's conclusion that the piping systems are safe.

5. LILCO is required to perform preoperational and periodic tests to detect leakage paths between the drywell and the wetwell areas of the containment.⁴²⁹ The results are to be measured against acceptance criteria that are considered to be conservative.⁴³⁰ A high pressure test — intended to simulate the pressures resulting during a large loss of coolant accident — is performed only once, during the preoperational test period.⁴³¹ The County argues that the drywell seal could deteriorate over time after the preoperational test is conducted and that the only way to verify the adequacy of the seal is to review the predictive validity of the test itself.⁴³² The Board reviewed the staff's justification for the adequacy of the tests, noting that the County had not discussed any alleged deficiencies.⁴³³ It resolved the issue in LILCO's favor. We see no basis for overturning that result. In our opinion, the County has not undermined the adequacy of the tests. Moreover, we note that the high pressure test is performed at 35 psig (pounds per square inch gage).⁴³⁴ The seals have an internal volume that is maintained at a pressure of approximately 60 psi.⁴³⁵ In any event, that pressure is monitored during the life of the plant. Thus, any deterioration in the seals would be readily detectable.⁴³⁶

G. Safety Relief Valve Tests and Challenges

Safety relief valves (SRVs) are used in boiling water reactor (BWR) power plants to relieve excess pressure in the reactor vessel by releasing steam from that vessel to the suppression pool.⁴³⁷ In view of concerns that grew out of the accident at Three Mile Island, the staff issued NUREG-0737⁴³⁸ which, among other things, provided guidance for reducing the incidence of stuck open relief valve (SORV) events in all reactors. As the Board recounted, LILCO participated in a BWR Owners

⁴²⁸ LBP-83-57, *supra*, 18 NRC at 526.

⁴²⁹ FF F-45 to F-49 (slip opinion at 379-81).

⁴³⁰ FF F-47 to F-48 (slip opinion at 380).

⁴³¹ LBP-83-57, *supra*, 18 NRC at 521.

⁴³² Suffolk Brief at 119.

⁴³³ LBP-83-57, *supra*, 18 NRC at 522.

⁴³⁴ Tr. 9872 (Metcalf).

⁴³⁵ Tr. 9875 (Metcalf). We note that LILCO witness James E. Metcalf stated that the seals are pressurized to "approximately 60 pounds per square inch" without indicating whether this value was in terms of gage or absolute pressure. Regardless of the term intended by the witness, however, the difference in the pressure values would not be sufficient to alter our discussion of this matter.

⁴³⁶ *Ibid.*

⁴³⁷ FF G-3 (slip opinion at 391).

⁴³⁸ "Clarification of TMI Action Plan Requirements" (Nov. 1980).

Group study that recommended three actions in furtherance of NUREG-0737: use of Target Rock two-stage SRVs, use of an operating procedure providing for manual implementation of low-low set relief, and lowering of the valve reclosure set point.⁴³⁹ The staff reviewed these recommended actions and found them to be sufficient and in compliance with the guidance contained in NUREG-0737. The Board agreed.⁴⁴⁰ We affirm.

NUREG-0737 provides that —

Challenges to the relief valves should be reduced substantially (by an order of magnitude).⁴⁴¹

The use of more reliable two-stage valves instead of three-stage valves is estimated to result in a marked reduction in the number of SORV events.⁴⁴² The County asserts that LILCO may not claim credit for this improvement because the decision to use two-stage valves *at Shoreham* was made before NUREG-0737 was issued.⁴⁴³ The Board rejected this argument⁴⁴⁴ and so do we. We agree with the staff that the argument is overly formalistic and ignores the historical context of NUREG-0737.⁴⁴⁵ The three-stage valve was typical of that used at the time NUREG-0737 was issued⁴⁴⁶ and the two-stage valve was thus the type of improvement contemplated by NUREG-0737. To adopt the County's argument would be tantamount to penalizing LILCO for committing to the improvement at an early stage on its own initiative.

The County also contends that the order of magnitude improvement claimed by LILCO results from a combination of reducing valve failures and challenges to the valves while NUREG-0737 requires an order of magnitude improvement resulting solely from a reduction in challenges.⁴⁴⁷ The Board found the County's interpretation too restrictive. Despite the literal wording of NUREG-0737, the Board concluded that improved valve reliability could be considered in measuring compliance with NUREG-0737.⁴⁴⁸ We find the Board's construction of the requirements of NUREG-0737 to be eminently sensible.

⁴³⁹ LBP-83-57, *supra*, 18 NRC at 530.

⁴⁴⁰ *Id.* at 528-32.

⁴⁴¹ NUREG-0737, II.K.3.16-1.

⁴⁴² LBP-83-57, *supra*, 18 NRC at 531.

⁴⁴³ Suffolk Brief at 123.

⁴⁴⁴ LBP-83-57, *supra*, 18 NRC at 531.

⁴⁴⁵ Staff Brief at 122.

⁴⁴⁶ See Tr. 8634-37 (Smith, Hayes).

⁴⁴⁷ Suffolk Brief at 122.

⁴⁴⁸ LBP-83-57, *supra*, 18 NRC at 531.

Staff witness Marvin W. Hodges, who is the author of the NUREG-0737 item dealing with relief valves, testified that the reduction of stuck open relief valve events was the intended goal.⁴⁴⁹ Even the County's witness admitted that it would be logical to consider both challenges and failure rates in an effort to reduce the occurrence of SORV events.⁴⁵⁰ We agree with the Board that the purpose of this task item is to reduce valve failures and all modifications to achieve this purpose should be included in determining if the "order of magnitude" reduction of valve failures has been achieved.⁴⁵¹

H. Emergency Planning Issues

LILCO filed its application for an operating license in 1975 but the case languished until LILCO asked the Board in the fall of 1981 to bring the prehearing process to an end.⁴⁵² Hearings were eventually scheduled for May 1982. As of that date, LILCO had prepared its onsite emergency plan but Suffolk County had decided to abandon its earlier offsite emergency efforts and begin anew. In the interest of expediting the litigation of emergency planning questions, the Licensing Board decided to bifurcate the hearing into two phases: Phase I, dealing with onsite issues, plus those offsite issues that could be litigated in the absence of the County's plan, and Phase II, comprising all remaining offsite issues.⁴⁵³ Following a number of procedural skirmishes, including efforts at redrafting litigable contentions, the Board ruled on the admissibility of onsite emergency planning contentions, accepting some and rejecting others.⁴⁵⁴

At the conclusion of discovery, prefiled testimony was submitted. At that time, however, the Board was still in the midst of hearings dealing with other health or safety issues at Shoreham. As a consequence, the Board proposed that, to expedite consideration of Phase I emergency planning issues, the parties conduct cross-examination, redirect examination, and recross-examination initially by means of public pre-

⁴⁴⁹ Tr. 8491, 8509-10, 8614-15 (Hodges).

⁴⁵⁰ Tr. 8795-97 (Bridenbaugh).

⁴⁵¹ The County observes that the reduction of SORV events may not be realized in view of the performance of two-stage valves at the Hatch 1 and Browns Ferry 2 plants. See Suffolk Brief at 124 n.60. As the Board noted, however, these incidents related to a problem of a failure of the valve to open rather than close and were thus unrelated to the requirements of NUREG-0737. The Board found, in any event, that the valve opening problem was remediable. See LBP-83-57, *supra*, 18 NRC at 531-32.

⁴⁵² See Appendix A of the Licensing Board's decision (slip opinion at A-16 to A-17).

⁴⁵³ See generally Suffolk Brief at 88-89.

⁴⁵⁴ See LBP-82-75, 16 NRC 986 (1982).

hearing depositions without the Board present. As the Board observed in a memorandum memorializing the proposal:

The depositions would be conducted as if the parties were examining on the prefiled direct testimony at the evidentiary hearing. The depositions would be filed with the Board, with the portions which each party seeks to move into evidence so noted. The witnesses would thereafter appear at the hearing before the Board to answer any Board questions and respond to questions from the parties. The questions from the parties are expected to be well-focused and primarily follow-up questions to the depositions and any Board questions. However, within reasonably set time limitations, parties may orally highlight salient facts in the depositions by re-asking some of the deposition questions at the hearing.⁴⁵⁵

The County objected to the proposed procedures on the ground that the Board lacked the requisite authority to direct that initial examination of the prefiled testimony be undertaken through public depositions. Following the receipt of written views from all interested parties, including the County, the Board rejected the County's argument.⁴⁵⁶ The Board convened a conference of counsel shortly thereafter to clarify and discuss implementation of its ruling. At that time counsel for the County indicated that his client would not participate in the examinations that the Board had ordered. As a result, the Board found the County in default and ordered its Phase I contentions dismissed.⁴⁵⁷

On appeal, the County presents three allegations of error. First, it claims that the Board erred in bifurcating emergency planning issues into two phases.⁴⁵⁸ Second, it asserts that the Board erred in denying admission of certain contentions.⁴⁵⁹ Third, it argues that the Board erred in requiring the use of evidentiary depositions.⁴⁶⁰ In this latter connection, the County contends:

Since the order for evidentiary depositions was illegal, the subsequent default ruling was likewise illegal.⁴⁶¹

⁴⁵⁵ Memorandum Advising SOC [Shoreham Opponents Coalition] and NSC [North Shore Committee] of Board Proposal to Require Depositions and of Opportunity to File Views (Nov. 9, 1982) at 1-2 (unpublished).

⁴⁵⁶ See LBP-82-107, 16 NRC 1667 (1982).

⁴⁵⁷ LBP-82-115, 16 NRC 1923 (1982).

⁴⁵⁸ Suffolk Brief at 91-94.

⁴⁵⁹ *Id.* at 94-95.

⁴⁶⁰ *Id.* at 96-98.

⁴⁶¹ *Id.* at 97-98. We note in this regard that the County rests its challenge to the default determination on the legality of the Board's procedural ruling; it does not contest the dismissal of its contentions as the appropriate sanction for default.

We find that the Board's employment of evidentiary depositions was both lawful and reasonable. Thus, in disagreement with the County, we find the Board's default ruling unassailable.

The County's argument regarding the Board's proposed procedure has a single theme — i.e., that section 189 of the Atomic Energy Act, 42 U.S.C. § 2239, provides parties with an opportunity for a hearing and such hearing must be an oral presentation before a Licensing Board.⁴⁶² The County's brief is wholly bereft of authority to support its position.⁴⁶³ The Board's decision, on the other hand, is thoughtful and well documented.

As the Board notes, section 189 does not in terms specify the nature of the hearings that must be held. But section 181 of that Act, 42 U.S.C. § 2231, brings into play the procedural ground rules established by the Administrative Procedure Act (APA), 5 U.S.C. § 551 et seq. We may assume, without deciding, that section 189 requires that a proceeding involving an application for a facilities license under 10 C.F.R. Part 50 of the Commission's regulations must be conducted in accordance with the formal hearing requirements of the APA.⁴⁶⁴ For, the APA expressly authorizes agencies in licensing cases such as this to adopt procedures for the submission of all or part of the evidence in written form as long as the parties are not prejudiced.⁴⁶⁵ The right to submit rebuttal evidence and conduct cross-examination, moreover, is not unlimited; it is bounded by a need for a full and true disclosure of the facts.⁴⁶⁶

To be sure, the receipt of an initial round of cross-examination or rebuttal in written form is novel in NRC proceedings. However, Suffolk County makes only the most generalized, undocumented claim of prejudice, i.e., that the Board's procedures will necessarily lead to a less than full Board consideration of the facts, including a failure to assess witness credibility. The Board was committed to review the evidentiary depositions carefully and take such procedural steps (including oral cross-examination) as were necessary to ensure full development of the record and a fair and thorough resolution of any matters the County wished ultimately to raise. Had the County continued to participate in the matter, it might have been able to show that prejudice had, in fact, resulted, or that additional oral cross-examination before the Board was needed.

⁴⁶² *Id.* at 96.

⁴⁶³ The County cites only to 10 C.F.R. § 2.71a (which we assume to be a reference to 10 C.F.R. § 2.718) for the proposition that licensing boards have discretion to control the course of a proceeding.

⁴⁶⁴ See *Kerr-McGee Corp. (West Chicago Rare Earths Facility)*, CLI-82-2, 15 NRC 232, 247-56 (1982), *aff'd City of West Chicago v. NRC*, 701 F.2d 632 (7th Cir. 1983); *Union of Concerned Scientists v. NRC*, 735 F.2d 1437, 1444 n.12 (D.C. Cir. 1984).

⁴⁶⁵ 5 U.S.C. § 556(d). Hearing boards routinely receive direct testimony in written form.

⁴⁶⁶ *Ibid.*

(The Board, of course, would likewise have been accorded an opportunity to assess the County's concerns in this regard.) The County's decision to withdraw from participation in these matters deprives its argument on appeal of any substance.⁴⁶⁷

V. NEW YORK STATE'S APPEAL

The State of New York has filed an appeal limited to a single argument, i.e., that the Board should not authorize issuance of a low power license "until a full determination on all relevant offsite emergency planning issues is made."⁴⁶⁸ Earlier in this proceeding, the County filed a motion to terminate the case entirely in light of its decision not to adopt or implement an offsite emergency plan for Shoreham. The Board denied the motion⁴⁶⁹ but nonetheless asked the Commission to decide whether the uncertainty surrounding offsite emergency planning should affect issuance of a license for low power operation.⁴⁷⁰ The Commission concluded that it should not.⁴⁷¹ We are, of course, bound by the Commission's earlier determination in the absence of any significant changes in circumstances. We have carefully reviewed the State's arguments and its request for relief and find nothing in its presentation that could warrant our departure from the Commission's earlier determination.

For the reasons stated, we *affirm* the Board's decision in principal part, and *remand* for further consideration consistent with this opinion those portions dealing with Unresolved Safety Issue A-47, housekeeping, and environmental qualification of electrical equipment. The condition imposed by the Licensing Board requiring LILCO to "acknowledge

⁴⁶⁷ Given our conclusion that the Licensing Board did not err in holding the County in default on the Phase I issues, we need not reach the County's claims regarding the bifurcation of the proceeding or Board rulings on the admissibility of its Phase I contentions.

⁴⁶⁸ Brief of Mario M. Cuomo, Governor of the State of New York in Support of Suffolk County Exception Nos. XII-1 through XII-6 to the September 21, 1983 Preliminary Initial Decision (Dec. 20, 1983) at 12.

⁴⁶⁹ LBP-83-22, 17 NRC 608 (1983).

⁴⁷⁰ LBP-83-21, 17 NRC 593 (1983).

⁴⁷¹ CLI-83-17, 17 NRC 1032 (1983).

. . . and adopt” the Board’s definition of the term “important to safety” is *vacated*.⁴⁷²

It is so ORDERED.

FOR THE APPEAL BOARD

Barbara A. Tompkins
Secretary to the
Appeal Board

⁴⁷² Our *sua sponte* review of the record on those matters considered by the Board in its partial initial decision but not embraced by the appeals reveals no error warranting corrective action.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Bloch, Chairman
Dr. Jerry R. Kline
Mr. Glenn O. Bright

In the Matter of

**Docket Nos. 50-440-OL
50-441-OL
(ASLBP No. 81-457-04-OL)**

**CLEVELAND ELECTRIC ILLUMINATING
COMPANY, et al.**
**(Perry Nuclear Power Plant,
Units 1 and 2)**

October 4, 1984

In this Memorandum and Order the Licensing Board denies Intervenor's motion for summary judgment and dismisses its contention finding that Applicants are not required to install an automated standby liquid control system under Commission regulations dealing with anticipated transients without scram.

RULES OF PRACTICE: SUMMARY DISPOSITION

Summary disposition may be granted against the party requesting summary disposition when all the relevant facts are agreed and the law dictates a result opposite the moving party's position.

ANTICIPATED TRANSIENTS WITHOUT SCRAM: AUTOMATED STANDBY LIQUID CONTROL SYSTEM

The Commission's regulations do not require an automated standby liquid control system to be installed in boiling water reactors that were not designed and constructed to incorporate such a system. 10 C.F.R. § 50.62(c)(4).

MEMORANDUM AND ORDER

(Denying Motion for Summary Disposition on OCRE Issue No. 6 and Dismissing the Contention)

Intervenor Ohio Citizens for Responsible Energy submitted its motion for summary disposition to us on July 6, 1984.¹ The motion seeks disposition in OCRE's favor of Issue No. 6 which states:

Applicant should install an automated standby liquid control system to mitigate the consequences of an anticipated transient without scram.

OCRE's motion is based on the new ATWS Rule entitled: Requirements for Reduction of Risk from Anticipated Transients Without Scram (ATWS) Events for Light-Water-Cooled Nuclear Power Plants. 49 Fed. Reg. 26,036 (1984) (to be codified at 10 C.F.R. § 50.62(c)(4)). Section (C)(4) of the newly published rule which was effective on July 26, 1984, states in pertinent part:

The SLCS initiation must be automatic and must be designed to perform its function in a reliable manner for plants granted a construction permit after July 26, 1984, and for plants granted a construction permit prior to July 26, 1984, that have already been designed and built to include this feature.

POSITIONS OF THE PARTIES

OCRE argues that the plain language of the new rule now requires that the Perry standby liquid control system (SLCS) be configured for automatic activation because the plant is being designed and built with the capability of automatic initiation and that automation can now be

¹ All parties have adequately briefed us on the rules governing motions for summary disposition and while affirming that we are aware of them we do not repeat them here. We turn immediately to the issues presented.

achieved at low cost (about \$100,000 of additional investment over a manually activated system according to OCRE).

Applicants replied in opposition to the motion on July 30, 1984. Their opposition is grounded on a close reading of the new rule which applies not only to plants granted a construction permit after July 26, 1984, but also to: "plants granted a construction permit prior to July 26, 1984 that have already been *designed and built* to include this feature" (emphasis in Applicants' reply). Thus in Applicants' view if Perry has not already been designed and built to include an automatic SLCS the motion for summary disposition must fail and Issue No. 6 should be dismissed.

In support of their position the Applicants state two facts as to which there exists a genuine issue to be heard: (1) Perry has not already been designed to include automatic initiation of its SLCS and (2) Perry SLCS has not already been built to include automatic initiation. The Staff SER and its own FSAR are referenced to establish that Perry is designed for manual initiation of the SLCS. OCRE's own words are used against them on the question of whether the plant is built for automatic initiation. In the Applicants' view OCRE's assertion that automatic initiation can be had at low cost (of construction) leads inevitably to the conclusion that it has not now been built for automatic initiation.

The Staff also replied in opposition to OCRE's motion on July 30, 1984. The Staff in essence agreed that resolution of the motion depended on interpretation of the "designed and built" language of the new rule but opposed summary disposition because in its view OCRE had not demonstrated affirmatively that Perry was designed and built for automatic activation of the SLCS. Thus, in the Staff's view, material issues of fact remained in controversy. Beyond this, however, the Staff had little assistance to offer since it could not itself attest to whether the Perry SLCS has been designed and built with an automatic initiation feature.

The Board concluded at this point that it needed further interpretation of the meaning of the "designed and built" language of the new ATWS rule and of how that language applies to Perry. It therefore requested orally that all parties submit additional information on these questions. OCRE, the Applicants and the NRC Staff responded on September 7, 1984.

OCRE replied with a lengthy recount of the history of the ATWS issue dating back over a decade. (OCRE Attachment 2.) That history shows that the concept of automatic initiation of BWR SLCS dates back to a proposal by GE in 1974. It also shows that the Staff was actively considering automated activation in NUREG-0460, Vol. 3 (1978) and later

in NUREG-0460, Vol. 4 (1980) wherein it considered a range of alternatives for the ATWS problem, two of which (3A and 4A) would have required an automatic SLCS. The Staff published for comment on November 24, 1981, three proposed ATWS rules, two of which would have required automatic SLCS.

OCRE's history of the ATWS issue skillfully outlines the developing consensus over a long period of time in favor of automated SLCS for newly constructed plants. The history also reflects a developing consensus that some form of exemption from backfitting of automated systems would be needed. At various stages, proposals were made to include automated initiation only for those existing BWRs that already have the capability to automate this system or plants that already have been designed to include this feature. It further reflects the fact that the motivation for exemption from the automation rule is traceable to an unfavorable generic value/impact analysis for conversion of existing plants that did not already have this feature. In short, the value/impact analysis shows that the value of the risk reduction in existing plants was less than the cost of conversion of manual systems to automatic² in existing plants. The costs of installation, however, were dominated by cost of downtime for installation and costs of spurious trip, factors which might not apply fully at Perry.

OCRE presented this history for the purpose of aiding the Board in interpreting the new ATWS rule and not to induce us to recast the generic value/impact analysis which stands behind the rule. Thus, we do not interpret OCRE's argument to be on its face a challenge to the new rule or the foundation on which it rests.

OCRE argues instead that the history of the ATWS rule demonstrates that the phrase "designed and built" should be interpreted flexibly and not literally. Only the added incremental investment of \$100,000 at Perry need be made to capture the incremental safety improvements expected for other reactors when the rule was adopted. This is less than the generically determined sum that was used in the value/impact analysis which undergirds the rule. OCRE does not dispute that a literal evaluation of Perry's present state would lead to the conclusion that the plant now stands with a manually activated system designed and built. Instead it says that with opportunities for automation so close at hand a flexible interpretation of the ATWS rule would lead to a conclusion that we should require the system to be automated under the intent of the rule

² The supplementary information that was published with the ATWS rule states that risk reduction attributable to automation amounts to a factor of about 7 but that the cost of conversion for existing plants is about \$24 million and that the value/impact analysis does not favor conversion in existing plants. 49 Fed. Reg. at 26,036.

which is to capture the additional increment of safety attributable to automation.

OCRE also argues that a literal interpretation of the rule could lead to an opportunity for its evasion on the part of utility CP holders simply by not building their facility with an automatic SLCS. We see no merit in this argument. It is clear from the rule itself that one instance where exemptions to CP holders will be granted will be for reactors that are in an advanced stage of construction. That is all that concerns us here. For other CP holders having reactors not so advanced in construction there will be ample opportunity for the Staff to scrutinize designs and construction and to properly enforce the rule.

The Applicants also responded fully to the Board's request for additional information. Their submittal included the affidavits of Gary R. Leidich on As-Built Status of SLCS Initiation; Frank R. Stead on the Design of the Initiation Function of the Standby Liquid Control System; and Dalwyn R. Davidson on SLCS Initiation. All are qualified engineers employed by or consultant to CEI.

The Applicants argue that the ATWS rule should be interpreted narrowly and literally. For automatic initiation of the SLCS to be required the system must be both designed and built for automatic initiation. Otherwise an automatic system is not required by the rule.

Applicants then go on to demonstrate through the affidavits of their employees or consultant that the Perry SLCS is not designed and built for automatic initiation but in fact is designed and built (or virtually complete) for manual initiation.

The affidavit of Frank Stead details the design history of the Perry SLCS. We need not duplicate that entire history here. Suffice to say that the design for manual initiation dates back to the CP stage for Perry and was discussed in both vendor's designs and the PSAR. The manual system was again discussed in the FSAR and in subsequent revisions including the current version. We conclude that there is no doubt whatever that CEI intended to design and did design a manually activated SLCS system for Perry.

During the design process the Applicants and their vendor were aware that the NRC Staff was considering an ATWS rule that might require an automatic SLCS. CEI therefore undertook several design studies which resulted in identification of design modifications that could be made to the Perry system in the event that automatic systems were ultimately required by the Staff. None of this design work altered CEI's own view that the manually activated system was their technically preferred system, however. Rather, the design modification work was undertaken simply so that CEI could be prepared to convert to automatic initiation if

necessary without serious schedule delays. Throughout the design process extending to the present time, however, the Applicants continued to present their design for a manually activated system to the Staff and the Advisory Committee on Reactor Safeguards (ACRS). We conclude that the design efforts undertaken by CEI to design an automatic SLCS initiation were done on a contingent basis because of uncertainty as to what a final ATWS rule might require.

Because of these design efforts the Perry SLCS has at present the capability to convert from manual to automatic initiation. The affidavit of Dalwyn R. Davidson, a consultant to CEI and formerly a Senior Vice President employed by CEI, confirms that he stated in a letter to the NRC Staff on August 13, 1982, that "although the design includes both manual and automatic initiation capability, only manual initiation will be functional." It was conveyed to NRC in this letter that CEI stood ready to convert its system to automatic initiation if the then-forthcoming ATWS rule should require it but it was the intent of CEI to make its manual systems functional (operational).

The affidavit of Gary Leidich, a General Supervising Engineer employed by CEI, establishes the present state of construction of the SLCS system. The SLCS system at Perry is virtually complete. The system itself consisting of tanks, valves and pumps would not change whether the method of activation is ultimately manual or automatic. The electrical control system is the only feature that distinguishes one mode of activation from the other.

As of July 26, 1984, the SLCS system was essentially complete and the manual initiation feature was at least 90% complete. Various subsystems were turned over by Construction to Nuclear Testing in July and August of this year and manual testing of the SLCS is now possible from motor control centers.

If automatic initiation of the SLCS were now to be required, many items of equipment over and above those required for manual initiation would have to be installed. This would be needed to bring plant status indications from the plant to the control system logic and then to send activating signals to the SLCS pumps and valves. A few cables which could serve an automatic system have been installed but not connected. The Redundant Reactivity Control System (RRCS) panels having capability for conversion to automatic initiation have also been installed. Otherwise a substantial list of needed circuits and relays have not been installed and at present the system does not stand in a configuration for automatic initiation.

The Staff submitted a complete response to the Board's request for further information, which was accompanied by the affidavit of George

Thomas who is a Nuclear Engineer employed by NRC and of John R. Grobe who is a Senior Resident Inspector for operations at the Perry Plant. Reporting on the views of the Reactor System Branch of the Office of Nuclear Reactor Regulation, Mr. Thomas states that "designed and built" means (a) necessary documentation exists to enable construction of a complete SLCS with a clear indication of the type of initiation and (b) physical installation of hardware has occurred, such as piping, valves, electrical cables, and panels in the plant, to the extent that construction is substantially complete.

Mr. Thomas goes on to state that he has reviewed the documentation of the SLCS system at Perry and that the most recent submissions establish that CEI has elected to follow the design for manual initiation. Moreover, although Perry was designed to have an automatic initiation option, it was not built with that option.

Mr. Grobe states that he personally inspected the Perry SLCS system on August 27-30, 1984, and has also personally examined SLCS documents at the plant. The documents which cover the period of June 30, 1977 to February 1984 represent the major milestones in the development and implementation of the current SLCS design which uses only manual initiation. His inspection of the SLCS system confirms that it is virtually complete with only a few items outstanding and that two subsystems of the SLCS were turned over to Nuclear Testing this past Summer. The SLCS is scheduled for preoperational testing in November/December 1984 and turnover to the operations department in January/February 1985.

Mr. Grobe's inspection reveals that the system as built would not support automatic initiation. To convert to automatic initiation would require the additional installation, modification or deletion of approximately forty cables, ten relays and numerous wires, switches, indicating lights and annunciators. Thus, he concludes that the SLCS at Perry Unit 1 has been designed and built to function as a manually initiated system.

BOARD ANALYSIS

The Board concludes at the outset that there is no remaining material issue of fact to be heard on Issue No. 6. The Applicants' and Staff's filings establish without contradiction that the Perry Unit 1 SLCS is now designed and built for manual initiation and that it is not designed and built for automatic initiation. Under the new ATWS rule which took effect July 26, 1984, those facts alone are sufficient to compel us to deny OCRE's motion for summary disposition and to dismiss Issue No. 6 from the proceeding.

However, the fact that a conversion of the system could now apparently be made at a cost of about \$100,000, which is low relative to the cost of the SLCS system or to the plant as a whole, is also uncontradicted on our record. Thus, while a literal interpretation of the ATWS rule compels denial of the motion, the special circumstances of the Perry case may present us with an opportunity to capture the marginal increment of safety attributable to automatic SLCS initiation at what appears to be a bargain price. We therefore turn to a consideration of whether the flexible interpretation of the ATWS rule urged by OCRE is permissible in this case.

Our own analysis of the ATWS rule starts with the assumption that all of the provisions of the SLCS rule apply with equal force and weight. In promulgating this rule the Commission has affirmatively decided that some reactors are included within its reach and that others shall be exempt, and that no greater weight attaches to one side of that equation than to the other. We conclude therefore that the issue before us does not involve an important unconsidered or unresolved issue of reactor safety. In determining that any reactors at all could be exempt from the rule it is clear that one inevitable consequence of an exemption would be to forgo the increment of safety attributable to automation. This is an acceptable outcome under the rule.

Second we examine the likely effect of the rule. Reactors that will surely qualify for exemption under the ATWS rule fall into two classes: (a) those which are already operating and that have manually initiated systems and (b) reactors in an advanced stage of construction for which an automated SLCS has not been designed and built. (We leave it to future cases to determine whether reactors which are not in an advanced stage of construction and which do not have either automatic or manual initiation designed and built would be compelled to install an automated SLCS.) The facts we have reviewed show that there is absolutely nothing unique about the circumstances surrounding Perry Unit 1. It now stands in an advanced stage of construction with a manually activated SLCS designed and built. Thus it stands in a class of reactors for which an exemption from automation was affirmatively intended.

A corollary to our conclusion that the issue before us is not a substantive one of unreviewed reactor safety is that the provision governing exemption in the ATWS rule is effectively procedural in nature. The provision for exemption is simply a nonbackfitting provision; in short, a deliberately chosen grandfather clause. As such it reflects a considered instruction from the Commission to its Staff and licensing boards not to backfit automatic systems on certain classes of reactors. Given that instruction there appears to be little or no latitude or flexibility remaining

once it is determined that a reactor falls into an exempt class. As we have already concluded, Perry falls foursquare into such an exempt class.

We see nothing inherently contradictory or inconsistent in any of this. It is well known in technology that improvements of any kind including safety improvements may come in small steps as well as large ones. It would be exceedingly difficult to adopt and incorporate the small increments of reactor safety as they get developed if each time it was done a wholesale backfit of the entire industry was also required. Thus a requirement to exempt plants from backfitting is as much in the interest of safety as one compelling it. It is therefore perfectly consistent with the public interest in safety to incorporate marginal improvements into new construction while exempting previously constructed plants. No inference is warranted that plants having automatic initiation are safe while those having manual initiation of SLCS are not. We infer from the SLCS rule that both modes of activation are adequate to meet safety standards but that automation simply adds incrementally to that safety.

Were we inclined to grant OCRE's motion based on the analysis thus far we would be unable to do so based on an uncritical acceptance of its estimate of \$100,000 for conversion of the SLCS. A full, rigorous site-specific value/impact analysis would be required before we could take such a step. We entertain considerable doubt whether a site-specific value/impact analysis should even be undertaken at this late stage on the construction of Perry. Our doubts are based not only on our consideration of the meaning of the ATWS rule but also on the fact that the low costs of conversion in this case may be deceptive not only for Perry but for any plant similarly situated. When the Commission Staff concluded that the generic value/impact assessment did not favor backfitting of automated systems for certain classes of reactors the costs it considered were at that time necessarily forward costs. Contributing to those costs were design costs, downtime costs to permit conversion and costs of spurious trip of the SLCS. In Perry's case, design costs for an automated system exist because of the uncertain regulatory situation previously existing but they would now appear on the ledger necessarily as sunk costs. The costs of delay are also partly sunk and the cost of spurious trip likely would remain unchanged.

While sunk costs are irretrievably expended it remains a fact that had Perry not voluntarily expended them the present forward cost of conversion would appear larger than it now does. At the very least, design costs would now have to be expended had that not been done earlier. Costs of delay which are now partly sunk costs would also enter the ledger as forward costs had they not already been expended. It is there-

fore not self-evident that a rigorous analysis would confirm OCRE's position in this matter.

We conclude from these brief considerations that we should not now recast a site-specific value/impact analysis under conditions different from those under which the Commission has already done generically. It is clear that such an analysis would founder in tangled controversy over the proper consideration of sunk costs and forward costs under circumstances where no important unresolved safety questions hung in the balance. The controversy would thus be empty and sterile. We believe that that would frustrate an important purpose of the rule which is in fact to resolve important issues generically rather than by adjudication on a case-by-case basis.

We learn one more lesson from our analysis of the Perry situation and that is that regulatory uncertainty itself has costs. The cost of regulatory uncertainty is justified so long as experts still grapple with issues and a fair solution still eludes them. When the problems are solved, however, as they now are for the issues before us, there is no further justification for regulatory uncertainty.

Moreover, the mandates now provided in the ATWS rule were not arrived at easily. OCRE's own history reveals that they are a result of over a decade of arduous technical and legal effort. That is not a situation where a board should lightly exercise flexibility based on its impressions from one case. Given the mature state of analysis of this problem and the clear language of the SLCS rule we believe that it would serve no one's interest to engender further controversy and regulatory uncertainty by rendering an *ad hoc* judgment in this case. Clearly we serve no one's interest by telling Applicants in clear language what is required of them and then clouding those instructions with yet another value/impact analysis struck at the 11th hour.

We see nothing in the Perry case that creates any unique problems that were not considered in the ATWS rule. Perry's dilemma arises from nothing more principled than a roll of the dice. It is merely coincidental that Perry stood with a virtually complete SLCS at the same time the new rule was adopted and that most of its costs were sunk and its forward costs of conversion necessarily smaller. Any plant similarly situated would give the deceptive impression of low forward cost for conversion of the SLCS system at that point. To conclude that the system should be converted would be to frustrate the clear intent of the rule and we shall not do it.

Based on our analysis of the issues we conclude that a fair interpretation of the ATWS rule does not permit the flexibility urged by OCRE and that OCRE's motion for summary disposition of Issue No. 6 in this

case should be denied. We also find that no further disputed issues of material fact exist that must be resolved in a hearing. Accordingly, we conclude that OCRE's Issue No. 6 should be dismissed from this proceeding. We are aware in so finding that we forgo whatever marginal increment of safety is attributable to automatic initiation of the SLCS. That is an acceptable result under the ATWS rule which is necessitated by a balancing of all relevant factors.

Order

For all of the foregoing reasons and based on a full review of the record, it is ORDERED³

(1) OCRE's motion for summary disposition of Issue No. 6 is denied.

(2) Issue No. 6 is dismissed from this proceeding.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Jerry R. Kline
ADMINISTRATIVE JUDGE**

**Glenn O. Bright
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

BLOCH, CHAIRMAN, DISSENTING

The question of whether or not Cleveland Electric Illuminating Company, *et al.* (Applicants) should be required to install an automatic standby liquid control system is a close question that turns on the interpretation of the Commission's final rule on anticipated transients without scram ("ATWS"). 49 Fed. Reg. 26,036 (1984). Since there are no factual issues in dispute, the issue turns entirely on interpretation of

³ The dissenting opinion of Judge Bloch is attached to this Decision.

legal materials, and summary disposition for one side or the other is mandatory.⁴

My dissent stems from my belief that legal materials should be interpreted to effectuate the purpose of the framer rather than by mechanical rules of word interpretation. The applicable section of the final rule states:

The SLCS [standby liquid control system] initiation must be automatic and must be designed to perform its function in a reliable manner for plants granted a construction permit after July 26, 1984, and for plants granted a construction permit prior to July 26, 1984, that *have already been designed and built to include this feature.*⁵

The facts about the ASLCS at Perry are not in dispute. Management has consistently characterized its system as manual, both in its FSAR and before the ACRS. However, Applicants applied prudent management practices and took steps to assure that they would be able to comply with an ASLCS requirement, if necessary, without a delay in startup. To do this, the design drawings for one 4-day period were changed to show an ASLCS, which is therefore completely "designed." Some features of automatic initiation, including certain printed circuit cards and memory chips, have been installed in the plant. However, necessary wiring has not been installed and key-lock switches in the control room would have to be replaced were ASLCS to be installed.⁶ The total remaining cost of installation is about \$100,000.⁷

Although the total cost of automating the SLCS is not in our record, our best estimate from available data is that — excluding downtime for installation and for unnecessary activation — it is about \$3.3 million.⁸

⁴ This issue was raised by Ohio Citizens for Responsible Energy's (OCRE's) July 6, 1984 motion for summary disposition of Issue No. 6: "Applicant should install an automated standby liquid control system to mitigate the consequences of an anticipated transient without scram."

⁵ 49 Fed. Reg. at 26,045 (emphasis added).

⁶ These facts are all set forth by Applicants in their Response to ASLB Request for Information on the ATWS Rule and the Perry SLCS. I would like to acknowledge Applicants for the straightforward and objective presentation of their position in this filing.

⁷ To confirm this fact, found on page 11 of OCRE Brief on the History and Intent of the ATWS Rule, September 7, 1984, I telephoned Applicants and OCRE on September 27, 1984, and ascertained that the estimate was contained in an interrogatory response filed by the Applicants. Applicants' counsel pointed out during the call that estimates of building costs often are subject to inflation due to unanticipated difficulties. We accept that statement, but we also note that the original estimate was one made by Applicants and may have contained some costs in anticipation of difficulties. In any event, the estimate seems to be a rough cost figure on which Commission action may be based.

⁸ See SECY-83-293, "Amendments to 10 C.F.R. 50 Related to Anticipated Transients Without Scram," William J. Dircks, Executive Director for Operations, July 19, 1983, at 5, which estimates costs of \$3.5 million to \$5.5 million per plant. This contrasts with the Final Rule, which contains Supplementary Information (slip op. at 12) that the cost is \$24 million per plant. The higher figure apparently includes costs related to unnecessary initiation of the ASLCS. (None of the estimates include cost savings from necessary initiation of the ASLCS.)

Hence, our best estimate is that the automated system is about 97% designed and built.

The majority of the Board interprets the phrase “designed and built” to mean that the ASLCS must be completely finished. Although that is a permissible interpretation, based on a notion that the Commission was setting up a mechanical prohibition against all backfitting, I would not interpret those words so inflexibly.

A similar issue of interpretation arose in an earlier phase of this proceeding. At that time, Intervenors argued that Appendix B, Criterion XIII, required “prompt” resolution of all deficiencies. They argued that a 1-month delay is not “prompt.” However, we decided that prompt should be interpreted in light of the entire program of closing deficiencies and that delays on some deficiencies did not negate promptness. In that instance, we applied a reasonableness test that was sensitive to the fact that people who write rules necessarily draft language that should be applied reasonably to particular facts.

I believe that a reasonable interpretation of “designed and built” would require that the total project, including its design and construction and possible costs for downtime during installation, be reasonably completed.⁹

The requirement for an automated standby liquid control system was included in a rule whose summary states, “[t]his [the various provisions of the rule] will significantly reduce the risk of nuclear power plant operation.” One of the provisions that would reduce risk for boiling water reactors is the ASLCS, which was not required for existing plants because of the costs. The purpose of the ASLCS is to provide for automatic operation of the boron poisoning system as preferable to operator action. It is characteristic of operator experience that the need for emergency action is rare. Hence, operators may be inclined to interpret ambiguous signals as *not* requiring emergency action, particularly because unnecessary activation of the SLCS may result in substantial costs for the employer. By contrast, machines are not affected by these conflicting motivations and will make tough decisions in appropriate circumstances without fear of reprisal.

The language used by the Commission in the Supplementary Information to the ATWS rule, covering the grandfathering of existing plants, makes it clear that the grandfathering was based on a weighing of costs and benefits; the Commission decided that existing plants should not be

⁹ The majority opinion apparently would apply this requirement of 100% built even if everything was done but for the last few bolts. Possibly, in those circumstances they would apply a reasonableness test in order to avoid silliness. However, I would argue that if a reasonableness test is applicable then (as surely it is) then it also is applicable now.

required to incur the great costs for downtime for installation and for backfitting, in addition to the operating costs that may result from unnecessary activation.

The Supplementary Information accompanying the rule, slip op. at 12, considers "downtime for installation in existing plants" to be an important factor affecting the decision not to require backfits. Similarly, the Staff of the Commission, in Enclosure D to SECY-83-293, at 32, stated that the Utility Group's estimate for the cost of an ASLCS is "dominated by downtime for installation in existing plants." Hence, I conclude that the Commission did not consider a situation such as has occurred at Perry, and the first authority in a position to make an informed decision about whether Perry should be grandfathered is the Licensing Board. We should accept that responsibility, by making a reasonable interpretation of the existing regulation consistent with its history, rather than by pretending that the Commission already took responsibility because of a meaning the Commission never considered but that the Board chooses to attach to the Commission's words.

Someone should decide this issue on a reasoned basis. The Commission's expectation of high backfit costs for an ASLCS does not fit this case, where only \$100,000 of additional costs are left¹⁰ to be incurred.¹¹ The phrase "designed and built" should not be interpreted to preclude the application of the ASLCS requirement in this instance.

A safety improvement applied to all future plants because of its importance should not be excluded from Perry because a small residue of work is yet undone. The community around the plant should not be deprived of this added protection by wooden application of language to a situation in which there is no sound reason to reach a different result than there is for plants required to have an ASLCS.

Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE

Bethesda, Maryland

¹⁰ I do not accept the majority's discussion of sunk costs. Costs that are already incurred, regardless of the motivation, are indications of the extent to which a system has been designed and built. Sunk costs are irrelevant to a value/impact analysis of installation of the ASLCS in this plant at this time.

¹¹ This issue has been raised at an early time so that Applicants may choose to install the ASLCS rather than to risk incurring downtime costs in the future. Consequently, should this issue be decided adversely to Applicants in the future, I do not think downtime (which could be avoided by making the change now) should be considered as a legitimate cost. It is based on this conclusion that a change in circumstances at the time of appeal would not affect the outcome of this issue, that Judge Bright and I decided that it is not appropriate to certify this issue to the Commission at this time.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Sheldon J. Wolfe, Chairman
Dr. Jerry R. Kline
Dr. George A. Ferguson

In the Matter of

Docket Nos. 50-338-OLA-1
50-339-OLA-1
(ASLBP No. 83-481-01-LA)
Docket Nos. 50-338-OLA-2
50-339-OLA-2
(ASLBP No. 83-482-02-LA)

**VIRGINIA ELECTRIC AND POWER
COMPANY**

**(North Anna Power Station,
Units 1 and 2)**

October 15, 1984

In Case OLA-1, involving an application for an amendment to the North Anna operating licenses to permit the receipt and storage of 500 spent fuel assemblies from the Surry facility, the Licensing Board rules that certain contentions, as recast by the Board into a consolidated contention, are admitted as issues in controversy, and admits the intervenor as a party. In Case OLA-2, involving an application for an amendment to the operating licenses to permit the expansion of the fuel pool storage capacity at the North Anna facility, the Licensing Board rejects the contentions, denies the petition for leave to intervene, dismisses the case, and authorizes the Director of Nuclear Reactor Regulation to issue an amendment to the North Anna operating licenses which revises the technical specifications to permit the expansion of the spent fuel storage capacity.

RULES OF PRACTICE: ADMISSIBILITY OF CONTENTIONS

Section 2.714 of 10 C.F.R. does not require the petition to detail the evidence which will be offered in support of each contention, and, in passing upon whether an intervention petition should be granted, it is not the function of a licensing board to review the merits of a contention. *Mississippi Power and Light Co.* (Grand Gulf Nuclear Station, Units 1 and 2), ALAB-130, 6 AEC 423, 426 (1973).

MEMORANDUM AND ORDER (Ruling on Contentions)

Memorandum

I. BACKGROUND

In Docket Nos. 50-338-OLA-1 and 50-339-OLA-1, the Applicant applies for an amendment to the North Anna, Units 1 and 2, operating licenses to permit the receipt and storage of 500 spent fuel assemblies from the Surry Power Station, Units 1 and 2 (Case OLA-1). In Docket Nos. 50-338-OLA-2 and 50-339-OLA-2, the Applicant applies for an amendment to the operating licenses to permit the expansion of the fuel pool storage capacity for North Anna, Units 1 and 2 (Case OLA-2). Concerned Citizens of Louisa County (CCLC) has filed petitions for leave to intervene in these two cases.¹

By agreement of counsel and/or Board directive, oral argument upon CCLC's proposed contentions was not heard during the course of the special prehearing conference held on February 16, 1983. (See Order of February 18, 1983 (unpublished)). In a letter dated October 20, 1983, the Applicant advised that all counsel were agreed that, once the Staff had issued its Environmental Analysis and Safety Evaluation Report, within certain time frames they would meet in an effort to agree upon a statement of contentions and that contentions that could not be agreed upon would be submitted to the Board. On July 3, 1984, the Staff issued

¹ In separate Notices of Hearing dated December 3, 1982, the Board, among other things, scheduled a joint special prehearing conference to be held on February 16, 1983, and noted that after this conference it might decide to consolidate the two cases. As reflected, *infra*, in Case OLA-1, a consolidated contention, as recast by the Board, is admitted as an issue in controversy and CCLC is admitted as a party-intervenor in that case. However, we reject as issues in controversy the contentions submitted in Case OLA-2, and deny CCLC's petition for leave to intervene in that case.

its Proposed Finding of No Significant Impact, the Environmental Assessment (EA), and the Safety Evaluation Report (SER) relating to the two requested amendments.

Under date of July 30, 1984, CCLC submitted five contentions relating to Case OLA-1 and three contentions relating to Case OLA-2. After Applicant and the Staff filed responses, a supplemental special prehearing conference was held on September 7, 1984. Because CCLC orally argued in general with respect to its contentions that Table S-4 relied upon by the Staff in the EA was inapplicable and that the Staff should have issued instead a final environmental impact statement, the Board requested that counsel submit briefs as to whether there have been any licensing board, appeal board, Commission and federal court rulings on the question of whether Table S-4 applies only in construction permit proceedings or whether that Table is applicable also in operating license amendment cases. Counsel simultaneously filed briefs on October 21, 1984, and thereafter simultaneously filed reply briefs.

II. CONTENTIONS

A. Case OLA-1²

1. *Contention 1*

In substance, Contention 1 alleges that the proposed license amendment constitutes a major federal action significantly affecting the human environment and thus should not be granted prior to the preparation of an environmental impact statement. As bases for this contention, petitioner CCLC asserts that the transportation of spent fuel by truck presents (a) a risk of accidents causing great health and environmental damage, (b) the risk of sabotage and (c) the risk of error by VEPCO employees in preparing the casks, which, for example, if not properly sealed, might break open in transit.

The Applicant, with respect to basis (b), and the Staff, with respect to bases (a) and (c), responded that, contrary to 10 C.F.R. § 2.714(b), these bases had not been set forth with reasonable specificity. We disagree — the purposes of the basis-for-contention requirement as set forth

² During the course of the supplemental special prehearing conference, CCLC withdrew Contention 2. Further, on August 14, 1984, CCLC submitted a revised basis for Contention 4, with respect to which the Board issued a protective order on September 26, 1984. After reviewing physical protection system documents, which are subject to the protective order, CCLC will notify the Board that it withdraws this contention if it concludes that there are no inadequacies. (See Order of September 13, 1984 (unpublished)).

by the Appeal Board have been met by CCLC.³ Certainly, § 2.714 does not require the petition to detail the evidence which will be offered in support of each contention, and, in passing upon whether an intervention petition should be granted, it is not the function of a licensing board to review the merits of a contention.⁴ Moreover, we do not understand that CCLC is challenging the values set forth in Table S-4. Rather it is urging that Table S-4 is inapplicable in operating license amendment cases, that said Table applies in construction permit cases and in certain operating permit cases but is to be used only for cost-benefit analysis purposes, and that the Staff should prepare and issue a detailed environmental impact statement evaluating the effects upon the environment which would result from the proposed shipment of 500 spent fuel assemblies from Surry to North Anna. While, as requested, counsel have submitted briefs which have served to clarify their positions with respect to the applicability of Table S-4, *inter alia*, we do not at this stage decide the merits of this contention.

Contention 1, as hereafter rewritten by the Board and consolidated with Contentions 3 and 5, is admitted as an issue in controversy.

2. Contention 3

In substance, Contention 3 alleges that neither Applicant nor Staff has adequately considered the alternative of constructing a dry cask storage facility at the Surry Station. CCLC's bases for this contention are that, contrary to the National Environmental Policy Act, 42 U.S.C. § 4332(2)(E), consideration was not given to this alternative method which is feasible, can be effected in a timely manner, is the least expensive and safest method for at least 50 years, and can be used on or off site.

The Staff responded that its EA had adequately discussed alternatives. Further, the Staff in substance urged that the National Environmental Policy Act does not obligate a federal agency to search out possible alternatives to a course which will neither harm the environment nor bring into serious question the manner in which this country's resources are being expended. The Applicant argues that the dictates of NEPA do not apply since CCLC has neither contended nor suggested that there are any unresolved conflicts over the alternative uses of available resources,

³ See *Philadelphia Electric Co.* (Peach Bottom Atomic Power Station, Units 2 and 3), ALAB-216, 8 AEC 13, 20-21 (1974).

⁴ *Mississippi Power and Light Co.* (Grand Gulf Nuclear Station, Units 1 and 2), ALAB-130, 6 AEC 423, 426 (1973).

and that in the absence of such an unresolved conflict, alternatives need not be analyzed where the environmental impacts are negligible.

We conclude that CCLC has set forth bases for this contention with reasonable specificity. As noted above, in our discussion with respect to Contention 1, we do not reach the merits of contentions at this stage of the proceeding. Accordingly, as hereafter rewritten by the Board and consolidated with Contentions 1 and 5, Contention 3 is admitted as an issue in controversy.

3. *Contention 5*

Contention 5 as proposed by CCLC reflects in a summary fashion that which it proposed in Contentions 1 and 3. For the same reasons advanced in opposing Contentions 1 and 3, the Applicant and Staff have opposed the admission of Contention 5 as an issue in controversy. For purposes of clarity, succinctness, and a more efficient proceeding, the Board has rewritten Contention 5 and admits it as CCLC Consolidated Contention 1. Consolidated Contention 1 reads as follows:

The Staff's Environmental Assessment is inadequate and an Environmental Impact Statement should be prepared. The bases for this contention are two-fold. First, the Environmental Assessment, in relying upon the inapplicable values in Table S-4, did not evaluate the probability and consequences of accidents occurring during the transportation of spent fuel casks from the Surry Station to the North Anna Station or which might be occasioned by acts of sabotage or by error of Applicant's employees in preparing the casks for shipment. Second, contrary to the National Environmental Policy Act, 42 U.S.C. § 4332(2)(E), consideration was not given to the alternative method of constructing a dry cask storage facility at the Surry Station which is feasible, can be effected in a timely manner, is the least expensive and safest method for at least 50 years, and can be used on or off site.

Accordingly, Consolidated Contention 1 is admitted as an issue in controversy and CCLC is admitted as a party-intervenor in Case OLA-1.

B. Case OLA-2

1. *Contentions 1, 2 and 3*

Contentions 1, 2 and 3 in this case are identical to Contentions 1, 3 and 5 proposed by CCLC in Case OLA-1. However, with respect to Contention 1, CCLC additionally argues that the environmental impacts of the proposed amendment modifying the North Anna spent fuel pool cannot be evaluated apart from the environmental impacts associated with the proposed amendment to ship Surry-to-North Anna spent fuel;

that, since the two modifications were requested almost simultaneously, it is clear that the North Anna spent fuel modification was basically designed to accommodate the 500 spent fuel assemblies shipped from Surry; and that the effects of the two proposed modifications must be summed in order to evaluate the significance of both proposed actions.

With respect to Contention 1, Applicant argues that the proposed amendment to modify the spent fuel pool capacity has a manifest independent utility — i.e., that even if no spent fuel assembly was ever shipped from Surry, the North Anna enlarged spent fuel pool would accommodate its own spent fuel assemblies and thus would extend the full core reserve loss date from 1989 to 1998. It urges that the approval of the spent fuel modification request would in no way prejudice the resolution of the separate and distinct transshipment of spent fuel issue involved in Case OLA-1. Thus, Applicant submits (and Staff concurs) that the Appeal Board's two-part test has been met.⁵ As discussed above, at this stage of the proceeding we do not consider the merits of a contention. However, additionally, Applicant urges in substance that there is no basis set forth with reasonable specificity in support of Contention 1. We agree that Contention 1 lacks a basis. While CCLC urges that environmental effects of the two proposed modifications must be summed in order to evaluate the significance of both proposed actions, there can be no summing inasmuch as CCLC has not filed a contention objecting on the merits, either technical or environmental, to the spent fuel modification.

Moreover, in that Contentions 2 and 3 either are directed solely to the transshipment of Surry spent fuel assemblies or to an alternative thereto, Applicant also urges that these two contentions lack bases. In sum, the Staff concurs. We agree that these two contentions lack bases.

We do not admit as issues in controversy Contentions 1, 2 and 3 in Case OLA-2 because they lack bases, and we deny CCLC's petition for leave to intervene in that case.

⁵ In *Duke Power Co.* (Amendment to Materials License SNM-1773 — Transportation of Spent Fuel from Oconee Nuclear Station for Storage at McGuire Nuclear Station), ALAB-651, 14 NRC 307, 313 (1981), the Appeal Board stated:

[I]t is settled that the agency may confine its scrutiny to the portion of the plan for which approval is sought *so long as* (1) that portion has independent utility; and (2) as a result, the approval does not foreclose the agency from later withholding approval of subsequent portions of the overall plan. . . .

Order

1. In Case OLA-1, Consolidated Contention 1, as recast by the Board, is admitted as an issue in controversy and Concerned Citizens of Louisa County is admitted as an intervening party. Pursuant to § 2.714a, Applicant and/or the NRC Staff may appeal this part of the Order to the Atomic Safety and Licensing Appeal Board within ten (10) days after service of this Order.

2. In Case OLA-2, the contentions of Concerned Citizens of Louisa County are not admitted as issues in controversy, the petition for leave to intervene is denied, and the case is dismissed. Pursuant to § 2.714a, Concerned Citizens of Louisa County may appeal this part of the Order to the Atomic Safety and Licensing Appeal Board within ten (10) days after the service of this Order.

3. With respect to Case OLA-1, within ten (10) days after the service of this Order, the parties shall confer and advise this Board whether, pursuant to § 2.749, any party plans to file a motion for summary disposition. Taking into account any necessity for discovery, the parties shall suggest to the Board a due date for the filing of any motions for summary disposition.

4. With respect to Case OLA-2, the Director of Nuclear Reactor Regulation is authorized to issue an amendment to Facility Operating Licenses No. NPF-4 and No. NPF-7 which revises the technical specifications to permit the expansion of the spent fuel storage capacity for North Anna Units Nos. 1 and 2 from 966 to 1737 fuel assemblies and

identifies a new nominal center-to-center spacing between fuel assemblies of 10-9/16 inches.

THE ATOMIC SAFETY AND
LICENSING BOARD

Dr. Jerry R. Kline
ADMINISTRATIVE JUDGE

Dr. George A. Ferguson
ADMINISTRATIVE JUDGE

Sheldon J. Wolfe, Chairman
ADMINISTRATIVE JUDGE

Dated at Bethesda, Maryland,
this 15th day of October 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Ivan W. Smith, Chairman
Dr. Dixon Callihan
Dr. Richard F. Cole

In the Matter of

Docket Nos. STN 50-454-OL
STN 50-455-OL
(ASLBP No. 79-411-04-OL)

COMMONWEALTH EDISON COMPANY
(Byron Nuclear Power Station,
Units 1 and 2)

October 16, 1984

In this Supplemental Initial Decision, the Licensing Board concludes that the Applicant has demonstrated its ability or willingness to comply with applicable NRC regulations to maintain a quality assurance and quality control program, and to observe on a continuing and adequate basis the applicable quality control and quality assurance criteria plans. The Board authorizes the Director of Nuclear Reactor Regulation, upon making all requisite findings, to issue full-power licenses for Byron Nuclear Power Station, Units 1 and 2.

LICENSING BOARDS: AUTHORITY

As a general rule, the authority of licensing boards is limited to deciding matters in controversy among the parties. An operating license for a nuclear power plant may be issued at such time as the NRC renders the findings required by 10 C.F.R. § 50.57(a), and the Commission, subject to the immediate effectiveness provisions of 10 C.F.R. § 2.764, has

vested the Director of Nuclear Reactor Regulation with the authority to make such findings.

LICENSING BOARDS: DELEGATIONS TO STAFF

A licensing board may delegate a matter or issue to the NRC Staff when it is clear that the NRC Staff can adequately resolve it.

APPEARANCES

On behalf of Applicant, Commonwealth Edison Company: **Joseph Gallo, Michael I. Miller, Bruce Becker, Martha E. Gibbs, Michael Goldfein, and Mark Furse, Esquires**

On behalf of the Intervenors, DAARE/SAFE, and Rockford League of Women Voters: **Douglass Cassel, Jr., Howard Learner, Vicki Judson, and Timothy Wright, Esquires**

On behalf of Intervenor, Rockford League of Women Voters: **Betty Johnson**

On behalf of the Nuclear Regulatory Commission: **Stephen H. Lewis and Michael N. Wilcove, Esquires**

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SUPPLEMENTAL INITIAL DECISION (Operating License)

Overview of Supplemental Initial Decision

On January 13, 1984, this Board denied the application for an operating license for the Byron Nuclear Power Station in Ogle County, Illinois, because the Intervenor had prevailed on their quality assurance contention. In today's Supplemental Initial Decision we conclude that, with respect to those quality assurance issues within our jurisdiction, there is no impediment to an operating license.

This overview is for those who have no need to work with the large body of findings and conclusions upon which the Supplemental Initial Decision is based. It is not a part of the Supplemental Initial Decision. It is incomplete. Therefore it may not fairly represent the merits of any party's case.

THE JANUARY 1984 INITIAL DECISION

Our Initial Decision denying the license was based principally upon findings that the NRC Staff had determined that there were widespread failures among contractors at Byron to demonstrate in accordance with NRC requirements that their quality assurance inspectors were properly

trained, qualified and certified. Although no significant construction or hardware defects were discovered, our concern about possible deficiencies in inspector competence precluded a finding that the quality of work at Byron was satisfactory.

The solution proposed by Commonwealth Edison was to be a reinspection program consisting of a sampling of inspectors' work with the primary purpose of validating the inspectors' qualifications. Also, all inspectors then working were to be properly recertified. The Staff accepted the reinspection program as possible satisfaction of its concerns about inspector qualifications. To a limited degree the Staff also looked to the program to resolve additional concerns about worker competence and pending work-quality allegations. However, the Staff was unable to assure the Board that the reinspection program would achieve its intended goals, and testified that, until the Staff was satisfied with the results of the program, it would not authorize the operation of the Byron Station. The Staff's final determination could not be made for some 3 months following Commonwealth Edison's report of the results of the reinspection program, and, as it later turned out, about 9 months following the close of the evidentiary record. The Staff proposed that the Board leave to the Staff the responsibility of evaluating the results of the reinspection program and the final determination of whether the program provided the assurance of safety required to authorize operation of the Byron Station.

We made findings respecting several of the contractors performing safety-related work at Byron and determined that the poor quality assurance programs of some of them demonstrated that the Applicant had failed in its responsibility to oversee the quality assurance activities of its contractors. We found that Systems Control Corporation, a supplier of electrical and control-related equipment, had a fraudulent and unreliable quality assurance program. But, since information available then indicated to us that all of Systems Control's work was to be reinspected, we found that we could properly leave the results to the Staff for final approval or disapproval. Reliable Sheet Metal, the heating and ventilating contractor, was also undergoing a 100% reinspection program which could be left to the Staff's oversight. There were indications that a few other contractors had quality assurance problems, but since those problems were not litigated in this proceeding, the Board had no evidentiary basis or authority to be involved with the results of their respective reinspection programs.

Hatfield Electric Company is the Byron electrical contractor. We found that Hatfield had a long and bad quality assurance record and

stated that we were particularly concerned with repeated examples of inadequate quality-related record keeping. Although we recognized that a reinspection program could provide assurance that the Hatfield quality assurance program was adequate, we could not find that the reinspection program would be effective. We were, of course, greatly influenced by the fact that the NRC inspectors could not testify that the reinspection program would do what it was intended to do. We did not know if the sampling rationale for reinspection was reliable. Half of the Hatfield inspectors were found to need more on-the-job training and about half needed retesting. Not all of these suspected inspectors' work was being reinspected, and some of the original inspection attributes were not subject to reinspection.

In view of these misgivings, we could not find that the quality of Hatfield work was sufficient to provide reasonable assurance of safety. We made similar, but less severe, findings with respect to the Hunter Corporation, the piping contractor at Byron.

The Board also concluded that, as a matter of law, we could not delegate to the NRC Staff the responsibility of determining after the hearing that the reinspection program would provide the requisite assurance that Hatfield's and Hunter's work met the standards of safety required for operation of the Byron Station. Intervenors were entitled to have these matters resolved in the adjudicatory context and they had prevailed on the quality assurance contention. Therefore we denied without prejudice the application for the Byron operating license.

However, it should be noted that the Applicant had prevailed on many other quality assurance issues. In particular we found no organizational inability or unwillingness to maintain an adequate quality assurance program and noted that the Applicant seemed to be catching up with its quality assurance responsibilities. Moreover there was no finding that the quality assurance inspectors had performed incompetently — only that there was insufficient assurance of their competence. In addition the Applicant carried its burden on many other safety issues; for example, the seismic features of the Byron site, emergency planning, and steam generator tube integrity.

APPEALS AND REMAND

Appeals followed. On May 7, 1984, the Appeal Board (ALAB-770, 19 NRC 1163), neither affirming nor reversing our decision, sent the proceeding back for a further evidentiary hearing on the quality assurance issue. We were instructed that the remanded proceeding must address whether the reinspection program was adequate to resolve concerns

about the capability of the Hatfield and Hunter inspectors and the quality of the work by those contractors. The Appeal Board also directed an inquiry into whether the program had sufficient independence and whether the sampling methodology and recording of discovered deficiencies were sufficient. We were directed to determine whether newly certified inspectors were competent, and whether all identified discrepant conditions have been properly resolved.

Acting on new information that, contrary to our initial belief, some of Systems Control's work had not been inspected, the Appeal Board directed further exploration of our earlier disposition of the Systems Control issue. Finally, we were authorized to include any other question in the remanded proceeding relevant to the ultimate issue of whether Byron has been constructed properly. Accordingly, we directed the parties to include the relevant activities of Pittsburgh Testing Laboratories, Applicant's independent testing contractor, in their evidentiary presentations.

REMANDED PROCEEDING AND FINDINGS

During the hearing on remand the Board received evidence on four broad issues:

1. The design, implementation and results of the Byron reinspection program.
2. Inferences of inspector capability — Hatfield, Hunter, and PTL.
3. Inferences of work quality — Hatfield and Hunter.
4. The adequacy of work by Systems Control Corporation.

The reinspection program was formulated to verify the effectiveness of quality control inspector qualification and certification practices of Byron contractors from the beginning of construction in 1976 until September 1982. It was designed to reinspect, by reinspectors known to be qualified, some original inspections and to analyze differences (discrepancies) in the results. Inspectors whose work was to be reinspected were selected as a sample from a roster listing all inspectors chronologically according to the date of their initial qualification. For most contractors, and Hunter, Hatfield, and PTL in particular, the first, fifth and every fifth inspector thereafter were selected. The NRC added inspectors to the sample whose qualifications were suspect. This process captured about 26 to 27% of Hatfield, Hunter, and PTL inspectors, which we find to be a sufficient and representative sample.

The first 90 days of an inspector's identifiable and reinspectable work was reinspected. The inspections were grouped into "subjective" and "objective" attributes. If the reinspector agreed with at least 95% of the

original inspector's calls for objective attributes or 90% for subjective attributes, the original inspector was deemed qualified. The work of any inspector who initially failed to pass either acceptance criterion was subjected to an expanded inspection process wherein the inspector either passed based on a reinspection of a second 90-day period, or if the inspector still failed, all of his identifiable and reinspectable work was reinspected. Also, if an inspector failed, the sample of inspectors was expanded by as much as 50% for the attribute in question. We find that the selection of the work to be reinspected and the scheme for expanding the sample upon the failure of an inspector was adequate.

All Hatfield, Hunter, and PTL inspectors passed the 95% acceptance criterion for objective attributes during their first 3 months of inspections. For the visual-weld subjective attribute, Hatfield and Hunter each had one inspector and PTL had three inspectors whose first 3 months of work failed to meet the 90% acceptance criterion. The Hatfield and Hunter inspectors, and two of the PTL inspectors had no further work, so their qualifications were considered indeterminate, but the reinspection results for those inspectors were retained in the data base. A substitute was selected for each by formula and each substitute passed. These are satisfactory results.

Intervenors presented the testimony of an expert statistician who stated that, since the reinspection program was flawed as a statistical project, no inference of inspector qualifications can be made. He stated that where, as here, there was no pure probability sample, the engineer must clearly justify the engineering-judgment assumptions underlying his sampling. In his view, those assumptions were not justified or explained in the reinspection program. For example, when the NRC added suspected inspectors to the sample, the results might have been biased nonconservatively because the assumption of conservatism was not tested. Intervenors' statistical expert was not convincing. The program was designed using engineering judgments and techniques primarily and statistical sampling concepts secondarily where appropriate. The acceptance criteria and underlying assumptions were fully explained and we find them to be rational.

Intervenors also presented the testimony of a human factors expert who testified that the program was flawed for several other reasons including a tendency of bored inspectors to fall off in performance following training, a tendency by reinspectors to mimic the work of the original inspectors, and a bias of the reinspectors favoring the original inspectors because of employment privacy. None of the human factors theses were convincing in the context of the entire evidentiary record.

The Board therefore concluded that the Hatfield, Hunter, and PTL inspectors had been shown to be competent by the program. Exactly how competent was a minor subissue. In any event, the inspectors passed the Appeal Board's test that the reinspection program must support a presumption that the inspectors had the competence to "have uncovered any construction defects of possible safety consequence." We have, therefore, a presumption of adequacy of Hatfield, Hunter, and PTL's work derived from a presumption of inspector competence.

The Applicant did not, however, rest with an indirect presumption of work quality. Although the program was not designed to be a work quality inspection effort, Sargent & Lundy, the Byron architect-engineer, evaluated the results of the program for its direct work-quality implications.

The Board received evidence of this evaluation with respect to Hatfield and Hunter's work. Because PTL, as an inspection arm of Applicant, did no construction work of its own, and its inspections were generally of a nature differing from contractors' direct inspections, the quality of the work inspected, or overinspected by PTL, was not examined as a major issue.

There were 87,783 Hatfield reinspections made and 3661 discrepancies were initially identified. Of these, 1251, or 34%, were within design parameters and were not actually discrepant; 2010, or 55%, were of such a minor nature that they could be dispositioned as acceptable, based on engineering judgment; 400, or about 11%, were analyzed by calculation to determine their significance. None of these Hatfield discrepancies had design significance and none reduced design margins below the level required by conservative design practice.

There were 73,349 Hunter reinspections and 793 discrepancies were initially identified. Of these, 639, or about 81%, were within design parameters and were not actually discrepant; 75, or 9%, were of a minor nature and were dispositioned as acceptable, based on engineering judgment; 79, or 10%, were analyzed by calculation to determine their significance. None of these Hunter discrepancies had design significance and none reduced design margins below the level required by conservative design practices.

Intervenors' expert statistician testified that the results of the reinspection program are not valid for inferences of work quality. He expressed concern about such perceived mathematical-statistical defects such as a failure to demonstrate homogeneity between the work reinspected and the work not reinspected, lack of homogeneity between inspectors sampled and those not sampled, failure to consider "clustering," and inappropriate aggregation of inspection elements. The Board, however,

was satisfied with the preponderance of the evidence demonstrating a general similarity in the work and inspectors captured in the program to the work and inspectors not captured. The inspectors sampled constituted a large portion of all Hatfield and Hunter inspectors. Most of the inspection attributes that could be reinspected were reinspected, and the inspection program spanned almost all of the relevant construction period. A large amount of inspections covering a broad range of Hatfield and Hunter work was reinspected. These facts, coupled with the surprising fact that none of the Hatfield and Hunter discrepancies had design significance, provide additional assurance of the quality of Hatfield and Hunter's work.

The Board was initially skeptical of Sargent & Lundy's report that no discrepancies with design significance were discovered from more than 160,000 Hatfield and Hunter reinspections, and from a substantial number of perceived discrepancies evaluated. In major part, the explanation lies in the very generous design margins inherent in the design process. Structures are designed to withstand stresses over and above those expected. Connections, for example, are designed in groups rather than individually with the most highly stressed connection dictating the design. The code writers incorporated yet another design margin, and a structure designed to a code might carry twice the design load without failure. Another example is the stepping of the available sizes of supporting devices. There cannot be, of course, infinite numbers of sizes for items such as bolts and hangers. Therefore, in practice, such supporting devices are employed in stepped capacities and larger-than-design sizes are often installed.

The reinspection program and the evaluation of the results lead to several conclusions:

1. The high agreement rates between the original inspectors and the reinspectors known to be qualified permit the inference that the original inspectors were competent.
2. The original inspectors presumably therefore did not overlook construction defects of possible safety consequence.
3. A very large number of broadly based Hunter and Hatfield reinspections, partly because of very generous design margins, revealed no design-significant discrepancies. Thus the reinspection program supports a direct inference of adequate Hatfield and Hunter work.
4. The absence of any design-significant discrepancies leads to the conclusion that, despite the existence of discrepancies, the original inspectors had sufficient competence not to overlook design-significant construction defects. This conclusion,

however, has limited value as a demonstration of inspector competence. The greater the sum of the design margins, the less it challenges the inspectors' competence to discover design-significant defects.

Quality of work was the central issue in that phase of the remand hearing which dealt with Systems Control. All parties agree, and we find, that the Applicant has met its burden of proof on SCC. SCC supplied Byron with items which house or support electrical equipment. As we noted above, the issue of the adequacy of SCC-supplied equipment was remanded to us after it became clear that the reinspection of SCC work, review of which we had delegated to the Staff, was not as thorough as we had thought.

Eventually, welding nonconformances reported in late 1983 and early 1984 led the Staff to require the Applicant to demonstrate the safety of all the SCC equipment at Byron. It was this demonstration which the Applicant presented in the remand hearing. The Applicant's many reinspections and evaluations, along with a very few welding repairs, prove the safety of all but one kind of SCC equipment, which at the close of the remand hearing was still being reinspected and evaluated. Because this continuing program of reinspection is extensive — potentially 100% — and because the Staff has found the design of the program to be adequate, we are delegating to the Staff the determination of the adequacy of this equipment. No party objects to this delegation.

SUPPLEMENTAL INITIAL DECISION

Findings of Fact and Conclusions of Law

I. INTRODUCTION

1. On January 13, 1984, this Board issued its Initial Decision denying Commonwealth Edison Company's (Applicant, Edison or CECo) application for a license to operate the Byron Nuclear Power Station (Byron). LBP-84-2, 19 NRC 36. Although we ruled in Applicant's favor on seven of the eight issues in controversy, we found that CECo had not met the burden of proof on the issue of quality assurance.

2. As set forth in Intervenor's Contention 1A, Applicant was required by the contention to demonstrate its "willingness and ability to implement and maintain an adequate quality assurance program."

3. Our Initial Decision summarized our findings with respect to CECo's quality assurance program by stating that CECo has "failed in

its responsibility to assure that its contractors carried out their delegated quality assurance tasks" (*id.* at 43); that we had not concluded that CECo "is institutionally unable or unwilling to maintain a reliable quality assurance program," but rather that CECo "began to deal effectively with its contractors' problems too late, but is catching up" (*id.* at 44); that there were "widespread failures in the contractors' quality assurance programs" at Byron (*id.*); and that although we had not found widespread hardware or construction problems, "we are not confident that such problems would have been discovered" (*id.*).

4. In the first set of hearings on the quality assurance issue in March and April 1983, we did not notice an item of noncompliance found in the March 1982 NRC Construction Assessment Team inspection regarding the certification practice for quality control inspectors by contractors at Byron. Our attention was drawn to this matter as a result of studying and granting Intervenor's motion to reopen the hearing record. Testimony was adduced in August 1983 on (1) the training and certification of a former QC inspector of the Hatfield Electric Company, (2) the very recently completed program of recertifying inspectors to revised criteria based on American National Standards Institute (ANSI) N45.2.6-1978, and (3) the structure and preliminary results of a reinspection program designed to show that inspectors who conducted inspections prior to the revised certification procedures were adequately qualified. On the basis of the evidence before us with respect to this last issue we denied the operating license application expressing reservation both about the reinspection program itself and the quality of the work of two site contractors, in particular, Hatfield and Hunter Corporation. I.D., 19 NRC at 213-16, ¶¶ D-429 to D-441.

5. When the evidentiary record was closed the reinspection program was still in progress, and a final report on its results was not published until February 1984 followed by a June 1984 supplement. In our Initial Decision we expressed several reservations regarding the adequacy of the Byron quality control inspector reinspection program (BRP), which had not been eliminated by evidence presented at the August 1983 reopened hearing. We noted that it had not been established that the program used a statistically significant and reliable sample. I.D., 19 NRC at 200-01, 214, ¶¶ D-382 to D-384, D-436. We also expressed concern about documentation deficiencies which were discovered during a CECo audit of the Byron quality control inspector reinspection program (BRP). I.D., 19 NRC at 199-201, 214-15, ¶¶ D-379 to D-382, D-438. These concerns, together with the fact that the testimony of the Region III Staff indicated that it was not satisfied completely with some aspects of the program's structures and that it would not be able to judge the

success of the reinspection program until its results were known, caused us to deny without prejudice the operating license application.

6. Following appeals, the Appeal Board remanded this proceeding to us with instructions to receive further evidence on the reinspection program as it applied to Hatfield and Hunter and to render a supplemental initial decision. The Appeal Board agreed with our decision that the record was insufficient to warrant issuance of an operating license, but held that further hearings should be conducted to allow a full exploration of the reinspection program to determine whether there is reasonable assurance that Byron has been properly constructed. Memorandum and Order, ALAB-770, 19 NRC 1163, 1178 (1984).

7. Additionally, the Appeal Board noted the recent disclosure of deficient welds on cable pan hangers supplied by Systems Control Corporation (SCC) and that CECo had apparently not fully met commitments to perform source inspections of SCC equipment. These matters raised questions concerning the overall adequacy of equipment supplied by SCC. To resolve these questions the Appeal Board determined that further exploration of these issues on the evidentiary record was warranted. *Id.*, 19 NRC at 1179, 1180. The adequacy of Applicant's oversight of Systems Control's quality assurance program was, by implication, also a matter warranting further inquiry.

8. Finally, the Appeal Board stated that the Licensing Board would have discretion to include within the scope of the reopened evidentiary record any other topics which it deemed relevant to the ultimate question whether reasonable assurance exists that the Byron facility has been properly constructed. *Id.*, 19 NRC 1182 n.72.

9. Thereafter Applicant identified various issues from our decision that it perceived to be of concern to the Board and as to which the Board might require an evidentiary showing. These issues included Region III Staff's acceptance of the reinspection program; the basis for the determination of inaccessible and nonre-creatable inspection attributes in the reinspection program; the relationship of deficiencies identified during the reinspection program to a trend analysis; the number of Hatfield inspectors requiring recertification and retraining at the inception of the reinspection program; Hunter documentation practices regarding discrepant conditions identified during the reinspection program; further evidence regarding possible fraudulent practices by contractors in the certification of quality control and quality assurance personnel; the disposition of allegations open as of the close of the record in August 1983; Applicant's general control of its site contractors; and supplemental evidence regarding Hunter "tabling" practices and any pattern of nonconformances by Hatfield. The Board accepted Applicant's list of issues and

added the issue of whether CECo's commitment to repair any defects identified during the reinspection program had been effectively satisfied.¹

10. We also ruled that certain issues proposed by Intervenor should be litigated and that the NRC Staff should present evidence on certain worker allegations, which the Staff had expected would be resolved by the reinspection program, and that the Staff present evidence on any other allegation which it deemed to have independent and important relevance to the reinspection program. Finally, we ruled that Pittsburgh Testing Laboratory (PTL), Applicant's independent testing contractor, should be added as one of the contractors to be examined with respect to the reinspection program.

11. Applicant presented the testimony of twenty-two witnesses in four segments. The first segment described the formulation and implementation of the reinspection program and its results with respect to the qualification of the Hatfield, Hunter, and PTL QC inspectors. The second and third segments of the testimony addressed the questions of the significance of the discrepancies discovered during the reinspection program and the adequacy of the Hatfield and Hunter work. Finally, evidence was presented concerning other issues, namely, the adequacy of the hardware furnished by Systems Control Corp., CECo oversight of Systems Control, the use by Hunter of a "tabling" practice and the adequacy of cable installed by Hatfield that had been subjected to excessive stress or overtensioning, a subissue added by the Board.

12. The NRC Staff submitted three witness panels who addressed the remanded issues. In addition, Mr. James Keppler, administrator of NRC's Region III, provided an overview and insight with respect to the Region's judgment concerning the adequacy of the BRP. Mr. William Forney, who was formerly NRC senior resident inspector at Byron, also testified. An affidavit prepared by him which described his differences with the testimony of an NRC Staff witness panel with respect to the conclusions to be drawn from the results of the BRP was at the Board's insistence received into evidence as his direct testimony.

13. Intervenor presented three witnesses. One witness questioned the adequacy of the engineering evaluations performed by Sargent & Lundy of the discrepancies discovered during the BRP. The remaining two witnesses challenged the adequacy of various assumptions used by Edison in the formulation of the BRP and the applicability of statistical

¹ The Appeal Board characterized this issue as whether "all identified discrepant conditions . . . [have] been properly resolved." ALAB-770, *supra*, 19 NRC at 1179. Repair was not the only basis on which discrepancies were dispositioned.

principles to the results of that program. Intervenor's proffered the testimony of two other witnesses, one an expert in reliability engineering and the other, an Authorized Nuclear Inspector at Byron, both of whose testimony the Board declined to receive. The Board also declined to receive portions of Intervenor's engineer's testimony concerning design issues, and portions of Intervenor's statistician's testimony concerning higher reliability requirements for inspections of greater safety significance.

14. All testimony was presented during the course of 3 weeks of hearings held in July and August of this year. All parties demonstrated a highly responsible attitude of cooperation with the Board and with each other. Only those issues which were genuinely and materially in dispute were litigated. Each party filed proposed findings and conclusions of law in prearranged format which permitted the Board to focus efficiently and reliably on the important issues and the areas of disagreement. To a very large extent the underlying facts are not in dispute. The Intervenor's and Staff adopted Applicant's undisputed proposed findings.² The Board in turn was able to accept in many cases the agreed-upon findings exactly as presented.

II. APPLICABLE LAW AND REMAND ORDER

15. An operating license for a nuclear power plant may be issued at such time as the NRC renders the findings required by 10 C.F.R. § 50.57(a). The Commission, subject to the immediate effectiveness provisions of 10 C.F.R. § 2.764, has vested the Director of Nuclear Reactor Regulation with the authority to make the findings under § 50.57(a). 10 C.F.R. § 2.760a. As a general rule, our authority is limited to deciding matters in controversy among the parties. 10 C.F.R. §§ 2.104(c) and 2.760a. It was in the context of this regulatory regime that Contention 1A was decided against the Applicant.

16. We were unable to make these findings in our Initial Decision of January 13, 1984, largely because of outstanding questions raised by an item of noncompliance contained in NRC Staff Inspection Report 82-05. Specifically, noncompliance item 82-05-19 questioned the qualifications of contractor QC inspectors certified under procedures which the Staff deemed defective. The Appeal Board agreed that the record pre-

² At the Board's request, counsel for Applicant provided their proposed findings of fact and conclusions of law in both hard-copy and magnetic-disc form.

vously before us was insufficient to support the issuance of an operating license, and remanded the record to us:

to permit a full exploration of the significance of the [reinspection] program in terms of whether there is currently reasonable assurance that the Byron facility has been properly constructed. Stated otherwise, the focus of the inquiry should be upon whether, as formulated and executed, the reinspection program has now provided the requisite degree of confidence that the Hatfield and Hunter quality assurance inspectors were competent and, thus, can be presumed to have uncovered any construction defects of possible safety consequence. [Footnotes omitted.]

Memorandum and Order, ALAB-770, *supra*, 19 NRC at 1178.

17. Further, subsequent to our Initial Decision, new information regarding another item of noncompliance resurrected questions we had deemed closed in our Initial Decision. Noncompliance 80-04-01, contained in a December 30, 1980 inspection report, asserted that Applicant had failed to take prompt and effective corrective action with respect to deficient equipment supplied to the Byron Station by Systems Control Corporation (SCC). While we had been willing to delegate the closure of this item of noncompliance to the NRC Staff, the Appeal Board, as a result of the new information, directed that we hold further hearings on this issue as well.

18. Noncompliance 80-04-01 has not been closed. However, the testimony of the NRC Staff and Applicant indicates that only one discrete issue remains to be resolved. A program for resolution of the one outstanding issue, by way of a 100% inspection of certain components, is in progress and the NRC Staff expressed confidence that this program will satisfy its concerns.

19. We may delegate a matter in issue to the NRC Staff when it is clear that the NRC Staff can adequately resolve it. (*See generally* our discussion in the Initial Decision, 19 NRC at 210-12, ¶¶ D-419 to D-427, and cases cited therein.) The nature of the program for resolution of the outstanding SCC issue, as discussed below, presents an appropriate case for delegation to the NRC Staff and we ruled to that effect at the close of the remand hearings. Tr. 11,169-71.

III. THE INCEPTION AND PURPOSES OF THE BYRON REINSPECTION PROGRAM

20. An intensely contested set of subissues was woven throughout the remanded proceeding concerning the history, purposes, design, results and uses of the reinspection program. For example, while the Applicant viewed the program as one intended to test the qualifications of

inspectors, the results of the program were also used to draw inferences directly about the quality of the work at Byron. Intervenors challenge the adequacy of the program for both uses. The Staff does not entirely agree with the Applicant on the original purposes and the meaning of the reinspection program. Therefore, to place these issues in proper context, we pay particular attention in the following sections to the inception and structure of the program as well as its implementation and results.

21. A special inspection was conducted at Byron during the Spring of 1982 by an NRC Construction Assessment Team (CAT). The CAT findings were published in IE Report Nos. 50-454/82-05 and 50-455/82-04. One of the findings (noncompliance 82-05-19) questioned the adequacy of the onsite contractors' programs for certifying QC inspectors. The CAT inspectors found deficiencies in (i) the contractors' evaluations of initial inspector capabilities, (ii) the documentation of initial certification, and (iii) the criteria used to establish inspector qualification. Applicant's Exh. 8; Del George, ff. Tr. 8406, at 6. Although there was no finding that these deficiencies had compromised the quality of construction, the NRC Region III Staff adopted the position that the site contractors' QC inspector qualification programs had to be upgraded and that the quality of the inspections already completed required verification. Del George, ff. Tr. 8406, at 5.

22. In response to noncompliance 82-05-19 and comments in the cover letter to the CAT Inspection Report (Applicant's Exh. 8), CECo initiated a recertification program between June and September 1982 for quality control inspectors then conducting inspections at Byron and made necessary revisions to site contractors' QC inspector certification procedures. The recertifications were in compliance with CECo's commitment to Regulatory Guide 1.58 which invokes and supplements ANSI N45.2.6-1978. Beginning on September 30, 1982, these upgraded procedures were used to certify inspectors. This action solved the Staff's concern with respect to the qualification of QC inspectors certified after September 30, 1982. However, it did not address whether the inspectors who performed QC inspections prior to that time were qualified. The BRP was constituted to address this latter concern. Hansel, ff. Tr. 8901, at 4; Del George, ff. Tr. 8406, at 7-11; Little, ff. Tr. 9510, at 7-10.³

23. To verify the effectiveness of inspector qualification and certification practices used by site contractors between January 1976 and

³ A full discussion of the recertification program is contained in ¶¶ D-385 through D-393 of our Initial Decision.

September 1982, the BRP was structured to reinspect the original QC inspections and to analyze any discrepancies (differences between the results of the original inspections and the reinspections) to determine their significance. The data would then be used to draw inferences about the qualification of the total inspector population on a contractor-by-contractor basis. Thus, the original purpose of the BRP was not to validate directly work quality at Byron. Given the concerns about work quality raised in our Initial Decision, however, Applicant determined that the BRP data could also be used as one basis for determining the quality of the construction work. Del George, ff. Tr. 8406, at 6, 7. The Staff agreed with this use. Little, ff. Tr. 9510, at 4.

24. The NRC Staff's characterization of the purpose of the BRP is stated differently. The Region III panel testified that the primary purpose of the BRP was to determine whether QC inspectors had overlooked significant safety-related hardware deficiencies. *Id.*; Little, Tr. 9577. However, Mr. William Little also agreed, on behalf of the panel, that determining whether QC inspectors had overlooked significant deficiencies was equivalent to determining whether they were competent. Little, Tr. 9582-83; *see also* Keppler, ff. Tr. 10,135. William Forney, former Region III Senior Resident Inspector at Byron, who made the original CAT findings, testified for the Staff in August 1983 that the purpose of the BRP was "to determine whether or not [the contractors] have used qualified inspectors."⁴ Forney, Tr. 7991. In sum, we cannot discern any practical differences in the views of the purposes of the program by Applicant and the Staff. The important point is that there is no dispute about either the problem that the program was designed to correct or its results.

IV. THE STRUCTURE OF THE PROGRAM

25. Contrary to Intervenor's assertion, the reinspection program was not designed by one official lacking expertise. It was formulated by the Director of Nuclear Licensing, Mr. Louis O. Del George, and his department, the Project Construction Department and the Quality Assurance Department. Del George, ff. Tr. 8406, at 5. Moreover, there was substantial input from the NRC Senior Resident Inspector and Region III officials, as will be noted below.

⁴ We note that Mr. Forney's most recent testimony seems to contradict this characterization. Mr. Forney testified at the reopened hearing that in his opinion, the fact that inspectors have not failed to discover significant deficiencies is not necessarily a demonstration of their competence. His reasoning is discussed in § VIII, below.

26. The BRP was formulated to address the qualifications of QC inspectors who performed inspections for eight onsite construction contractors during the period January 1976 through September 1982. In general, the adequacy of the original inspection results was determined by reinspection using qualified QC inspectors. Inspectors were selected for reinspection by a sampling technique and the first 90 days of their identifiable and reinspectable work was reinspected. The subject matter of the inspections was grouped into two work categories called "subjective" and "objective" attributes. If the reinspector agreed with at least 95% of the original inspector's calls for objective attributes or 90% for subjective attributes, the inspector was deemed qualified. The work of any inspector who initially failed to pass either acceptance criterion was subjected to an expanded inspection process wherein the inspector either passed or failed based on a reinspection of a second 90-day period. If the inspector still failed, all of his identifiable and reinspectable inspections of the attributes in question were reinspected. These program elements will be discussed in detail below.

a. Selection of Contractors

27. The first element of the BRP was the selection of site contractors whose QC inspectors would be subjected to reinspection. However, the selection of contractors was not a material issue in this proceeding. Of the contractors who performed onsite construction work, the significant ones were captured in the program. Their work represented 93% of the safety-related work at Byron. In any event, these remanded proceedings were limited to Hatfield, Hunter, and PTL, and these contractors were included in the BRP.

b. Selection of Inspectors

28. The second element of the BRP was the selection of inspectors for reinspection. The inspection work of the original QC inspectors of Hatfield, Hunter, and PTL was reinspected on a sampling basis. Del George, ff. Tr. 8406, at 11. Edison and the NRC Staff agreed that a 100% reinspection effort was not necessary since a properly structured sampling plan permits sound judgments to be drawn concerning the total population based on the sample results. Hansel, ff. Tr. 8901, at 10; Del George, Tr. 8482-83; Little, ff. Tr. 9510, at 4. Whether CEC's program was soundly structured, however, is a matter sharply disputed by Intervenor. That issue was extensively litigated.

29. The names of inspectors for Hatfield, Hunter, and PTL were compiled on rosters and listed chronologically by date of certification.

The fifth and every fifth inspector thereafter on the roster were initially included in the BRP. In addition, the NRC Staff Senior Resident Inspector, Mr. Forney, reviewed the sample and added both the first inspector certified and two to four additional names to each contractor's group of inspectors. This selection method resulted in 27%, 26%, and 27% of Hatfield, Hunter, and PTL QC inspectors, respectively, being included in the program. Del George, ff. Tr. 8406, at 11, 12, 30, 31, 33.

30. The table contained in Mr. Del George's testimony shows that Applicant (and Mr. Forney) with respect to Hatfield, Hunter, and PTL, at least, made certain the inspectors selected were sufficient in number and spanned the range of inspection activities for the entire 6 years of interest, i.e., the beginning of construction to September 1982. The table also shows that inspectors were chosen from each year of work activity. Del George, ff. Tr. 8406, at 13.

31. To qualify to have his work reinspected, an inspector had to perform at least fifty reinspectable inspections during the period subject to reinspection. In mounting their argument about the statistical soundness of the selection process, Intervenor correctly point out that this finding could also be stated "[t]o have a chance of being included in the reinspection program an inspector had to perform, etc." Intervenor's Proposed Finding 33. In the case of PTL, twenty-five inspections or more for an inspector were determined to be acceptable because of the limited number of inspections for the typical inspector. Where reinspection was initiated for the original inspector but it was subsequently learned that the "minimum quantity" was not available, all reinspections actually performed for the original inspector were nevertheless included in the BRP data base. Del George, ff. Tr. 8406, at 16, 17.

32. In commenting on the "minimum quantity" of inspections needed to qualify an inspector for selection in the sample, Intervenor suggests that a weakness in the program is demonstrated because "CECo introduced no evidence to show that inspectors who performed fewer than the minimum number of inspections would be likely to perform as well as inspectors who stayed on the job longer." Intervenor's Proposed Finding 33. Thus we address for the first time in this decision an effort by Intervenor to take the inspector qualification issue where the Board will not follow. The reinspection program was formulated and implemented as a device to validate the qualifications of suspect inspectors. It was not a direct work-quality inspection. It will be necessary to make this point repeatedly in the sections below. The length of service of the inspectors is irrelevant to the issue of their initial training. Intervenor's point can be made and has been considered in the context of whether an inference of adequate work quality can be drawn from the results of the

program. Keeping the two concepts separate has been a major task of the Board in managing the proceeding on remand.

33. The Staff concluded that the sample size of inspectors whose work was reinspected was sufficiently large and provided an adequate basis for evaluating the qualifications of inspectors whose work was not reinspected. The Staff enhanced the adequacy of the selection methodology by adding two to four inspectors for each contractor. Little, ff. Tr. 9510, at 4, 5.

34. The inspector sampling scheme was the result of an engineering judgment that for a small population of inspectors, a sample size in excess of 20% would provide a reliable indicator of the quality of the total population of the Hatfield, Hunter, and PTL inspectors, provided the sample covered the entire period of interest from January 1976 through September 1982. The engineering judgment of both CECo and Staff personnel which led to the selection of the sample of inspectors whose work was reinspected is responsive to our concerns regarding the statistical significance and reliability of the inspector sample expressed in our Initial Decision, even though there was not a rigorous application of mathematical statistical theory to the inspector selection process. It would appear, therefore, that a sufficient and representative number of inspectors was captured by the sampling process to provide confidence that inferences could be drawn with respect to the qualification of the Hatfield, Hunter, and PTL inspectors not captured in the BRP. This judgment is reinforced by the nature of the selection process used by the NRC Staff to add inspectors to the program. The list of inspectors to be reinspected was biased by Mr. Forney to include the inspectors thought to be most likely to be determined to be unqualified. Little, Tr. 9817-19.

35. As the opening shot in the battle between Intervenor's statistician and the Applicant's and Staff's engineers, Intervenor's proposed:

Neither the staff, nor the Applicant, however, tested the assumption that the staff had added the worst inspectors to the list. What little data is available in the record (covering Hunter weld inspections) shows that the overall discrepancy rate for inspectors added by the NRC was less than the overall discrepancy rate for the inspectors chosen by taking every fifth inspector. The NRC selected inspectors had an overall discrepancy rate of 1.5% (9 out of 594) (for these elements), less than half of the discrepancy rate of 3.3% (103 out of 3134) for those not chosen by the NRC. Ericksen, ff. Tr. 11,045, Attachment D, Supp. Applicant and staff have failed to show that the deviation from random selection of inspectors was conservative. In fact, available data indicates that the NRC's additions may have introduced a non-conservative bias in the results.

Intervenor's Proposed Finding 34A.

36. By way of background, Mr. Forney, the Senior Resident Inspector, who selected the additional inspectors for the sample, testified in August 1983 that he selected them after a review of the records of a number of inspectors "whom I felt were at least marginally experienced." Tr. 7994. It may be that his choice of the words "at least" imparts some ambiguity to his testimony. But when considered against the background of Mr. Forney's role in the noncompliance citation and his continuing concern about inspector qualifications, we inferred that he intended to state that he added inspectors to the sample whose experience was so marginal that inadequacies in training would not be masked. Were this not the case, we would have noted that fact in our Initial Decision of January 13, 1984. There we found simply that he selected his candidates "on the basis of their experience." I.D., 19 NRC at 201, ¶ D-383.

37. Moreover, Mr. Little, the senior Region III official with direct responsibility for the reinspection program, testified that the purpose was to identify inspectors with weak-appearing certifications and to bias the roster of sampled inspectors in the direction of including those most likely to be found unqualified. Tr. 9818-19.

38. Applicant reads Intervenor's respective proposed findings to be a suggestion that Mr. Forney intentionally selected inspectors who were likely to score well in the reinspection program. Reply Findings at 9 (apparently noting Intervenor's Proposed Finding 35). The better reading of Intervenor's argument is that, while acknowledging that Mr. Forney intended to conservatively bias the sample by adding the most suspected inspectors, this is a matter of unexplained engineering judgment. The argument goes on that, in the presence of data to the contrary, Mr. Forney's assumptions may have introduced a nonconservative bias into the results. Intervenor's Proposed Findings 34A, 35.

39. Dr. Eugene P. Ericksen, Intervenor's expert statistician, testified that whenever one generalizes from a sample to a population, one is making a statistical statement. Tr. 11,074. Therefore, he states, in the absence of a probability sample, an engineer must clearly state the justification underlying his assumptions instead of making general assertions of engineering judgment. Ericksen, Tr. 11,048-49. One of the problems with CECO's statistical inferences, according to Dr. Ericksen, is that CECO did not test the assumption that the NRC Staff added inferior inspectors to the sample. Intervenor's Proposed Finding 36 *citing* Ericksen at Tr. 11,083.

40. Intervenor's argument can be summarized as follows: The NRC Senior Resident Inspector added suspected inspectors to the one-in-five sample formula. Some of these inspectors scored better than

those not chosen by the NRC. Also, Applicant and Staff did not test the assumption that those inspectors selected by the NRC would impart a conservative bias. Therefore, since the reinspection program depended upon neither a probability sample nor tested assumptions, the inferences to be drawn from the results are not reliable.

41. While we grant that Intervenor's statistical argument is made in the larger context of several asserted unjustified assumptions in the sampling methodology, we believe that the mini-debate about the inspectors selected by the NRC affords an easily understood insight into Dr. Erickson's and Intervenor's approach to nuclear engineering.

42. Mr. Forney performed a completely rational task. Recognizing that the 82-05-19 finding centered about the incomplete certification packages of the contractors' inspectors, which packages he had personally reviewed during the CAT inspection, he wanted to be sure that those about whom he had special concerns were captured in the sample. If Mr. Forney were correct in his suspicions that certain inspectors may do less well on the reinspection program, the sampling was biased in an appropriately conservative direction. But assume for argument that, despite his experience and his knowledge of the certification files of individual inspectors, it turned out that the inspectors selected generally scored better than others in the reinspection. True, if it were a purely statistical program based upon probability samples, he would have influenced the result nonconservatively. But the program, as we discuss throughout this decision, was a deterministic endeavor, using statistical concepts where appropriate and using engineering judgments and techniques where the result could be improved. Even if he could not predict from the certification files which inspectors would score poorly, his innocent selections would, in a statistical sense, have a harmless effect on the results.

43. The only basis upon which we could accept Dr. Erickson's thesis that Mr. Forney could have biased the sample nonconservatively is to make the absurd assumption that Mr. Forney possesses some quirk of thought process that would lead him to select the best inspectors while believing that they had the worst certification packages.

44. Moreover, Dr. Erickson's reasoning is dangerous to Intervenor's own case. If the NRC could not reliably predict from the inspector certification packages that the inspectors with the poorest credentials would perform poorly, perhaps the underlying concern of Region III in demanding a reinspection program was unfounded; perhaps CECO was right from the outset, that the inspectors were qualified notwithstanding the state of their personnel files. We do not, however, make this finding. As Intervenor's point out, there is sparse evidence about the per-

formance of the inspectors selected by the NRC for the reinspection sample.

45. In sum, Dr. Ericksen was presented with a logical circumstance: that inspectors perceived to be the worst were added to the sample. The fact that he could not deal with this rationally generated data in applying his statistical expertise diminishes the value of his opinion.

46. Dr. Ericksen further testified that generalizations to a population from a sample are straightforward if one utilizes a probability sample, a sample drawn from a population in which all elements have a known non-zero chance of being selected. Ericksen, ff. Tr. 11,045, at 8; Ericksen, Tr. 11,073. Dr. Ericksen also concluded that since certain inspectors had "no chance" of being included in the sample, there was an inadequate statistical basis from which to draw inferences about these inspectors. Ericksen, ff. Tr. 11,045, at 8.

47. Dr. Martin Frankel, an expert statistician testifying on behalf of Applicant, agreed that the inspector sample does not qualify as a "probability sample," mainly because of the addition of designated inspectors whose qualifications were considered suspect by the NRC Staff. Frankel, ff. Tr. 11,120, at 7-8. Although the sample of inspectors does not meet the criteria for a probability sample, Dr. Frankel believes that inferences to the total population of inspectors can be drawn if supported by the judgments of individuals with appropriate substantive knowledge. *Id.* We agree. The persons with the substantive knowledge who urged inferences to the total population appeared at the remand hearing, presented their prepared testimony, and were subject to extensive examination by the parties and the Board as we discuss with respect to each subissue. While Dr. Ericksen is correct in that unexplained bald assertions of engineering judgment cannot be a justification for deviating from a probability sample, in general we do not find that bald assertions have been made. It would be contrary to the weight of the evidence to reject inferences drawn from the results of the BRP by experienced engineers employed by Applicant and Staff, as well as by independent consultants, based on Dr. Ericksen's unrealistic application of statistical theory. We accept the validity of the inspector sample in the BRP and conclude that the results form an adequate basis for inferences to the qualifications of inspectors whose work was not reinspected.

c. Selection of Inspector Work to Be Reinspected

48. The third element of the BRP involved the selection of the part of each inspector's work which would be reinspected. This work was

categorized into discrete work activities called attributes. All safety-related work attributes that were re-creatable, accessible, and identifiable to a sampled inspector were to be reinspected. An attribute was considered re-creatable if it could be traced to a specific inspector and the condition or state originally inspected was capable of reinspection at a later time. An attribute was accessible for reinspection if extensive dismantling were not required for the reinspection to be performed. However, attributes were deemed accessible if reinspection could be accomplished through the erection of scaffolding or through the removal of paint, insulation or fireproofing. Del George, ff. Tr. 8406, at 17-19.

49. Intervenors urge a finding, with which we agree, that “for Hatfield, all welds for which the original inspector could not be identified were excluded from the program.” Proposed Finding 38A *citing* Ericksen, ff. Tr. 11,045, Table 1, at 1. But then we are requested to conclude that

This may have been a nonconservative bias, since one can reasonably question whether those welds for which there was no adequate record identifying the welder are likely to be of less reliable quality than fully documented welds for which the welder can be identified.

Proposed Finding 38A. Here again the issues have been confusingly blended — perhaps unintentionally. Intervenors have wandered from the reliability of the reinspection program as a validation of inspectors’ qualifications to questioning the use of the results to infer work quality. The identification of the *inspector*, not the *welder*, is the relevant consideration.

50. Approximately 80% of Hatfield’s total inspections performed at Byron (up to the date its revised certification procedures were implemented) were reinspectable. For Hunter, this figure was approximately 70%. Tuetken, ff. Tr. 8408, at 25, 26. Appreciably less than 50% of the inspections performed by PTL prior to the implementation of its revised certification procedures were reinspectable. *Id.* This is because PTL performed mainly concrete and soil inspections, which are not re-creatable. Tuetken, Tr. 8664. It is undisputed that placement of work in either an inaccessible or nonre-creatable category was supported by proper documentation which showed appropriate reasons why a certain inspector’s work could not be reinspected. Hansel, ff. Tr. 8901, at 17; Hansel, Tr. 8982.

51. Finally, some attributes for work to be reinspected were not captured in the BRP. This was the case for two of eleven Hatfield inspection attributes and five of forty-eight Hunter inspection elements. The two Hatfield attributes (cable pan covers and cable pan identification) were

not reinspected because they were not inspected by any inspector sampled in his/her first 90 days. The five Hunter inspection elements not reinspected were not captured because this work had not been initiated before September 1982. Del George, ff. Tr. 8406, at 17, 18.

52. The first 90 days of each selected inspector's work was reinspected. Hansel, ff. Tr. 8901, at 11; Del George, Tr. 8490. Both Edison and the NRC Staff agree that the first 90 days of work is an appropriate period to evaluate to determine inspector qualification. They reason that, if training has been inadequate to produce a qualified inspector, the first 90 days covers the time when an inspector is most likely to make mistakes as a result of that inadequate training. Therefore, in the judgment of CEC and the Staff, a conservative bias was factored into this element of the BRP. Hansel, ff. Tr. 8901, at 11, 12; Hansel, Tr. 8948; Del George, Tr. 8790-91; Little, ff. Tr. 9510, at 5; Little, Tr. 9646. The selection of the first 90 days as the initial period to be sampled was based on the issue of the adequacy of QC inspector certification identified in noncompliance 82-05-19 and was not modeled upon any independent review at other plants because the Staff and Applicant were not specifically aware of other independent reviews focused on the issue of QC inspector qualifications. Little, Tr. 9609-11; Del George, Tr. 8472.

53. Applicant's witness Del George stated that he evaluated the nature of nonreinspectable work but in his prepared testimony he was mistaken in his analysis of what items were and were not reinspected. For example, he reported that piping and component support temporary attachment, piping component inspection and whip restraint component inspection were reinspected. Del George, ff. Tr. 8406, Attachment B at 11 of 14. After Intervenor informed the Applicant of numerous data errors, however, the Applicant stated that portions of these items were nonre-creatable and thus were not reinspected. Ericksen, ff. Tr. 11,045, Amended Attachment B, at 6.

54. The validity of the first 90 days criterion is disputed by Intervenor's witness Dr. Dev. S. Kochhar, a human factors expert from the University of Michigan. He has engaged in research and consultation on how human factors affect the performance of quality control inspectors. According to Dr. Kochhar, inspector performance can be expected to attain its highest proficiency level in the period immediately following completion of training. He testified that in general newly trained inspectors perform better initially because the novelty of the job causes them to be more attentive. As the novelty wears off, sensory stimulation and performance effectiveness decline. This is because of the dull, repetitive

nature of the inspection task. Thus, in Dr. Kochhar's opinion, reinspection of only the first 90 days of inspectors' work is likely to have caused a nonconservative bias in the BRP results. The better course, according to Dr. Kochhar, would have been to reinspect the work of inspectors over the full range of their tenure at Byron. Kochhar, ff. Tr. 10,538, at 7-10.

55. Both Applicant and Intervenor agree that the question presented is whether Dr. Kochhar's testimony persuades us that the first 90 days (as opposed to a longer period) is "appropriate." Applicant's Proposed Finding 43, Intervenor's Proposed Finding 42. Once again, the dual use of the reinspection program must be addressed. Dr. Kochhar readily agreed in his oral testimony that if the purpose of the program is to evaluate the adequacy of the inspector's training, one would reinspect a period of the work prior to the time his job experience might mask any lack of acceptable training. Tr. 10,571. Intervenor, however, remain ambivalent on the issue. They request us to find that:

the BRP would have more accurately examined inspector performance and qualifications if the reinspections had tested inspector performance over an extended range of the work period.

Proposed Finding 48A *citing* Kochhar, ff. Tr. 10,538, at 9-10.

56. They also propose that we find that:

While the selection of this period was understandable for purposes of validating inspector training and pre-employment qualifications, it is nonconservative for purposes of generalizations concerning the levels of inspector performance over time at Byron, and for purposes of any inferences concerning work quality made on the basis of the BRP sample.

Intervenor's Proposed Finding 49A.

57. We agree with the implications of Dr. Kochhar's testimony, that the reinspection program would not fulfill its intended purpose if examining a longer period of inspectors' work produced results less relevant to the adequacy of his initial training. We believe that Intervenor have tacitly conceded this point.

58. In any event, Dr. Kochhar's fall-off theory is irrelevant to the issue pervading our Initial Decision and the proceeding on remand, i.e., whether the reinspection program reliably demonstrated that the inspectors were properly trained and tested and qualified at the beginning of their inspection work. The period of interest for that issue is obviously the first few months of their employment as inspectors.

59. Intervenor would have us accept Dr. Kochhar's testimony as relevant to two other issues. First, aside from the adequacy of training,

the program is not conservative for validating inspector competence over time. Second, it is not valid for any inference concerning the quality of work.

60. Applicant is only partially correct in its reply that the issue of inspector competence over time has never been an issue in the proceeding. It is true that it was never in itself directly in issue. But since we are asked to look at the results of the program as an inference of work quality, inspector performance over time necessarily relates to work quality over time. If, as stated by Dr. Kochhar, inspector competence can be expected to fall off after the 90-day test period, the strength of the inference that work quality during the 6 years of construction captured by the program would be weakened. Therefore we must consider Dr. Kochhar's testimony on its merits where relevant.

61. At the outset, Dr. Kochhar's view that inspectors performing a dull repetitive task might experience a fall-off tendency in accuracy following their initial enthusiasm is probably correct. No party disputes the existence of such a phenomenon. It is a common human experience. The question is, how much and when does proficiency fall off, and are there compensating factors?

62. Dr. Kochhar testified that his experience with inspection activities has been limited, primarily, to assembly-line or batch-manufacturing operations involving a Firestone Tire and Rubber Company assembly-line operation where inspectors inspected three or four major attributes on tires which passed by at a controlled rate. Kochhar, Tr. 10,548. Dr. Kochhar's laboratory experiments involved television monitors on which simulated products moved across the screen at controlled rates. The subject inspectors were required to identify any faults or defects in the products as they moved across the screen. Kochhar, Tr. 10,550. Aside from his review of the BRP, Dr. Kochhar has no experience at all with nuclear plant inspection activities. Kochhar, Tr. 10,547.

63. Evidence was adduced that the duties of the inspectors at Byron might differ significantly from the duties of an assembly-line inspector. Even though the duties of the Byron workers were not carefully analyzed in that context and the issue cannot turn on those differences, we believe that the differences are material. *See* Applicant's Proposed Findings 45-46. But, as we explain in the following paragraphs, the issue turns primarily on the fact that Dr. Kochhar has experience with only very short-term studies, and his extension of the phenomenon to 90 days does not impress us as logical.

64. Dr. Kochhar testified that none of his own experiments lasted more than 2 or 3 hours. Kochhar, Tr. 10,558. He is not aware of any studies which have examined this job performance phenomenon over an

extended period of time, i.e., more than a few days. Kochhar, Tr. 10,558-59. He testified that his predictions concerning long-term job performance are based on a simple analogy to daily performance. Kochhar, Tr. 10,568, 10,592. Yet Dr. Kochhar also testified that, based on what he has read in the literature, it is likely that the predicted downturn in inspector performance would begin after only a couple of days. Kochhar, Tr. 10,562. If true, even according to Dr. Kochhar, any downturn in inspector performance at Byron would have occurred within an inspector's first 90 days and would be reflected in the results. Dr. Kochhar was unable to quantify the effect of the alleged nonconservative bias on the results of the BRP. Nor was he able to say when, if ever, an inspector who was initially performing his tasks competently would become incompetent. Kochhar, Tr. 10,595.

65. As noted above, Dr. Kochhar testified that he applied his theory to long-term inspector performance by superimposing the daily pattern. Tr. 10,568, 10,592. In our view, this application is too speculative to accept.

66. Intervenors concede that performance will not continue to decline indefinitely, that over time a plateau is reached. Proposed Finding 49. Observation of persons performing repetitive, routine, unstimulating tasks over short and long periods of time is not confined to the experimenter's laboratory or to the human factors engineers. It is a very common part of ordinary human activity experienced by most of us. Moreover, Staff and Applicant witnesses, including Messrs. Little and Hansel, have relevant background in supervising and evaluating the performance of inspectors. Little, Tr. 9646-48; Hansel, ff. Tr. 8901, at 2.

67. Our judgment is that the fall-off phenomenon in the type of work at issue in this proceeding would probably take place within no more than a few days, probably within a few hours, and possibly even during on-the-job training before the actual inspections. Moreover, Dr. Kochhar seems to ignore the positive influence of experience. Improvement in performance caused by experience on the job might even cancel out any fall-off effect from boredom. Were this not the case, Dr. Kochhar certainly would have discovered and produced literature to that effect, and it would be a commonly observed phenomenon.

68. In sum, Dr. Kochhar's fall-off thesis is too speculative and, to us, too illogical to accept.

d. Inspector Qualification Acceptance Criteria

69. In order to evaluate the performance, and thus the qualifications, of the original inspectors, it was necessary to establish appropriate acceptance criteria. To facilitate the establishment of such criteria, the

reinspection of QC inspections was divided into two attribute categories: objective and subjective. Hansel, ff. Tr. 8901, at 13; Del George, ff. Tr. 8406, at 19, 20,

70. An attribute is subjective if its inspection requires qualitative interpretation by the inspector. Visual weld examination was the only subjective attribute in the BRP. An attribute was classified as objective if its inspection was not significantly affected by qualitative interpretation. Del George, ff. Tr. 8406, at 19, 20. The types of inspections included in this category, such as dimensions that should not change and verification of materials and shape, are repeatable and require very little exercise of judgment by the inspector. Hansel, ff. Tr. 8901, at 13; Del George, ff. Tr. 8406, at 18, 20. Nonetheless, inspection of objective attributes involves an element of subjective judgment. Kochhar, Tr. 10,542-43.

71. For inspections involving objective attributes, the acceptance level was set at 95%, which means that the reinspector agrees with the original inspector's findings in 95% of the reinspected inspections. Hansel, ff. Tr. 8901, at 13; George, ff. Tr. 8406, at 19, 20.

72. Both Applicant and NRC Staff witnesses testified that the 95% acceptance level for objective attributes was reasonably conservative and recognized that unintentional human error precludes total agreement. Del George, ff. Tr. 8406, at 23; Little, ff. Tr. 9510, at 8. We agree.

73. For inspections involving subjective attributes, the acceptance level was set at 90%. Hansel, ff. Tr. 8901, at 13; Del George, ff. Tr. 8406, at 23-25. The 90% acceptance level for subjective attributes recognized the likelihood for reasonable disagreement between inspectors and reinspectors where judgmental decisionmaking was involved in the inspection. Del George, ff. Tr. 8406, at 24; *see also* Little, Tr. 9560, 9574. As John Hansel testified, the inspection agreement rate on a piece of hardware can range from 20% for a very complex piece to 80% for a very simple piece. Hansel, Tr. 8942. Mr. Hansel ranked visual weld inspections in the 70 to 80% agreement range. Hansel, Tr. 8943.

74. Intervenors challenge Mr. Hansel's testimony because of an asserted failure to distinguish between inspector agreement rates and defect detection rates. Nevertheless Intervenors agree that the 90% subjective attribute rate is acceptable, albeit not demonstrably conservative. Thus we need not resolve the dispute. The 90% agreement rate is acceptable to the Board.

75. If an acceptance criterion was not met for the first 3 months of an inspector's job performance, inspections during the second 3 months of the individual's inspection tenure were reinspected for the attributes for which the inspector failed the acceptance criterion. If the results of the second 3-month period did not meet the acceptance criterion, the

inspector was judged to be unqualified. In this event, 100% of the inspections performed by that inspector of the type found to fail the acceptance criterion were reinspected. In addition, the original inspector sample population for the particular contractor involved was expanded by as much as 50% for the attribute in question, depending on the number of inspectors still available for inclusion in the program. Applicant's selection of inspectors added to the sample was made from an overall list of inspectors certified in the specific area where the unqualified inspector was identified. Del George, ff. Tr. 8406, at 26, 27.

76. If an inspector had no inspections beyond 3 months and did not meet an acceptance criterion, the next inspector certified chronologically was substituted and his first 3 months of work was reinspected. The qualification of the original inspector in such a case was considered indeterminate, but his results were retained in the program data base, and all observed discrepancies were evaluated for design significance. Del George, ff. Tr. 8406, at 27.

77. The Board finds that the mechanisms used to expand the reinspection process in the event that inspectors failed to pass the applicable acceptance criterion were reasonable. Furthermore, we agree it was prudent to include the results of all reinspections in the BRP, including those of the inspectors characterized as indeterminate.

V. IMPLEMENTATION OF THE PROGRAM

a. Meetings with Contractors

78. Implementation of the BRP began in February 1983. At that time Applicant's representatives met with the contractors whose work was to be reinspected. The contractors whose inspectors were the subject of the BRP had no input into the formation of the program. Tuetken, Tr. 8845.

79. The basic instructions given to the contractors were (i) the reinspections were to be conducted employing the acceptance criteria used at the time of the original inspections; (ii) individuals involved in the reinspection of work could not be the same inspectors who performed the original inspection, and (iii) the need for removal of fireproofing, paint and insulation did not render an item inaccessible for purposes of reinspection. Tuetken, ff. Tr. 8408, at 4, 5.

80. As the BRP proceeded, weekly meetings were held between the participating contractors and the CECo project construction department to discuss and resolve questions concerning the ongoing program, establish methods for recording results, and determine action to be taken on

discrepancies observed in the reinspection effort. A series of written interpretations regarding implementation of the BRP were created, as necessary and disseminated to all contractors for their guidance. Tuetken, ff. Tr. 8408, at 5; Shewski, ff. Tr. 8423, at 4. *See* Tuetken, ff. Tr. 8408, Attachment A, at 5.

b. Physical Reinspection Activities

81. Physical reinspection activities began in the middle of March 1983. Tuetken, ff. Tr. 8408, at 6.⁵ The BRP was performed by reinspectors who were properly recertified to ANSI N45.2.6-1978 before commencing reinspections.⁶ Del George, ff. Tr. 8406, at 20, 21; Tuetken, ff. Tr. 8408, at 16, 17. The proper certification of the reinspectors was confirmed on the basis of extensive overview inspections by Applicant's project construction and quality assurance departments and the NRC Staff. Del George, Tr. 8789; Ward, Tr. 9691-92.

82. Reinspections were performed to the same or more stringent criteria than had been used in the original inspection. Del George, ff. Tr. 8406, at 21. If design requirements or inspection criteria had been relaxed subsequent to the initial inspection, acceptability of the work performed by the original inspector was evaluated according to the earlier, stricter criteria. Del George, ff. Tr. 8406, at 20-22. A further conservatism was introduced whenever the reinspectors, having been trained to 1983 standards, were required to apply less stringent earlier criteria. Mr. Tuetken testified that in many cases it was simply not possible to ignore the influence of the current standards. Tuetken, Tr. 8706-07.

83. More than 80,000 man-hours of actual reinspections were performed, and more than 160,000 additional man-hours were spent in

⁵ The Appeal Board noted that the reinspection program only covered inspectors certified up to September 1982 and the recertification program was not completed until early 1983. It therefore questioned whether Applicant had ensured that inspectors certified between those dates were capable of performing their tasks. ALAB-770, *supra*, 19 NRC at 1178-79. To address this concern, Mr. Richard P. Tuetken explained that the reinspection program examined the first 3 months of work performed by inspectors who were certified before the date the revised certification procedures were implemented. The first 3 months of work of at least a small number of inspectors who were certified during the summer of 1982 were included in the BRP and this 3-month period extended beyond September 1982. Tuetken, ff. Tr. 8408, at 18; *see also* Connaughton, ff. Tr. 9510, at 16-17.

⁶ In our Initial Decision, we identified a concern about the number of Hatfield inspectors that required recertification and/or retraining at the inception of the BRP. I.D., 19 NRC at 214, ¶ D-436. In response, Mr. Kevin Connaughton explained that as of September 30, 1982, Hatfield employed 46 inspectors all of whom required additional training, testing, and/or documentation to comply with the new QC inspector certification requirements. Mr. Connaughton also explained that there is no particular significance to the number of Hatfield inspectors requiring recertification inasmuch as they were required to meet new, more prescriptive certification standards irrespective of whether they had previously received adequate testing and on-the-job training and all of them were included in the population considered in the BRP. Connaughton, ff. Tr. 9510, at 18-19.

construction, clerical, and administrative support work related to the BRP. More than 202,000 inspection points were reinspected. Tuetken, ff. Tr. 8408, at 19; Behnke, ff. Tr. 9336, at 14.

84. Each contractor used its own QC inspectors as reinspectors. Del George, ff. Tr. 8406, at 21; Hansel, Tr. 8928. However, steps were taken to ensure that no inspector reinspected his own work. Hansel, ff. Tr. 8901, at 15; Hansel, Tr. 8917. Supervisors assigned work to reinspectors only after verifying that the inspector performing the reinspection was not the original inspector. Tuetken, ff. Tr. 8408, at 20.

85. In most cases, a reinspector knew whose work he was reinspecting. *Id.* at 21. However, a sample audit by Mr. Hansel found no evidence or patterns indicating the presence of a buddy system or any attempt to alter the results. Hansel, ff. Tr. 8901, at 16; Del George, Tr. 8480; *see also* Little, Tr. 9854-57. There was no evidence that reinspectors were concerned and/or influenced by the potential economic consequences to their employer of adverse program results. Hansel, Tr. 8928-33.

86. Independent third-party reviews were conducted by Level III inspectors of all visual weld inspections which were found discrepant. Tuetken, ff. Tr. 8408, at 19, 20. Third-party reviewers examined 3136 weld discrepancies identified by Hatfield reinspectors, and determined that 1150 of these should have been accepted by the reinspectors rather than rejected. The third-party reviewers examined 121 weld discrepancies identified by Hunter and determined that 12 should have been accepted rather than rejected. For PTL the third-party reviewers examined 999 weld discrepancies identified by reinspectors, concluding that 94 should actually have been accepted. These third-party review results confirm that the reinspectors of Hunter, Hatfield, and PTL generally evaluated weld inspections consistently and conservatively. Tuetken, ff. Tr. 8408, at 30. This judgment was confirmed by the NRC Region III Staff. Ward, ff. Tr. 9510, at 10-11; Ward, Tr. 9691-92, 9776; Del George, ff. Tr. 8406, at 25.

87. Mr. Kavin Ward, the Region's welding expert, testified that he found no instance where a reinspector had missed a deficiency. Indeed, in his opinion, in many cases the reinspectors were overly conservative, classifying welds as unacceptable even though they were in fact acceptable under the AWS Code. Ward, Tr. 9774-76; Ward, ff. Tr. 9510, at 10-12; *see also* Little, ff. Tr. 9510, at 14-16. Mr. Ward estimated that re inspections were overly conservative in about 10% of the cases. He based his judgment on having inspected 330 (about 1%) of the more than 31,000 Hatfield-, Hunter-, and PTL-reinspected welds. Ward, Tr. 9868, 9911.

88. To verify the accuracy of the reinspections, Edison directed PTL to perform a special unit concept inspection to determine whether PTL's inspectors would independently arrive at the same results as the contractors' QC inspectors who were performing the reinspections. Tuetken, ff. Tr. 8408, at 19, 20. PTL performed a sample reinspection of the items inspected during the reinspection program. PTL randomly selected QC inspectors and activities for reinspection; PTL inspectors were able to reproduce the reinspection results for Hatfield and Hunter at a very high rate (*see* Shewski, ff. Tr. 8423, at 21) providing an additional level of confidence that the reinspections by Hatfield and Hunter were reliable and conservative (*id.* at 5).

89. The special unit concept inspection also verified that the reinspection personnel for Hatfield and Hunter were not involved in the reinspection of work that they had originally inspected. In addition, the reproducibility of the results by PTL, whose inspection personnel had no connection with Hatfield and Hunter employees, demonstrated that the reinspectors did not bias their results in favor of the inspectors whose work they were reinspecting. Shewski, ff. Tr. 8423, at 22; Tuetken, ff. Tr. 8408, at 21.

90. Intervenors argue that the PTL inspectors do not inspire confidence because PTL had a cumulative average of 85.3% for all its inspectors whose subjective work was reinspected, and 77% for its inspectors who were reinspected in the expanded sample period. These percentages are below the 90% acceptance criterion for subjective attributes. The averages below 90% reflect the results of two inspectors who did not pass the acceptance criteria established under the program. Del George, Tr. 8504. The special unit concept inspection, however, was conducted by five PTL inspectors who were qualified and certified to the requirements of ANSI N45.2.6. Shewski, ff. Tr. 8423, at 20.

91. Dr. Kochhar testified for Intervenors about his general concern that workplace dynamics and social associations can influence the reinspectors' decisionmaking criteria. Kochhar, ff. Tr. 10,538, at 10. He believes that knowledge by the reinspectors of the identities of the original inspectors could have biased the reinspection results nonconservatively, that is, in favor of conforming reinspections. Dr. Kochhar testified that the reinspection effort should have been undertaken by individuals with no previous involvement at the site to minimize any bias. *Id.* at 11. On cross-examination Dr. Kochhar admitted that he could not state whether such knowledge did in fact lead to nonconservative bias in this particular inspection setting. Nor would he even attempt to quantify the amount of bias which may have been introduced. Kochhar, Tr. 10,604-05, 10,612. Even so, for some industries, he believes the bias to

be important. Tr. 10,610. Dr. Kochhar admitted that such bias, even if it were introduced, might just as well have led to stricter reinspection rather than leniency. Kochhar, Tr. 10,605.

92. In many instances the reinspectors simply did not know the inspectors whose work they were reinspecting. For Hatfield, almost the entire population of inspectors had turned over by the time of the BRP. Of the five Hatfield original inspectors who remained, only one was included in the program sample. Hansel, Tr. 8926-27. Dr. Kochhar counters these facts however, by stating that, to him, it is not a question whether the individuals concerned are still on the site, but whether there was any personal association between the inspector and reinspector. Kochhar, Tr. 10,608. For Hunter, only the identification number of the original inspector was provided to the reinspector. Hansel, Tr. 8927. Obviously, a person is much less likely to remember a number than to recognize initials. For PTL, offsite PTL inspectors were brought in to perform the reinspections. Hansel, Tr. 8927.

93. In most instances the reinspectors knew the results of the original inspections. Hansel, Tr. 8933-35; Kochhar, ff. Tr. 10,538, at 12. This is because the reinspection program was set up so that the only inspections which were reinspected were those where the items inspected had been found originally to conform to requirements.⁷

94. Dr. Kochhar testified that this knowledge of the original results introduces another source of possible bias because the results of the original inspections could have resulted in a "mimic" effect where reinspectors conform their results to the original inspection results. Kochhar, ff. Tr. 10,538, at 12. Dr. Kochhar testified that this phenomenon is based on the "general human tendency to avoid deviation from a prior determination." *Id.* Dr. Kochhar further testified, however, that he had never personally observed this phenomenon in any of his laboratory experiments; rather his testimony regarding this theory is based on his review of the literature. Kochhar, Tr. 10,620.

95. We accept Intervenors' argument that in order to have maximum confidence in the validity of the reinspection program, the reinspector should be independent of the original inspector. Proposed Finding 70B. The ideal situation would have been for the reinspectors to have no knowledge of the identity of the original inspector or the results of his inspection. Neither separation was completely possible or practical under the circumstances, however. We do not believe the effect was very large, and in any event, the effect was nullified by other factors.

⁷ The single exception is with respect to "as-builts," where the reinspector was simply asked to measure the dimensions of certain components as built. In these cases, the reinspectors' measurements were compared with the measurements of the original inspectors. Kochhar, Tr. 10,619.

96. Intervenors acknowledge that it would have been difficult to undertake a completely independent reinspection program. Proposed Finding 70B. In our view, not only would it have been difficult, but on any large scale, it would have been counterproductive to bring in a totally independent outside inspection contractor. Familiarity with the job and valuable time would be lost to little advantage.

97. We cannot find from this record that the reinspectors knew the identities of the respective inspectors in very many instances. Even in those cases where they might have known who the original inspector was, there is no evidence, nor do we believe that a reinspector would forsake his duties and endanger his own position simply because he could identify the inspector. Moreover, there is no evidence that there would be any benefit even to the original inspector derived from bias in his favor. However, the Board never understood the need in the first instance to supply the reinspector with the name of the inspector, and in hindsight the appearance of independence would have been enhanced if that information had been deleted. It is not, however, a very important matter.

98. Dr. Kochhar's "mimic effect" theory makes more sense in that there probably would be a tendency for a reinspector to expect to see what the inspector saw. Indeed in more than 90% of the cases overall in the program that is what happened. But as Intervenors acknowledge, it would not be possible to shield the reinspectors from the results of the original inspector because, by program definition, the only inspections which were reinspected were those originally found to conform to the requirements. This factor alone tends to diminish any mimic effect.

99. Intervenors' point is that somehow the mimic effect must be taken into account before reliable conclusions about the program results can be made. Proposed Finding 76. There are other factors which tend to offset any mimic effect.

100. As to the mimic effect, Dr. Kochhar agreed that if the inspectors were very thorough and rigid in their reinspection, the effect would be lessened. Kochhar, Tr. 10,621-22. Such thoroughness and rigidity in fact took place. The Staff testified that weld reinspectors were often overly conservative, even to the point of being "gun shy," in their assessment of earlier inspection results. Ward, Tr. 9776, 9790; *see also* Kochhar, Tr. 10,625.

101. The reinspectors knew their work would receive a great deal of attention. They knew particularly that they themselves might be reinspected, by the NRC Staff, by a CECO auditor or by someone like Mr. Hansel. In Mr. Hansel's judgment, the reinspectors were strongly

motivated to perform their jobs properly, even stringently, not to mimic the results of the earlier inspections. Hansel, Tr. 8938-40.

102. The mimic effect would also be offset by the tendency of inspectors generally to justify their existence by finding discrepancies (Kochhar, Tr. 10,625-26), and the tendency of inspectors to exercise more care when inspecting safety-related equipment. Kochhar, Tr. 10,626.

103. In sum, we have accepted none of Dr. Kochhar's human factors concerns as having a material effect on the validity of the reinspection program.

c. Termination of Allen Koca

104. In our June 8 Order (unpublished) setting forth the scope of the reopened proceedings, we denied Intervenor's request to make the circumstances surrounding the termination of Allen Koca, former Hatfield QA supervisor, a mandatory issue to be addressed. However, Intervenor had been granted the right to discover information concerning Mr. Koca's termination (Tr. 8156-61) and we stated that the parties themselves should determine its relevance, if any, to the BRP. Memorandum and Order Following Prehearing Conference, dated June 8, 1984, at 6. In the interest of a complete record, Edison and the Staff presented undisputed testimony concerning Mr. Koca.

105. Intervenor and the Staff have adopted Applicant's proposed findings on the matter, which we also accept as disposing of it. Proposed Findings 75-79.

VI. OVERSIGHT OF PROGRAM IMPLEMENTATION

a. CEC's QA Audits and Surveillances

106. CEC's quality assurance department conducted three audits and four surveillances of the BRP. Two of the audits dealt with the activities of all site contractors, including Hatfield and Hunter. The third audit involved only Hatfield. Additional surveillances were performed to close out all audit findings and observations. These audits and surveillances were described in detail in the testimony of Walter Shewski. Mr. Shewski testified that all findings, observations or other concerns raised as a result of these audits and surveillances have been closed by Applicant on the basis of acceptable corrective actions. Shewski, ff. Tr. 8423, at 5-20. We discuss the specifics of the audits in the following paragraphs.

107. Audit 6-83-66 was conducted between June 21, 1983, and July 6, 1983, and examined the following areas for each of the seven contractors involved in the BRP:

- Reinspection sample size of inspectors and inspection items.
- Items determined to be inaccessible.
- Third-party review of potentially unacceptable subjective-type inspections.
- Dispositions of nonconforming conditions discovered during the BRP.
- Adequate documentation of the reinspection program as implemented by the contractors.
- Qualifications of inspection personnel performing reinspection.

Audit 6-83-66 resulted in a single finding. Part A of that finding applied to Hunter, Part B to Hatfield and Part C to PTL. *Id.*, Attachment E, at 8.

108. Part A of the audit finding identified two problems with potential consequences on the analysis of the BRP results. The first problem involved the use of field problem sheets by Hunter rather than discrepancy reports. A subsequent quality assurance surveillance (No. 5189) verified that discrepancy reports had in fact been initiated for the particular discrepancies as required by Hunter's procedures. *Id.*, Attachment F, at 9. The second problem involved the reinspection of bolted connections by Hunter. This item was dispositioned by a letter from Sargent & Lundy which stated that the particular torque values would relax over time and thus could not be reproduced for purposes of the reinspection program. *Id.*

109. Part B of the audit finding determined that Hatfield was using field problem sheets to resolve discrepancies identified during reinspection for conduit and termination attributes. A subsequent quality assurance surveillance (5202 R1) determined, however, that all discrepancies identified on field problem sheets during the BRP by Hatfield were included in the results of the BRP and that Hatfield inspectors were instructed not to use field problem sheets in the future. *Id.*, Attachment G. That surveillance also found that Hatfield NCR No. 674 was written to disposition a deficient item discovered during the reinspection of electrical terminations, which had previously been the subject of a field problem sheet prepared by Production personnel. *Id.*, Attachment G, at 10.

110. Part C determined that PTL had not yet transmitted inspection reports generated during the BRP to the appropriate contractors. These inspection reports described discrepant conditions in work performed by other contractors, but inspected by PTL. PTL was working on the premise that reports with nonconforming conditions would be reported to the

contractors upon completion of the BRP. Upon being advised during the audit to immediately transmit nonconforming reports to the appropriate contractors after concurrence by the independent third-party inspector, PTL began and continued transmitting such reports as they were prepared. No further corrective action was required. *Id.*

111. The second audit, 6-83-93, was conducted between November 14 and November 17, 1983, and examined the following areas for each of the seven contractors involved in the BRP:

- Accuracy of BRP results as reported to the NRC in the Interim Report.
- The design basis for the engineering evaluation of visual weld inspection discrepancies as described in the Interim Report.
- Qualifications of the third-party inspectors.
- Documentation of third-party inspections.
- Basis for project construction department "Interpretations" regarding the BRP.
- Correction of deficiencies identified as a result of the BRP.

Id., Attachment N, at 14.

112. Audit 6-83-93 identified no findings or observations applicable to Hatfield or Hunter. It did, however, result in one finding applicable to PTL. Following implementation of a project construction department interpretation of the BRP, PTL had changed the deficient status of some welds which previously had received third-party concurrences on rejectability without allowing the independent third-party inspector to concur or disagree with the changes. Corrective action for this finding involved the resubmittal to the third-party inspector of the particular reports which changed the deficient status of the rejected welds for reasons other than those addressed by the Interpretation. In addition, the contractors were advised that such second inspections should not be performed without allowing the third party to concur or disagree. This corrective action was documented in CECo surveillance 5696. *Id.*, Attachment O, at 15.

113. The third CECo quality assurance audit, 6-83-124, was directed solely at Hatfield and was conducted between August 24 and September 1, 1983. Its purpose was to verify proper implementation of the BRP by Hatfield. The audit examined welding and Hatfield reinspection methodology for welding. Specifically, field and record reviews were performed to determine that Hatfield had adequate traceability of weld travelers to installations in the field. The reviews were accomplished by retrieving weld travelers from Hatfield for a particular component and then going into the field to determine which weld travelers corresponded to which weld on the component. Since welders identify welds on a

component with a unique identification number assigned to them, traceability of weld traveler to weld could be made. In addition, this audit reviewed the method Hatfield used to identify hangers which had been reworked or renumbered so that a reinspection could be performed if required. This was done by reviewing the inspection history of a component to determine the completeness of inspection as well as identification of the most current inspection. Finally, the audit was performed to verify that Hatfield was properly inspecting combination cable pan hanger welds (hangers shared with the HVAC contractor). This was performed through identification of combination hangers, and review of installation and inspection documentation to support the installation. *Id.*, Attachment P, at 16-18.

114. Audit 6-83-124 resulted in two findings. The first finding was that in some cases the weld traveler cards did not adequately identify the weld in the field for inspection. The second finding was that not all combination hanger inspections had been documented to indicate conclusively that the inspection was completed. *Id.* at 18.

115. Hatfield's corrective action for the first finding was to correlate the weld-traveler inspection data to design-drawing cable pan hanger data using computer data base management techniques to demonstrate traceability of inspection. This use of the computerized data base identified the welders and inspectors who worked on and inspected the component as well as components not inspected. For those components for which no correlation existed between component and inspection data, it was assumed that no weld inspection had ever occurred. An inspection was initiated to complete the documentation and any necessary repairs. This corrective action was documented in CECQ QA surveillance 5275. *Id.*, Attachment Q, at 19.

116. Hatfield's corrective action for the second finding involved the identification of all combination hangers for which inspection accountability was indeterminate. The hangers identified were considered as never having been inspected. An inspection was performed and, where required, rework was performed. This corrective action was documented in CECQ surveillance 5274. *Id.*, Attachment R, at 19.

117. The audit finding in Audit 6-83-66 regarding the use of field problem sheets by Hatfield and Hunter was one of the matters discussed in our Initial Decision as indicating continuing documentation problems on the part of Hatfield and Hunter. I.D., 19 NRC at 216, ¶ D-444. In the remanded hearing we had the opportunity to place that audit finding in the context both of the overall evolution of documentation requirements for Hatfield and Hunter and oversight of the BRP by the CECQ Quality Assurance Department. While we do not condone the use of the

field problem sheets we now do not believe that they undermined the reliability of the results of the BRP, and any adverse effects have been corrected. Moreover, CEC's overall quality assurance effort, including the special audit of Hatfield and the special unit concept inspection of the BRP by PTL, adds to our confidence that the program was conducted in accordance with the program description, that there were no alterations of the results and that the reported results are accurate.

b. NRC Staff Overview

118. Staff oversight of the implementation of the BRP has been extensive. Little, ff. Tr. 9510, at 7. In the reinspection area of greatest concern to the Staff because of its subjectivity and difficulty, i.e., visual weld inspections, the Staff examined a significant number of welds covered in the BRP. Little, Tr. 9637. These inspections were conducted principally by Mr. Kevin Ward, a weld inspector with approximately 38 years of experience in welding and/or weld inspection. Ward, ff. Tr. 9510, Professional Qualifications of Kevin Ward, at 10-11. Mr. Ward testified that he and another Staff inspector visually examined and documented approximately 500 welds which had been reinspected in the BRP, of which approximately 330 had been reinspected by Hatfield, Hunter, or PTL inspectors. *Id.*, Enclosure 1 at 37-38, at 10, 18. In addition, Mr. Ward looked at thousands of other welds during the course of his inspections at Byron, but did not document his examination of those welds. Ward, Tr. 9772-73. The Staff inspectors examined the welds to determine that they had in fact been reinspected and that the reinspector had not overlooked a discrepancy. Mr. Ward testified that he also examined the documentation of welds generated by the BRP as well as the documentation generated by the original weld inspection. He also held discussions with supervisors and lead weld inspectors. Ward, ff. Tr. 9510, Enclosures 1, 2, at 10, 11.

119. Mr. Ward testified that during his oversight inspections he found no case of a reinspector missing a deficiency. To the contrary, Mr. Ward concluded that in many cases the reinspection results were overly conservative because reinspectors were classifying welds and attributes as unacceptable even though, in Mr. Ward's judgment, they were in fact acceptable under the applicable welding code. Nor did Mr. Ward find any instance of a reinspection not being conducted correctly. Finally, Mr. Ward found no deficiencies in the documentation generated by the BRP or by the original inspections. *Id.* at 11.

120. For other than welding attributes, Staff oversight of Hatfield and Hunter included the review of inspection reports, nonconformance reports, deficiency reports, and the observation of work activities,

including in-process inspections. Ward, Love, ff. Tr. 9510, Enclosure 3, at 10-12.

121. The Staff also verified Applicant's oversight of the BRP by reviewing audit and surveillance reports and by interviews with CECO personnel. Love, ff. Tr. 9510, at 11, 12.

VII. METHOD OF EVALUATING RESULTS OF BRP

122. The original inspection record and the reinspection record were compared and evaluated to determine whether any discrepancy between the two records existed. Del George, ff. Tr. 8406, at 20, 21.

123. Acceptable items were defined as those for which the reinspector agreed with the condition recorded on the original inspection record. Without that agreement, the item was graded as unacceptable. *Id.* at 21.

124. All observed discrepancies were recorded and tabulated and subsequently compared to the BRP acceptance criteria. These discrepancies were counted against the original inspector whether or not the observed discrepancy was later demonstrated to be a valid discrepancy when compared to current design or installation parameters and tolerances. *Id.* at 22.

VIII. RESULTS OF THE REINSPECTION PROGRAM AS THEY RELATE TO INSPECTOR QUALIFICATION

125. The BRP results for Hatfield, Hunter, and PTL inspectors demonstrated with few exceptions that the sampled inspectors were qualified. All Hatfield, Hunter, and PTL inspectors passed the 95% acceptance criterion for objective attributes during their first 3 months of inspections. *Id.* at 27, 28; *see also* Hansel, ff. Tr. 8901, at 22.

126. For the subjective attribute (visual weld inspection), Hatfield and Hunter each had one inspector whose first 3 months of work failed to meet the 90% acceptance criterion. PTL had three such inspectors. Because the Hatfield and Hunter inspectors, and two of the PTL inspectors had no further work, their qualifications could not be assessed further and under the terms of the BRP were considered indeterminate. The reinspection results for these inspectors were retained in the BRP data base. A substitution was made for each of these inspectors and each substitute's reinspected work was determined to meet program acceptance criteria. Del George, ff. Tr. 8406, at 28.

127. The performance of one PTL inspector did not meet the 90% subjective acceptance criterion for either his first or second 3-month

period. Therefore, all of this inspector's remaining work was reinspected. In addition, PTL was subjected to an inspector-sample expansion which captured the first 3 months of work for visual welding inspection of all remaining inspectors whose work was accessible. Each of the four additional inspectors passed the 90% acceptance criterion. *Id.* at 28; Shewski, ff. Tr. 8423, at 24; Little, ff. Tr. 9510, at 9, 10.

128. The two PTL inspectors who did not meet the 90% criterion in the first 90 days and the one PTL inspector who failed to meet the criterion for both the first and the second 90 days, had the effect of reducing PTL's cumulative average agreement rate in the BRP. The acceptance criteria were not, however, directed at contractor-wide performance and the cumulative results did not cause the Staff to be concerned about the qualifications of PTL as the independent testing agency at Byron. The focus was on individual inspectors, not the company. Connaughton, Tr. 9666-67.

129. Both Edison and the Staff have concluded that the number of inspectors whose work was reinspected, the amount and type of work reinspected, and the requirement for sample expansion provide a valid basis to draw positive conclusions about the qualifications of the overall population of inspectors, and specifically those for Hatfield, Hunter, and PTL. Del George, ff. Tr. 8406, at 29-53; Hansel, ff. Tr. 8901, at 23; Little, ff. Tr. 9510, at 4; Connaughton, Tr. 9876. Based upon the findings of the BRP that a representative sample of QC inspectors had generally performed competently irrespective of any deficiencies in the practices by which they were certified, the Applicant and Staff conclude, and we agree, that there is reasonable assurance of the capability of Hunter, Hatfield, and PTL inspectors whose work was not reinspected. Del George, ff. Tr. 8406, at 33; Little, ff. Tr. 9510, at 4-6. In particular, we conclude that the Applicant has met the requirement we set out in our June 8, 1984 Memorandum and Order at 12-13 that there be a showing that the results of the BRP provide reasonable assurance that PTL's work presents no safety problems.

130. Intervenors would have us reject the foregoing conclusion and substitute findings from the Byron reinspection program report respecting all eight site contractors subject to the reinspection program. Proposed Finding 99 *citing* Applicant's Exh. R-4, Exh. V-2. Were we to do this we would find, for example, that 16% of the inspectors sampled overall did not achieve either 90% on visual weld inspections or 95% on objective attributes. In other words, the numbers for all eight contractors collectively are not as good as the numbers for Hatfield, Hunter, and PTL. We decline to make such a finding. Although the report cited was received into evidence, its use was limited to issues within the scope of

the remanded proceeding. In particular, only those portions actually referred to by witnesses could be used as a basis for proposed findings, thus our decision. Tr. 11,146. Intervenors have not complied with the spirit of our ruling. We emphasize however that, by excluding those portions of the report beyond the scope of the hearing, we are not making a ritualistic evidentiary or procedural exclusion. The data offered by Intervenors do not have probative value for the purposes of the remanded proceeding. The data have never been probed or explained and are therefore meaningless. We can no more impose upon Applicant conclusions from the summary result of the five contractors whose activities are beyond the scope of the hearing, than we could impose upon Intervenors the summary and favorable results for Hatfield, Hunter, and PTL. It took 14 days of hearing and weeks of evaluation to determine the meaning of the results respecting the three contractors in issue.

131. The fact that certain inspections were inaccessible or not re-creatable does not affect the conclusions, since, as Mr. Del George pointed out, the qualification and certification programs for inaccessible and nonre-creatable attributes were the same as those verified by the BRP. Del George, ff. Tr. 8406, at 22. Hatfield and Hunter QC inspectors were selected and trained in the same manner regardless of the types of inspections they were to perform. Buchanan, ff. Tr. 11,174, at 3, 4; Somsag, ff. Tr. 11,172, at 2-5. The requirements imposed for prior experience, job training, and performance demonstration have the same general scope and technical content for each of these attributes. In addition, the attributes not reinspected are similar in many respects to those captured for reinspection. Del George, ff. Tr. 8406, at 33-35; Muffett, ff. Tr. 9510, at 21-23. Although the BRP reveals less about non-reinspectable PTL attributes than it does about Hatfield and Hunter attributes, additional assurance as to the quality of the PTL inspections is provided by the fact that, throughout the construction of the plant, presently nonreinspectable items inspected by PTL had been audited by CECco and inspected by the Staff, resulting in no discovery of significant problems. Muffett, ff. Tr. 9510, at 22-23; Muffett, Tr. 9870-71.

132. Before arriving at a favorable conclusion on the results of the BRP, the Board very carefully considered whether the Staff's endorsement of the program left room for doubts about its adequacy. The Staff's inability to provide assurance that the program would be effective played an important part in the decision denying the Byron operating license. *E.g.*, I.D., 19 NRC at 206-09. We were consequently very attentive to apparent differences in views of the Staff members.

133. Mr. Forney was the Bryon Senior Resident Inspector and was the initiator of the 82-05-19 noncompliance citation. He testified in

August 1983 that the purpose of the program was to determine whether the contractors used qualified inspectors. Tr. 7991.

134. At the hearing on remand, Mr. Little of the Region III Staff testified that:

The NRC staff believes that the results of the reinspection program provide adequate confidence in the capability of the Hatfield, Hunter and PTL quality control inspectors whose work was not reinspected, and provides additional assurance to support the Region III staff's position that the overall quality of the work of these contractors is acceptable. However, it should be noted that the Region III staff believed at the time of the Program's inception and believes today that the primary purpose of the reinspection program was to determine whether quality control inspectors who may not have been properly certified prior to September, 1982 had overlooked significant safety-related hardware deficiencies in their inspections.

Little, ff. Tr. 9510, at 4.

135. Mr. Forney, however, apparently had a somewhat different view of the purpose and significance of the program, and the Staff appropriately submitted his affidavit to that effect. Referring to the above-cited Region III testimony by Mr. Little, Mr. Forney stated:

8. I reviewed staff testimony on the reinspection program as it was under development, and provided comments where I considered the testimony to require modification or clarification. The comments which I provided were resolved to my satisfaction except for the conclusion(s) which may be drawn regarding the "capability" or qualification of a particular inspector(s). . . .
9. In my view, while the reinspection program was not intended to, and did not directly determine whether CECO contractors at Byron always used qualified inspectors, it provided a good basis to evaluate whether inspectors had overlooked significant safety-related deficiencies. I agree with the staff position to this effect. . . .
10. In conclusion, I agree that the reinspection program achieved the purpose I understood it to have, namely, to determine whether prior to September 1982 inspectors overlooked significant safety related hardware problems.

Forney Affidavit, ff. Tr. 10,040.

136. Neither the Board nor the parties understood the exact meaning of Mr. Forney's affidavit. We deemed the matter to be important, so Mr. Little and Mr. Forney, joined by Mr. Hayes and Mr. Connaughton, appeared as a panel. Ff. Tr. 10,037. Thus, we had before us the Staff members best able to express the Staff's view of the purposes and significance of the reinspection program and they were examined extensively by the Board and the parties.

137. Based in part upon statements by Mr. Forney, Intervenor's argue, contrary to our conclusion above, that we are unable to find that

the reinspection program provides reasonable assurance that the Hatfield, Hunter, and PTL inspectors are qualified. Intervenor's Proposed Findings 99, 104.

138. Mr. Forney did not fully clarify why he explained the purpose of the program differently in August 1983 than in August 1984. This is not especially significant, however, because at the earlier hearing his rather spontaneous answer to a Board question does not seem to be intended to define the limitations and strengths of the program in the detail of his later testimony. Tr. 7991. Of greater importance are the specifics of his view of the program. He believes that the program cannot demonstrate that, across the board, all inspectors are qualified. Tr. 10,042. But, consistent with his affidavit, he states that the primary purpose was to determine whether inspectors, possibly not properly certified, had overlooked significant hardware deficiencies. Tr. 10,042-43. Because the quality of the work at Byron is good, according to Mr. Forney, it might not challenge the competence of the inspectors. Tr. 10,063. Other capability demonstrations would be required to conclusively determine that inspectors are capable. Tr. 10,063-68. The program was never intended to tell "the full abilities of the inspectors." Tr. 10,084. As to inferences of work quality from the program, Mr. Forney stated that an inspector does not have to be a very good one to find a significant safety-related hardware problem. Tr. 10,088-89.

139. The general tenor of Mr. Forney's testimony, in our view, is that the reinspection program was not designed to nor is it capable of determining whether the inspectors met all of the exact requirements of the ANSI N45.2.6 certification standard. We agree. The program would not be the equivalent of the formal testing, documented on-the-job training and experience requirements in making the exact ANSI determinations. The recertification program resolved those aspects of the problem for later inspections. But, as he stated on several occasions, the program could and did determine whether the inspectors were capable of finding significant safety-related hardware problems. He also stated on several occasions that his differences with the Region III position were "miniscule." *E.g.*, Tr. 10,069. We are satisfied that Mr. Forney's reluctance to overstate the inferences to be drawn from the program does not mask a weakness in it nor does it indicate an important difference with the rest of the Region III Staff.

140. We have previously found that the sample selection process for inspectors whose work was to be reinspected was appropriate; that the choice of the first 90 days of an inspector's tenure on the site was a proper time period for checking the validity of an inspector's training and initial qualification; the acceptance criteria for establishing whether

an inspector was qualified, based on the results of the reinspection, are appropriate and conservative; the results of the BRP are accurate and reliable; and there was extensive oversight of the entire BRP by CEC's QA department and the NRC Regional Staff. Based on the results of the BRP, the Board finds that Applicant has provided reasonable assurance that the Hatfield, Hunter, and PTL inspectors who performed inspections at Byron, beginning with the construction of safety-related work in 1976 and extending through September 1982, were qualified, even though their certifications were not in strict accordance with ANSI N45.2.6-1978.

IX. SARGENT & LUNDY DISCREPANCY EVALUATIONS

141. Applicant presented testimony on the engineering evaluation of discrepancies performed by Sargent & Lundy consisting of a panel comprised of John M. McLaughlin, Partner and Manager of the Structural Department at Sargent & Lundy; Ernest B. Branch, Associate and Director of Mechanical Design at Sargent & Lundy; Richard X. French, Partner and Manager of the Electrical Department at Sargent & Lundy; and Anand K. Singh, Associate and Assistant Head of the Structural Analytical Division at Sargent & Lundy. The NRC Staff presented the testimony of William Little, Branch Chief in the Division of Reactor Safety, NRC Region III; Kavin D. Ward, Ray Love and James Muffett, Reactor Inspectors in the Division of Reactor Safety, NRC Region III; and Kevin Connaughton, Resident Inspector at Byron. Intervenors presented the testimony of Charles C. Stokes, an engineering consultant with P/S Associates. In response to questions raised by Mr. Stokes relating to Sargent & Lundy's engineering evaluation of discrepancies, Applicant presented the rebuttal testimony of Bryan A. Erler, Associate and Director of the Structural Division at Sargent & Lundy; Robert W. Hooks, Assistant Division Head of the Structural Engineering Division at Sargent & Lundy; Dennis DeMoss, Mechanical Project Engineer in the Project Management Division at Sargent & Lundy; and Ernest B. Branch, who was part of the original panel.

142. Sargent & Lundy performed an engineering evaluation of discrepancies in work performed by Hatfield involving hardware installation and work performed by Hunter involving hardware installation and related documentation, which were categorized as objective attributes. A total of 63,085 reinspections of Hatfield objective attributes was performed as part of the reinspection program, out of which 2153 discrepancies were identified. Another 3896 reinspections of Hatfield objective attributes were performed under a supplemental reinspection program and

158 discrepancies were identified. A total of 71,510 reinspections of Hunter objective attributes was performed under the reinspection program, out of which 689 discrepancies were identified. French, ff. Tr. 9044, at 4, 6, 12; Branch, ff. Tr. 9051, at 5-7. As we will explain below, 1244 of the Hatfield discrepancies and 614 of the Hunter discrepancies were determined upon evaluation either not to exceed design parameters or tolerances or to involve inconsequential documentation items and were, therefore, not valid discrepancies, as that term was used by CECO in the reinspection program.

143. Sargent & Lundy also performed an engineering evaluation of visual weld discrepancies on welds produced by Hatfield covered by the American Welding Society (AWS) standard and welds produced by Hunter covered by AWS and the American Society of Mechanical Engineers (ASME) Code. The ASME Code governs welding for piping and pressure vessels and the AWS Code governs all other welding. A total of 27,538 Hatfield AWS welds were subjected to reinspection during the original program, out of which 1986 discrepancies were identified. A total of 3725 Hunter welds were reinspected (27% AWS welds, 73% ASME welds), out of which 109 discrepancies were identified, 60 AWS and 49 ASME. McLaughlin, ff. Tr. 9047, at 3-5, 7, 14; Branch, ff. Tr. 9051, at 6, 10-11.

a. Objective Attributes — Hatfield Discrepancies

144. Hatfield installed all the components, materials and equipment associated with the electrical systems at Byron, including the installation of electrical equipment, cable tray and conduit and the pulling and terminating of cable. Hatfield also installed concrete expansion anchors that were initially inspected and reinspected by PTL. This work was divided into the following objective attributes for reinspection: conduit installation, cable termination, cable-tray and cable-tray hanger installation, equipment modification, conduit as-built reconciliation, A-325 bolting, and concrete expansion anchors. (Visual weld inspection, discussed *infra*, was separately characterized as a subjective Hatfield attribute.) French, ff. Tr. 9044, at 5; Summary of Objective Discrepancy Evaluation — Hatfield, ff. Tr. 9239.

145. The 63,085 reinspections of Hatfield objective attributes performed as part of the reinspection program included 2840 reinspections of concrete expansion anchors inspected by PTL.⁸ Of the 2153 discrepancies identified, 38 were associated with concrete expansion anchors.

⁸ As indicated *supra*, PTL only provided inspection services; it did not perform any construction work at the Byron site.

Most of the discrepancies were associated with conduit as-built reconciliation. These discrepancies consisted primarily of differences between the installed locations of conduit, conduit supports and junction boxes and the locations shown on the installation drawings. French, ff. Tr. 9044, at 6-8.

146. For the 2153 observed discrepancies, 1713 evaluations were performed. The number of evaluations was less than the total number of discrepancies because some evaluations covered more than one discrepancy. The discrepancies were first compared with current design parameters and tolerances. This involved a comparison of installed component locations and dimensions with the corresponding locations, dimensions, and tolerances shown on the design drawings. The discrepancies found to be outside of design tolerances were evaluated either by engineering judgment or by engineering calculations. French, ff. Tr. 9044, at 6.

147. Engineering judgment evaluations were performed in two ways, by either a review of the component design function to determine whether the function of the component was affected by the discrepancy, or a comparison of the discrepancy to the current design to determine whether the discrepancy had design significance. Engineering calculations were used to resolve the remaining discrepancies. *Id.*

148. Of the total of 1713 evaluations of discrepant conditions, 1244 found the discrepancies to be within current design parameters and tolerances. Applicant concludes that the reason the reinspectors identified these as discrepancies was that the acceptance tolerances established for the reinspection program were more stringent than the tolerances indicated on the installation drawings and used by the original inspectors. *Id.* at 7. Intervenors appear to accept the point that the reinspection criteria were more stringent but continue to argue that uncertainty exists as to how many of the discrepancies should have been detected by original inspectors based on their instructions at that time. Applicant counters, and we agree, that none of the discrepancies covered by the 1244 evaluations should have been detected by the original inspectors because the "discrepant" condition did not exist at the time of the original inspection.

149. Eighty evaluations of discrepancies were deemed acceptable by engineering judgment. Approximately two-thirds of these evaluations involved a review of the component design function to determine whether the function was impaired by the existence of the discrepancy. None of these discrepancies impaired component design function. The balance of these evaluations involved a comparison of the discrepancy to current design requirements to determine significance. None of the discrepancies was significant. *Id.*

150. The remaining 389 evaluations were conducted by reviewing the conduit support, junction box loading, and mounting detail design calculations. The variations in support locations and associated variations in loads were found to be acceptable. *Id.* at 7-8.

151. The detailed engineering evaluation of the discrepancies in Hatfield objective attributes demonstrated that none of the evaluated discrepancies had design significance and, therefore, they had no safety significance. *Id.* at 8.

152. A supplemental program was established for the reinspection of certain Hatfield attributes, namely, equipment setting, equipment modification, A-325 bolt installation and conduit-support bolting. This program was established to provide further assurance that work in these areas was properly done and to complete the data base for attributes where the reinspection program samples were too small to permit meaningful reliability calculations. *Id.* at 9. Intervenors argue that the supplemental reinspection program was established because of shortcomings in the original BRP which were identified by the NRC Staff and others. Applicant correctly states that the supplemental program was initiated to provide further information requested by the Region III Staff and was not encompassed by the requirements of the original reinspection program. Tuetken, ff. Tr. 8408, at 31.

153. With respect to equipment setting, 778 inspections associated with 50 pieces of electrical equipment identified 34 discrepancies. The majority of the discrepancies consisted of equipment anchoring details with weld length and weld spacing deviations. An evaluation of the discrepancies determined that none had design significance. French, ff. Tr. 9044, at 9. With respect to equipment modification, a 100% wiring inspection performed on 1850 elements associated with 50 pieces of safety-related equipment identified 44 discrepancies. The discrepancies were minor wiring variations that did not affect the functioning of the equipment. An evaluation of the discrepancies determined that none had design significance. *Id.* at 10. With respect to A-325 bolting, which was used in the assembly of cable-tray riser supports, inspection of 295 bolts on 50 supports identified 46 discrepancies. The discrepancies were represented by bolts with torque less than the acceptance criteria. The design of the associated connections was reviewed and it was determined that the connections were structurally sound despite the lack of complete bolt torque. Therefore, the discrepancies were determined to have no design significance. In any event, all A-325 bolted connections were retorqued because of the unsatisfactory discrepancy rate. *Id.* at 10-11; French, Tr. 9232-34.

154. With respect to the supplemental reinspection of conduit-support bolting, inspection of 1008 conduit-support bolts on 305 supports identified 34 discrepancies. The discrepancies were evaluated and determined to have no design significance. French, ff. Tr. 9044, at 11. However, two missing conduit clamps were detected during the inspection and, because a missing clamp at a critical location could have design significance, a walkdown was performed of all 8532 critical clamp locations. Ten locations were found with missing bolts or clamps. Based on these results, a walkdown of the remaining accessible conduit clamps and bolts was conducted. An evaluation of the ten cases showed that the discrepant conditions had no design significance. The last of these evaluations to be completed involved a missing clamp on a 6- or 7-foot run of conduit in a hard-to-reach location. Due to the presence of another conduit and a large piece of steel in the area, even without the clamp, the conduit could only move a fraction of an inch. Sargent & Lundy's evaluation demonstrated that the conduit could not be pulled out during a seismic event and that there was no design significance. French, ff. Tr. 9044, at 11-12; French, Tr. 9282-85.⁹

155. Including the supplemental reinspections discussed in ¶¶ 152-154, 66,981 reinspections of Hatfield objective discrepancies were performed. Although 2311 discrepancies were identified, none of the evaluated discrepancies had design significance. French, ff. Tr. 9044, at 12. Accordingly, the quality of the foregoing reinspected Hatfield work is adequate. *Id.*; French, Tr. 9273-74.

b. Objective Attributes — Hunter Discrepancies

156. Hunter was responsible for the installation of nearly all the mechanical systems at Byron. This work included installation of mechanical equipment and interconnective process piping and supports, and the

⁹ The design significance of another discrepancy was debated during the cross-examination of the Region III Staff Panel. Tr. 9732-47. This discrepancy involved the miswiring of a damper that without correction would not have closed automatically under certain accident conditions. However, it was established that the discrepancy lacked significance since operation of the damper on a manual basis, an acceptable alternative to automatic operation, was not impaired. Moreover, although the discrepancy had been missed by the original inspector, by the time of the BRP, it had already been discovered and repaired during system turnover testing. Intervenor's disagree with Applicant's and Staff's position as to the significance of this discrepancy and cite as their basis "the history of manual operations in operating plants such as TMI and the imperfect nature of any testing system." Applicant contends that even with the apparent error of the original inspector, the finding and correction of the faulty wiring termination even prior to the preoperational testing phase is indicative of the in-depth mechanisms of the Byron Program to assure work quality and safety. The NRC Staff expressed the highest degree of confidence that had the faulty connection not been discovered during the construction phase, it would have been caught in preoperational testing (Connaughton, Tr. 9743), or in the highly unlikely circumstance that the discrepancy was undetected in the preoperational phase it would have been caught in the surveillance testing program conducted throughout the life of the plant. Little, Tr. 9743.

supply of miscellaneous piping and welding materials. As noted *supra*, the Hunter work fell into three attributes: hardware installation, related documentation, characterized as objective attributes, and welding, characterized as a subjective attribute. Each objective attribute consisted of a number of elements. For example, the documentation attribute was subdivided into such inspection points as work process sheets, weld material regulation sheets, field inspection reports and discrepancy reports. Branch, ff. Tr. 9051, at 5-6; Summary of Objective Discrepancy Evaluation — Hunter, ff. Tr. 9265.

157. A total of 69,624 reinspections of Hunter objective attributes was performed as part of the reinspection program. Another 1886 Hunter installations of concrete expansion anchors were inspected by PTL. Thus, there were 71,510 total reinspections of Hunter objective attributes. Of this amount, a total of 689 discrepancies was reported. The 689 discrepancies involved 441 documentation and 248 hardware discrepancies. Five of these discrepancies were associated with concrete expansion anchors inspected by PTL. Branch, ff. Tr. 9051, at 6-7.

158. Sargent & Lundy evaluated all 689 discrepancies. The evaluations were performed by the same procedure as described for the discrepancies associated with the Hatfield objective attributes. *Id.* at 7-9. A total of 614 discrepancies in Hunter objective attributes was evaluated by comparison to the design parameters and tolerances. This included all 441 documentation discrepancies and 173 hardware discrepancies. Discrepancies evaluated typically included cosmetic flaws, minor dimensional errors, and documentation errors. The dimensional errors consisted primarily of minor as-built piping and pipe support dimensional errors or incomplete as-built information. Documentation errors consisted primarily of minor data-entry errors and omissions on work reports and process sheets. These discrepancies were evaluated by reviewing corroborating information on the affected documents and other independent documents. The evaluation showed that all hardware discrepancies were within the current design parameters and tolerances. All documentation discrepancies were deemed acceptable based upon reviewing other corroborating documentation. *Id.* at 8. Again, this class of discrepancies, like similar ones for Hatfield, contains discrepancies which are either inconsequential or in conformance with current design requirements, and as such they were not considered valid discrepancies.

159. A total of fifty-four hardware discrepancies was evaluated by engineering judgment. Discrepancies evaluated included dimensional errors and omissions for piping, pipe supports and pipe-whip restraints; hardware substitutions; minor configuration changes; and minor me-

chanical joint bolting deviations. None of these discrepancies impaired component design functions or had design significance. *Id.* at 8.

160. A total of twenty-one hardware discrepancies was evaluated using detailed engineering calculations. Discrepancies evaluated included three as-built pipe support dimensions, four concrete expansion anchors, three pipe-whip restraints, and eleven small-bore pipe bends with excessive ovality. These elements were originally established by engineering calculation, and a new calculation was necessary in order to account for the identified discrepancy. For example, with respect to pipe ovality, which is a measure of the pipe roundness at the point of bending, the eleven pipe bends exhibited average ovality values of 10.5%, which is in excess of the 8% limit of ASME, Boiler and Pressure Vessel Code — § III, Nuclear Power Plant Components — Division I (1974 Ed., Summer 1975 Addenda). Accordingly, calculations were performed verifying the acceptability of the pipe wall thickness and flow area reductions allowed by the ASME Code. Stress intensification effects were evaluated as negligible because all of the pipe bends are at least five pipe diameters in radius. *Id.* at 9.

161. The detailed engineering evaluation of the 689 discrepancies in Hunter objective attributes demonstrated that none of the discrepancies had any design significance and, hence, no safety significance. *Id.* at 10. Accordingly, the quality of the foregoing reinspected Hunter work is adequate. *Id.* at 14; Branch, Tr. 9277-78.

162. The Board finds that, based upon the Sargent & Lundy evaluations of discrepancies in the Hatfield and Hunter objective attributes, none of the discrepancies had design significance and, accordingly, they had no safety significance. With the exception of the miswired damper discussed above, Intervenor agree. Proposed Finding 126.

c. Subjective Attribute AWS Welding — Hatfield Discrepancies

163. The Hatfield AWS welding covered by the reinspection program included the welding of conduit supports, junction-box supports, cable-tray supports, cable-tray holddown welds, and auxiliary steel for electrical supports. McLaughlin, ff. Tr. 9047, at 5.

164. Of the 27,538 AWS Hatfield welds that were subjected to reinspection during the original program, 1986 welds were identified with various discrepant conditions. A total of 169 welds was taken from this group for analysis by Sargent & Lundy. An additional 187 discrepant welds were included as a part of the sample to be analyzed by Sargent & Lundy when, in response to NRC questions, additional inspections were made of welds not initially covered by the reinspection program. Thus, a

total sample of 356 Hatfield discrepant welds was analyzed by Sargent & Lundy. McLaughlin, ff. Tr. 9047, at 7.

165. Of the 356 Hatfield weld discrepancies analyzed by Sargent & Lundy, 50 were selected at random, 50 were selected by a third-party inspector and were identified as the worst discrepant welds. An additional sixty-nine welds were selected on the basis of being highly stressed. The remaining 187 highly stressed welds were included in the sample in response to NRC questions. *Id.* at 7-8, 17. Thus, the sample of 356 Hatfield weld discrepancies analyzed by Sargent & Lundy were biased to examine a sampling of the most highly stressed welds in the reinspection program, where the greatest potential existed for exceeding design margins. *Id.* at 8, 16-17.

166. A review of weld maps for the 356 discrepant Hatfield welds indicated that five of the discrepant welds involved arc strikes, spatter and convexity. Arc strikes and spatter are cosmetic discrepancies which would create a strength problem only if there were a large number in a given weld. The weld maps indicated that arc strikes and spatter were minimal. Convexity is of no consequence when, as in this case, the welds on the structures under consideration are not subject to fatigue loading. Thus, these five weld discrepancies do not reduce the load-carrying capacity of the weld and, therefore, have no structural impact. *Id.* at 10.

167. A detailed engineering evaluation based on the weld maps was conducted with respect to the remaining 351 discrepant welds to determine (i) the effect of the discrepancy on the strength of the weld and (ii) because the discrepant welds were among the several welds joining steel members and components, the effect of strength reductions on these joints or connections. Of the 351 discrepant Hatfield welds, 165 had strength reductions ranging from 10 to 100%. Irrespective of the actual strength reduction, the discrepant portion of the weld was entirely disregarded for evaluation purposes. Three welds had cracks. In the case of welds with cracks, no credit (100% strength reduction) was given in the evaluation for the presence of the weld. *Id.* at 9-11; McLaughlin, Tr. 9161-63.

168. After the weld strength reductions were determined, an evaluation of the ability of the connection to withstand the expected loads or forces was performed. The forces on the connections are made up of two major loadings. The first is the deadweight or static load of the cables and the tray. The second is the seismic load on the connection. With respect to the static load, Sargent & Lundy reviewed the cable loadings to confirm that the loads on the cables were less than that assumed in the original design. Because maximum or bounding loads were used in the

original design of the cable tray and conduit system, the actual loads are expected to be less than design loads. In each case, where Sargent & Lundy calculated the actual load, it found that load to be less than the original design load. McLaughlin, ff. Tr. 9047, at 11-12. The neighboring welds to one of the three cracks, which involved a cable-tray hold-down weld, bore a slight additional load (still within the Code allowable) as a result of the crack. These welds were inspected by Sargent & Lundy. The inspection revealed that none of the neighboring welds was discrepant. Erler, ff. Tr. 11,158, at 5-6. Intervenors argue that the evaluation of the ability of the neighboring welds to withstand the expected loads was a theoretical evaluation, because the neighboring welds were not reinspected for discrepancies unless they happened to be captured in the reinspection program. McLaughlin, Tr. 9155-56. Applicant counters that when a discrepant weld was identified during the reinspection program, the "inspection activity" was expanded to include all welds on the connection containing the discrepant weld(s). See Applicant's Reply Finding 132A.

169. Intervenors' point is well taken. The "inspection activity" apparently consisted of checking the reinspection program discrepancy reports to determine if there were discrepancy reports in the other welds to which the load would be transferred. McLaughlin, Tr. 9155. However, to do differently and expand the sample to all welds on a connection when a discrepancy was found, regardless of the original inspector, would be a drastic departure from the planned approach of the reinspection program. It would likely produce results not conducive to conclusions about inspector qualifications, but would lend itself better to conclusions as to work quality. The reinspection program was primarily for the former and accordingly, as Intervenors point out, Sargent & Lundy evaluators had knowledge of discrepancies only for welds included in the reinspection program and assumed nondiscrepant conditions on other welds in their analysis. The exception to this procedure was Mr. Kenneth T. Kostal's evaluation of SCC discrepant welds where all connections and their welds were inspected in instances where Mr. Kostal insisted on establishing the existence of redundant load paths. Kostal, Tr. 10,234-38. Applicant contends, and we agree, this activity was unnecessary but it was ordered by Mr. Kostal because of his desire to answer any conceivable question during cross-examination. Kostal, Tr. 10,238-40.

170. Sargent & Lundy next reexamined the seismic loading and performed a seismic analysis representative of the Byron site, which reduced the load from that determined initially. The seismic loading used in the original design of the cable tray and conduit system was based on a response spectra design method, a very conservative design method used

in the nuclear industry. The reevaluation of the seismic loading on connections was based on a time-history seismic analysis, which, as indicated, is a more refined and accurate determination of the seismic loading. McLaughlin, ff. Tr. 9047, at 11-12.

171. Due to the recurring nature of two types of discrepancies, an additional investigation was performed by Sargent & Lundy to determine their significance. The first recurring discrepancy involved a fit-up gap between the horizontal and vertical cable-tray members. Strength tests performed by Sargent & Lundy demonstrated that, even though the AWS Code required that the capability assigned to this connection be reduced, there was no actual reduction in the joint capacity. The second recurring discrepancy involved the use of a partial penetration weld rather than a fillet weld as called for in the design. Laboratory testing by Sargent & Lundy demonstrated that the as-built partial penetration weld had less than a 10% reduction in capacity when compared to the original design. *Id.* at 12-14.

172. The detailed evaluations described above were conducted on all 356 discrepant Hatfield welds. The results of these evaluations demonstrated that none of the discrepancies exceeded design margin and, accordingly, none had design or safety significance. Accordingly, the quality of this reinspected work is adequate. *Id.* at 12. Intervenor agrees. Proposed Finding 135.

d. Subjective Attribute AWS and ASME Welding — Hunter Discrepancies

173. The Hunter AWS welding covered by the reinspection program included pipe supports and pipe restraints. McLaughlin, ff. Tr. 9047, at 6. The Hunter ASME welding covered by the reinspection program included large-bore butt welds, socket and fillet welds, NF support welds, and pipe penetrations and reinforcing saddles. Branch, ff. Tr. 9051, at 11. Of the 3725 welds produced by Hunter that were reinspected (27% AWS welds, 73% ASME welds), 109 discrepant welds were observed. One hundred percent of these 109 discrepant welds were evaluated by Sargent & Lundy. As noted above, this included sixty AWS welds and forty-nine ASME welds. McLaughlin, ff. Tr. 9047, at 5, 14; Branch, ff. Tr. 9051, at 6, 10-11.

174. The sixty discrepant Hunter AWS welds were evaluated by the same procedure as described for the Hatfield discrepancies. Nineteen of the welds fell into the no-structural-impact category encompassing arc strikes, weld spatter and convexity, which do not reduce the load-carrying capacity of the weld. Eighteen of the welds had a capacity reduction

of less than 10%. The remaining twenty-three welds had a capacity reduction of 10% or more. McLaughlin, ff. Tr. 9047, at 14-15.

175. The detailed engineering evaluation of the sixty discrepant Hunter AWS welds indicated that none of the discrepancies exceeded design margin and, accordingly, none had design or safety significance. Accordingly, the quality of this reinspected work is adequate. McLaughlin, ff. Tr. 9047, at 15.

176. The forty-nine discrepant Hunter ASME welds were evaluated to ASME § III Code design criteria using three methods to determine whether the Code was met and whether the discrepant welds had design significance. The initial method involved comparing the weld discrepancy with the current design parameters and tolerances and with the ASME Code to determine if it was acceptable on that basis. For example, in some cases, such as with surface porosity, the visual welding reinspection criteria were overly stringent and exceeded Code acceptance criteria. These reported discrepancies were determined to meet the Code design criteria and were, therefore, judged to be acceptable. If it was not possible to disposition a discrepancy using the first approach, the second method involved evaluation by engineering judgment based on a comparison of the effect of a weld discrepancy to design margins or the component design function. The final method of resolution of the weld discrepancy was an evaluation by detailed engineering calculation. Branch, ff. Tr. 9051, at 11-12.

177. Three discrepancies were reported involving large-bore piping butt welds. Two were within current design parameters and tolerances. The third was compared to design margins and determined to be acceptable by engineering judgment. *Id.* at 12.

178. A total of thirty discrepancies involving socket and fillet welds was reported. Three were within current design parameters and tolerances; four were compared to design margins and determined to be acceptable by engineering judgment; and twenty-three were evaluated by engineering calculation and met ASME Code design criteria. The majority of the calculations involved a simple arithmetic computation of the Code-required fillet weld size. *Id.* at 13.

179. A total of fourteen discrepancies involving NF support welds was reported. One was within current design parameters and tolerances and thirteen were reviewed by calculation and met ASME Code design criteria. The majority of the calculations involved recalculating the designed weld with consideration of the discrepancy accounted for. All welds were found to meet ASME Code design criteria. *Id.* at 13.

180. A total of two discrepancies involving welds with pipe penetration and reinforcing saddles was reported. Both were reviewed by engi-

neering calculation and found to meet ASME Code design criteria. Both welds were compared to actual design requirements and neither of the discrepancies was determined to have design significance. *Id.* at 13-14.

181. All forty-nine ASME-discrepant welds met ASME Code design criteria. The Sargent & Lundy evaluations of the Hunter ASME weld discrepancies demonstrate that, as was true with respect to the Hunter AWS weld discrepancies, as well as the Hatfield weld discrepancies, none of the discrepancies had design significance and, hence, they had no safety significance. Accordingly, the quality of this reinspected work is adequate. *Id.* at 14.

182. The Board finds that, based upon the Sargent & Lundy evaluations of the Hatfield AWS-discrepant welds and the Hunter AWS- and ASME-discrepant welds, none of the discrepancies had design significance and, accordingly, they had no safety significance. Intervenor agree. Proposed Finding 150.

e. Matters Raised by Intervenor's Witness, Mr. Stokes

183. Intervenor's engineering expert, Mr. Stokes, raised several concerns about Sargent & Lundy's evaluation methodologies and practices. These concerns were thoroughly addressed by Applicant's rebuttal witnesses to the satisfaction of the Board and, for the most part, Intervenor. As has been their practice throughout the remanded hearing, Intervenor have not pursued matters not in genuine dispute and have agreed with Applicant's proposed findings on many of the issues raised by Mr. Stokes, as has the Staff. *See* Intervenor's Proposed Findings 139, 145-148, 151-153, 156.

184. However, Intervenor remain concerned about the discrepancy evaluations performed by Sargent & Lundy of thirty flare-bevel AWS welds produced by Hatfield and captured by the reinspection program.

185. Mr. Stokes also expressed concern because the flare-bevel groove welding was included under a prequalified AWS welding procedure designated as 13AA. Stokes, Tr. 10,800-01. Such welding should be produced against a qualified welding procedure, i.e., one that is validated by establishing through a field demonstration that the procedure produces an adequate weld. However, the Hatfield AWS flare-bevel welds captured in the Byron reinspection program were produced during the period May 1978 through September 1982. During that period, flare-bevel groove welds were, in fact, produced under qualified procedures 13Q and 13AB. Procedure 13AA, a prequalified welding procedure, was not approved until December 30, 1983, and flare-bevel groove welding was erroneously included in that procedure. This error is being rectified

and the procedure for flare-bevel groove welding is being issued as a qualified procedure. Erler, ff. Tr. 11,158, at 7.

186. In any event, the thirty flare-bevel welds produced by Hatfield and captured by the reinspection program were inspected for a determination of the actual radius. The inspection yielded a radius measurement of at least 2 times the tube wall thickness ($2 T$) for all tubes except one, which had a radius equal to $1.75 T$. The stress of each weld was conservatively evaluated using the AWS formula for effective throat of $5/16$ radius with the smallest radius measurement of $1.75 T$. This demonstrated that the AWS-allowable stresses were met. *Id.* at 6-7. The Board concludes that no legitimate concerns have been raised with respect to flare-bevel welding at the Byron plant.

187. Applicant's witnesses were questioned about the fact that some of the Hunter visual weld discrepancies and discrepancies in Hatfield and Hunter objective attributes were repaired prior to evaluation by Sargent & Lundy. The repair of a discrepancy in no way interfered with Sargent & Lundy's engineering evaluation inasmuch as all the information necessary to perform the evaluation was contained in the discrepancy reports. McLaughlin, French, Branch, Tr. 9278-80, 9293-96.

188. All discrepancies subject to ASME Code examination acceptance criteria were repaired, even though they were determined by evaluation not to have design significance. All other discrepancies were either repaired or dispositioned as acceptable "as is" based on the engineering evaluation results. Del George, ff. Tr. 8406, at 36.

189. The Board was initially suspicious of the absence of any design-significant discrepancies from all of those analyzed. Sargent & Lundy attributes this absence to the extensive margin incorporated in the Byron design and, as explained by the Sargent & Lundy panel, is an inherent consequence of the design process. Engineers design a structure so that it is sufficiently strong to withstand the expected forces and stresses with spare or extra strength to account for uncertainties and contingencies. This extra strength is called margin. Design margin is that margin imposed by engineers during the design process. For example, connections are designed in groups rather than individually. As a consequence, the strength or load-bearing capability of each connection is established on the basis of the most highly stressed connection of the group. Therefore, the actual stresses for most connections will be less than those established in the design process. The difference between the two is an example of design margin. Sargent & Lundy contends that the existence of this design margin in the work they evaluated is the primary reason that none of the weld discrepancies was found to be design significant.

McLaughlin, ff. Tr. 9047, at 8-9, 11-12; French, Branch, McLaughlin, Tr. 9254-61.¹⁰

190. There is a second margin in the structural design of connections. This is the margin that the code writers put into the design process in the form of allowable stresses. The code writers typically attempt to include a margin of approximately 2 when they write the code. This means that a structure designed to a code could carry approximately twice the design load and not fail. McLaughlin, ff. Tr. 9047, at 9.

191. In Sargent & Lundy's detailed engineering evaluation, the code-allowable for stress was not exceeded for any discrepancy. *Id.*; Erler, ff. Tr. 11,158, at 4-5; McLaughlin, Tr. 9271-72. Although Mr. Stokes initially stated that some of Sargent & Lundy's calculations "appeared" to exceed the code-allowable for stress (Stokes, ff. Tr. 10,770, at 7, 8), following cross-examination Intervenor and Applicant stipulated that after reviewing the calculations and discussing them with Sargent & Lundy personnel, Mr. Stokes found no calculations for work performed by Hatfield or Hunter where the actual stress exceeded the code-allowable based on design criteria used by Sargent & Lundy. Tr. 10,936.

192. There were some additional examples of possible justification of the engineering practice whereby items called discrepant were later proven acceptable. In many instances an item of construction is specified by, say, a practical dimension with no statement of any acceptable tolerances or bounds on that dimension. If then an inspector observes a dimension different from that specified by more than the sensitivity of his measuring device he will call a discrepancy. In truth, however, the dimension will not be discrepant provided the observed value is within the dimensional bounds established by the designer but not appearing in the specification. Branch, Tr. 9250. A slightly different example is the original 6-inch-radius tolerance on the location of a conduit hanger on a Byron ceiling or beam. To catch marginal installations, the 6-inch latitude was reduced in the reinspection program to 3 inches. With due consideration, a support called discrepant when observed by the inspector to

¹⁰ Intervenor asserts that because design is not an issue in this proceeding, the Licensing Board can make no findings with respect to conservative loadings, assumptions or margin used in the Byron design. Although the adequacy of the general design of the Byron plant was not an issue, the Sargent & Lundy discrepancy evaluations clearly do fall under the ambit of the remanded proceeding. Sargent & Lundy's evaluation necessarily considered loadings, assumptions and margins used in the design. And, as noted by the Licensing Board, the issue of design criteria is relevant to the extent that the criteria are used in the evaluation of the discrepancies noted in the BRP. Tr. 10,668-87. Thus, to the extent that these factors were used in the Sargent & Lundy evaluations, information on loadings, assumptions and margins was properly received into evidence, and findings based upon that evidence may be made. Accordingly, the Board may properly find that the un rebutted evidence on loadings, assumptions and design presented by Mr. McLaughlin and Mr. R.V. Laney lend support to their conclusion on the adequacy of the Hatfield and Hunter work.

be “off” by 4 inches may well be quite acceptable. French, Tr. 9251. In the layout of conduits a standard 9-foot span between supports has been adopted and incorporated in the design. That span suffices for a $\frac{3}{4}$ -inch-diameter conduit. Obviously a 3-inch conduit can tolerate a larger span — perhaps twice or three times as great — allowing judgmental latitude. French, Tr. 9256. In the area of welds, a cable tray may, by design, be supported by several welds. In the inspection, one is observed to be substandard, even cracked. In an analysis the acceptance of remaining welds is established. Then the total support is reanalyzed with no credit taken for the cracked weld, or partial credit for other degrees of nonconformance. The result of that reanalysis may show no need for the discrepant item. McLaughlin, Tr. 9154-56; Branch, ff. Tr. 9051, at 13. The required capacity of individual support items, like bolts and hangers, will be shown by design to have a wide range. It is impractical and uneconomic, for a number of reasons, to procure an inventory of such support items having capacities fitting a ramp function. Therefore, in practice, the bolt supply follows a step function and a larger-than-design size is installed. French, Tr. 9255.

193. There were a few instances where a 10% overstress factor was used by Sargent & Lundy at an intermediate point in the calculative process. The 10% overstress factor refers to a 10% limit where Sargent & Lundy engineers are allowed to use their knowledge of the margin in the structural analysis to decide, when the calculated stress is less than or equal to 10% greater than allowable, that the calculated stresses have sufficient conservatism or margin to meet the American Institute of Steel Construction (AISC) Code stress-allowable. Erler, ff. Tr. 11,158, at 4. However, as Intervenor and Applicant stipulated, in each of these instances, the overstress factor was not relied upon for the ultimate conclusion in the calculation that the actual stress did not exceed the Code-allowable stresses. Tr. 10,936; Erler, ff. Tr. 11,158, at 4-5; Erler, Tr. 11,159-60.

194. Mr. Stokes charged that the judgments and assumptions used by Sargent & Lundy in its evaluation of the BRP discrepancies lacked “objectivity and impartiality” and, hence, an independent review was required. Stokes, ff. Tr. 10,770, at 7. However, outside of pointing to an alleged inconsistency between Sargent & Lundy’s structural engineering group and the mechanical engineering group in the treatment accorded fatigue loading (Stokes, Tr. 10,893), Mr. Stokes could point to no specific instance, including no specific calculations, where Sargent & Lundy demonstrated a lack of “objectivity and impartiality.” Stokes, Tr. 10,885-10,904. As Mr. Stokes himself stated, “I’m just saying they [Sargent & Lundy] ignored certain things, but I can’t cite one.” Tr.

10,894. He also testified that his statement was based in part upon testimony we had declined to receive. Tr. 10,895.

195. With respect to the alleged inconsistency between the mechanical group and the structural group in their treatment of fatigue loading, Mr. Stokes asserted that if mechanical designs account for fatigue in the piping system, then the structural group should take that into account when designing those respective pipe supports. Stokes, ff. Tr. 10,770, at 18. Contrary to Mr. Stokes' assertion, there is no inconsistency in Sargent & Lundy's treatment of fatigue loading for piping and for pipe supports. Due to the nature of loading on a piping system, the requirements may vary depending on the class of the system. For example, the ASME Code requires an explicit calculation of fatigue loading for a Class 1 piping system while Class 2 and 3 piping systems are affected by cyclic loading only if the number of cycles exceeds 7000 (ASME § III, NC 3611.2). For pipe supports with respect to Class 1, 2 and 3 piping, both ASME and AISC are consistent in not requiring any reduction in allowable stress for less than 20,000 cycles. Erler, ff. Tr. 11,158, at 8. At Byron, for Class 1 piping systems, the analysis has accounted for the number of cycles as required by the Code. Fatigue loadings were properly neglected for Class 2 and 3 piping systems and for pipe supports because the number of cycles experienced is less than the thresholds established in the Codes for requiring a reduction in the allowable stress limits. *Id.* Mr. Stokes apparently considered water hammer to occur each time some change in the system occurs. This is not the case. Water hammer does not occur at such a frequency that it would be a factor in fatigue loading design. There is no inconsistency in the manner in which fatigue loading was factored into the Byron design.

196. The Board finds that the Sargent & Lundy evaluations were performed in accordance with proper engineering standards and that the assumptions used in performing these evaluations were sufficiently conservative. In the words of Mr. Muffett, Sargent & Lundy's program for evaluating the discrepancies was "more than adequate." Muffett, Tr. 9813. Accordingly, the Board finds no evidence in this record to support the need for an independent review based upon any alleged lack of objectivity or impartiality on the part of Sargent & Lundy. Intervenors agree. In addition, in response to the issue added by the Board concerning Applicant's repair of defects, the Board finds that all discrepancies were either repaired or dispositioned as acceptable "as is" based on engineering evaluation results, thereby resolving this issue. Finally, the Board finds the complete absence of any design-significant discrepancies in the entire reinspection program to be a strong indication that the pre-

September 1982 inspectors had not overlooked any significant safety-related deficiencies.

X. QUALITY OF THE WORK

a. Introduction

197. The disposition of a few thousand discrepancies observed among some 160,000 individual items of Hatfield and Hunter work examined in the reinspection program has been adequately discussed in the preceding section (§ IX). There it was recounted that all of the discrepancies were shown to be of no design significance. This conclusion was largely a consequence of engineering judgments and design recalculations on a case-by-case basis by the Byron architect-engineer leading to the striking result that not a single discrepancy in construction, observed by qualified inspectors assigned to the reinspection program, survived the engineering analyses as a fault. *See, e.g.,* McLaughlin, ff. Tr. 9047, at 10-12.

b. Evaluation Results and Scope of Work

198. A panel of engineers-executives from the Byron architect-engineer discoursed at some length on the concepts and procedures of practicing engineers when making assessments such as those of the discrepancies in this instance. Emphasis was on the accumulation of favorable safety margins occurring in a normal design process which, when summed, can provide a sizeable leeway, in a particular instance, between the nominal design capability of an item or of a structure and the capability it can provide in its service, as we discuss in the § IX, above. *See also* Tr. 9249-67.

199. With those engineering evaluations as bases, the members of the panel, comprised of J.M. McLaughlin and A.K. Singh (structural), R.X. French (electrical) and Ernest Branch (mechanical), concluded that all Hatfield and Hunter items caught in the reinspection program are of adequate quality to fulfill their design intent. McLaughlin, ff. Tr. 9047, at 16; French, ff. Tr. 9044, at 12; Branch, ff. Tr. 9051, at 14; Singh, ff. Tr. 9055, at 4.

200. These results, coupled with the adequacy of the sample, can be extrapolated to the conclusion that all Hatfield and Hunter work at the Byron Station is adequate for the purposes of the design.

201. Additionally, R.V. Laney, an individual with long technical and administrative experience in nuclear power and presented by the Appli-

cant, explained that the engineering analysis of discrepancies demonstrated that inherent design conservatism rendered virtually all the discrepancies inconsequential. This conservatism, combined with an extremely rigorous code definition of weld discrepancies, resulted in the generation of reports of many discrepancies that were later found to be acceptable. Mr. Laney concluded that the absence of any identified design-significant discrepancies provides additional assurance that the work of Hatfield and Hunter is adequate. Laney, ff. Tr. 9339, at 10, 19-23.

202. The Intervenor fault several of the Applicant's conclusions, particularly those of Mr. Laney, in their claim that the Applicant was unable to supply unequivocally correct data in response to their interrogatories and did, in fact, make changes up to the time of this remand hearing. Intervenor view these successive changes as evidence of an unstable system of data acquisition and recording which undercuts the confidence to be expected in the Applicant's testimony and in the conclusions drawn therefrom. Intervenor's Finding 184A. The Applicant concedes to corrections having been made from time to time in its answers and downplays the consequences of the single incident named by the Intervenor. Applicant's Reply Finding 184A.

203. Mr. Del George and Mr. Behnke similarly concluded that Sargent & Lundy's finding of no design-significant discrepancies contributes to a demonstration of the adequacy of the Hatfield and Hunter work. Del George, ff. Tr. 8406, at 49; Behnke, ff. Tr. 9336, at 14. The Board accepts the results of the Sargent & Lundy analyses as supportive of the acceptable quality of work at the Byron site.

204. Mr. Laney also explained how the scope of the reinspection program supported his conclusion that the quality of the Hatfield and Hunter work was adequate. He stated that he assessed the adequacy of the Hatfield and Hunter data in relation to all work performed by Hatfield and Hunter. Laney, ff. Tr. 9339, at 11. Specifically, Mr. Laney performed a comparison of the attributes that were inspected with the total of each contractor's attributes. The BRP involved 160,000 reinspections of Hunter and Hatfield work. Of the approximately 4800 discrepancies found, about 90% were eliminated by comparison with current design parameters and tolerances or by engineering judgment based on a comparison of the discrepancy with design margins. Fewer than 500 discrepancies were of such a nature as to require engineering calculations to determine their significance. None had design significance and none reduced design margins below the level required by conservative design practice. Most of the work attributes and elements that were accessible and not nonre-creatable were sampled in the BRP. The attributes not

included in the Hatfield sampling were, according to Mr. Laney, less significant in size and importance, and, in addition, were installed using the same procedures as attributes that were reinspected. Of the fourteen Hunter work elements which could not be included because of inaccessibility or nonre-creatability, seven were welding-in-process inspection points such as preheat or welding interpass temperature. The BRP found Hunter's agreement rate between welding inspectors to be good, with less than a 3% discrepancy rate on 3725 welds and no design-significant discrepancies. The reinspection effort redid 11% and 6%, respectively, of Hatfield's and Hunter's total inspector work-months or some 5 to 10% of the total work of these two contractors. *Id.* at 12-17.

205. We find that a broad range of attributes was examined and no inspection attributes or elements were excluded from the BRP for any reasons other than inaccessibility, nonre-creatability or luck of the draw (i.e., none of the inspectors included in the BRP had conducted inspections of those attributes). There appeared to be no effort or action to exclude or minimize inclusion of any areas of inspection activity in the BRP.

206. Mr. Laney concluded that, in addition to the qualification of inspectors, the absence of any discrepancies with design significance considered with the inherent design conservatisms and CECO's QA program, the scope of the reinspected work demonstrates that the quality of the Hatfield and Hunter work at the Byron plant is adequate. Laney, ff. Tr. 9339, at 26, 27.

207. However, Mr. Laney's overall conclusions on the quality of work were not based solely on the reinspection report and the supplemental report. Laney, ff. Tr. 9339, at 7-11. He stated that, if he had not made additional inquiries himself and if he had no other knowledge than the two reports, he did not know whether the two reports alone would have been sufficient to enable him to reach a professional judgment that the quality of the work by Hunter and Hatfield was adequate. Laney, Tr. 9379. In fact the February 1984 reinspection report alone did not satisfy Mr. Laney as being sufficient to verify construction quality. Laney, ff. Tr. 9339, at 8.

208. Mr. Del George similarly concluded that the large number of Hatfield and Hunter items reinspected, the relatively small number of discrepancies, and the absence of any design-significant discrepancies provide a basis for his conclusion that the quality of work is adequate. Del George, ff. Tr. 8406, at 49. Specifically, Mr. Del George pointed to (1) the inspection of approximately 130,000 Hatfield and Hunter objective attributes and 30,000 Hatfield and Hunter subjective attributes and (2) the diverse data base developed for Hatfield and Hunter, including

related indicia of acceptability for inaccessible and nonre-creatable attributes. Del George, ff. Tr. 8406, at 50-51, Attachment E.¹¹

209. All these judgments on work quality were made on the basis of engineering judgment rather than on the basis of the application of mathematical statistical theory. Del George, Tr. 8518. The Staff also stated that the sampling methodology in the BRP was based on engineering judgment and "was not statistically conceived." Little, ff. Tr. 9510, at 4. Nevertheless, the Applicant also offered the testimony of Dr. Anand Singh, Assistant Head of the Structural Analytical Division of Sargent & Lundy. Dr. Singh applied principles of statistics to the results of the engineering evaluations discussed in the testimony of Messrs. McLaughlin, Branch, and French and in § IX, *supra*. Singh, ff. Tr. 9055, at 3-4. Based on his statistical analysis, Dr. Singh concludes with 95% confidence that in general more than 99% of Hatfield and Hunter work in the plant meets the design requirements. *Id.* at 4-8. The conclusions of the Applicant's witnesses based on engineering judgment, however, stand independently of Dr. Singh's statistical analysis. McLaughlin, ff. Tr. 9047, at 16-17; McLaughlin, Tr. 9272-74.

210. Intervenors presented the testimony of Dr. Ericksen in an effort to demonstrate that, applying mathematical statistical theory, inferences could not be made regarding the entire scope of Hatfield and Hunter work based upon the sample of work reinspected in the BRP. In assessing the significance of the testimony of Intervenors' statistical expert, Dr. Ericksen, we recognize that he does not purport to be an expert in the design, construction or evaluation of nuclear power plants and that he has no experience as a quality control inspector at a nuclear power plant. Tr. 11,026-45. He is an expert statistician. However, he recognizes that the conclusions expressed by knowledgeable professional engineers in this proceeding may in fact not be statistical statements at all, but rather the results of an engineering analysis. Ericksen, Tr. 11,077-78.

211. As we discussed in the context of inferences of inspector competency in § IV, *supra*, the limited role of a statistician in these circumstances was also recognized by Dr. Frankel, the statistical expert testifying on rebuttal for Applicant. He explained that a sampling statistician is

¹¹ In response to a Board concern, Mr. Del George's testimony explained that the results for all attributes were evaluated on a contractor-by-contractor basis to determine whether any trends existed in the observed discrepancies that might warrant further review. Only two such trends were found, one involving reproduction of original visual weld inspection reports by PTL, the other involving a relatively large number of Hatfield visual weld discrepancies associated with sheet steel welds. Both of these trends involved discrepancies that were not design-significant and were caused by factors that have since been remedied. Del George, ff. Tr. 8406, at 38-41.

not qualified to draw inferences where a nonprobability sample is used, but can only assist the subject-matter expert in drawing inferences from that sample and has no role to play when a subject-matter expert does not purport to apply mathematical statistical theory at all. Frankel, ff. Tr. 11,120, at 8-9. None of the witnesses presented by Applicant or Staff, except Dr. Singh, purported to rest their conclusions on an application of mathematical statistical theory and Mr. McLaughlin specifically stated that the results of a statistical analysis were immaterial to his conclusions. McLaughlin, Tr. 9272-73. Thus, recognizing that mathematical statistical theory plays an extremely minor role in the evaluation of the quality of Hatfield's and Hunter's work, we turn to a consideration of Dr. Ericksen's testimony.

212. Dr. Ericksen's criticism of Applicant's use of statistics focused principally on the formula used by Dr. Singh to calculate the reliability and confidence interval of statements expressing the absence of design-significant discrepancies in the work attributes of Hunter and Hatfield. Since the only statistical inferences made by Applicant were Dr. Singh's, we will discuss here only Dr. Singh's use of statistics.

213. According to Dr. Ericksen, the equation used by Dr. Singh to estimate the reliability that inspection attributes met design standards is valid only if the inspectors in the sample were "homogeneous" (claiming that different inspectors had different probabilities of success) and if the effect of "clustering" the sample were taken into account. He also criticized the aggregation of inspection elements into larger groups claiming that in some cases the sample sizes of individual inspection elements were too small to be meaningful for extrapolation of the results to the remaining population. Ericksen, ff. Tr. 11,045, at 10-13; Ericksen, Tr. 11,047-49. Dr. Ericksen purported to demonstrate the lack of inspection homogeneity by calculating "intraclass correlation," a standard technique for measuring homogeneity. Ericksen, ff. Tr. 11,045. In the calculation of intraclass correlation, Dr. Ericksen used observed discrepancies, not design-significant discrepancies. The results expressed by Dr. Singh refer to design-significant discrepancies. We agree with Applicant that it is appropriate to use only design-significant discrepancies. Dr. Ericksen agreed that the use of design-significant discrepancy values would lead to intraclass correlation values of zero and would demonstrate inspector homogeneity. Tr. 11,058.

214. Similarly, to assess the effect of clustering, the statistician must first calculate the "design effect." Ericksen, ff. Tr. 11,045, at 15. If one uses design-significant discrepancies and if the inspectors are homogeneous (as discussed above) the "design effect" of using a clustered sample is unity, and clustering has no effect. Frankel, Tr. 11,124. As regards

aggregation of inspection elements, the BRP essentially aggregated inspections into two major categories — subjective and objective. Hunter identified only two objective inspection attributes — documentation and hardware. Dr. Ericksen indicated two ways by which inspection elements could be properly aggregated. In the first, an expert in the subject matter could have made that judgment (and the rationale for the judgment should be included as part of the report for evaluation) and in the second, with hindsight, one could look at the data and make the judgment based on inspection of the data. Ericksen, Tr. 11,048-49.

215. Applicant provided two witnesses to demonstrate the similarity of inspector background, training and certification and similarity of inspection technique as they relate to differing components. Mr. Malcolm Somsag established the similarity of all the Hunter hardware inspections and specifically demonstrated that the same inspection parameters — type, size, location and condition — applied to a wide range of inspection elements, some of which had been identified by Dr. Ericksen as lacking adequate sample size. Somsag, ff. Tr. 11,172, at 2-9; Ericksen, ff. Tr. 11,045, at 7; Ericksen, Tr. 11,046-47. Mr. Buchanan provided similar information as to Hatfield inspections and inspection program. Buchanan, ff. Tr. 11,174.

216. In view of the testimony addressing each of Dr. Ericksen's criticisms of Dr. Singh's use of a reliability equation, it appears to the Board that Dr. Singh's application of statistics is not unreasonable and the results provided by his calculations are acceptable estimates of the reliability of statements concerning Hunter and Hatfield work quality. *See also* Frankel, Tr. 11,124-25.

c. NRC Staff Conclusions on Work Quality

217. The Staff says that from the August 1983 hearings on, it has always maintained that the quality of work at Byron was good, perhaps even exemplary. In the words of the Senior Resident Inspector at Byron, William Forney,

[I]t has been Region III's position all along, and . . . mine, that the construction at the Byron plant was good, because we had not discovered obvious hardware problems like we have at other sites. . . .

I feel at this time that the information provided by the reinspection program did, in fact, provide a very large data base to confirm Region III's position that the quality of the Byron site is acceptable and that it is generally good. . . .

And when you couple this with the work . . . that the workers do, which I believe to be generally of good quality, the inspection programs that not only does the NRC undertake, but Licensee has inspection programs, they've had reinspection programs, they've had overinspection programs, you have that coupled with the

construction testing before it's turned over to preoperational testing, and when you put those all together and you have the overlap, . . . it's my belief and my professional opinion that those together have provided that degree of assurance required by 10 C.F.R. 50, Appendices A and B, as to the requisite safety and health of the public.

Tr. 10,044-45.

218. When polled by the Board during the most recent hearings, the members of the Region III Staff panel expressed opinions very similar to Mr. Forney's. Mr. Ward said that with all the reinspection the Byron plant had gone through, in relation to welding it was "probably the safest plant there is." Tr. 9872. Mr. Muffett agreed, and added that the results of the reinspection program reinforced the Staff's already positive conclusions about Byron. *Id.* Mr. Little said that those conclusions were based on Region III's inspection activities throughout the construction of the plant. Tr. 9872-73. *See also* Connaughton, Tr. 9877. James Keppler, Region III Administrator, was emphatic about the continuity of the Staff's position since before the August 1983 hearings:

I want to take this opportunity to emphasize to the Board that, despite the identification of certain quality assurance problems at the Byron site, my staff and I had, and continue to have, confidence in the quality of completed construction at Byron. This confidence is based on our overall inspection effort and was reinforced by the special team inspection conducted in early 1982. The applicant's reinspection program further reinforced our confidence. Unfortunately, I believe that in the August 1983 hearing we may have failed to convey to this Board our degree of confidence.

Ff. Tr. 10,135, at 2.

219. One of the obstacles the Staff faced in August 1983 in trying to convey to us the confidence it had in the quality of Byron construction was the difficulty we had in reconciling the Staff's expression of confidence and the magnitude of the reinspection program — magnitude in time, in money, in scope, in the number of persons involved, and in the number of issues whose resolutions depended on the results of the program. Region III was not going to recommend that a Byron operating license be issued until the Region had concluded that the results of the reinspection program were acceptable. *See* I.D., 19 NRC at 206-09, ¶¶ D-405 to D-416. In August 1983, with such a large program under way, and its design still not agreed upon by the Applicant and the Staff, the Staff was nonetheless confident enough in the quality of Byron to urge us to delegate to it the resolution of the remaining QA issues. In the Initial Decision we inferred from the Staff's position a view of delegation which we observed was not consistent with Commission case law. *See id.* at 209-12, ¶¶ D-418 to D-428. Apparently, however, the Staff

would rather have had us attribute less importance to the reinspection program — view it as reinforcing a conclusion the Staff had already drawn on other grounds (Keppler, ff. Tr. 10,135, at 2) — as providing “additional assurance that the plant is safe to operate.” Connaughton, Tr. 9873; *see also* Muffett, Tr. 9872.

220. Even now, we have some difficulty in reconciling the Staff’s present assertion that it has always been confident of the quality of work at Byron with its position as reported by the Appeal Board in remanding the record to us — that the record at the time of appeal was not sufficient to permit the authorization of operating license issuance. *See* ALAB-770, *supra*, 19 NRC at 1168. Also, however continuous the Staff’s confidence may have been, it did not always extend to all the contractors: For reasons outlined below in § XI of this Decision, the Staff took the position some time around the middle of this year that the Applicant had to demonstrate that all equipment supplied by Systems Control Corporation was able as built to withstand as-built loads in conformance with applicable codes. *See* Hayes, Connaughton, Muffett, ff. Tr. 10,478, at 8.

221. Whatever the history of the Staff’s opinion of the quality of work at Byron may be, the Staff expresses no reservations now about that quality. Indeed, the Staff even appears willing to rest its confidence on the results of the reinspection program alone. Speaking in his capacity as supervisor of Region III’s review of the program, William Little said,

Region III believes that the reinspection of a total of 179,407 safety related elements for Hatfield, Hunter and PTL, the results of those inspections, and the analysis and disposition of the reinspection findings give us reasonable assurance that the overall quality of the work of those contractors is good. This conclusion is considered valid for both accessible and inaccessible work.

Ff. Tr. 9510, at 6. Mr. Muffett emphasized that the Staff reviewed the reinspection engineering evaluations of discrepancies “with a more critical eye than usual.” Tr. 9872.

222. In § VIII of this Decision, we discussed the difference of opinion which exists between Mr. Forney and the Staff panel over whether from the findings of the reinspection program one may conclude not only that the QA inspectors did not overlook safety-significant deficiencies, but also that they were competent. We note here only that this difference of opinion, being about the competence of the inspectors and not about the quality of the construction, in no way detracts from the present unanimity among the Staff on whether the construction is good. The long quotation from Mr. Forney in the first paragraph of this section attests to this unanimity. Besides, as we noted in our earlier discussion of the difference of opinion about contractor QA inspector competence,

Mr. Forney has characterized that difference as “miniscule,” and we agree. *See* Forney, Tr. 10,064.

d. Board Conclusions on Work Quality

223. Before stating the Board’s conclusion on the quality of the work at Byron, as inferred from the reinspection program, it is useful to place again the work quality subissue into a perspective appropriate for this remanded proceeding.

224. Returning to the quality assurance contention, it charges generally that CECo does not have the ability or willingness to maintain a quality assurance program and to observe quality assurance criteria and plans. The contention also challenged the independence of the Applicant’s quality assurance program. The contention, as accepted and litigated, looked at Applicant institutionally. The quality of the work at Byron was never regarded as a matter directly in issue. Our Initial Decision recognized the scope of the contention. We found that Applicant was institutionally capable of maintaining an adequate quality assurance program. We also found that there was no evidence of widespread hardware or construction defects. Our decision turned more than anything else around the problem against which the reinspection program was designed — a failure to demonstrate that the quality control inspectors at Byron were properly trained, tested and certified.

225. The Appeal Board recognized the bounds of the issue in ALAB-770 where it instructed:

In the totality of circumstances, the appropriate course is a further hearing to permit a full exploration of the significance of the program in terms of whether there is currently reasonable assurance that the Bryon facility has been properly constructed. Stated otherwise, the focus of the inquiry should be upon whether, as formulated and executed, the reinspection program has now provided the requisite degree of confidence that the Hatfield and Hunter quality assurance inspectors were competent and, thus, can be presumed to have uncovered any construction defects of possible safety consequence. [Footnotes omitted.]

19 NRC at 1178.

226. Applicant argues, with considerable merit, that the language quoted above is an observation that, for the purposes of this proceeding, a presumption of work quality follows a showing of worker competence. The argument continues that the reinspection program removed doubt about the qualifications of the inspectors, *ergo*, we have an un rebutted presumption of the adequacy of the Hatfield and Hunter work. Proposed Finding 166.

227. Applicant then implies that the extensive testimony of its seven witnesses who draw direct inferences of work quality from the reinspection program data, rather than through the inspector competence inference, is an unneeded extra body of proof. Proposed Finding 167.

228. We agree that the decisional predicates in this proceeding could have provided a justification for ending the inquiry at the inference of inspector qualifications. We need not, however, decide that point. As we noted, the reinspection program provided data from some 160,000 Hatfield and Hunter reinspections. The data covered a very broad range of the Hatfield and Hunter work, cutting across their inspectors, the various types of inspections and work, and covered most of the time the plant was in construction. The data necessarily held useful information about the quality of work.

229. If Applicant had stopped at the point of evaluating the data against the program criteria, and if it had rested on its inspector qualification inference, we would have had very pointed questions about why the data were not looked at for any other implications respecting the safety of the Byron facility. To have wasted the information after its initial use would have, in our view, demonstrated a careless disregard for quality assurance opportunities. We know now, of course, that the Sargent & Lundy engineers could not resist using the results for their purposes. Their testimony and the testimony of Messrs. Laney and Del George about quality inferences were not only appropriate, but under the circumstances, very desirable for a complete record.

230. Since the large mass of reinspection data was almost entirely a byproduct of the inspector qualification reinspection program, and was not statistically conceived, its use for a work-quality inference was somewhat handicapped, and its use for statistical inferences was even more so. Nevertheless, the broadly based numbers produced are very strong. Not a single design-significant discrepancy was found.

231. The Board tolerated, rather than encouraged, the statistical debate between Dr. Singh and Dr. Ericksen. Overlooked in the debate was the fact that there was no passing score for work-quality conclusions. Byron work quality does not depend upon the reinspection program. Dr. Singh's calculated reliabilities of 99% plus (except for two small samples) with a 95% confidence level is reassuring. But given the purposes for which the data were generated, we find two other factors to be also very important. One is that the data were looked at in a careful and technically sound manner, thus we have no unexplored questions. The other factor is that the data do not reflect unfavorably on the quality of the Hatfield and Hunter work.

232. As to work quality, we find that the numerous bases presented by Applicant taken together demonstrate that the quality of the Hatfield and Hunter work is adequate.

Other Issues

XI. ADEQUACY OF THE EQUIPMENT SUPPLIED BY SYSTEMS CONTROL CORPORATION

233. In our January 13, 1984 Initial Decision, under the impression, eventually shown false, that every accessible piece of equipment supplied by Systems Control Corporation (SCC) either had been, or would be, reinspected by PTL, we concluded that there was nothing left to litigate about SCC. *See* I.D., 19 NRC at 216, ¶ D-442. The reinspection program for SCC equipment, unlike the one for Hunter and Hatfield, was aimed at quality of work, not the qualifications of inspectors, and did not appear to involve sampling. The SCC program therefore appeared routine and not at all controversial, and thus delegable to the NRC Staff. *Id.* However, in the months after the Initial Decision, enough nonroutine questions came to light about SCC's equipment and PTL's inspections to put the issue of the safety of SCC-supplied equipment squarely before us in the remand proceeding. We now are able to be more conclusive than we were in January and to speak more directly to quality of work than we can in our findings on Hunter and Hatfield: All the parties agree, and we find, that the extensive program of inspection and evaluation of SCC-supplied equipment that has been carried out since the Initial Decision demonstrates the adequacy of all but one of the kinds of that equipment. The parties also agree, and we also find, that, much as in January, the Staff may properly be delegated the function of overseeing the further inspection and evaluation of that one kind of equipment. Given this agreement among the parties we need do no more here than briefly report how the question of the adequacy of SCC's equipment came before us again, briefly describe the case the Applicant presented on remand, and describe the issue which remains to be resolved by the Staff.

234. At the outset, we emphasize that although the findings on the adequacy of SCC's equipment are fuller than they were in January, the two essential points of our treatment of SCC in the January Initial Decision still stand. First, overseeing the remaining inspection and evaluation properly belongs to the Staff, and second, "Applicant defaulted in its responsibility to be assured of the adequacy of Systems Control's quality assurance program as required by Criterion I of Appendix B to Part 50."

I.D., 19 NRC at 135, ¶ D-109. Nothing we heard in the remand proceeding weakens the latter point. Indeed, some things we heard on remand, and which we mention below, strengthen that point. Of course, since, as we observe throughout this Supplemental Initial Decision, the various reinspection programs provide additional reasonable assurance of the safety of the Byron plant, the Applicant's failure with SCC no longer supports denial of the operating license but instead only belongs to what we hope is an instructive history.

235. SCC supplied Byron with main control panels, cable trays, and other items which house or support safety-related electrical equipment. As reported more fully in our January Decision, since 1977 various efforts by the Applicant and the Staff uncovered an unreliable, indeed fraudulent, quality assurance program at SCC: among other deficiencies, nonconforming welds, unperformed inspections, falsified SCC internal audit reports, possibly unqualified welders and inspectors, and a clearly unqualified QA/QC manager, who was also involved in the falsified reports, and who on one safety-related job performed the conflicting roles of QA manager and project engineer. See *id.*, 19 NRC at 131-34, ¶¶ D-94 to D-108.

236. In its proposed findings for the Initial Decision, the Applicant had urged us to find that it had dealt very responsibly with the deficiencies in SCC's QA program; the Staff had agreed. *Id.*, 19 NRC at 134, ¶ D-106. The Applicant had been, after all, the first to reveal problems in SCC's QA program and had duly reported them (*id.* at 132, ¶ D-95), had issued stop-work orders on two occasions (*id.*, ¶ D-96), and finally had, or so it appeared, discontinued new purchases from SCC (*id.* at 133, ¶ D-105).

237. Nevertheless, in the Initial Decision we concluded that the Applicant had defaulted in its responsibility to oversee SCC's QA program. That program was very bad, we said, and the Applicant did not explain how it had gotten so. *Id.* at 134, ¶ D-108. Moreover, other problems with SCC's QA program, most especially the fraud, came to light through no effort of the Applicant. *Id.* Finally, on one occasion, almost 3 years after problems first appeared, the Applicant waived some crucial inspections of some SCC equipment. *Id.* at 133, ¶ D-102. Now, since the Initial Decision, our finding of default has been strengthened by the Staff's discovery that, although the Applicant did indeed submit no new purchase orders to SCC after January 1978, it nonetheless continued purchasing from SCC after that date, simply by revising upward the quantities in the existing purchase orders. Connaughton, ff. Tr. 10,478, at 8. With this conclusion on the Applicant's default, and with what we

took to be complete reinspection under way, we thought that the litigation on SCC was over.

238. How wrong we turned out to be about the reinspection of SCC work clearly illustrates what in the Initial Decision we called the “randomness in this quality assurance litigation,” namely, that how the Applicant fared in the litigation depended not on a complete and systematic review of the Applicant’s QA program, but rather on the somewhat random collection of facts which came before us and on whether issues concerning those facts were delegable to the Staff. *See id.* at 213-14, ¶¶ D-431 to D-433. We had, after all, learned about the nondel-egable reinspection programs for Hunter and Hatfield almost accidentally. *Id.* at 208, ¶¶ D-411 to D-413.

239. At the time of the Initial Decision we did not know how limited the scope of the reinspection of SCC’s work was. We were given to understand then that:

In February 1980, Applicant assigned personnel of the Pittsburgh Testing Laboratory . . . to the SCC plant All items were required to pass inspection by PTL before being shipped either to Byron or Braidwood. Tr. 2579 (Shewski). Panels already shipped and received at Byron were reinspected and repaired. Tr. 2509, 2579 (Shewski); Tr. 3898-99 (Hayes, Williams).

Id. at 133, ¶ D-104. We stretched this description too far and concluded that there would be reinspection “of all of Systems Control’s work, which by its nature is accessible for reinspection.” *Id.* at 216, ¶ D-442. The Appeal Board later pointed out that our conclusion was “possibly erroneous.” *See* ALAB-770, 19 NRC at 1179. The Appeal Board had been alerted to the possibility of our having erred by reports first from the Applicant and then from the Staff that welding deficiencies had been found on some SCC-supplied cable pan hangers already at the Byron site. The Appeal Board reasoned that PTL might have either not performed a 100% reinspection of SCC work or not performed it carefully. *Id.* at 1179-80. Thus, the issue of the quality of SCC’s work was no longer simply delegable to the Staff, and it became ours again on remand. *Id.* at 1180.

240. Eventually it came out that even the description we had stretched was inaccurate. The Applicant had committed to the described reinspection in a January 26, 1981 letter to the Staff, but the Staff later learned — we are not told exactly when, though we would assume it was after the record was remanded to us — that for the first 11 months of the program, from February 1980 up to the time of the letter, some shipments from SCC were not source-inspected by PTL at all, and some others were inspected only by sampling. Hayes and Connaughton, ff. Tr.

10,478, at 6; Marcus, ff. Tr. 10,319, at 6-7 and Attachment A. Mr. George F. Marcus, the Applicant's Director of Quality Assurance for Engineering and Construction, was helpful in trying to explain how administrative confusion could have been the cause of the January 26, 1981 letter's being inaccurate (Marcus, ff. Tr. 10,319, at 8-10), but he volunteered an admission that the cause was not completely clear. *Id.* at 11.

241. Moreover, after the January 26, 1981 letter, although PTL source-inspected each SCC shipment, the inspection did not necessarily go beyond sampling. Hayes and Connaughton, ff. Tr. 10,475, at 6. Mr. Marcus testified that although the January 26, 1981 letter spoke variously of inspection of "all equipment shipped" and of inspection of "all shipments," the latter phrase more accurately conveyed the Applicant's intent, and that it was common practice in the industry to rely on sampling when inspecting a shipment containing a large number of items. Marcus, ff. Tr. 10,478, at 4-5.

242. On the basis of nonconformance reports issued by the Applicant in late 1983 and early 1984 on welding discrepancies in SCC-supplied equipment, the Staff eventually concluded that the limited scope of PTL's source inspection program for SCC-supplied equipment was not adequate, and that the Applicant would have to demonstrate that all SCC equipment as built was able to withstand as-built loads in conformance with applicable codes. Hayes and Connaughton, ff. Tr. 10,478, at 8. We are not told exactly when the Staff came to this conclusion, but we would assume that it was after the Appeal Board remanded the matter to us.

243. The case presented to us in the remanded hearing was therefore rather large. It consisted of the demonstration the Applicant had made to the Staff of the adequacy of all of SCC's work, the Staff's evaluation of that demonstration, and the results of a third-party review of the demonstration performed at the Applicant's request by Torrey Pines Technology.

244. Testifying for the Applicant were Mr. Bradley F. Maurer, Mr. Kenneth T. Kostal, and Dr. Anand K. Singh. Mr. Maurer is a Senior Engineer with the Equipment Qualification Analysis Department of the Water Reactor Division of Westinghouse Electric Corporation. The Applicant retained Westinghouse in 1982 to evaluate the structural adequacy of the main control panels supplied by SCC. Westinghouse had done similar evaluations on some main control panels it had supplied Byron. Maurer, ff. Tr. 10,158, at 5-6. Mr. Kostal is a Partner and Assistant Manager of the Structural Department of Sargent & Lundy, which evaluated the adequacy of SCC DC fuse panels, cable trays, cable tray hangers, and local instrument panels. Dr. Singh, a structural engineer

and Assistant Head for Sargent & Lundy's Structural Analytical Division, did a statistical analysis of Sargent & Lundy's evaluations of components inspected by sampling. We allude to other testimony by Dr. Singh in § X, above.

245. Testifying for NRC Staff were Messrs. K.A. Connaughton, D.W. Hayes, and James Muffett, all of whom have been identified earlier in connection with their testimony on the reinspection program. Testifying for Torrey Pines Technology (TPT) was Mr. Louis D. Johnson, a mechanical engineer and Manager of Projects for TPT. TPT reviewers were either qualified inspectors or engineers experienced in the field of structural analysis, QA, statistics, mechanical systems, and project management. TPT reviewed all of SCC's work; for each kind of SCC equipment, TPT collected and evaluated pertinent records, did an engineering evaluation of the technical bases used to substantiate the acceptability of SCC work, reinspected samples of SCC work, and documented discrepancies found during such reinspection. Johnson, ff. Tr. 10,294, at 9-12. The Intervenors relied mainly on cross-examination, but their witness, Mr. Stokes, identified in § X of this Decision in connection with his testimony on Sargent & Lundy's evaluations, raised some concerns about SCC, matters which the Intervenors agree were adequately dealt with by the Applicant, in part by explanation, and in part by a modest amount of reinspection and three new welds. See Applicant's Proposed Findings at 120-22, ¶¶ 221-225, adopted by the Intervenors.

246. Despite the disconcertingly large number of discrepancies in SCC's work, the parties agree that the Applicant has demonstrated that, except for one discrete area still under review and delegable to the Staff for resolution, the SCC work at Byron is adequate to accept design loads without exceeding code-allowable stresses. Except for a very few typographical errors and incorrect references, those of the Applicant's findings which outline its demonstration of the adequacy of SCC's work, ¶¶ 216-262, have been adopted by both the Staff and the Intervenors. Since we have only a few additions to make to those findings, we now by reference incorporate them as corrected by the Staff in its September 24, 1984 Proposed Supplemental Initial Decision. We make our additions in our discussion of the one discrete area which is still under review by the Staff, and which we are delegating to the Staff for resolution.

247. That one discrete area involves cable tray hangers. These support the trays which support and protect electrical cables. As we noted earlier in this section, it was the discovery of welding discrepancies in these hangers that led the Appeal Board to remand to us the issue of the quality of SCC work. As we show below, the Applicant has been particularly thorough in reviewing these hangers. We have no difficulty in

delegating to the Staff the oversight of the last remaining stages of that review. The Intervenor has raised no objection to this delegation.

248. Of the several engineering evaluations which have been performed on the cable tray hanger system, the most significant was conducted in early 1984, after the Applicant's nonconformance reports which led to the remand of SCC issues. See Kostal, ff. Tr. 10,159, at 12; see also Applicant's March 14, 1984 letter to the Appeal Board, cited in ALAB-770, *supra*, 19 NRC at 1179. During this most significant of the evaluations, Sargent & Lundy reinspected 358 SCC shop-welded connections of 80 cable tray hangers randomly chosen from the 5717 cable tray hangers at Byron. Kostal, ff. Tr. 10,159, at 12-13. Of the 358 connections, 106 were found to have some kind of discrepancy, and 2 of the 106 were missing portions of welds. *Id.* In evaluating each discrepant weld, Sargent & Lundy calculated the capacity of only the nondiscrepant portion of the weld. *Id.* at 13. The calculations showed that none of the discrepancies had design significance. *Id.*

249. It is certainly arguable that at this point the evaluation of the discrepancies had gone far enough. Indeed, Dr. Singh, using generally accepted statistical methods, determined that there was a 95% chance that more than 99% of the connections on the cable tray hangers met design requirements. Singh, ff. Tr. 10,160, at 4-5. Moreover, TPT's third-party review of the hangers, which included new inspections and calculations by TPT, confirmed Sargent & Lundy's results. Johnson, ff. Tr. 10,294, at 31-35. (The Applicant's proposed findings mention neither Dr. Singh's nor TPT's analyses, perhaps for reasons which will become clear below.)

250. Nevertheless, the Applicant mounted three further stages of evaluation. It is the review of the last of these which we are delegating to the Staff.

251. The first of the three further stages looked more closely at the worst of what was found during Sargent & Lundy's inspection of the eighty hangers. Three of the eighty contained the three welds which, among those inspected, had the greatest reductions in load capacity. Computer models of the as-built condition of these three hangers showed that all three hangers could bear at least three times design load without exceeding code-allowable stresses. Kostal, ff. Tr. 1059, at 14-15; Kostal, Tr. 10,241.

252. The other two further stages involved expanded inspections so extensive that Dr. Singh's and TPT's review, which dealt with the inferences that could be drawn from the inspection of only a small population of welds, become unnecessary to confirm Sargent & Lundy's initial finding that none of the discrepancies on the eighty randomly chosen hangers had design significance.

253. Among the 358 connections which Sargent & Lundy inspected, the greatest reduction in load capacity was found to be 53%, this on one of the connections which was missing a portion of weld. Kostal, Tr. 10,261-62. To assure that there were no missing portions which compromised the adequacy of welds on any of the 5637 hangers not among the 80 Sargent & Lundy had inspected, the Applicant established a program of inspection of about 3000 SCC hanger connections which cannot accommodate a 53% reduction in load capacity. Kostal, ff. Tr. 10,159, at 23; Kostal, Tr. 10,243-48, 10,255-56; Muffett, Tr. 10,506. The program also called for any necessary repair. Kostal, ff. Tr. 10,159, at 23.

254. The discovery that one among these 3000 connections had suffered a capacity reduction of more than 53% triggered the last and most extensive, but also delegable, stage of evaluation. This last stage calls for inspection of *all* accessible SCC connections on cable tray hangers, and inspection of even the nominally inaccessible SCC connections of types DV-8 and DV-8(a), since it was among connections of these types that the missing portions and the most discrepancies were found in Sargent & Lundy's original inspection. Muffett, ff. Tr. 10,478, at 17-18; Muffett, Tr. 10,484, 10,488-89. There are about 10,000 DV-8 and DV-8(a) connections, some of which are inaccessible, and there are about 20,000 connections of all other types, 80 to 90% of which are accessible. Muffett, Tr. 10,488. At the time of the August 1984 hearings, the Applicant was proposing that if during this expanded inspection, any connection were found to have a capacity reduction of more than 53%, all inaccessible connections would be inspected, unless the circumstances of the connections with capacity reduction of more than 53% suggested otherwise. Muffett, Tr. 10,483-84, 10,512-13. Since those hearings, the Applicant has reported to the Staff all accessible SCC connections and all nominally inaccessible SCC connections of types DV-8 and DV-8(a) have been inspected and that one DV-1 connection, two DV-3, one DV-7, and four DV-162 connections have been found to have capacity reductions of more than 53%. *See* Applicant's September 26, 1984 Letter to Region III. The Applicant now proposes reinspecting all the presently inaccessible connections of the last four types just named. *Id.*

255. The procedure for the conduct of this third stage of further evaluation has been reviewed and accepted by the Region III Staff. Muffett, ff. Tr. 10,478, at 17-18; Muffett, Tr. 10,480-81, 10,500; NRC Staff Exh. R-1, "Instruction for Walkdown of Cable Tray Hanger Connection Welds, Byron Station." Thus, we are in a position in relation to SCC

work much like the position we thought we were in last January. There is afoot a 100% reinspection of all accessible work, under procedures accepted by the Staff. The differences between our position now and what we thought our position was then strongly suggest that delegation to the Staff is even more justified now than we thought it was then. The new inspection program includes some inaccessible work, and may eventually include all. Moreover, the questions which we thought remained in January concerned all SCC equipment, but the question which remains now concerns only cable-tray hangers.

256. We therefore conclude that, except for the work still under review in the Applicant's expanded inspection of cable tray hangers, the quality of the SCC work is acceptable. We delegate to the Staff the determination of whether the hangers are adequate. Once again we have a vivid proof of the prudence of conservative design.

XII. CABLE OVERTENSIONING

257. In the installation of safety-related electrical conductors in conduit, the cables are subjected to tensile forces while being pulled. Additionally when the cable bundle snugly fits within the conduit, as it might at bends of short radius, side wall forces develop between the conduit and the cable. In both these situations, the insulation and the conductors are subjected to unusual, undesirable and potentially damaging forces. Such occurrences concerning Hatfield's work were found during inspections and were addressed in the Initial Decision. 19 NRC at 184.

258. This subject of overstressing was brought again to the Board's attention by the Staff in early 1984 by NRC Inspection Reports 50-454/84-02 and 50-454/84-09. Binder, ff. Tr. 9406, Attachment F at F-14, Attachment G at G-3. The former of these citations documents historically the evolution of the requirements for determining and documenting the tensions in pulled cables; it states that the item remains open. Binder, ff. Tr. 9406, Attachment F at F-14 through F-17 (pp. 12-15 of the Report, ¶ v). Further, the topic was suggested by the Intervenor as an item for the remand hearing.

259. The Board ordered a full evidentiary presentation of the alleged overstressing at the remand hearing. Board Memorandum and Order, June 8, 1984, at 9. The issue was addressed by Applicant's witnesses James G. Binder, a Project Electrical Supervisor of Commonwealth Edison, and Bobby G. Treece, a Senior Electrical Project Engineer at Sargent & Lundy, and by Staff witness Ray Love. The Intervenor presented no testimony.

260. In the context and terminology of the reinspection program, this attribute of the electrical installation was considered to be not re-creatable, that is, the subject items are in place and the measurements cannot be repeated. Applicant Exh. R-4, Exh. II-1 at 2. In any reevaluation, therefore, recourse must be made to documentation or to other indirect observations. Cable pulling was, strictly speaking, not a part of the formal reinspection program. Love, Tr. 9718.

261. Throughout the construction period the procedures for cable pulling by Hatfield have been changed. Now for example, a quantitative determination of the pulling force and the stress contribution of compression at bends is required for both hand and machine cable-pulling operations. Prior to December 1982 inspectors were not required to monitor and record tensile stresses. Binder, ff. Tr. 9406, Attachment F at F-14 through F-16.

262. As a consequence, the detail of the history of a particular cable depends upon when its installation occurred.

263. A conservative average "general" permissible force applicable to an individual cable for the purpose of its installation in a conduit is specified by the manufacturer. When that cable is one of several located in a single conduit, the distribution of the total pull among the components of the bundle cannot be precisely established, so the total pulling force is less than the sum of the individual ones by some factor determined by the installing contractor based on the characteristics of the bundle. The manufacturer, however, can violate his "general" criterion, on a case-by-case basis, to establish greater permissibility. Treece, ff. Tr. 9408, at 6, 7; Treece, Tr. 9422-27.

264. Evidence on the acceptability of cables for their intended use was prepared by several methods depending upon the input data available. In some instances of safety-related cables installed before December 1982, cable-pull reports were sufficiently complete to allow an analysis based on general specifications supplied by manufacturers. In instances where local analyses indicated an overstress, review of the installations by the cable manufacturers found them within the tolerances placed on the general limiting tensile force. The result could be a certification of acceptability by the cable manufacturer.

265. Still another investigative method entailed calculations of the maximum pull expected to have been required based on the length of the conduit between pull boxes, the number, location and dimensions of bends, the configuration and dimensions of the bundle, the dimensions of the conduit and the value of the coefficient of friction. If a calculation entailing worst possible conditions showed a too-large pull, more realistic input characteristics were applied. Finally, the properties of installed

cable could be measured *in situ*. This last method includes the electrical resistance of insulation to ground determined by an instrument known in the trade as a "megger" and, as a second test, the observation of the ability of insulation to withstand a relatively high direct current potential without sparking to ground. Treece, ff. Tr. 9408, at 5-9; Binder, Tr. 9428-29.

266. The result of the initial review, based on manufacturers' criteria, of reports on pulls of nearly 200 safety-related cables installed before implementation of the revised Hatfield inspection procedures in December 1982 was the identification of an excessive pulling force in 25 installations resulting in potential overstress by either tensile forces, radial forces, or both. Review on an individual basis of the details of these twenty-five instances by the cable manufacturers showed each of them to be acceptable for the designed purpose. Treece, ff. Tr. 9408, at 7, and Attachment A.

267. In a more inclusive study, all of the approximately 2600 identifiable conduits into which safety-related cable had been pulled prior to 1983, including those documented, were investigated by one or more of the analytical methods. All but three cable/conduit runs were deemed acceptable. These three, conduits COA-6158, COA-6193, and COA-6192, having no cable-pull reports, were referred to the manufacturer who, on the basis of a reanalysis, judged installation to be acceptable provided, in the case of COA-6193 and COA-6192, pull through the conduit was in a direction specified as towards junction box 1JB261A. If the pull were made in the opposite direction, the manufacturer recommended replacement. The oral and written testimony is silent on the direction of installation except for statements in the information supplied to the manufacturer (Treece, ff. Tr. 9408, Attachment C at C-4) where the direction of pull is noted as "Starts At 1JB261A" and as "Cable Pulled From 1JB261A to 1JB262A . . . [and] . . . From 1JB261A to Gear" (Here the testimony is illegible.) The forces calculated for the 1JB261A to 1JB262A section, if the overall pull beginning at 1JB261A were truly in two parts, are given by the manufacturer's analysis as 2803 lb and 740 lb/ft, both apparently acceptable. The second part of the pull, 1JB262A to the use point, if analyzed, is not reported. It is not clear why the manufacturers calculated the forces for a single pull, from 1JB261A to use point, and arrived at unacceptable values. Treece, ff. Tr. 9408, Attachment B at B-6 through B-8. The Staff is requested by the Board to examine this paradox.

268. Although certain NRC Inspection Reports now a part of this record cite many instances of overstressed cables (*see*, particularly, Binder, ff. Tr. 9406, Attachment G at G-6 through G-12), we are in-

formed that all cables earlier shown by one or more of the several analyses and tests not to be acceptable have been replaced. Binder, ff. Tr. 9406, at 11, 12.

269. In one instance one cable of a bundle of thirteen was necessarily removed requiring a force greater than the permissible tensile stress of others in the bundle. Since the distribution of this force among the remaining twelve cables could not be ascertained, all thirteen were replaced at the behest of an NRC Inspector. *Id.* at 12-14.

270. The question of cable tension was addressed briefly by the Staff through the testimony of Ray Love, a Region III Reactor Inspector. Ff. Tr. 9510, at 25-27. In NRC Inspection Report 50-454/84-27 and 50-454/84-19 (Binder, ff. Tr. 9406, Attachment E at E-10 to E-11; Treece, ff. Tr. 9408, Attachment D) appears a review of Applicant's actions on the overtension in cables encased in conduit which have been detailed in the preceding paragraphs. The Staff concurs in the method and results of the various tests and analyses and concludes that safety-related cables will serve their intended purpose. This hitherto unresolved item, opened in a 1981 NRC Inspection Report 50-454/81-16, is now closed.

271. With the exception of the above assignment to the Staff to inquire into an apparent inconsistency in the testimony, the Board concludes the inquiry in a manner favorable to the Applicant.

XIII. TABLING ALLEGATION

272. In the earlier hearing, an Intervenor witness, Michael Smith, a one-time inspector at Byron for the Hunter Corporation, alleged observing, in a pre-1980 interval, the absence of a number of pipe supports although documentation attesting to their proper installation existed. Upon reporting these conditions to his supervisor, he was instructed not to document the missing items, for their absence would be detected later. This delayed action was called "tabling." Ff. Tr. 3243, at 23. In the previous Initial Decision, this Board found that Hunter had been delinquent in identifying and documenting such discrepancies. 19 NRC at 141-43, ¶¶ D-137 to D-145. Accordingly those allegations became candidates for consideration in the remand hearing.

273. In this remand hearing the issue was addressed by Applicant's witness Malcolm Somsag and Staff's witnesses Kevin Connaughton and Kevin Ward.

274. Mr. Somsag, Quality Assurance Supervisor for Hunter, explained that the genesis of the tabling allegations was probably an assignment to Mr. Smith whereby he was to collect data on hangers as a consequence of reports that a number of such hangers had been installed with-

out complete inspection and concomitant documentation and instances of documentation of nonexistent hardware. In Mr. Smith's collection appeared both safety-related and nonsafety-related items. Since the collection was to have been limited to safety-related equipment, other items were deleted by Mr. Somsag, who opined that those nonsafety-related hangers, so removed from his list, are the "tabled" items put forward by Mr. Smith. Somsag, ff. Tr. 9452, at 6 and 7.

275. The absence of even nonsafety-related items as well as those classed as safety-related would have been detected through the final walkdown and during the three or four types of inspection effected for safety-related supports in the completion-of-work process. *Id.* at 2-3, 7-8; Somsag, Tr. 9453-54, 9476-78. The employment of Mr. Smith by Hunter terminated in early 1980; subsequently Hunter conducted a 100% inspection of pipe supports installed prior to March 1, 1980, which would, in principle, have detected discrepancies occurring during Mr. Smith's tenure. *Id.*

276. The Staff addressed the tabling allegation in its direct testimony. The Staff has no evidence that the tabling practice was in any way followed during the reinspection, an observation consistent with the tenure of Mr. Smith's employment. As to practices and occurrences during the Smith era (pre-early 1980), Hunter did document and control identified discrepancies by procedures not in agreement with its QA program, actions subsequently remedied. The Staff concludes that "tabling," as alleged to have occurred, has been adequately addressed and that the quality of Hunter's work has not been compromised. Connaughton and Ward, ff. Tr. 9510, at 19-21.

277. Mr. Somsag's concept of how Mr. Smith's allegation arose is believed by the Board not to be unreasonable. Further, any gross omission of structural items has a high probability of discovery during the Type 3 (or Type 4) inspection made by the contractor immediately preceding transfer of that phase of construction to the control of the Applicant. Additionally there are the usual, though not necessarily as thorough, inspections by the Staff. Accordingly the Board concludes that the tabling practice alluded to by Mr. Smith could have been, and likely was, negated by the Hunter QA program described by Mr. Somsag.

XIV. APPLICANT'S QA PROGRAM — PARTICULARLY SINCE AUGUST 1983

278. The attitude, capability and interest in the quality of the construction of the Byron Station of the highest management of the Applicant was not an issue in this remanded proceeding. In fact the Applicant

prevailed on that matter in the Initial Decision. 19 NRC at 218, ¶ D-449. Nonetheless the Applicant presented as a witness Wallace Behnke, Vice Chairman of the utility, who held upper management responsibility for quality during the reinspection program. He addressed items ruled on favorably earlier and reiterated the corporate policy of delegating initial responsibility for quality control and quality assurance to the contractors actually performing the work, a practice based on CECo's belief that the organization doing the work will produce a higher quality product if it inspects and audits itself. This is also consistent with CECo's policy to insist on obtaining documented quality performance from each of the contractors and vendors with whom it does business. He cited PTL as an "arm of our quality assurance department" which shares with CECo the responsibility of complementing the contractors' audit functions. Behnke, ff. Tr. 9336, at 5, 6. The function of PTL in the reinspection and other activities has been discussed earlier in this decision.

279. Mr. Behnke has experience with CECo quality assurance dating back to 1965. In 1973, he established a separate quality assurance department which reported directly to him as Executive Vice President. Behnke, ff. Tr. 9336, at 4. In 1982 Unit Concept Inspections by PTL at Byron were inaugurated. For a Unit Concept Inspection a section of a generating station is selected for an overall comprehensive inspection within many disciplines. In the Byron instance the inspections were done by a selected team of PTL, an organization which did no construction and, hence, no initial evaluation of the quality of the work. A special and more comprehensive CECo management audit was conducted at Byron in 1983. Although the testimony does not define a "management audit," in our Initial Decision we noted it to be a formal investigation by a team of experts reporting to the upper echelon of CECo, i.e., not those employed on site whose duties are day-to-day examinations of construction. Behnke, ff. Tr. 9336, at 6, 7; I.D., 19 NRC at 128, 129.

280. In late 1982 a group of twenty senior management personnel with multi-discipline backgrounds evaluated Byron against the performance-objectives criteria put forth by the Institute of Nuclear Power Operations. Byron "measured up well" against those criteria. Behnke, ff. Tr. 9336, at 9.

281. Mr. Behnke testified that on three occasions Hatfield's activities resulted in senior management attention. In 1980, an NRC inspection of Hatfield's activities at Byron led to multiple items of noncompliance and issuance of a stop-work order by the CECo quality assurance organization. In 1982, extensive reinspection of cable pan hangers installed by

Hatfield was performed at CECo's request because of incomplete documentation of inspections by Hatfield and led to a meeting of the presidents of the two companies where CECo's concerns about the quality of Hatfield work were forcefully expressed. Hunter's activities have not necessitated similar intervention. Behnke, ff. Tr. 9336, at 10.

282. The tables which comprise Attachment A to Mr. Behnke's testimony show the extent of CECo's quality assurance program for Hatfield and Hunter. When asked to compare the inspection effort performed by CECo's own QA department with that of PTL, Mr. Behnke testified that the bulk or mainline of the effort was by CECo's own QA department. Behnke, Tr. 9346-48.

283. A comparison of the column totals of the tables might lead to a hasty comparison of the relative contributions of the three organizations (Hatfield, CECo and PTL, for instance) to the overall inspection effort with the inference that PTL carried the brunt in the Hatfield case. See *Intervenors' Proposed Findings* 166c, 190. It is to be noted, however, that the successive groups of columns report different things — for example, *audits* by Hatfield and CECo and *inspections* by PTL. If PTL did make a significant contribution, it is as it should be. That is what PTL was hired to do.

284. Mr. Behnke concluded that the Applicant's QA program adequately controls the activities of Hatfield and Hunter and provides assurance that the work of these two contractors is adequate. Behnke, ff. Tr. 9336, at 12-14.

285. Mr. Del George also testified that his confidence in the Hatfield and Hunter work quality at Byron was based in part on the many independent layers of inspection and review of their work. Del George, ff. Tr. 8406, at 51. Similarly, Mr. Laney based his engineering judgment on the adequacy of Hatfield and Hunter work in part on the coverage and effectiveness of CECo's quality assurance program. Laney, ff. Tr. 9339, at 26-27.

286. Following completion of the reinspection program, two sets of Staff Inspection Reports were issued which relate to Hatfield QC activities. Report 84-27 identified two items of noncompliance. The first involved failure to incorporate a drawing on a cable pan cover installation into an inspection procedure. However, the affected contractor personnel had been trained on the requirements of the drawing and are believed to have properly implemented them. Del George, ff. Tr. 8406, at 43-45.

287. The second item of noncompliance identified a number of discrepant cable pan hangers caused by deficient inspections. The majority of the observed discrepancies was in welds with fit-up gaps, items only

recently designated as candidates for inspection and does not compromise the integrity of previously performed inspections. The valid discrepancies were shown not to be significant. *Id.*

288. Report 84-09 identified one apparent item of noncompliance involving a single Hatfield discrepancy report (DR-3382) which dealt with the removal of a cable from a conduit. The discrepancy report inaccurately described the pulling force applied in the removal of that cable, resulting in a deficient engineering evaluation. This event was determined to be an isolated occurrence. *Id.* It is described in § XII.

289. Taken together, these three items of noncompliance do identify an apparent weakness in translating design requirements into inspection procedures. However, these procedural discrepancies have not demanded major rework on the affected safety-related components and do not contribute to our evaluation of the QA program. Del George, ff. Tr. 8406, at 47.

290. In the course of the remand hearing, at the Board's request, Applicant witness W.J. Shewski, the corporate manager of quality assurance, testified on the oversight by his department of Hatfield, Hunter, and PTL between August 1983 and July 1984.

291. Mr. Shewski reported that Hatfield had been subjected to 14 audits and at least 222 surveillances, covering a broad spectrum of its work, which identified 17 deficiencies (7 findings and 10 observations).¹² The findings included the absence of followup on audits and on objective errors, inadequate identifications on weld-traveler cards, a lack of inspection of combination hangers, improper disposition of discrepancy reports and the failure of some QC inspectors to perform required read/study activities. Shewski, ff. Tr. 8423, at 32, 33.

292. Hatfield's corrective actions have consisted of additional inspections, audits and training, together with reviews of personnel documentation and of discrepancy reports to ensure proper disposition of the discrepancies. All seven findings have been acceptably corrected or action on them is under way. The Hatfield quality assurance performance during this period has been acceptable. *Id.*

293. Applicant's quality assurance organization has conducted 14 audits and at least 142 surveillances of Hunter between August 1983 and July 1984 covering the key aspects of Hunter's work and quality requirements, resulting in the identification of 16 deficiencies (6 findings and 10 observations). None was found to be significant and each required only minor corrective action. All of these deficiencies were

¹² Absent more formal definition, the Board likens "findings" and "observations," at least in relative degree of severity, to Staff's "noncompliance" and "open items," respectively.

closed out during subsequent surveillances. Shewski, ff. Tr. 8423, at 30, 31.

294. Eight audits and at least fifty-one surveillances of PTL have been performed since August 1983 covering such items as instrument calibration, personnel qualifications, visual and other nondestructive inspections, and document and material controls. The audits identified ten deficiencies (four findings and six observations) including improper acceptance of seven welds, improper certification of a receiving inspector, and obliteration and incomplete recording of data. The cause of these deficiencies was correctable through retraining. Adequate corrective measures were easily achieved. Shewski, ff. Tr. 8423, at 31-32.

295. We reaffirm our early 1984 ruling that the Applicant is institutionally capable and willing to maintain and effect an adequate and acceptable quality assurance program at Byron. We continue to believe that during and prior to the initial sessions of this proceeding that strong managerial attitude had not permeated the day-to-day, onsite activities of the Applicant and its contractors. 19 NRC at 218. The reinspection program and time appear to have brought cohesion into the gross structure of the quality program.

XV. APPLICANT'S QA MEASURES TO PREVENT INACCURATE OR UNRELIABLE CONTRACTOR DOCUMENTATION PRACTICES

296. A concern of this Board at the close of the earlier proceeding challenged the reliability of Hatfield's documentation of its inspection procedures and results and the exercise of Applicant's oversight of it. In an endeavor to alleviate that concern Applicant reviewed its current efforts to assure itself that quality documentation is accurate and reliable. Mr. Shewski reported that Hatfield's documentation procedures have gone through several changes since Hatfield began work at Byron in 1976. Originally, about 5% of the welds were spot checked and the results were indicated directly on the drawings. Thereafter, Hatfield changed from inspections based on drawings to the use of weld-traveler cards which now constitute the primary record of weld quality and record the inspection results by quality control inspectors (see Applicant's Exh. R-1). In 1981, Hatfield changed from spot checks to 100% inspection of all welds. Mr. Shewski testified that, based on his experience, neither Hatfield's documentation practices nor its procedures over time differ markedly from those of electrical contractors at other nuclear sites. Shewski, Tr. 8763. This evolution in inspection practices and documentation is at least partially responsible for the apparent difficulty

which Hatfield has experienced from time to time in maintaining proper documentation. Hunter performs much of its construction work under the ASME Code which required a weld traveler system and documented inspections and, therefore, has not experienced documentation problems comparable to Hatfield's. Shewski, Tr. 8761.

297. Since mid-1982, special attention has been given by Applicant's site quality assurance organization to actions by site contractors which might lead to inaccurate or unreliable documentation. Training for detecting possible alterations to documents was provided for site QA personnel. Shewski, ff. Tr. 8423 at 25.

298. An audit by the Applicant of over 10,500 records was conducted in late 1982 to verify the authenticity of contractor QC documentation. CECO's audit of Hatfield's implementation of the reinspection program specifically included a review of the accuracy and reliability of Hatfield's records. Another related audit was performed for the reinspection program in early 1984 by Applicant's corporate quality assurance department which covered the records of Hunter and PTL as well as those of Hatfield. Included in these investigations were the contractors' methods of control and administration of QC qualification tests of inspectors and of measuring-instrument calibrations to ensure a complete and properly authorized record. Contractor-welder and QC-inspector qualifications were examined to establish acceptability and authenticity. Neither fraudulent activities nor evidence of inaccurate or unreliable certifications of contractor inspection and reinspection personnel were observed. Shewski, ff. Tr. 8423, at 26; Hansel, Tr. 9013.

299. On the basis of the evidence presented, the Board concludes that the exercises stimulated by the reinspection program in general have sharpened the awareness, by those directly responsible for the quality of the Byron Station, of both careful observations, *per se*, and of complete and intelligible records of those observations. In effect we sense improvements in these inspection practices since our opinions in the first Initial Decision were noted. 19 NRC at 214-15, ¶ D-438. We encourage the Applicant to maintain close surveillance, throughout the life of Byron, over the quality of those equipment alterations and procedural changes that will inevitably occur in the future. Concomitantly, we suggest continuing oversight by the Staff as those improvements are effected.

300. The Board did not explore again the specific instances which caused us to conclude in the Initial Decision that Hatfield seems to be incapable of maintaining reliable records of nonconforming and deviating conditions. We were mindful from the outset of the remanded proceeding that the Appeal Board determined that a finding, as a result of the

reinspection program, that the quality of work of Hatfield and Hunter is acceptable would indicate that any deficiencies in document control did not affect the final product. ALAB-770, *supra*, 19 NRC at 1178 n.65. Whatever deficiencies in Hatfield's and Hunter's document control practices might have been perceived by us and others outside their respective organizations, those deficiencies did not affect the ultimate quality of the work. The documentation must have been acceptably reliable for the contractors' own use. We cannot, however, conclude that we were initially mistaken in criticizing specific instances of ambiguous record keeping.

XVI. DISPOSITION OF ALLEGATIONS

301. In our Initial Decision, we expressed concern over several matters regarding Hatfield arising from worker allegations that were still pending with Region III and the Office of Investigations, and noted that the NRC Region III Staff intended to close out several allegations on the basis of the results of the reinspection program. I.D., 19 NRC at 206-07, 215, ¶¶ D-406, D-407, D-439. In our June 8, 1984 prehearing order, we clarified that our concern was limited to whether, in accordance with the NRC Staff's expectations, the BRP has been effective in resolving some of the worker allegations. We also asked whether the NRC Staff or Applicant had identified any allegations as having independent and important relevance to the reinspection program. Memorandum and Order (June 8, 1984), at 8-9.

302. NRC Staff witnesses testified that the BRP was relied upon to resolve two worker allegations regarding Hatfield welding, and supplemented the resolution of three others. The remainder of the twenty-three allegations assigned to Region III and as yet uninvestigated at the close of the August 1983 hearings have since been resolved independent of the BRP. Hayes, Connaughton, ff. Tr. 9964, at 3.

303. In response to our second request, the NRC Staff found, with one exception, no other allegations of independent and important relevance to the BRP. In the one exception, the NRC Staff found an allegation regarding the improper certification of one QC inspector to be substantiated. Appropriate corrective actions were taken with respect to this individual and found acceptable to the NRC Staff. Hayes, Connaughton, ff. Tr. 9964, at 5-6.

304. Because of the NRC Staff's testimony, our questions in this regard have been satisfied.

XVII. MODIFICATION OR WITHDRAWAL OF FINDINGS AND CONCLUSIONS IN INITIAL DECISION

305. In ALAB-770 the Appeal Board directed us to include in our Supplemental Initial Decision any modification or withdrawal of any ultimate findings and conclusions of our Initial Decision that might be required as a result of the additional evidence received in the remanded proceeding. 19 NRC at 1182.

306. In our January 13, 1984 Initial Decision we observed the changing nature of the quality assurance program at Byron. We noted that the reinspection program was still freshly in its implementation phase and that CECo was, during the hearing, just catching up on its quality assurance oversight responsibilities. For our part upon remand we saw no need to question in either direction the validity of the findings and conclusions of the January Initial Decision and we concentrated on later events. The parties also focused on the events occurring shortly before the close of the record in August 1983 and on the period following. As a consequence, this Supplemental Initial Decision, as its title implies, is the conclusion of the story rather than a substantial alteration of it.

307. Applicant has, however, requested a series of particular modifications which, for the most part, have been considered in the discussions of the respective issues. Applicant's Proposed Findings 318-333. For example, we have found that Michael Smith's tabling allegations against Hunter Corporation have a probably benign explanation as demonstrated by Mr. Somsag's testimony. We found that Hatfield's and Hunter's record-keeping abilities were necessarily sufficiently reliable for sound construction purposes, but for Hatfield, at least, we would not change our original finding that their records were ambiguous to persons outside their organization, namely us. There are, however, some very important ultimate conclusions which must be expressly superseded in this Supplemental Initial Decision in keeping with the ALAB-770 mandate.

308. Contrary to ¶ D-434 (19 NRC at 214), we have concluded now that, with respect to the record before us, the quality of Hatfield work at Byron is adequate as inferred from inspector competence and as directly inferred from evaluating the reinspection results. Also, contrary to that earlier finding, CECo has today met its oversight responsibilities respecting Hatfield.

309. Contrary to ¶¶ D-436 and D-437, the rationale of the reinspection program sampling has been thoroughly explained, and the reliable similarity between work reinspected with the work not reinspected has been demonstrated. 19 NRC at 214.

310. In connection with ¶ D-439, there has been a satisfactory explanation of the disposition of worker allegations pending at the close of the record. 19 NRC at 215.

311. Consistent with ¶ D-444 of the Initial Decision (19 NRC at 216), the reinspection program became an effective verification of Hunter's quality assurance program.

312. Finally, our finding in ¶ D-429 (19 NRC at 213) to the effect that Intervenor's prevail on the quality assurance contention is superseded in the following section to the effect that Applicant has prevailed.

XVIII. CONCLUSIONS OF LAW

313. The Board concludes that the Applicant prevails on the quality assurance contention. Applicant has, in the language of the contention, demonstrated its "ability or willingness to comply with 10 C.F.R. Part 50, Appendix B, to maintain a quality assurance and quality control program, and to observe on a continuing and adequate basis the applicable quality control and quality assurance criteria and plans"

XIX. ORDER

The Appeal Board retained jurisdiction of the proceeding while we complete the hearing and issue the Supplemental Initial Decision. ALAB-770, *supra*, 19 NRC at 1168. Pointing to the local rules of the Court of Appeals for the District of Columbia, the Appeal Board noted that it retained jurisdiction for the purpose of facilitating the procedures on appeal. Since we were expressly instructed to modify or withdraw any ultimate finding in our Initial Decision of January 13, 1984, it is apparent that the Appeal Board returned full jurisdiction to this Board on the quality assurance issue in all substantive respects. Accordingly, it is our intention to resolve this matter as if it had been resolved in Applicant's favor in our Initial Decision.

IT IS THEREFORE THE ORDER OF THE BOARD, that the January 13, 1984 Order that the Director of Nuclear Reactor Regulation may not issue the operating license for Byron Nuclear Power Station, Units 1 and 2, is set aside. 19 NRC at 280. The Board's Order denying the Byron operating license is also set aside. *Id.*

The Director of Nuclear Reactor Regulation, upon making the findings on all applicable matters specified in 10 C.F.R. § 50.57(a), is authorized to issue full-power licenses for Byron Nuclear Power Station, Units 1 and 2, subject however to the provisions of 10 C.F.R. § 2.764(f). That

section, the so-called immediate effectiveness provision, limits the authorization to fuel loading and low-power (up to 5% of rated power) testing pending the Commission's review on its own motion of any decision authorizing an operating license.

XX. RESERVATION OF JURISDICTION, FINALITY AND EFFECTIVENESS

Intervenors' September 12, 1984 motion to reopen the record to include the Byron design as an issue in the proceeding is pending. By its Order of September 19, 1984 (unpublished), the Appeal Board authorized this Board to consider the motion in the first instance and we have done so. We intend to deny the motion. A memorandum and order to that effect will issue soon. We reserve jurisdiction for that purpose. The pendency of Intervenors' motion does not influence the effectiveness of this Supplemental Initial Decision.

Finality of this Supplemental Initial Decision will be subject to Appeal Board rule. It shall not become effective until the Commission actions specified in 10 C.F.R. § 2.764(f)(2) have taken place. The parties may file brief comments with the Commission pointing out matters which, in their view, pertain to the immediate-effectiveness issue. To be considered, such comments must be received within 10 days of the Board's decision.

ATOMIC SAFETY AND LICENSING BOARD

Dixon Callihan, Ph.D.
ADMINISTRATIVE JUDGE

Richard F. Cole, Ph.D.
ADMINISTRATIVE JUDGE

Ivan W. Smith, Chairman
ADMINISTRATIVE LAW JUDGE

Bethesda, Maryland
October 16, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

John H Frye, III, Chairman
Dr. James H. Carpenter
Dr. Peter A. Morris

In the Matter of

Docket No. 40-2061-ML
(ASLBP No. 83-495-01-ML)

**KERR-MCGEE CHEMICAL
CORPORATION**
**(West Chicago Rare Earths
Facility)**

October 19, 1984

In a proceeding commenced to consider Staff's proposal to license onsite storage of thorium mill tailings, the Licensing Board, in considering objections to contentions, rules that Staff must consider permanent disposal of the mill tailings now and that the Applicant may file contentions in the proceeding even though it did not request a hearing.

RULES OF PRACTICE: ADMISSIBILITY OF CONTENTIONS

An applicant for a license amendment may file contentions challenging Staff's proposed action in a proceeding commenced at the request of another party despite the fact that applicant did not request a hearing.

LICENSING BOARDS: DELEGATED AUTHORITY

Commission's delegation to Licensing Board of authority to act on petitions to intervene and conduct any necessary proceedings pursuant to

10 C.F.R. Part 2, Subpart G, includes authority to accept contentions filed by applicant even though applicant did not request a hearing.

NEPA: SEGMENTATION

Facts surrounding Staff's proposal to license onsite storage of mill tailings where applicant had applied for a license permitting onsite permanent disposal are strongly indicative of the conclusion that Staff's proposal amounts to segmentation prohibited by NEPA of an overall plan. Provisions of the CEQ's regulations (adopted by NRC) mandate that permanent disposal be considered now.

NEPA: SEGMENTATION

Where no concrete proposal exists to add material to the mill tailings which are the subject of the proceeding, there is no requirement that Staff consider the addition of such material in its environmental impact statement.

NEPA: CONSIDERATION OF ALTERNATIVES

Consideration of alternative sites under NEPA is meaningful only when all alternatives considered meet the requirements of the Commission's regulations promulgated under the Atomic Energy Act.

UMTRCA: COST OF LONG-TERM MAINTENANCE AND MONITORING OF TAILINGS DISPOSAL SITES

Nothing in § 203 of UMTRCA suggests that a licensee must post a bond to cover the cost of adverse health and socioeconomic effects resulting from disposal of mill tailings.

UMTRCA: EPA AND NRC REGULATIONS

EPA's regulations promulgated under UMTRCA provide a minimum level of protection which may not in all cases be deemed sufficient by NRC after the latter considers the level of risk posed by a specific tailings pile, economic costs, and other appropriate factors (§ 84(a), Atomic Energy Act).

UMTRCA: OWNERSHIP OF DISPOSAL SITES

Section 83(b)(1)(A)(ii) of the Atomic Energy Act provides that, if the State in which a permanent tailings disposal site is located elects not to become the owner of that site on license termination, the federal government must.

UMTRCA: COST OF LONG-TERM MAINTENANCE AND MONITORING OF TAILINGS DISPOSAL SITES

Criteria 9 and 10 of Appendix A to 10 C.F.R. Part 40 require that the financial cost of long-term maintenance and monitoring of disposal still be considered initially rather than deferred until shortly before license termination.

NEPA: COST-BENEFIT BALANCE

Part 51 of the Commission's regulations requires a cost-benefit balance which includes a consideration and balancing of qualitative as well as quantitative environmental impacts.

MEMORANDUM AND ORDER **(Ruling on Kerr-McGee's and Illinois' Contentions)**

This proceeding concerns Kerr-McGee Chemical Corporation's (Kerr-McGee) application for a license amendment which would permit it to permanently dispose of certain mill tailings at its West Chicago Rare Earths Facility site. The mill tailings in question are the result of thorium milling which began when the Lindsay Light and Chemical Company established a mill at this site in 1931. In 1958, Lindsay transferred ownership of the mill to American Potash and Chemical which, in turn, transferred ownership to Kerr-McGee in 1967. Kerr-McGee closed the plant in 1973 and for some time has been in the process of demolishing the buildings and preparing the site for eventual return to unrestricted use. This work is being carried out pursuant to NRC authorization. (See FES at xi.)

Kerr-McGee wishes to dispose of the mill tailings on a so-called disposal site which is connected to the factory site by means of an intermediate site. (See FES at 1-1.) Kerr-McGee has requested a license amendment which would permit permanent disposal of these mill tailings on the disposal site in an engineered disposal cell.

Staff reviewed Kerr-McGee's request and prepared draft and final environmental impact statements (NUREG-0904, May 1982 and May 1983). Staff concluded that, while it would not approve Kerr-McGee's request for permanent disposal on the disposal site, it would approve storage for an indeterminate period on the disposal site in a cell very similar to that proposed by Kerr-McGee. Staff would thus defer a decision with regard to permanent disposal until after a period of monitoring for at least 5 years, and would hold open the possibility that the mill tailings might be moved to another site. At the time Staff reached this conclusion, the Environmental Protection Agency (EPA) had not yet adopted its regulations setting out standards for disposal of this type of waste.

On June 7, 1983, Staff published a notice in the *Federal Register* affording an opportunity for hearing on this matter. (See 48 Fed. Reg. 26,381.) That notice referred to the difference between Kerr-McGee's proposal and Staff's alternative of choice. The notice further provided that Kerr-McGee and any other person whose interest might be affected could request a hearing. Kerr-McGee did not request a hearing. However, the People of the State of Illinois and the West Chicago Chamber of Commerce did file such requests.¹

Demolition of the factory site buildings had been authorized by the Commission following informal hearings. An issue arose whether resolution of the matters presented by the pending hearing requests should be similarly resolved or should be the subject of adjudication pursuant to 10 C.F.R. Part 2, Subpart G. In an unpublished Order of November 3, 1983, the Commission determined that the latter procedures should govern and authorized the appointment of this Board.

Following our appointment,² we issued a Memorandum and Order on November 17, 1983, which set a schedule for the filing or amending of contentions by the two petitioners and for responses by Kerr-McGee and Staff. Subsequently, we scheduled a prehearing conference for February 2, 1984. By letter of January 20, 1984, Kerr-McGee noted three contentions which it wishes to litigate. On January 31, Staff objected to the admission of these contentions. Kerr-McGee, Staff, and the

¹ The People were admitted as a party after Kerr-McGee and Staff conceded their standing. See Prehearing Conference Memorandum and Order of February 24, 1984 (unpublished). The Attorney General of Illinois advised on February 29, 1984, that in addition to the People of the State, he also represents the Illinois Department of Nuclear Safety (IDNS). No party objected to the participation of IDNS, and it is also a party. The IDNS and the People are collectively referred to herein as the People. Pursuant to its request, the West Chicago Chamber of Commerce's petition to intervene was withdrawn in favor of a limited appearance statement. See Memorandum and Order of March 7, 1984 (unpublished).

² See 48 Fed. Reg. 52,300 (Nov. 17, 1983).

People have briefed the issue thus presented.³ These parties have also briefed Contentions AG 1 and portions of AG 2 filed by the People.⁴ Contention AG 1 attacks the adequacy of the FES, and the parties agreed that it presents legal issues which may be decided without an evidentiary hearing. The Board, in its February 24 Prehearing Conference Order, also directed the parties to address portions of AG 2 in their briefs. It is the purpose of this Memorandum and Order to rule on these matters.

Kerr-McGee's Proposed Contentions

The first of Kerr-McGee's three contentions takes issue with the Staff's position that permanent disposal of the mill tailings should not now be authorized. This contention raises the questions whether Kerr-McGee's proposed onsite Stabilization Plan meets the requirements of the Uranium Mill Tailings Radiation Control Act (UMTRCA)⁵ and EPA's implementing regulations and whether, as a consequence, permanent disposal of the tailings on site should now be authorized. Thus it challenges Staff's rejection of Alternative I in favor of Alternative III as set forth in the FES. Kerr-McGee and the People are agreed that this question should be resolved now, although they are diametrically opposed on how it should be answered. While Staff opposes admission of this contention, it believes that compliance with UMTRCA and EPA's implementing regulations can be litigated under Alternative III of the FES. The positions of the parties are more fully discussed below. For purposes of this discussion, it is important to note that this contention and the People's Contention AG 1 raise the question whether the deci-

³ "Memorandum of Kerr-McGee Chemical Corporation in Support of the Admission of Its Contentions" of May 2, 1984; "People of the State of Illinois' Post-Prehearing Conference Brief" of May 2, 1984, at 2-7; "NRC Staff Memorandum in Opposition to Admission of Kerr-McGee Contentions" of June 6, 1984; "Reply of Kerr-McGee Chemical Corporation to the NRC Staff Memorandum in Opposition to the Kerr-McGee Contentions" of June 21, 1984; People's "Reply to Staff Memorandum Opposing Kerr-McGee Contentions" of June 22, 1984; "NRC Staff Answer to Board's Question" of September 6, 1984, and "Clarification of NRC Staff Answer to Board's Question" of September 20, 1984; "Response of Kerr-McGee Chemical Corporation to the Board's Question" of September 25, 1984; and "People's Response to NRC Staff Answer to Board Question" of September 24, 1984.

⁴ "People of the State of Illinois' Post-Prehearing Conference Brief" of May 2, 1984; "Brief of Kerr-McGee Chemical Corporation Concerning Contentions of the Illinois Attorney General" of June 6, 1984; "NRC Staff Memorandum in Opposition to State of Illinois Contentions" of June 21, 1984; and "People of the State of Illinois' Reply Brief" of August 7, 1984. We note that in a few instances, citations to authority were not always complete, omitting later relevant decisions in the same case. In the future, we expect the parties to be thorough in their briefing and argument.

⁵ UMTRCA made amendments to the Atomic Energy Act. When discussing specific provisions of UMTRCA, we cite the applicable Atomic Energy Act section.

sion with regard to permanent disposal should be made now rather than later as Staff would have it.

Kerr-McGee's Contentions KM 2 and KM 3 raise technical matters pertaining to the design of the disposal cell. Contention KM 2 challenges the Staff's determination that a uniform gravel layer, 1 foot in depth, should be installed beneath the cell, while KM 3 raises a question concerning Staff's determination with regard to the thickness of the top cover of the cell. In its discussion of KM 3, Kerr-McGee notes that Staff's apparent determination that a top cover thicker than that proposed may be no more than a typographical error in the FES.⁶

We heard argument from the parties with regard to Staff's position of the February 2, 1984, prehearing conference. Because we perceived that Staff's position might well have implications for licensees' and applicants' procedural rights to challenge Staff determinations in an adjudication, and because of the novelty in NRC practice of a licensee or applicant filing contentions,⁷ we called for briefing of the issues by the parties.

THE POSITIONS OF THE PARTIES

In its January 31, 1984 response to Kerr-McGee's contentions as further elaborated in its June 6 Memorandum, Staff takes the position that:

First, by failing to request a hearing in response to the June 1983 *Federal Register* notice, Kerr-McGee waived its right to raise contentions challenging Staff's conclusion stated in the FES. Staff concedes Kerr-McGee's status as a party and its right as such to respond to contentions advanced by others. However, Staff views Kerr-McGee's failure to request a hearing as limiting its participation as a party to this role.

Second, because, in Staff's view, the contentions advanced by Kerr-McGee are outside the scope of the contentions advanced by the People or the Chamber, and because the Commission referred only the latter two petitions to the Board for action, Kerr-McGee's contentions raise matters which are outside the authority delegated to this Board.⁸

⁶ See January 20, 1984 Letter to the Board from Kerr-McGee's counsel at 7.

⁷ We are aware of only one other proceeding in which a Staff-Applicant disagreement persisted to an evidentiary hearing. See *Tennessee Valley Authority* (Bellefonte Nuclear Plant, Units 1 and 2), LBP-74-66, 8 AEC 472, 475, 476 (1974).

⁸ Staff relies on *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit 1), LBP-81-60, 14 NRC 1724 (1981) and *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-316, 3 NRC 167 (1976) for the proposition that this Board may act pursuant to delegated authority only.

Staff also takes the position that, because others who might have petitioned to intervene were not on notice that Kerr-McGee would take issue with the Staff's conclusion, acceptance of the Kerr-McGee contentions would require that a new notice be published.⁹

Finally, Staff asserts that admission of Contention KM 1 would prejudice the People because they oppose onsite disposal of the mill tailings and Staff because it would, if successfully prosecuted by Kerr-McGee, prevent Staff from ordering removal of the tailings to another site if, after closure of the cell, it developed that its performance was substandard. Curiously, Staff goes on to argue that, even if Contention KM 1, is denied, Kerr-McGee can, within the scope of Alternative III, seek to demonstrate that its proposed disposal cell complies with UMTRCA and the implementing regulations. Staff states that any Board determination on this point would be *res judicata* as to it, Kerr-McGee, and the People. Thus Staff's view is that Kerr-McGee can litigate, under Alternative III and the contentions already admitted, all of the matters it seeks to litigate under Contention KM 1.

Kerr-McGee takes issue with the Staff's position that admission of its contentions would require that a new notice inviting petitions to intervene be issued. Kerr-McGee points out that its position has been a matter of public record identified not only in the FES but also in the notice inviting requests for hearing. Further, Kerr-McGee points out that, because it was invited to request a hearing by the same date as other interested persons, no one could have relied on Kerr-McGee's failure to request a hearing as a reason for inaction.

Kerr-McGee maintains that the public interest will be served by evaluating its disposal cell as a permanent repository now, and that, because it is impractical to change that cell once constructed, deferral of that evaluation is not feasible. Kerr-McGee believes Staff's statement that compliance of the cell with EPA's requirements may be litigated under Alternative III concedes this position. Kerr-McGee justifies delaying the filing of Contention KM 1 until January on the unavailability prior to October 7, 1983, of EPA's regulations, pointing out that the Staff's justification, stated at page 1-6 of the FES, for rejecting Alternative I was the lack of these regulations. It notes that Staff does not seriously contest the timeliness of its contentions.

⁹ See Staff's January 31 Response at 2 n.1.

Kerr-McGee characterizes Staff's position that, by failing to request a hearing, Kerr-McGee waived its right to have contentions adjudicated as attempting to apply standards applicable only to petitioners to intervene to Kerr-McGee, and points out that nothing in the regulatory scheme compels this result. Kerr-McGee suggests that in fact the regulations and the *Federal Register* notice imply the contrary.

Kerr-McGee asserts that Staff's position that this Board lacks jurisdiction to hear these contentions is not compelled by the Commission's delegation of authority (to "conduct any necessary proceedings"), and is in fact contrary to the authority contained in 10 C.F.R. § 2.714(a) to accept tardy contentions and in 10 C.F.R. § 51.52(b)¹⁰ which permits *any* party to take a position on matters covered by NEPA. Kerr-McGee also argues that its contentions are within the scope of those sponsored by the People. Finally, Kerr-McGee takes issue with Staff's position that prejudice would result from the admission of Contention KM 1. In this connection, Kerr-McGee points out its undertaking, if Alternative I were approved, to monitor and maintain the site for a period of 25 years and to remedy any problems consistent with applicable performance criteria.

The People argue that the regulatory scheme here in question permits Kerr-McGee to litigate its contentions in this proceeding. The People

question what possible public interest can be served by limiting this hearing as the Staff suggests. In terms of administrative and judicial economy, not to mention the welfare of West Chicago's citizens, resolution of the long-term problem posed by Kerr-McGee's application should be decided now.¹¹

The People point out that, while they oppose Kerr-McGee as to what the ultimate outcome of that litigation should be, admission of the contention does not prejudice them. The People also express puzzlement as to how Staff might be prejudiced by the admission of this contention.

Because we were also puzzled by the Staff's position, at the August 22 Prehearing Conference we posed a question to Staff. We wished to know whether Staff perceived that, should Alternative I be approved, some regulatory constraint might exist which would prevent Staff from subsequently ordering relocation of the tailings if the cell did not meet applicable standards, an option which Staff clearly believes to be available under Alternative III. In its answer of September 6, Staff makes the following points:

¹⁰ This provision is now contained in 10 C.F.R. § 51.104.

¹¹ People's Post-Prehearing Conference Brief at 7.

First, if the Board approved Alternative I, Staff and the People would be bound by that decision.

Second, as a consequence, Staff would have to issue an enforcement order on which it would have the burden of proof in order to require that the tailings be moved. In Staff's view, if Alternative III were approved, Kerr-McGee would have the burden of showing that the cell had performed adequately and should be approved for permanent disposal.

Third, a reasonable period of monitoring is necessary to demonstrate the acceptability of this site for permanent disposal.

Fourth, that even though the compliance of the site with EPA's regulations governing permanent disposal of the tailings can be litigated under Alternative III, the acceptability of the site for this purpose would not be an issue under this Alternative.

Staff also took the position, relying on an exchange between counsel for Kerr-McGee and the People at the second prehearing conference, that Alternatives I and III are virtually identical and that therefore Contention KM 1 should be denied as redundant.

After receiving the Staff's answer, we called for responses from Kerr-McGee and the People.

In its Response of September 25, Kerr-McGee perceives that Staff may view Alternatives I and III as substantially different in that Alternative III might permit Staff to seek relocation of the tailings after their storage on the disposal site for reasons other than nonperformance of the disposal cell and site. Kerr-McGee thus renews its plea that Contention KM 1 be admitted. Kerr-McGee believes that under either Alternative I or III, the Staff would need to proceed by way of an enforcement order to require that applicable standards and license conditions be met. It does not address Staff's burden-of-proof argument.

The People take issue with the Staff's view that under Alternative I it would have to proceed by way of an enforcement order to require that the tailings be moved. The People point out that whether Alternative I or III is approved, that approval should be on the condition that Kerr-McGee must demonstrate prior to license termination that the cell and site are performing in accord with applicable standards. The People also take the position that *Consumers Power Co.* (Midland Plant, Units 1 and 2), ALAB-283, 2 NRC 11 (1975); *reconsideration denied*, ALAB-315, 3 NRC 101 (1976) would place the ultimate burden of proof in an enforcement proceeding on Kerr-McGee.

We find ourselves in substantial agreement with the People on this point. First, we envision that any storage or disposal plan approved in this proceeding would likely include a condition which would require

Kerr-McGee to demonstrate that applicable criteria were being met prior to license termination. Second, absent such a provision, we suspect that the rationale expressed in ALAB-283 and ALAB-315, *supra*, for placing the ultimate burden of proof on a licensee in a show cause proceeding may also be applicable in any enforcement proceeding brought prior to license termination to ensure compliance of a disposal cell and site with applicable criteria. A cursory review of Title II of UMTRCA certainly suggests this possibility.¹² Thus we do not perceive any regulatory constraint on Staff under Alternative I, and move to our consideration of whether Kerr-McGee may litigate contentions in this proceeding.

DISCUSSION

A. Kerr-McGee's Waiver and Its Consequences

At the outset, we must note our agreement with Staff that Kerr-McGee has waived its right to cause a hearing to be held in this proceeding. However, we must also note our disagreement with Staff on the consequences of that waiver.

There can be no doubt that a person may waive a right to a hearing,¹³ and that an NRC licensee may waive its right to a hearing on Staff's action with respect to its request for a license amendment.¹⁴ Kerr-McGee's failure to have requested a hearing within the time prescribed in the *Federal Register* notice must be viewed as constituting such a waiver. Absent good cause, Kerr-McGee now would be precluded from causing a hearing to be held with regard to its contentions.

However, we disagree with Staff that this conclusion also bars Kerr-McGee from advancing these contentions in a hearing held at the request of another party. We regard Staff's position as entirely too rigid. If followed, it would subject applicants and licensees to standards which are far more strict than those applicable to intervenors. We perceive no reason to follow such a course.

¹² In a September 20 clarification of its September 6 response, Staff notes ALAB-283 and points out that that decision distinguished an earlier decision — *New York Shipbuilding Corp.*, 1 AEC 707 (1961) — which had placed the ultimate burden of proof on Staff in an enforcement action related to a materials license. The distinction was based on the fact that the materials license was not governed by the same statutory criteria as those governing construction permits. See ALAB-283, *supra*, 2 NRC at 18. We believe Title II of UMTRCA may be more similar to the statutory provisions interpreted in *Midland* than to those involved in *New York Shipbuilding*.

¹³ See, e.g., *EEOC v. Bay Shipbuilding*, 668 F.2d 304 (7th Cir. 1981); *Reese Sales Co. v. Hardin*, 458 F.2d 183 (9th Cir. 1972); *Eastern Oil Transport Inc. v. United States*, 413 F. Supp. 121 (E.D.N.C. 1976).

¹⁴ See, e.g., *Toledo Edison Co. (Davis-Besse Nuclear Power Station)*, ALAB-300, 2 NRC 752 (1975); *Easton Utilities Commission v. AEC*, 424 F.2d 847 (D.C. Cir. 1970).

We agree with Kerr-McGee that there are no regulations which are applicable to this situation. We therefore begin with the proposition that Kerr-McGee is a party to this proceeding. No regulation specifically accords Kerr-McGee this status, although the long-standing practice of the NRC and its predecessor, the AEC, provides for it. As such, Kerr-McGee has, in general, the same rights and duties as the other parties.

We perceive no purpose to be served by prohibiting a party from filing contentions in a proceeding commenced at the instance of another party, and Staff has advanced none. Intervening parties are accorded the right under § 2.714 to file contentions without leave at any time until 15 days prior to the first prehearing conference, and to file new or amended contentions after that time upon a satisfactory showing under § 2.714(a). Staff's position would apply a different and much more rigid rule to applicants and licensees to deny them the same treatment. We see no reason for this. Indeed, it would be arbitrary to treat applicants differently from intervenors in this respect. Because both are parties, and because no specific rule governs the filing of contentions by applicants, applicants must be afforded substantially the same rights as intervenors to challenge Staff's actions by filing contentions.¹⁵

In this case, Kerr-McGee's three contentions were filed 13 days prior to the first prehearing conference and 21 days after the deadline imposed on the intervening parties to file new or amended contentions. The timing of the filing of these contentions thus approximates the schedule contemplated by the Rules of Practice for the filing of contentions. Kerr-McGee did not sleep on its rights, and we do not perceive that Staff's argument raises laches.

We conclude that although Kerr-McGee waived its right to cause a hearing to be held, it did not waive its right to raise contentions on a timely basis should a hearing be held at the instance of another. We also conclude that Kerr-McGee's contentions were timely filed.¹⁶

¹⁵ Cf. *Etelson v. Office of Personnel Management*, 684 F.2d 918, 926-27 (D.C. Cir. 1982); *Offshore Power Systems* (Floating Nuclear Power Plants), ALAB-489, 8 NRC 194, 221-22 (1978).

It is true that applicants and licensees who, like Kerr-McGee, are willing to abide by the Staff's action on their request unless a hearing is requested by another could protect their rights by routinely requesting a hearing. Interested States which desire to participate in any hearing which may be held on an application but do not themselves wish to cause a hearing to be held sometimes follow this practice. However, this practice adds an administrative burden without any perceptible benefit. Indeed, even if it were imposed, it would not require that an applicant's contentions be filed at the time the hearing request was made, there being no apparent reason why applicants should be treated differently from intervenors or interested States in this respect.

¹⁶ We agree with Kerr-McGee that the acceptance of its contentions does not necessitate a new notice of hearing. Its differences with the Staff were publicized, and any hearing request filed by it would not necessarily have advised the public of the specific issues it wished to litigate.

B. Kerr-McGee's Contentions and the Scope of the Commission's Delegation to This Board

Staff takes the position that, in its November 3, 1983 Order, the Commission referred only the petitions for hearing filed by the People and the Chamber of Commerce. Therefore, in Staff's view, we lack jurisdiction to entertain Kerr-McGee's contentions because, Kerr-McGee having failed to request a hearing, no jurisdiction to consider its contentions was delegated to us. Staff relies on *Three Mile Island*, 14 NRC at 1727, and *Marble Hill*, *supra* note 8, for this position.

We agree with Staff that our jurisdiction is strictly limited by the Commission's delegation expressed in its November 3 Order. It is true that, Kerr-McGee having failed to request a hearing, no such request was referred to us by the Commission. Nonetheless, the Commission authorized us to "conduct any necessary proceedings under 10 C.F.R. Part 2, Subpart G."¹⁷

In Part A of this discussion we held that Kerr-McGee had not waived its right to file contentions pursuant to Part 2, Subpart G of the Commission's rules and that its contentions were timely. Thus, those contentions were properly filed pursuant to the Rules which the Commission has directed to be followed in this proceeding. It follows that we have been delegated jurisdiction by the Commission to consider them.¹⁸

The People's Proposed Contentions

Contention AG 1 filed by the People raises issues under the National Environmental Policy Act (NEPA). This contention is divided into eight subparts, but its overall thrust is to assert that Staff's proposed action (approval of Alternative III in the FES) constitutes an illegal segmentation of an overall plan to permanently dispose of the mill tailings in question at the disposal site in West Chicago. Staff characterized its proposal and comments on the People's position as follows:

It is essential at the outset to understand what this case is about, for that understanding is the key to a proper disposition of contention AG 1. The NRC Staff can only reiterate that the licensing decision at issue is to permit KM to store waste at West Chicago in an engineered containment cell for a period of years. During this period of years there will be site monitoring to check on the performance of the containment cell. After sufficient monitoring there will be a further review of health,

¹⁷ November 3, 1983 Order at 2.

¹⁸ Our ruling with respect to these contentions also requires that Contention AG 2(k) be admitted. See our Memorandum and Order of April 17, 1984 (unpublished).

safety, and environmental matters (and, since a licensing action will be involved, a hearing may be requested by interested parties at that time). An additional factor for consideration at that time will be the availability of an established disposal site. All of this is spelled out in the FES. This is the licensing action on which the NRC offered a hearing.

Illinois would transform the present licensing decision into something else. In all of its material filed in this case, it distorts the NRC Staff's position into a present licensing decision for permanent disposal of the waste at West Chicago. Based on this distortion, the State contends that the FES is subject to myriad infirmities and sins of omission. However, permanent disposal is not the issue in this hearing. Illinois will not be denied a hearing on the issue of permanent disposal. Such a hearing will be available when that issue is ripe.¹⁹

Before addressing the subparts of this contention, we discuss the law applicable to segmentation of proposals for federal action in the context of the Staff's proposal. At the outset we note that the FES discusses eight alternatives, as follows:²⁰

- I — Kerr-McGee's plan for permanent disposal at the disposal site in West Chicago;
- II — Another plan for permanent disposal at the disposal site which differs from Alternative I in the construction and configuration of the disposal cell;
- III — Staff's preferred alternative, which would authorize storage for an indeterminate period in a cell very similar to that proposed in Alternative I and would defer the decision on permanent disposal;
- IV — Shipment of the tailings to an existing site in Illinois for either storage or disposal;
- V — Shipment of the tailings to a licensed burial site at Beatty, Nevada; Hanford, Washington; or Barnwell, South Carolina;
- VI — Minimal protective action to reduce airborne emissions and groundwater contamination pending the selection of a permanent disposal site;
- VII — Segregation and disposal of the less radioactive material at West Chicago and storage of the more radioactive material there pending future removal for permanent disposal; and
- VIII — No action.

¹⁹ NRC Staff Memorandum in Opposition to State of Illinois Contentions of June 21, 1984, at 4 (footnote omitted).

²⁰ These alternatives are discussed in Chapters 1 and 3 of the FES.

A few facts concerning Staff's preferred alternative are necessary to this discussion. First, the disposal cell which Staff would approve for interim storage is essentially the same as that proposed by Kerr-McGee for permanent disposal. The cost of building this cell is estimated by Staff to be \$16.4 million, compared with a cost of \$16 million attributable to building the cell proposed by Kerr-McGee. Staff estimates the cost of subsequent removal of the wastes to Hanford, Washington, should the factory site not be ultimately approved for permanent disposal to be upwards of \$56.9 million, a figure which would be less if removal were to a less distant permanent disposal site. If permanent disposal elsewhere were approved now, the cost would be approximately \$51 million for Hanford, \$43.3 million for Beatty, Nevada, and \$27.8 million for disposal in a shale quarry located 270 miles away.²¹

Analysis of the costs set out in Table 3.2 of the FES reveals that, should Alternative III be adopted and the factory site not be approved for permanent disposal, the cost would be at least \$50.1 million,²² a figure only slightly less than, and substantially more than, the cost of permanent disposal at Hanford or Beatty, respectively. Staff regards the cost of permanent disposal at Hanford or Beatty to be prohibitive.²³

The FES recognizes that, if Alternative III is implemented and the tailings subsequently are moved, radioactive dust releases equivalent to that released during initial burial would result.²⁴ The FES also recognizes that radiological impacts from all alternatives (except the no-action alternative) are about equal.²⁵ Thus radiological impacts could be doubled if Alternative III were adopted and the tailings subsequently moved.

The FES estimates the radiological releases which would occur during movement of the tailings to be 6.44×10^{-4} Ci of the U-238 and U-234 series, 1.49×10^{-3} Ci of Th-230 and daughters, 1.58×10^{-2} Ci of Th-232, and 1.78×10^{-2} Ci of Ra-228 and daughters. Additionally, the FES estimates that 2 Ci and 28 Ci Rn-222 and Rn-220 would be released.²⁶ The FES estimates the doses which would result from either

²¹ These costs are set out in § 3.8, Table 3.2, of the FES.

²² Table 3.2 reveals that the additional cost of removing the wastes from the disposal cell are \$5.9 million (\$56.9 million cost of removal from the cell and disposal at Hanford as compared with \$51 million cost of disposal at Hanford now). If the \$5.9 million cost is added to the \$27.8 million cost of disposing of the tailings now at a shale quarry 270 miles distant, and this total is added to the \$16.4 million cost of implementing Alternative III, the result is \$50.1 million.

²³ FES, ch. 1, ¶ IV.B, at 1-7.

²⁴ FES, § 5.9.2.3, at 5-25.

²⁵ *Id.* at 5-24.

²⁶ *Id.* at 5-25.

disposal or storage at the disposal site or disposal elsewhere to be the following:

Dose to Population (person-rem)	Dose to Individual at Nearest Residence (mrem)			
	Whole Body	Bone	Lung	Bronchial Epithelium
80	5	90	90	5

Should the wastes be stored at the disposal site and subsequently moved, these doses would double.²⁷ The FES recognizes that the costs and environmental impacts discussed above make eventual removal of the tailings from the disposal site undesirable:

Implementation of Alternative III will, however, make eventual removal of the wastes from the West Chicago site a less desirable option because of the additional costs and environmental impacts associated with recovery and movement of the stabilized waste material. It should be noted that implementation of Alternative III requires expenditures in the near term that might otherwise be unnecessary if it were known now that the wastes would be removed from the site in the future.²⁸

Nonetheless, Staff apparently felt compelled to reject Alternative I in favor of Alternative III because of a lack of regulatory standards governing disposal of these kinds of wastes.

Under UMTRCA, the USEPA is required to promulgate standards of general application for the protection of the public health, safety, and the environment from radiological and nonradiological hazards associated with the disposal of byproduct material. The USEPA has not published such standards in final form. In 1980, the NRC, based on a published Generic Environmental Impact Statement on Uranium Milling, established criteria relating to the disposition of tailings or wastes produced from source material processing. Use of these criteria, however, has been embargoed by Congressional legislation. Although licensing criteria exist for uranium tailings disposal on a case-by-case basis, there are no existing standards or criteria the NRC can use to assess the current suitability of any site for disposal of thorium waste under Title II of UMTRCA.

Under Alternative I, Kerr-McGee would retain ownership of the site under an NRC license for a 25-year period. At the end of the period, the license would be terminated if safe performance criteria had been met. As discussed above, criteria applicable to UMTRCA thorium waste-disposal sites have not yet been established; therefore,

²⁷ FES, § 5.9.3.1, at 5-26, 5-27; Table 5.5, at 5-28.

²⁸ FES, ch. 1, ¶ V, at 1-8.

the staff has no basis on which to evaluate the applicant's proposal for use of the site as a disposal site. The staff is unwilling to commit to terminate a license at a fixed time in the future without knowledge of the rules and regulations that might apply to disposal of this class of material at that future time.²⁹

Subsequent to the publication of the FES, EPA published its standards in final form. It is against this background that we examine the propriety under NEPA of the Staff's preferred alternative, Alternative III.

SEGMENTATION

Now that EPA has promulgated final rules governing disposal of these mill tailings, Staff's justification for refusing to consider Alternative I, that there is no basis on which to evaluate it, no longer exists. Staff relies on *Kleppe v. Sierra Club*, 427 U.S. 390, 49 L. Ed. 2d 576 (1976); *Sierra Club v. Froelke*, 534 F.2d 1289 (8th Cir. 1976); *United States Department of Energy* (Clinch River Breeder Reactor Plant), CLI-82-23, 16 NRC 412 (1982), and *Offshore Power Systems* (Floating Nuclear Power Plants), LBP-79-15, 9 NRC 653 (1979) for the proposition that it may properly limit its proposed action and hence its NEPA consideration to Alternative III. Staff does not, however, furnish any substantive reason for so limiting its consideration now that the EPA guidelines have been published.

Staff relies on *Kleppe v. Sierra Club* for the proposition that it is the proposed federal action which determines the scope and content of the FES. Staff's description of the proposed federal action contained in its brief is quoted at pp. 1307-08, *supra*. We agree with Staff's statement of the holding in *Kleppe*. However, we find, after careful comparison of the opinion in *Kleppe* with the facts presented here, that *Kleppe* does not support Staff's position.

In *Kleppe*, the Supreme Court reversed the holding of the Court of Appeals for the District of Columbia Circuit³⁰ that certain federal officials contemplated development of coal resources in a particular region and that that contemplation might trigger the need to prepare a comprehensive environmental impact statement covering the regional development. In reaching its conclusion, the Court of Appeals did not overturn the District Court's findings that there was no existing or proposed plan or program pertaining to the region on the part of the federal officials

²⁹ *Id.*, ¶ IV.B, at 1-6.

³⁰ *Sierra Club v. Morton*, 514 F.2d 856 (D.C. Cir. 1975).

and that there was no evidence that the various projects proposed by private industry for the region (and requiring approval of the federal officials) were integrated into a plan or otherwise interrelated.³¹ The Court of Appeals nonetheless concluded that a regional development plan was within the contemplation of these officials.

The Supreme Court held that mere contemplation of a proposed federal action was not sufficient to trigger NEPA's requirements. Rather, a concrete proposal for federal action must be present. The Court pointed out that not only is NEPA precise in indicating what triggers the necessity of an environmental impact statement, it would be futile to attempt to prepare such a statement in the absence of a concrete proposal because of the uncertainty over what such an impact statement would address.

The Supreme Court went on to address the Sierra Club's argument, not addressed by the Court of Appeals, that the intimate relationship of the projects planned for the region nonetheless required a comprehensive impact statement. The Supreme Court agreed that "when several proposals . . . that will have cumulative or synergistic environmental impact upon a region are pending concurrently before an agency, their environmental consequences must be considered together."³² However, the Court refused to accept the Sierra Club's conclusion that such was required in the case before it on the ground that the federal officials' refusal to prepare a comprehensive impact statement had not been shown to be arbitrary.

The factual situation in the instant case is quite different from that in *Kleppe*. Here we are concerned with essentially one proposal — that of Kerr-McGee to permanently dispose of these mill tailings on its disposal site. Staff would divide this proposal into two separate steps, one pertaining to storage during which time certain data would be gathered which would permit consideration of the second step, authorization of permanent disposal. While such an approach might well have been required in the absence of standards governing disposal, the promulgation of those standards by EPA appears to remove any bar to consideration of Kerr-McGee's proposal now.

Thus, one of the findings of the District Court upon which the Supreme Court in *Kleppe* relied — that there was no evidence that the projects proposed by private industry for the region were interrelated — has no parallel here. Here there is but one proposal by private industry for which NRC approval is sought. Here, in contrast, that one proposal has been divided into two steps by the Staff.

³¹ See *Kleppe v. Sierra Club*, *supra*, 427 U.S. at 400-01, 49 L. Ed. 2d at 585.

³² *Id.*, 427 U.S. at 410, 49 L. Ed. 2d at 590.

Nor do we believe that the concrete steps set out by Alternative III under which Kerr-McGee's proposal would ultimately be reviewed parallel the "contemplation" of a federal action which the Court found insufficient to trigger NEPA's requirements. Here Staff proposes 5 to 10 years of monitoring prior to deciding whether to approve Kerr-McGee's cell and disposal site as a permanent repository. Consequently there is little uncertainty surrounding the goal which Staff ultimately wishes to reach and concomitantly little reason why that goal cannot be subjected to an environmental analysis now. Alternative III essentially provides a means to demonstrate whether the cell and disposal site are suitable for permanent disposal of the mill tailings. In this sense it is not readily separable from the issue of permanent disposal for NEPA purposes. And it presents an entirely different set of facts than that addressed by the Supreme Court in *Kleppe*.

Staff relies on the Commission's decision in *Clinch River*³³ for the proposition that "it is well settled that an agency may consider separately under NEPA the different phases of a proposed federal action where approval of the phase under consideration will not result in any irreversible or irretrievable commitments to the remaining phases of the proposed action."³⁴ The Commission did indeed reach this conclusion in *Clinch River*. However, we view the facts presented to the Commission in *Clinch River* to be substantially different from the facts presented here.

In *Clinch River*, the proposed federal action was the issuance of a construction permit for the Clinch River project, a demonstration liquid metal-cooled fast breeder reactor. Staff had conducted an environmental review of this proposal, and had issued an FES and a draft supplement to the FES. An adjudicatory proceeding on the proposal was under way. It was in this context that the *Clinch River* applicants sought an exemption which would permit them to undertake site preparation activities in advance of completion of that portion of the adjudicatory hearing and issuance of a partial initial decision which would ordinarily constitute a prerequisite to these activities.³⁵ Thus applicants sought to begin their construction activities in advance of the completion of the environmental review incident to their application for a construction permit. Their request made it necessary for the Commission to consider whether commencement of site preparation activities would prejudice that review. The Commission concluded that it would not, and it was in this context

³³ CLI-82-23, *supra*.

³⁴ Staff Memorandum at 10.

³⁵ See 10 C.F.R. §§ 2.761a and 50.10(c) which provide for authorization of the site preparation activities upon completion of environmental hearings on the proposed project and issuance of a favorable initial decision.

that the Commission emphasized its conclusion that "[t]he key point . . . is that site preparation . . . will not result in any irreversible or irretrievable commitments to the remaining segments of the CRBR project."³⁶

Here the facts are different. Here Staff proposes to limit this licensing proceeding to one phase of an overall plan to dispose of the mill tailings in question. In contrast, in *Clinch River* no such proposal was made. No question existed that the licensing proceeding would consider the entire proposal to permit construction of a breeder reactor. The only question was whether a portion of that construction could be authorized in advance of the completion of the environmental review. In short, we do not believe *Clinch River* provides support for the Staff's proposed limitations on the scope of this proceeding.

Staff relies on *Sierra Club v. Froelke*, *supra*, and *Offshore Power Systems*, *supra*, for the proposition that other relevant factors to consider are whether there is an overall federal plan and whether the proposed action has independent utility. We do not quarrel with Staff's statement of these propositions. However, we do not agree with Staff's conclusions that there is no overall federal plan for permanent onsite disposal and that licensed onsite storage has independent utility.

Staff now appears to view the independent utility consideration in terms of demonstration of the performance capability of the proposed cell and the disposal site as a permanent repository. Staff states that demonstration of the performance capability of the cell is a central aspect of Alternative III.³⁷ In the FES itself, Staff appeared to view Alternative III as providing an acceptable means of providing for storage of the tailings while awaiting the development of standards by EPA governing permanent disposal, a means which might also provide for permanent disposal once those standards were published.³⁸

Because EPA's standards have now been published, Staff's view of Alternative III expressed in the FES is no longer valid and hence does not establish the independent utility of Alternative III. This leaves demonstration of the performance capability of the disposal cell as its independent utility.

While it is true that Alternative III would provide for the collection of monitoring data which would bear on the performance capability of the cell, so would Alternative I,³⁹ or, for that matter, any other alternative. Thus, Alternative III has independent utility only if it avoids some

³⁶ CLI-82-23, 16 NRC at 424 (emphasis supplied).

³⁷ Staff Memorandum at 9.

³⁸ See FES, ch. 1, ¶ IV.B, at 1-5, *et seq.*

³⁹ See *id.*, ¶ II.A, at 1-1 to 1-2.

regulatory restraint which would inhibit Staff from requiring that the tailings be removed to another site in the event that the disposal or storage cell failed to meet the applicable standards. We inquired of Staff with regard to this matter in connection with its opposition to Kerr-McGee's contentions, asking whether Staff viewed Alternative I as posing regulatory restraints not posed by Alternative III. Our conclusions are stated at pp. 1304-05, *supra*. For purposes of this discussion, we simply note that we do not believe Alternative III would avoid any regulatory restraints posed by other alternatives.

Nor can we agree with Staff that there is no overall plan regarding permanent disposal of these tailings on the factory site. First, we note that Staff has conceded that compliance of the disposal cell and the factory site with the EPA standards can be litigated in this proceeding under Alternative III, and that the results of that litigation will be *res judicata* to the parties. Second, Staff has outlined the conditions under which it would approve the cell and disposal site for permanent disposal under Alternative III.⁴⁰ Third, Staff has already evaluated the radiological doses resulting from onsite disposal. Fourth, Staff notes that subsequent removal of the tailings after implementation of Alternative III would not only result in unnecessary expenditures of money, but would double the radiological doses received by the population.

The FES notes that under Alternative III one of the conditions for termination of Kerr-McGee's license is:

The removal of the wastes to an established offsite disposal site and the release of the storage site for unrestricted use following a final NRC determination that the removal of the wastes to an established offsite disposal site is necessary to meet health, safety, and environmental requirements.⁴¹

However, the FES fails to indicate what an "established offsite disposal site" is and what NRC would consider in reaching a conclusion that removal to such a site was necessary to meet "health, safety, and environmental" requirements. Because the FES contemplates monitoring of the cell and disposal site to determine their compliance with EPA standards, and does not specifically contemplate removal of the tailings to another site because such other site may be superior to the disposal site,

⁴⁰ We must also note that there is ambiguity with regard to these conditions. Staff does not say whether it would take the position that the tailings should be moved if a future proceeding revealed that an "obviously superior" site existed even though the disposal cell and site met applicable criteria, or whether Staff would only take such a position in response to a demonstrated, irreparable failure of the disposal cell and site.

⁴¹ FES, ch. I, ¶ VI, at 1-8.

we are left with the inference that the wastes would only be moved if the cell and disposal site failed to meet the EPA standards. This is strongly indicative that Staff does plan to ultimately approve permanent disposal at the disposal site.

Regardless of the existence of an overall plan for permanent disposal, other considerations dictate that permanent disposal be evaluated now. The Commission's regulations implementing NEPA provide for the use of certain definitions set out in the Council on Environmental Quality's regulations. Two of those definitions are applicable to this situation. First, 40 C.F.R. § 1508.23⁴² defines the time when a "proposal" exists as "that stage in the development of an action when an agency subject to [NEPA] has a goal and is actively preparing to make a decision on one or more means of accomplishing that goal and the effects can be meaningfully evaluated." This definition also notes that a proposal may exist in fact as well as a result of an agency's determination that it exists.

This definition is applicable here. Kerr-McGee has proposed permanent disposal. Staff recognizes that permanent disposal eventually must be implemented. Its selection of Alternative III is but one step toward that goal. Staff is thus actively moving toward that goal, and the existence of the EPA standards means that that goal, as well as Alternative III, may now be meaningfully evaluated. Staff's position that the compliance of the cell and disposal site with those standards may be litigated under Alternative III concedes no less.

Further, 40 C.F.R. § 1508.25 defines the scope of an environmental impact statement.⁴³ This definition requires that three types of actions be considered in determining scope. The first of these are connected actions, or actions which are closely related. Clearly Alternative III is closely related to a future action to pass on permanent disposal which Staff notes will require another FES and another proceeding.⁴⁴ The second type of actions are cumulative actions, or actions which may have cumulative impacts. Under Alternative III it would be necessary to consider exhuming the tailings and moving them to another location, an action which has cumulative radiological impact. The third type of actions are similar actions, or actions which when viewed with other reasonably foreseeable actions have similarities which provide a basis for evaluating their impacts together. Here such similarities clearly exist between Staff's presently proposed action (implementation of Alternative

⁴² 10 C.F.R. § 51.14(b) adopts this definition.

⁴³ 10 C.F.R. § 51.14(b) adopts this definition.

⁴⁴ See Staff Memorandum at 4.

III) and the future action on permanent disposal which would thus become necessary.

In short, given the circumstances, we agree with Kerr-McGee and the People that the public interest demands that permanent disposal be considered now. Moreover, we find that CEQ's regulations mandate that permanent disposal be considered now. Having reached these conclusions, we proceed to our discussion of the specific subparts of Contention AG 1.⁴⁵

Contention AG 1(f) notes the possibility that tailings which have found their way off site by various means may be returned to the site for storage and/or disposal. This contention alleges that the Staff's failure to consider this possibility in the FES also amounts to an illegal segmentation of the proposal for federal action.

The tailings in question consist of material used for fill at various residences, Reed-Keppler Park, and the sewage treatment plant in West Chicago, as well as tailings which found their way into Kress Creek. The former are the subject of a voluntary agreement between the City of West Chicago and Kerr-McGee under which tailings used as fill material at residences have been excavated and returned to the site and those deposited in the park and sewage treatment plant have been evaluated. Both the City and Kerr-McGee believe that the thorium-containing material at the park and plant should also be returned to the site, if possible.⁴⁶ Staff has approved the return to the site of the material deposited at residences and has requested further information on the disposition of the material at the park and sewage treatment plant.⁴⁷

⁴⁵ Contention AG 1(a) states that the FES fails to explicitly disclose the fact that onsite disposal of the mill tailings will be permanent. The effect of our rulings on Contentions KM 1 and AG 1 is to require that the issue of permanent disposal be addressed in this proceeding. Thus it becomes irrelevant whether the FES improperly failed to disclose that onsite disposal would be permanent. This issue is moot.

Contention AG 1(b) states that the FES implicitly but clearly acknowledges that onsite disposal will be permanent. This contention alleges that the FES fails to address the long-range environmental, social, and economic significance of this fact, and provides examples of these alleged failings. In their brief, the People have added to this list of examples. Our ruling stated above requires that this contention be accepted. Staff will need to assess the extent to which the FES should be supplemented to meet any shortcomings with regard to its consideration of long-range environmental, social, and economic factors. After Staff's assessment and any supplementation which Staff believes necessary have taken place, we will consider this contention on its merits.

Contention AG 1(h) alleges that Staff has given inadequate consideration to comments on the DES. In their Post-Prehearing Conference Brief, the People cite three areas in which this consideration was inadequate: alternate sites, the rationale for rejecting offsite disposal, and long-term environmental impacts. Our ruling on AG 1(b) immediately above accepts a contention on the last point, and our rulings on AG 1(c) and (e), *infra*, accept contentions on the first two points. Therefore, this contention is rejected as redundant.

⁴⁶ See "Program Outline — Offsite Thorium Removal — West Chicago, Illinois" dated June 25, 1984, attached to Staff's July 12 submittal of further information.

⁴⁷ See Letters of July 26, 1984, from R.E. Cunningham, Director, Division of Fuel Cycle and Material Safety, to C. Rice, Vice President, Kerr-McGee and A.E. Rennels, Mayor of West Chicago.

The Kress Creek materials are the subject of a Show Cause Order of March 2, 1984, which would force Kerr-McGee to develop and execute a plan for the removal and disposition of these tailings. Kerr-McGee is resisting this Order and a proceeding has been commenced in which the People have intervened.

Staff relies on *Kleppe v. Sierra Club* for the proposition that no proposal for federal action now exists with respect to these tailings and therefore there is no requirement to prepare an environmental impact statement.⁴⁸ The People assert that *Kleppe* and common sense dictate that the amount of wastes proposed to be stored or disposed of at the disposal site be discussed in the FES which Staff has prepared.⁴⁹

We agree with Staff that no proposal for federal action now exists which would require supplementation of the FES in this respect. Our discussion of *Kleppe*, at pp. 1311-12, above, is applicable here and need not be repeated. Suffice it to say that no concrete proposal for federal action now exists which may be effectively addressed in the FES.⁵⁰

However, we cannot lose sight of the fact that a proposal to add large quantities of material to the tailings already on site would require supplementation of the FES. We note that Staff also recognizes this fact.⁵¹ In light of our ruling that permanent disposal must be considered now, we think it prudent to ask Staff and Kerr-McGee to consider what volume of material could be added to the proposed cell without significantly affecting the analyses which have taken place to date and whether the volume of material which conceivably might be added to that already on site exceeds that amount. We would, of course, also welcome the People's views on this subject. We believe this consideration will be helpful in charting the future course of this proceeding. Pending a decision to add substantial amounts of material to the proposed cell, we will hold AG 1(f) in abeyance.⁵²

⁴⁸ Staff's June 21 Memorandum at 29-35.

⁴⁹ People's August 7 Reply Brief at 11-15.

⁵⁰ We recognize that tailings have been removed from residences for ultimate storage or disposal with the tailings on site. Having viewed the pile of this material on our recent site tour and having reviewed the maps accompanying the program outline for offsite thorium removal (note 46, *supra*) we regard the volume of these tailings as inconsequential for purposes of this contention.

⁵¹ See Staff's June 21 Memorandum at 34-35.

⁵² Contention AG 2(f) is related. It asserts that Kerr-McGee has not evaluated the effect of the addition of these materials to its proposed cell. In our Prehearing Conference Order of February 24 (at 7), we held this contention in abeyance pending a ruling on AG 1(f). We will continue to hold this contention in abeyance pending a decision on Kerr-McGee's part to include substantial amounts of additional material in its proposed cell. In the event of such a decision, this contention will be admitted.

ALTERNATE SITES

Contention AG 1(c) challenges the review of alternative sites contained in the FES. The People regard Alternative IV as the only realistic alternative to onsite disposal.⁵³ This alternative contemplates the acquisition by Kerr-McGee of a site within Illinois and the shipment of the tailings to and disposal at that site.⁵⁴

The People criticize Staff's treatment of this alternative on the following grounds:

First, Staff left it to Kerr-McGee to search for and identify possible alternative sites. The People assert that Kerr-McGee's economic self-interest unduly limited that search.⁵⁵

Second, Staff required that only reconnaissance-level information be furnished by Kerr-McGee in order to evaluate the identified sites.⁵⁶

Third, Staff did not supervise Kerr-McGee's efforts.⁵⁷

Fourth, in accepting and evaluating the sites identified by Kerr-McGee, Staff committed the same error which lead to a rejection of its alternative site analysis in *Boston Edison Co.* (Pilgrim Nuclear Generating Station, Unit 2), LBP-77-66, 6 NRC 839 (1977), *aff'd*, ALAB-479, 7 NRC 774 (1978). This error, according to the People was Staff's acceptance, as a threshold matter, of the acceptability for disposal at the West Chicago site.⁵⁸ The gist of People's position is that, while they do not quarrel with the Commission's requirement that Kerr-McGee submit the information for the alternate site inquiry, they do quarrel with the alleged lack of requirements and guidelines governing the acquisition of that data, as well as the Staff's allegedly uncritical review of it.⁵⁹ They argue that, as a result, the alternative site analysis is inadequate and that, contrary to Staff's and Kerr-McGee's position, the FES does reveal a superior site.⁶⁰

In its response, Staff relies on the Commission's discussion of alternative site considerations contained in the Statement of Consideration accompanying the revision of 10 C.F.R. Part 51.⁶¹ Although it notes that

⁵³ People's Post-Prehearing Conference Brief at 31.

⁵⁴ See FES, ch. 1, ¶ 11.D, at 1-2; § 3.4.1, at 3-18, *et seq.*

⁵⁵ People's Post-Prehearing Conference Brief at 34.

⁵⁶ *Id.* at 35-39.

⁵⁷ *Id.* at 39-41.

⁵⁸ *Id.* at 42-44.

⁵⁹ People's Reply Brief at 15-19.

⁶⁰ *Id.* at 20-25.

⁶¹ 49 Fed. Reg. 9352 (March 12, 1984).

this discussion is aimed at power reactors, Staff views it as clearly applicable to this case. Accordingly, Staff views the issue as whether the alternative site analysis in this case conformed to the criteria set out in the Statement of Consideration.⁶²

Staff maintains that what was done here conforms with those criteria. First, Staff asserts that Kerr-McGee's slate of alternative sites was among the best that reasonably could be found. The specific criteria which Kerr-McGee used to identify alternative sites were based on those contained in 10 C.F.R. Part 61.⁶³ These overlap the criteria contained in 10 C.F.R. Part 40, Appendix A. Although the latter, and not the former, apply, at the time Kerr-McGee initiated its survey, the decision had not been made whether to characterize the material in question as low-level waste or mill tailings, so that it was uncertain whether Part 40 or Part 61 of the regulations would be applicable. Out of eighty-four sites identified, six were selected as best. Kerr-McGee's methodology was very much like that used by Boston Edison Company to cure the deficiencies identified in LBP-77-66, *supra*. Staff notes that this methodology was approved in *Boston Edison Co.* (Pilgrim Nuclear Power Station, Unit 2), LBP-81-3, 13 NRC 103 (1981). Thus Staff concludes that the first criterion stated by the Commission was met: the alternate site selection process was adequate and the six sites identified were among the best that reasonably could be found.⁶⁴

Second, Staff defends its conclusion that none of the identified sites is markedly better than the West Chicago site, and consequently, none is obviously superior. Staff acknowledges that the socioeconomic impacts might be less at an alternate site, but concludes that this factor alone does not make such a site obviously superior "since the population factor is only one of many factors that have to be considered in determining whether a site is obviously superior." Staff relies on *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-471, 7 NRC 477 (1978) for the latter proposition.⁶⁵

Third, Staff defends the use of reconnaissance-level information gathered by Kerr-McGee to evaluate the alternative sites as sufficient to permit an adequate evaluation and reasonable resolution of the alternative site question.⁶⁶

⁶² Staff's Memorandum Opposing the People's Contentions at 12-15.

⁶³ The specific criteria were population, land use, hydrology, geology, accessibility, natural resources, and distance from West Chicago.

⁶⁴ Staff's Memorandum Opposing the People's Contentions at 15-16.

⁶⁵ *Id.* at 16-18.

⁶⁶ *Id.* at 18-19.

Kerr-McGee begins its answer to the People with a recitation of the steps it took in conducting its alternative site search⁶⁷ and points out that 10 C.F.R. § 51.40⁶⁸ requires it to gather and submit data on alternative sites. Consequently, it views the People's criticism as an impermissible attack on the regulations. Kerr-McGee also maintains that the People do not quarrel with its methodology, the application of that methodology, or the accuracy of the data submitted.⁶⁹

Kerr-McGee defends the adequacy of the analysis of the alternative site data against the People's charge that it committed the same error found in the analysis of the *Pilgrim* alternative site data by LBP-77-66, *supra*.⁷⁰ Kerr-McGee maintains that, when viewed in light of applicable precedents, this analysis is adequate.⁷¹

The People's first charge is that Staff left it to Kerr-McGee to search for and identify possible alternative sites. The People assert that Kerr-McGee's economic self-interest unduly limited this search. However, the regulations clearly contemplate that it is the applicant who is to gather the information which the Staff considers in its FES. *See* 10 C.F.R. §§ 51.45(c) and 51.60. This is a long-standing NRC practice which reflects the necessity that, in the absence of some reason not to, the Commission must rely on information generated and furnished by applicants in the discharge of its responsibilities.

The People, in their reply brief, clarify their position by pointing out that they do not quibble with the requirement that applicants submit information, but do contend that where an applicant's economic self-interest is contrary to a full and complete investigation, the Staff must establish requirements for that investigation and view the results critically.⁷² Staff, in its Memorandum opposing the People's contentions, points out that it has no reason to believe that Kerr-McGee falsified or omitted any relevant data.⁷³ Moreover, the FES reflects that Staff reviewed and approved Kerr-McGee's methodology used in its investigation.⁷⁴

We view the People's position as elaborated in their reply brief as raising what is essentially a question of fact: Was Kerr-McGee's investiga-

⁶⁷ Kerr-McGee's Brief on the People's Contentions at 19-22.

⁶⁸ Section 51.60 of revised Part 51 is now applicable. At the time the information was gathered, § 51.40 was applicable.

⁶⁹ Kerr-McGee's Brief on the People's Contentions at 23. Staff makes a similar argument at page 19 of its memorandum.

⁷⁰ Kerr-McGee's Brief on the People's Contentions at 24.

⁷¹ *Id.* at 24-26.

⁷² People's Reply Brief at 18-19.

⁷³ Staff's Memorandum at 19.

⁷⁴ FES, § 3.4.1 at 3-19.

tion of alternative sites on which the Staff based its NEPA consideration tainted by self-interest? This is clearly an appropriate inquiry because the information generated by Kerr-McGee forms the basis for the Staff's discharge of its duties under NEPA. If that information is tainted — i.e., incomplete or inadequate to permit the “hard look” at alternatives which NEPA requires⁷⁵ — then Staff's analysis must similarly be inadequate.

We cannot resolve this question on the papers before us. The People's allegations state an acceptable contention which can only be resolved after hearing.

The remaining charges brought by the People are all subsumed within the first. The People's second charge is that Staff should have required more of Kerr-McGee than “reconnaissance level” information. In their reply brief, the People clarify their position by stating that the issue is not whether reconnaissance-level information may be used, but rather “whether adequate data has [sic] been presented to allow the decision-maker to make a rational, informed decision”⁷⁶ Thus this issue is subsumed within the issue of whether Kerr-McGee's investigation of alternative sites was adequate to support the Staff's NEPA analysis.

Similarly, the People's third charge, that Staff failed to supervise Kerr-McGee's investigation, is also contained within the issue of the adequacy of that investigation. In response, Staff points out that it never supervises the preparation of an applicant's reports.⁷⁷ While we agree that this is so in the usual sense of the word “supervise,” in a larger sense Staff does exercise supervision when it asks for more information or rejects a report. It is in this larger sense that we view the People's charge. We view it as simply saying that not only was Kerr-McGee's investigation inadequate, but Staff should have recognized that inadequacy and acted accordingly.

Indeed, if the Staff believes that inadequate data about environmental considerations is [sic] available or that reasonable alternatives have not been adequately explored, it can and should decline to issue a DES.⁷⁸

⁷⁵ See *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-77-8, 5 NRC 503, 524-25 (1977); *Pilgrim*, ALAB-479, *supra*.

⁷⁶ People's Reply Brief at 21.

⁷⁷ Staff's Memorandum at 19.

⁷⁸ CLI-77-8, *supra*, 5 NRC at 525.

In this sense, the People have stated an acceptable contention which requires resolution after hearing.⁷⁹

The People's last charge, that the Staff has accepted, as a threshold matter, that the West Chicago site is appropriate,⁸⁰ may be viewed as a rationalization of Staff's allegedly improper acceptance of Kerr-McGee's allegedly inadequate information. As such, it is subsumed within the issue of the adequacy of that information. However, this charge may also be viewed as challenging the acceptability of the West Chicago site under UMTRCA and Appendix A to Part 40.

Consideration of alternate sites under NEPA cannot be divorced from consideration of compliance with the Commission's health and safety regulations. The two are interrelated. In this case, that interrelationship is perhaps complicated by the fact that the health and safety regulations applicable, 10 C.F.R. Part 40, Appendix A, are primarily directed toward environmental protection by isolation of the tailings through both site selection and engineering design with "overriding consideration" being given to siting features,⁸¹ and by the fact that Staff has chosen to treat both NEPA and health and safety considerations in the FES.

NEPA requires an alternate site analysis which the Commission carries out with a view toward selecting a site which minimizes adverse environmental impacts. The NEPA alternate site analysis is meaningful only when comparing sites which have all been found acceptable under applicable health and safety criteria. Contentions AG 1(g) and AG 2(s), (u), (v), and (w) all bear on requirements laid down by UMTRCA and its implementing regulations. As will be seen, these contentions also bear on the alternate site analysis under NEPA.

Contention AG 1(g) begins with the assertion that the FES gives inadequate consideration to federal, state, and local policies. It goes on to

⁷⁹ We note that the second paragraph of this contention criticizes the Staff's failure to have considered disposal of these mill tailings at a Title I UMTRCA site. In its initial response to the People's contentions of January 20, 1984, the Staff characterized this criticism as patently frivolous because Title I allows the Department of Energy to dispose of tailings from certain designated processing sites only and because the West Chicago site is not such a designated site. In their brief (at 44 n.11), the People point out that they do not mean to suggest that the cleanup of the West Chicago tailings be funded to any extent by the government and that disposal at a Title I site would further the objective of Criterion 3 of 10 C.F.R. Part 40, Appendix A, to minimize the proliferation of disposal sites. Neither Staff nor Kerr-McGee responded to this position. While we have no opinion with regard to the feasibility of this suggested alternative, we believe that it should be the subject of more consideration than it apparently has received. It may well be that UMTRCA or other considerations would preclude implementation of this alternative. However, Staff should explain in more detail why this alternative is legally precluded, or, if not legally precluded, why it is infeasible.

⁸⁰ Contention AG 1(e) states this proposition conversely; it asserts that the FES fails to provide an adequate rationale for onsite disposal. In their briefs, the parties have raised what are essentially factual arguments on this contention which can only be resolved after hearing. We will admit AG 1(e) and consolidate it with AG 1(c).

⁸¹ 10 C.F.R. Part 40, Appendix A, Criterion I.

assert that federal policy requires selection of a site that minimizes the need for long-term maintenance and monitoring. It refers to the requirements of Part 61, and it alleges that Staff has disregarded applicable State policies on groundwater quality, disposal of industrial wastes, and local policies on land use.

Contention AG 2(s), (u), (v), and (w) spell out the ways in which the People maintain that the site-selection process has not complied with the federal policy set out in UMTRCA. AG 2(s) asserts that Kerr-McGee gave inadequate consideration to below-grade disposal at another site and has not demonstrated that above-grade disposal at the disposal site will provide equivalent isolation. AG 2(u) asserts that the tailings must be disposed of at a site that will minimize the need for long-term maintenance and monitoring, while AG 2(v) asserts that Kerr-McGee's stabilization proposal is inconsistent with the requirement that Kerr-McGee bear the cost of long-term environmental protection. AG 2(w) asserts that Kerr-McGee's proposal is inconsistent with Criterion 1 of Appendix A that, in selecting disposal sites, primary emphasis be placed on hydrologic and other natural conditions, and demography, rather than on short-term convenience.

Apparently, recognizing the overlap between AG 1(g) on the one hand and AG 2(s), (u), (v), and (w) on the other, the People have briefed all together.⁸² Their arguments rely primarily on UMTRCA and Appendix A to Part 40. Thus, AG 2(s) — relating to below-grade disposal — relies on Criterion 3 of Appendix A, AG 2(u) — relating to the need to select a site which will minimize long-term maintenance and monitoring — relies on § 203 of UMTRCA and Criteria 1 and 12, and AG 2(w) — that the site-selection process should not emphasize short-term convenience — relies on Criterion 1 of Appendix A.⁸³

In their June 18 Memorandum, the People discuss AG 1(g) in terms of the failure of the FES to discuss the matters raised by AG 2(s), (u),

⁸² The People briefed AG 2(s) and (v) in their May 2 Post-Prehearing Conference Brief and AG 2(u) and (w) in an untimely May 31 Memorandum. Kerr-McGee responded to the May 31 Memorandum on June 18; Staff did not respond.

⁸³ Contention AG 2(v) asserts that Kerr-McGee's proposal is inconsistent with the requirement of Criterion 10 that it bear the cost of long-term maintenance and monitoring. At the first prehearing conference, counsel for the People explained that by this contention, the People were asserting that the long-term maintenance and monitoring needs of the disposal site must be assessed before a decision to utilize the disposal site is made. See February 24, 1984 Prehearing Conference Order at 12. However, in their May 2 Brief (at 82-83), the People characterize this contention as asserting that Kerr-McGee's proposal would improperly place on the community the costs of adverse health and socioeconomic effects resulting from utilization of the disposal site. If the contention is interpreted as it was by counsel at the first prehearing conference, it is duplicative of AG 2(u). If it is interpreted as it was by counsel in her brief, a question is raised whether it may be litigated at all. Nothing in § 203 of UMTRCA suggests that a bond is required to cover such costs. To the extent that this interpretation is litigable, it is covered by AG 1(b). Therefore, AG 2(v) is denied.

and (w), as well as Illinois' groundwater quality standards⁸⁴ and certain other Illinois policies.

Although Staff has not specifically replied to the People's June 18 Memorandum on AG 1(g) and AG 2(u) and (w), its position seems to be well set forth at pages 35-40 of its June 21 Memorandum. There Staff points out that, to the extent Illinois' groundwater quality standards need to be considered, the absence of their discussion in the FES may be remedied on the record of this proceeding. Staff does not address the other Illinois policies mentioned by the People; we assume that Staff would deal with them in the same manner. Kerr-McGee agrees that any necessary consideration may take place in the hearing process.⁸⁵ The People in their reply brief, do not take issue with this proposition.

We agree with Staff that, to the extent necessary, these matters may be considered in the hearing and the FES thus supplemented.⁸⁶

With respect to consideration of the requirements of Appendix A, Staff points out that at the time the FES was in preparation, portions of Appendix A had been suspended in response to congressional action.⁸⁷ Thus, there was some question what portions of Appendix A, if any, would be reinstated as valid and enforceable regulations. In light of this and in light of its decision to consider storage rather than disposal, Staff believes its decision not to address Appendix A was a reasonable one.⁸⁸

Staff recognizes that our rulings require that the Appendix A Criteria and 40 C.F.R. § 192.32(b) requirements promulgated by EPA be ad-

⁸⁴ Illinois' groundwater quality standards are also the subject of AG 2(g) which asserts that Kerr-McGee must demonstrate that leachate from the disposal cell will not violate Illinois groundwater requirements. We admitted this contention in our February 24 Prehearing Conference Order (at 7-8) on condition that the People demonstrate that Kerr-McGee is subject to these requirements and on our finding that we are competent to enforce them. The applicability of these requirements is the subject of litigation in the courts of Illinois. Thus, the first condition has not yet been satisfied. The second condition is no longer applicable. In their Post-Prehearing Conference Brief (at 62-63), the People note that they are not asking that the Board enforce these requirements, but rather that the Board withhold its authorization of any license amendment until Kerr-McGee shows that any applicable requirements have been met. Kerr-McGee concurs that this approach is proper. (See Kerr-McGee's June 6 Brief at 38-39).

⁸⁵ Kerr-McGee also maintains that the People have not demonstrated that the groundwater standards and other policies are applicable and thus must be considered. See Kerr-McGee's June 18 Memorandum at 7-9.

⁸⁶ Contention AG 1(g) also refers to 10 C.F.R. Part 61. As pointed out by Staff and recognized by the People, Part 61 is not applicable to this proceeding. Contention AG 1(g) will be modified accordingly.

⁸⁷ Title IV, Pub. L. 97-88 (95 Stat. 1147, December 4, 1981) prohibited the expenditure of funds to enforce Appendix A. This prohibition extended through September 30, 1983. See § 101(f), Pub. L. 97-377 (96 Stat. 1906). Pub. L. 97-415 (96 Stat. 2067) required the suspension of portions of Appendix A.

⁸⁸ Although it is now in effect and no proposal to modify it has been published by the Commission, Appendix A is still under a cloud. The uranium milling industry sought review of Appendix A in the tenth circuit. Although that court initially upheld the rule (see *Kerr-McGee Nuclear Corp. v. NRC*, ¶ 20217, CCH Nuclear Regulation Reporter), it subsequently withdrew its opinion on granting petitioners' request for reconsideration. Reargument had not been scheduled at the time Staff's Memorandum was filed.

dressed. We do not view Staff as posing any further objection to Contentions AG 1(g) and 2(s), (u), and (w).

Kerr-McGee, on the other hand, does raise further objections to these contentions. With respect to Contention AG 2(s), Kerr-McGee maintains that the legal basis put forward by the People is invalid. The People relied on Criterion 3 of Appendix A to support their position that below-grade disposal must be considered. Kerr-McGee argues that this criterion is incompatible with EPA's standards, and points out that it was suspended in its entirety on publication of EPA's proposed standards. Kerr-McGee further argues that it has no obligation under the Atomic Energy Act (and UMTRCA) to consider alternatives.⁸⁹

Kerr-McGee reiterates this position with respect to Contentions AG 2(u) and (w).⁹⁰ It also attacks Contention AG 2(u) on the ground that this contention seeks to impose an absolute bar to utilization of any site which would require long-term maintenance and monitoring which is not contemplated by UMTRCA or EPA's standards. To the extent that this contention would impose higher standards than those promulgated by EPA, Kerr-McGee views it as a prohibited attack on the latter standards.⁹¹

The People take issue with Kerr-McGee's interpretation of UMTRCA with respect to the need to consider alternate disposal sites and disposal methods. They point out that the EPA standards are not site-specific, but rather establish goals to be met by all sites. Thus, their failure to address the need to minimize long-term maintenance and monitoring is not dispositive of that issue. The People also note that Kerr-McGee has mischaracterized its position as seeking selection of a site which would make the need for long-term maintenance and monitoring unnecessary. Rather, they point out that their position is that the need for such activity must be eliminated to the maximum extent practicable.⁹²

Kerr-McGee's arguments may be quickly dealt with. First, Kerr-McGee relies on the fact that Criterion 3 of Appendix A was suspended in its entirety for the proposition that it is inconsistent with EPA's standards and therefore invalid. Were this argument valid, it would raise a question of whether it constitutes an attack on the Commission's regulations. However, a reading of the Commission's proposal to suspend Criterion 3 quickly shows that it is not a valid argument. The Commission stated its reason for suspending Criterion 3 in its entirety as follows:

⁸⁹ See Kerr-McGee's June 6 Brief at 43-45.

⁹⁰ See Kerr-McGee's June 18 Memorandum at 5-6, 9-10.

⁹¹ *Id.* at 2-5.

⁹² See People's Reply Brief of August 7, at 48-55.

The thrust of Criterion 3 is to maximize below-grade disposal of all tailings. The intent was to establish that the most effective way to assure long-term stability with no maintenance is to restore the disposal area to its original contours and thus eliminate differential erosion over a long term of thousands of years. Since the EPA standard specifies a 1,000-year design objective rather than thousands of years and "minimized" rather than "eliminated" maintenance for nonradiological hazards, the entire criterion is suspended because the EPA standard can be met without below-grade disposal. The suspension does not mean that applicants or licensees should not seriously consider below-grade or partially below-grade disposal on a site-specific basis. The Commission continues to believe that below-grade disposal is a very good way to minimize erosion and provide reliable control measures. EPA also expressed the view that below-grade disposal is a preferred alternative but could not justify the extra costs for across the board application.⁹³

Thus, even when the criterion was suspended, the Commission expected applicants and licensees to give some attention to below-grade disposal. The Commission obviously did not consider Criterion 3 to be at odds with the EPA standards. Rather, its suspension reflects a conservative, literal approach which was designed to avoid unnecessary expenditures by applicants and licensees pending completion of EPA's rulemaking and NRC's evaluation of Appendix A in light of the former. The Commission specifically noted that on completion of this effort, it "may well conclude . . . that some or all of the suspended portions of Appendix A represent the preferred method for satisfying the final EPA standards."⁹⁴ Kerr-McGee's view that Criterion 3 is inconsistent with EPA's standards is simply incorrect.⁹⁵

Kerr-McGee's argument that UMTRCA does not require it to consider alternatives is clearly without merit. The Commission in promulgating Appendix A has clearly interpreted UMTRCA as requiring such consideration. We are bound by that interpretation.

Finally, we note that Kerr-McGee has misinterpreted Contention AG 2(u) as maintaining that no site may be approved if it would require long-term maintenance and monitoring. This contention merely maintains that the need for long-term maintenance and monitoring must be eliminated to the extent practicable. It is an acceptable contention. The

⁹³ See 48 Fed. Reg. 23,649, 23,651-52 (May 28, 1983).

⁹⁴ *Id.* at 23,651.

⁹⁵ We recognize that there may be potential difficulties in applying both the Appendix A criteria and the EPA standards. However, we note that under UMTRCA the Commission is to ensure that mill tailings are managed in such a manner as will adequately protect the public health and safety as well as conform to the EPA standards and standards promulgated by the Commission with EPA's concurrence. Thus, we are inclined to view the EPA standards as providing a minimum level of protection which may not in all cases be deemed sufficient by the Commission after it considers the level of risk posed by any specific tailings pile, economic costs, and such other factors as it deems appropriate. See § 84(a) of the Atomic Energy Act, 42 U.S.C. § 2114(a). We are also inclined to the view that these matters may appropriately be raised in connection with these contentions.

fact that it may seek the imposition of requirements which are more stringent than EPA's standards is, for the reasons discussed in connection with below-grade disposal, no bar to its consideration.

In sum we admit Contentions AG 1(g) and AG 2(s), (u), and (w) for litigation.⁹⁶

COST-BENEFIT BALANCE

Contention AG 1(d) asserts that the FES contains an inadequate cost-benefit balance. The People begin their discussion of this topic with the proposition that NEPA requires a cost-benefit analysis which quantifies to the extent possible the various costs and benefits of the proposed action and its alternatives. They assert that the Staff has not fulfilled this obligation, but rather has only attempted to assess the costs of onsite and offsite disposal. They criticize this effort on the following grounds:

First, because no site-specific data were gathered for alternatives, costs of disposal at an alternate site cannot be realistically estimated. In particular, they question the adequacy of the analysis of storage or disposal costs at New Douglas. Additionally, they question the accuracy of the figures which are given in the FES.

Second, no attempt was made to estimate long-term maintenance and monitoring costs, long-term radiological doses and

⁹⁶ Contentions AG 2(h), (i), and (j) are related to AG 2(u) and (w). AG 2(h), (i) and (j) assert that Kerr-McGee's plan fails to give attention to the need to exclude humans from the disposal site over the long term, fails to identify the ultimate custodian of the disposal site, and fails to address the financing of long-term maintenance and monitoring, respectively. Staff poses no objection to AG 2(h) but suggests that AG 2(i) and (j) may constitute challenges to the regulations. Kerr-McGee objects to all three on the ground that they are challenges to the regulations.

We agree with Staff and Kerr-McGee that AG 2(i) is not litigable. While the People have raised certain factors which bear on the question which government, state or federal, should become the owner of the disposal site and therefore the ultimate custodian, the fact remains that the choice is completely within the control of the state. Section 83(b)(1)(A)(ii) of the Atomic Energy Act as implemented by Criterion 11 of Appendix A clearly provides that if the State elects not to become owner of the site, the federal government must. This contention is denied.

Kerr-McGee objects that Contention AG 2(h) goes beyond the EPA requirements and thus poses a challenge to these regulations. That may be so. However, as indicated in the above discussion, that fact may not preclude the imposition of requirements by NRC which are more stringent than necessary to meet the EPA standards in appropriate cases. This contention is admitted.

Kerr-McGee believes that Contention AG 2(j) should be addressed shortly before license termination when the costs of long-term maintenance and monitoring may be more accurately assessed. While we agree that specific attention will have to be given to this point at that time, we also note that this issue must be addressed in at least general terms now. We have held that permanent disposal must be considered now. Section 84(a)(1) of the Atomic Energy Act provides that factors such as this are relevant to the Commission's responsibility to ensure that tailings are properly managed. Criterion 9 of Appendix A requires that the surety to be established by a licensee prior to the commencement of milling activities must include payment of the charge for long-term surveillance and control required by Criterion 10. If this matter must be considered prior to operation, it clearly must be considered when the issue posed is ultimate disposition of the tailings. This contention is admitted.

health effects, long-term land use considerations, or long-term groundwater contamination.

The People maintain that all these factors are amenable to some degree of quantification and that Staff's efforts in this area are inadequate. In their reply brief, the People clarify their position as follows:

While they do not demand that all considerations entering into the cost-benefit balance be monetized, they maintain that a cost-benefit analysis be struck which compares all relevant costs and benefits in qualitative terms where quantification is not reasonably possible.⁹⁷

In its response, Staff agrees that the FES does not contain a formal cost-benefit analysis. Staff maintains that the Commission's regulations do not require one. Rather, Staff points out that the regulations require that all considerations, both qualitative and quantitative, which go into a cost-benefit analysis receive appropriate consideration. Staff relies on the Statement of Considerations accompanying revised Part 51 for its position, and maintains that many considerations, such as dose reductions and improvement in the quality of an aquifer, are difficult to quantify. Staff also maintains that it is premature to monetize the long-term maintenance and monitoring needs at West Chicago or elsewhere because Staff is not ready to consider where permanent disposal should take place.⁹⁸

Kerr-McGee takes the position that none of the People's arguments can withstand scrutiny. Nonetheless, Kerr-McGee believes that an evaluation of costs and benefits no longer supports Alternative III because the justification for selecting that alternative, the lack of EPA standards, is no longer available. Kerr-McGee believes a balancing of costs and benefits now supports Alternative I,⁹⁹ a point with which the People strongly disagree.

We agree with the People that a more rigorous cost-benefit analysis is required in this case. The portion of the Statement of Considerations quoted by the Staff in its Memorandum supports the People's point of view. That quotation closes with the statement that "the Commission intended to make clear that a comprehensive environmental analysis should include the consideration and balancing of qualitative as well as quantitative impacts."¹⁰⁰ Staff should therefore set out its cost-benefit balance as a separate topic within the FES and should consider therein

⁹⁷ People's Brief at 44-51, and Reply Brief at 25-32.

⁹⁸ Staff's Memorandum at 23-26.

⁹⁹ Kerr-McGee's Brief at 27-31.

¹⁰⁰ 49 Fed. Reg. 9363 (March 12, 1984).

in qualitative terms those elements which cannot be reasonably quantified.

Our rulings herein require that permanent disposal of these mill tailings must now be considered. This will undoubtedly affect the content of the information to be included in the cost-benefit analysis. In this regard, we agree with the People that long-term maintenance and monitoring costs, land use values, doses to the surrounding population, and impacts on groundwater must be considered and compared with respect to the West Chicago site and the possible alternative sites. These considerations are intimately bound up with the Staff's consideration of alternate sites which is also being challenged by the People. Without some evidentiary basis, we are not in a position to pass on the adequacy of the consideration or quantification of these factors in the FES. Thus these are matters which must be subjected to 10 C.F.R. Part 2 procedures before they may properly be resolved.

RADIOLOGICAL DOSES

Contentions AG 1(i) and AG 2(x) concern radiological doses. AG 1(i) argues that, because children are more radiosensitive than adults, the FES should consider the health effects of doses received by a child rather than an adult. Both Staff and Kerr-McGee offer rationalizations for considering doses to an adult rather than a child. While their rationalizations may ultimately prove to be correct, we may not reach that conclusion prior to subjecting these rationalizations to the hearing process. Contention AG 1(i) is admitted.

Contention AG 2(x) asserts that Kerr-McGee's and Staff's assessment of post-closure radiation doses are inaccurate and that Kerr-McGee has not demonstrated that these doses will be low enough to avoid endangering the health of the public. The People moved to have this contention admitted on August 15, but did not furnish the text of the contention until August 22, when we heard argument on it.¹⁰¹

While Staff believes that this contention is inexcusably late, it also believes that it is subsumed within AG 1(b), so that, if the latter is admitted, AG 2(x) will be covered. The People, in their motion, indicated that the same issue was raised with respect to Staff in AG 1(b). They note that AG 2(x) would raise this issue with respect to Kerr-McGee. Staff also has concerns that the contention is overly vague and perhaps a

¹⁰¹ Tr. 224-31.

challenge to the regulations. Kerr-McGee opposes the contention on the ground that it is untimely.

We share the Staff's concern that the contention is overly vague. While the first phrase of this one-sentence contention clearly calls into question the accuracy of the assessment of post-closure radiological doses, the second phrase is subject to two interpretations. The first is that because of inaccurate assessment, Kerr-McGee and Staff have not demonstrated that the doses will be low enough to adequately protect the health of the public. We believe that this is what was intended because the People have alluded in their motion to the preliminary view of their consultant that there may be significant problems with calculations contained in the FES and justify the acceptance of this contention on the need to begin discovery on this matter now, rather than waiting for a ruling on AG 1(b). While this contention does specifically bring these allegations to bear on Kerr-McGee (AG 1(b) is directed only at Staff), we believe this to be a distinction without a difference in this instance. Staff has chosen to utilize the FES as the vehicle for its health and safety analysis. The assessment and health effects of radiological doses are plainly a principal part of that analysis and must be performed by Kerr-McGee in the first instance. Thus, in this respect AG 1(b) calls Kerr-McGee's work into question as well as Staff's. We therefore deny AG 2(x) as redundant.

SCOPE OF PROCEEDING

The rulings which we have made require that permanent disposal of these mill tailings be considered now and that that consideration must include both disposal at the disposal site as well as at alternative sites. The People have indicated that they believe that Alternative IV presents the only realistic alternative to disposal at the disposal site.¹⁰² Therefore, absent some new development with respect to alternatives, this proceeding should focus on Alternatives I and IV as set forth in FES.

On September 24, 1984, the People moved the Board to direct Staff to clarify a statement made in its September 6 answer to our question regarding any regulatory constraints which might adhere to Alternative I as opposed to Alternative III.¹⁰³ The statement in question notes that an application to dispose of tailings at a new site in a residential neighborhood would likely be rejected out of hand, citing Criterion 1 of Appendix

¹⁰² People's Post-Prehearing Conference Brief at 31.

¹⁰³ This matter is discussed at pp. 1303-05, *supra*.

A. The People note that Appendix A makes no distinction between new and existing sites, and take the position that they may be entitled to an immediate disposition of the proceeding in their favor. Staff opposes the People's motion.

The motion is denied. Kerr-McGee and, to the extent it supports Kerr-McGee's application, Staff will have to satisfy us that this site may be approved for permanent disposal of these tailings. A motion to clarify is not the procedural vehicle to raise this issue.

It is so ORDERED.¹⁰⁴

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Dr. Peter A. Morris
ADMINISTRATIVE JUDGE

Dr. James H. Carpenter (by JHF)
ADMINISTRATIVE JUDGE

John H Frye, III, Chairman
ADMINISTRATIVE JUDGE

Dated at Bethesda, Maryland,
this 19th day of October 1984.

¹⁰⁴ Appendix A gives the disposition (and date of disposition) of each of the contentions. Appendix B sets out the language of the contentions. [The Appendices have been omitted from this publication but can be found in the NRC Public Document Room, 1717 H Street, NW, Washington, DC 20555.]

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

B. Paul Cotter, Jr., Chairman
Mr. Gustave A. Linenberger, Jr.
Ivan W. Smith, Alternate Chairman

In the Matter of

Docket Nos. 50-463-CP
50-464-CP
(ASLBP No. 76-300-01-CP)

PHILADELPHIA ELECTRIC COMPANY
(Fulton Generating Station,
Units 1 and 2)

October 23, 1984

In this Initial Decision, the Licensing Board dismisses the proceeding without prejudice as moot, subject to the condition that the Applicant is barred from filing a future application identical to the one dismissed.

**RULES OF PRACTICE: DISMISSAL WITH OR
WITHOUT PREJUDICE**

An unparticularized, unsupported general allegation of harm to property values caused by Applicant's delay in dismissing its application is not of sufficient weight or moment to cause the Board to inquire further.

**RULES OF PRACTICE: DISMISSAL WITH OR
WITHOUT PREJUDICE**

General allegations of psychological stress, even if factually supported, provide no basis for a legally cognizant claim for relief.

RULES OF PRACTICE: DISMISSAL WITH OR WITHOUT PREJUDICE

Costs incurred by the NRC Staff in reviewing an application subsequently withdrawn may not be billed to the applicant as a condition of dismissal, where those costs were incurred prior to the November 6, 1981 adoption of revised regulations.

INITIAL DECISION

I. INTRODUCTION

On February 4, 1982, the Commission declined to review an appeal board decision, ALAB-657, 14 NRC 967 (1981), which had vacated this Board's decision to dismiss the captioned proceeding with prejudice. The appeal board decision remanded the proceeding "for further action in conformity with this opinion." *Id.* at 979. ALAB-657 held that the licensing board had abused its discretion in deciding to dismiss with prejudice Philadelphia Electric Company's (Applicant or PECO) application for a permit to construct twin high-temperature gas-cooled reactors (HTGR) at its Fulton site 17 miles south of Lancaster, Pennsylvania. Following a review of the entire record in this matter, the application to construct twin high-temperature gas-cooled reactors at the Fulton site is hereby dismissed without prejudice as moot. The dismissal is conditioned, all as more fully set out below.

II. BACKGROUND

The sole issue before this Board* is whether this remanded proceeding should be dismissed with or without prejudice. The issue is before us on a motion for summary decision filed by Applicant.

The background of this proceeding is set forth in greater detail in the prior licensing board's unpublished opinion dated February 27, 1981, and the ALAB-657 decision to vacate and remand. Those decisions recite that the original application for a construction permit to build twin HTGRs at the Fulton site was filed in July 1973; that PECO's reactor supplier unilaterally stopped work on the project and NRC suspended its

*The board was reconstituted on December 9, 1983 (48 Fed. Reg. 55,789) and February 28, 1984 (49 Fed. Reg. 8097) by replacing two of its three members.

review of the application in 1975; and that the proceeding was then suspended for 3 years, although PECO filed monthly status reports with the licensing board from December 1975 to December 1978. The decisions further recite that the Commission issued its regulation authorizing Early Site Review (ESR) in 1977; that in March 1978 PECO informed NRC Staff informally that PECO would amend its application to seek early site review, that PECO filed the application in December 1978, but then on December 5, 1980, PECO moved to withdraw its application without prejudice. The ESR application was not actually docketed by the NRC Staff prior to its withdrawal. Thereafter, one of the three principal groups of intervenors requested that the licensing board dismiss the application with prejudice. The board granted Intervenor's request in 1981, and an appeal led to the issuance of ALAB-657.

The ALAB-657 decision was based on the appeal board's defining the licensing board dismissal with prejudice to mean that PECO could be barred from filing an application to construct *any* reactor at the Fulton site. The appeal board's chosen definition was the third of three possible limitations it saw on PECO's future activities, namely:

- (1) refiling an identical application to construct an *HTGR* at the *Fulton* site; (2) filing a new application to construct *any* type of nuclear reactor at *any* site; or (3) filing a new application to construction *any* type of nuclear reactor at *Fulton*.

If the Board contemplated the first alternative, then this appeal may be much ado about nothing.

Id. at 973. (Emphasis in original.) We agree. The dismissal with prejudice in the original licensing board decision meant that PECO was barred from refiling an identical application to have General Atomic Corporation construct the twin HTGRs proposed at the Fulton site.

However, the licensing board's decision contained discussion of PECO's intent and good faith in reaching its final decision to withdraw the ESR application. The original application proceeding had been actively litigated by the parties for the first 2 years after the application was filed, and the NRC Staff had produced both a Safety Evaluation Report and a Final Environmental Statement by the time General Atomic Company announced its unilateral decision not to build the facility in September 1975. The proceeding was essentially suspended for 3 years while PECO reassessed its options and then was reactivated in December 1978 by PECO's amending its construction permit application to seek early site review instead. The licensing board's discussion of those events in conjunction with the dismissal with prejudice in 1981 apparently prompted PECO's appeal.

Upon reconstitution in late 1983, this Licensing Board issued a proposed decision and order dismissing this proceeding with prejudice for the narrow purpose of bringing to a final conclusion the original application to build the General Atomic HTGRs at the Fulton site. Nevertheless, PECO and the NRC Staff objected, and PECO filed a Motion for Summary Decision seeking to terminate the proceeding without prejudice as moot. Staff supported PECO. Intervenor York Committee for a Safe Environment, a member of Environmental Coalition on Nuclear Power (ECNP) opposed PECO's motion, and the only other respondent, the Susquehanna River Basin Commission, did not object to dismissal of the proceeding. Thereafter, oral argument on PECO's motion, including any possible claim for intervenors' fees and expenses, was held in Philadelphia, Pennsylvania.

III. POSITIONS OF THE PARTIES

Applicant states that the record demonstrates and ALAB-657 held that there is no evidence either of a bad faith prosecution of PECO's amended application for early site review or any injury to any legally cognizable interest. PECO argues that a dismissal with prejudice requires both bad faith and harm to an individual or the public, that the burden of making such a showing is on the one seeking dismissal with prejudice, not the Applicant, and that no such showing has been made. Consequently, PECO concludes the proceeding should be dismissed without prejudice. PECO asserts further that it would not object to a condition that any future application for a Fulton nuclear plant could not be identical to the amended application now pending before this Board. Motion for Summary Decision at 23.

Dr. Judith H. Johnsrud, representing the York Intervenor, asserts that the only reason for PECO's actions (which she characterizes as unreasonable, arbitrary, and capricious) in connection with the ESR application was to keep it alive. Tr. 23-27. While not asserting bad faith as such, Dr. Johnsrud sees three distinct injuries resulting from PECO's actions: (1) an unspecified harmful effect on property values; (2) damaging stress on individual citizens concerned about the application; and (3) the substantial cost to the Commission in Staff time and effort expended on reviewing the original and the amended applications. Tr. 48-66; January 7, 1984 Intervenor's Response. Nevertheless, Dr. Johnsrud affirmatively asserts that Intervenor York, the central Pennsylvania group, and herself personally, do not seek fees or costs. Tr. 61, 66. Rather, they seek in the first instance an order "that this utility may not raise another application for a reactor license at the Fulton site" (Tr.

52), or, in the alternative, dismissal with prejudice confined to a ban against building the original General Atomic HTGR at the Fulton site. Intervenor's Response at 4.

The NRC Staff concurs with PECO's position, and adds that because PECO paid a licensing fee on the original application and a First Circuit Court of Appeals' decision banned retroactive imposition of fees equal to the amount the Staff had expended in reviewing the application, no further fees are payable. Staff submitted a copy of its letter to PECO in 1982 stating that position. Tr. at 70.

IV. DISCUSSION

The grounds for either form of relief sought by intervenors has evolved at this juncture into two broad categories: (1) harm to those near the site either to property values or in the form of psychological stress; and (2) recoupment of costs incurred by the Commission Staff above and beyond the initial application fee. For the reasons set out below, no such relief is available.

The claimed harm to property values has never risen above the status of an unparticularized, general allegation. No property or properties have ever been identified, no affidavits proffered, nor has any basis of any kind been offered such as would require this Board to inquire further. The allegation has been brief and casual to say the least. In short, it is not

supported by a showing, typically through affidavits or unrebutted pleadings, of sufficient weight and moment to cause reasonable minds to inquire further.

Puerto Rico Electric Power Authority (North Coast Nuclear Plant, Unit 1), ALAB-662, 14 NRC 1125, 1133-34 (1981); *Fulton*, ALAB-657, *supra*, 14 NRC at 979.

Similarly, general allegations of psychological stress are wholly unsupported. ALAB-657, *supra*. More significantly, however, even if a threshold factual showing were made, no basis for a legally cognizable claim for harm to psychological health has been suggested. In *Metropolitan Edison Co. v. People Against Nuclear Energy*, 103 S. Ct. 1556, 75 L. Ed. 2d 534 (1983), the Supreme Court held that the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 *et seq.*, did not create a cause of action for harm to psychological health resultant from the prospect of renewed operation of the Three Mile Island nuclear plant. Harm to psychological health is a perception of risk beyond the scope of

NEPA. Dr. Johnsrud's claim of psychological stress has even less purported foundation than that asserted in the Supreme Court case where an accident had occurred in the twin to the reactor proposed for renewed operation. In the instant case there has not only been no accident, there has been no reactor. This Board has found no other legal basis for a claim for psychological harm, and thus it must fail both factually and legally.

Finally, Intervenors allege that the Commission has incurred additional costs that should be compensated. Intervenors make no legal arguments, they simply allege the fact of additional costs. The allegation as to additional costs may well be grounded in fact, but there is no basis for asserting a right to compensation in law. In opposition, Staff points to *New England Power Co. v. NRC*, 683 F.2d 12 (1st Cir. 1982). There the Court held that applicants could not be billed for withdrawn applications if the request for withdrawal was filed before November 6, 1981. The application at issue here was withdrawn in 1980. Consequently, the Staff has concluded that it is barred from billing PECO for costs of review beyond those in effect prior to the time the Commission's revised rule became effective on November 6, 1981 to enlarge the amount that could be billed. We concur in the Staff's conclusion. *Id.* at 18.

All litigation must come to an end some time. *Union Electric Co.* (Callaway Plant, Unit 1), ALAB-750A, 18 NRC 1218, 1220 (1983). To that end we accept PECO's lack of objection to a condition on the dismissal barring "any future application at Fulton . . . identical to the one which, as amended, is presently pending before . . ." this Licensing Board. The term "identical" is used in our Order to mean, as PECO points out, that with changes in technology and regulations, it is highly unlikely that a future application would be the same in all respects as the HTGR application at issue here.

ORDER

For all the foregoing reasons and upon consideration of the entire record in this matter, it is, this 23rd day of October 1984,

ORDERED

That Philadelphia Electric Company is barred from filing a future application at Fulton identical to the one, as amended, which is presently pending before this Licensing Board; and

That Applicant's Motion for Summary Decision is granted and *In the Matter of Philadelphia Electric Company*, NRC Docket Nos. 50-463-CP and 50-464-CP, is dismissed without prejudice as moot.

THE ATOMIC SAFETY AND
LICENSING BOARD

B. Paul Cotter, Jr., Chairman
ADMINISTRATIVE JUDGE

Ivan W. Smith
ADMINISTRATIVE LAW JUDGE

Gustave A. Linenberger, Jr.
ADMINISTRATIVE JUDGE

Dated at Bethesda, Maryland,
this 23rd day of October 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Bloch, Chairman
Dr. Kenneth A. McCollom
Dr. Walter H. Jordan

In the Matter of

Docket Nos. 50-445
50-446
(Application for
Operating License)

TEXAS UTILITIES ELECTRIC
COMPANY, *et al.*
(Comanche Peak Steam Electric
Station, Units 1 and 2)

October 25, 1984

In this Memorandum, the Licensing Board requests information concerning certain technical issues.

TECHNICAL ISSUES DISCUSSED

Safety factors derived from materials tests;
Tests of materials (representativeness of sample tested);
A36 and A307 steels as structural materials.

MEMORANDUM

(Information on Composition of A36 and A307 Steel)

Because of the variability in A36 (A307) steel, the Licensing Board requires information about the extent to which the items tested by Applicants have been representative of the steels actually employed at the plant. This issue was brought to our attention by CASE in "CASE's Answer to Applicants' Statement of Material Facts Relating to Richmond Inserts as to Which There Are No Material Issues in the Form of Affidavit of CASE Witness Mark Walsh," September 10, 1984, at 10-12.¹ The issue relates to the validity of the tests of U-bolts² and of A36 bolts used in Richmonds. It may also relate to limitations of testing techniques.

Another relevant question about testing techniques is what the appropriate safety factor is in allowables established by test. It is our understanding that manufacturers' specifications and code allowables include safety factors designed to compensate for a variety of tolerances, including installation tolerances. We have not been informed about how safety factors are accounted for in the use of test results.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is, this 25th day of October 1984,

ORDERED

Texas Utilities Electric Company, *et al.*, may respond to this request for information within 1 month from the time of issuance of this Order. It shall provide to CASE and the Staff all underlying documents and analyses on which it relies in its response. CASE shall have 1 month

¹ In this filing, Mr. Walsh cites Applicants' witness, Dr. Robert Iotti, "In the Matter of Questions on Summary Dispositions Filed by Texas Utilities on Comanche Peak" (Staff Meeting), August 8, 1984, Tr. 15-16.

² Westinghouse Electric Corporation, Comanche Peak Steam Electric Station U-Bolt Support/Pipe Test Report, May 17, 1984 (Attachment 1 to Applicants' Motion for Summary Disposition of CASE's Allegations Regarding Cinching Down of U-Bolts, June 29, 1984), at 3-4 describes the "Test Items," which are comprised of A36 material, without reference to their chemical composition, the method by which they were chosen or their representativeness. Indeed, there also is no mention of the extent of their representativeness of the dimensions of U-Bolts used at the plant. *See also* Affidavit of Robert C. Iotti and John C. Finneran, Jr. Regarding Cinching Down of U-Bolts (Attachment 1 to Applicants' Motion, *supra*) at 21 n.8, stating without a description of the variation in dimensions within the plant and without any explanation, that "small differences in dimension do not affect the conclusion of this study."

from the receipt of the last underlying document and analysis within which to respond.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

**Walter H. Jordan (by PBB)
ADMINISTRATIVE JUDGE**

**Kenneth A. McCollom (by PBB)
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Marshall E. Miller, Chairman
Glenn O. Bright
Elizabeth B. Johnson

In the Matter of

Docket No. 50-322-OL-4
(ASLBP No. 77-347-01C-OL)
(Low Power)

LONG ISLAND LIGHTING
COMPANY
(Shoreham Nuclear Power
Station, Unit 1)

October 29, 1984

Licensing Board grants 10 C.F.R. § 50.57(c) exemption to requirements of general design criteria to authorize license for low-power operation in reliance upon an "enhanced" offsite AC emergency power system in the absence of a fully qualified onsite system.

REGULATIONS: EXEMPTIONS

Pursuant to Commission direction, applicant for 10 C.F.R. § 50.57(c) exemption to portions of design criteria must show that the operation of the plant will be "as safe as" it would be were it in full compliance, and that equities of exigent circumstances favor the grant of the exemption.

REGULATIONS: INTERPRETATION AND APPLICATION

An examination of “inconsistencies” in NRC regulations must include not only inconsistencies in their literal wording, but also inconsistencies in their application in practice.

SAFETY STANDARDS: COMPLIANCE

If no core cooling is necessary to protect public health and safety during certain phases of Applicant’s low-power testing program, no emergency AC power can be needed for that purpose; compliance with requirement for sufficient available emergency power is achieved, even in the absence of any emergency AC power sources whatsoever.

SAFETY STANDARDS: COMPLIANCE

The safety limits of 10 C.F.R. § 50.46(b) are set conservatively to provide a safety margin. A plant is deemed safe if it can show that it meets these limits; it need exceed them by no particular margin of safety.

SAFETY STANDARDS: COMPLIANCE

NRC reactor safety standards are viewed in the functional sense: What must safety systems be able to do in order to protect public health and safety, and are they able to do it? A point-by-point comparison of each component of alternate systems is not appropriate.

DESIGN CRITERIA: GDC 17

An exemption to the requirement for a fully qualified onsite emergency AC power source is granted for purposes of low-power operation where emergency power is available from “enhanced” offsite systems.

SEISMIC AND GEOLOGIC CRITERIA: OFFSITE POWER SOURCES

Although, in lieu of a fully qualified source of onsite emergency AC power, normal offsite power sources will be relied upon, in part, for emergency power during low-power operations, there is no requirement or justification for imposing the seismic qualification of these normal off-site power sources.

SINGLE FAILURE CRITERION: APPLICATION

Where emergency AC power is to be supplied utilizing a system comprised of multiple separate power sources, the single failure criterion is applied to determine the impact of a single failure on the ability to provide power to the system as a whole, not on the ability of each component thereof.

OPERATING LICENSES: LOW POWER

An exemption to GDC 17 may be authorized for low-power operation where applicant has shown that operation would be as safe as it would be if it were in full compliance, and that exigent circumstances favor the grant of the exemption.

SECURITY PLAN: VITAL AREAS

Where an exemption is sought from regulation requiring a qualified source of onsite emergency AC power, the offsite power "enhancements" provided as sources of additional emergency power need not be treated as vital.

OPERATING LICENSE HEARINGS: ISSUES FOR CONSIDERATION

Cost to applicant of protracted litigation may be considered as an "economic and financial hardship" experienced by it relevant to an equitable "exigent circumstances" determination.

TECHNICAL ISSUES DISCUSSED

- Emergency AC Power
- General Design Criterion 17
- LOCA at Low Power
- Low-Power Operation
- Offsite Electrical Power Grid
- Safety Standards
- Single Failure Criterion
- Standby Gas Treatment System.

APPEARANCES

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INITIAL DECISION

I. PROCEDURAL HISTORY

The Applicant, Long Island Lighting Company (LILCO), tendered its application for an operating license for the Shoreham Nuclear Power Station in August 1975. Proceedings on the application began in April 1976 with the appointment of a licensing board constituted to conduct adjudicatory hearings in this matter.¹ In the 8 years since that time over 180 days of evidentiary hearings have been held, generating more than 34,000 transcript pages, before seven different licensing boards which have issued more than 2900 pages of decisions. More than 310 witnesses have testified, and almost 400 exhibits have been offered into evidence.²

This Initial Decision decides issues relevant to authorization of a low-power operating license, pursuant to 10 C.F.R. § 50.57(c) for the Shoreham plant. For reasons set forth below, this Board authorizes the grant

¹ 41 Fed. Reg. 17,979 (1976).

² Tr. 1726-27.

of an exemption from the requirements of certain General Design Criteria (GDC), specifically GDC 17,³ and recommends that a low-power operating license be granted.

Shortly after the close of the record as to all issues in the proceeding except for offsite emergency planning, LILCO on June 8, 1983, submitted its original motion for a low-power operating license. However, after a failure during testing of the facility's onsite emergency diesel generators (TDIs)⁴ a new contention regarding these generators was admitted June 22, 1983.⁵ Thus, when the Partial Initial Decision (PID) was issued in this proceeding on September 21, 1983,⁶ it said,

Even though we resolve all contentions which are the subject of this Partial Initial Decision favorably to LILCO, at least insofar as operation at levels up to five percent of rated power is concerned, we do not authorize the issuance of the license for fuel loading and low-power operation which LILCO has requested at this time. No such license may be authorized until such time as that portion of Suffolk County's recently admitted emergency diesel generator contention may be resolved in LILCO's favor, at least insofar as necessary to support a finding of reasonable assurance that Shoreham can be operated at levels up to five percent of rated power without endangering the health and safety of the public.

Id., 18 NRC at 634.

³ GDC 17 states:

Electric power systems. An onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

The onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure.

Electric power from the transmission network to the onsite electric distribution system shall be supplied by two physically independent circuits (not necessarily on separate rights of way) designed and located so as to minimize to the extent practical the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. A switchyard common to both circuits is acceptable. Each of these circuits shall be designed to be available in sufficient time following a loss of all onsite alternating current power supplies and the other offsite electric power circuit, to assure that specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. One of these circuits shall be designed to be available within a few seconds following a loss-of-coolant accident to assure that core cooling, containment integrity, and other vital safety functions are maintained.

Provisions shall be included to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electric power supplies.

⁴ So-called because of the manufacturer, Transamerica Delaval, Inc.

⁵ "Memorandum and Order Ruling on Suffolk County's Motion to Admit New Contention," LBP-83-30, 17 NRC 1132 (1983).

⁶ LBP-83-57, 18 NRC 445 (1983).

The Licensing (Brenner) Board which authored that PID did not, however, preclude LILCO from proposing other ways it could qualify for low-power operation (Brenner Board, Tr. 21,630-61).

On March 20, 1984, LILCO submitted its "Supplemental Motion for Low-Power Operating License." Therein, LILCO submitted that the pending diesel generator issues need not be resolved prior to the granting of a low-power license for Shoreham,⁷ as these generators were not necessary to assure the public health and safety during low-power operations. Because two members of the Licensing Board with jurisdiction over nonemergency planning matters for Shoreham were heavily committed to work on another proceeding, the instant Board was established on March 30, 1984, to hear and decide LILCO's supplemental motion.⁸

LILCO has divided its proposed low-power testing program into four distinct phases, each consisting of a separate set of operations and testing. These phases are:

- (a) Phase I: fuel load and precriticality testing,
- (b) Phase II: cold criticality testing,
- (c) Phase III: heatup and low-power testing to rated pressure/temperature conditions (approximately 1% rated power); and
- (d) Phase IV: low-power testing (1-5% rated power).

The LILCO motion, supported by affidavits, alleged that during Phases I and II, no AC power whatsoever was necessary to protect public health and safety, and therefore no diesel generators were necessary to satisfy NRC regulations. Furthermore, LILCO said, even assuming the TDI diesels are unavailable, ample alternate sources of AC power are available to provide reasonable assurance of no risk to public health and safety up to 5% rated power.

In addition to the in-place, though not fully litigated, TDI diesels and the site's access to offsite power grid,⁹ LILCO had added certain additional AC power generating equipment as "enhancements" for emergency backup power. These are:

- four 2.5-MW EMD (Electro-Motive Division, General Motors) deadline blackstart mobile diesel generators
- a 20-MW gas turbine with deadline blackstart capability.¹⁰

⁷ Section 50.57(c) of 10 C.F.R. permits the issuance of a "license authorizing low-power testing (operation at not more than 1 percent of full power for the purpose of testing the facility), and further operations short of full power operation."

⁸ 49 Fed. Reg. 13,611 (1984).

⁹ A 138-kV and 69-kV high voltage network system interconnected with other power networks.

¹⁰ "Blackstart" means able to be started independently of any other power source; "deadline blackstart" means that the equipment recognizes through its own circuitry that a loss of power has occurred, and automatically starts without operator action.

Although the 20-MW gas turbine and the EMD diesels are physically located on the Shoreham site, they are, for NRC licensing purposes, considered "offsite" — that is, not fully qualified as "onsite" power sources in compliance with all safety-related nuclear requirements.¹¹

The necessity for onsite diesel generators derives from General Design Criterion (GDC) 17, which requires that electric power systems assure that, in the absence of either onsite or offsite power systems, (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences, and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.¹² LILCO's motion alleged that a review of the spectrum of transients and accidents postulated in Chapter 15 of Shoreham's Final Safety Analysis Report (FSAR) revealed that there were no requirements for AC power during Phases I and II. Thus there was no need for any emergency power sources to protect public health and safety. During Phases III and IV, LILCO said, the public would be exposed to far less risk than it would be during full-power operations, and LILCO would be well able to restore emergency AC power in the ample amount of time available to avert any danger to public health and safety.

Intervenors Suffolk County and the State of New York opposed LILCO's motion.¹³ The NRC Staff, however, supported LILCO. The Staff said that in resolving this issue, the Board must focus on the nature of the license being sought: the issue is whether low-power activities, not full-power activities, may safely be conducted in the absence of a fully qualified onsite AC power source. The Staff noted that licensing boards have previously determined that the emergency planning measures required for low-power operation were not the same as for full-power operation. However, the protection offered the public during low-power operation should be no less than that afforded at full-power operation in full compliance with regulations.¹⁴ The Staff concluded that the same concept should be applied to the requirements associated with emergency power sources (specifically GDC 17), and that if the

¹¹ Until the main shaft of one of the TDI diesels broke during testing, calling into question the reliability of each of LILCO's three diesels, they were considered fully qualifiable, onsite emergency power sources.

¹² 10 C.F.R. Part 50, Appendix A.

¹³ "Supplement to Suffolk County's Preliminary Views on Scheduling Regarding LILCO's New Motion," March 30, 1984; "Preliminary Views of Governor Cuomo, Representing the State of New York, Regarding LILCO's So-called 'Supplemental Motion for a Low-Power Operating License,'" March 28, 1984.

¹⁴ *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), LBP-82-3, 15 NRC 61, 185-97 (1982); see also *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), LBP-81-21, 14 NRC 107, 120-23 (1981).

protection afforded the public at low-power levels without approved diesel generators was found to be at least equivalent to the protection afforded the public at full power with approved diesel generators, LILCO's motion should be granted.¹⁵

At a conference of counsel on April 4, 1984, oral arguments of the parties were heard on the issues raised by LILCO's Motion. At that conference, LILCO agreed that, for purposes of deciding the instant low-power motion, no discussion of any possible or potential use of the TDIs in an emergency would be relevant (Tr. 18-20). This was consistent with the statements made by the original Licensing (Brenner) Board that had the TDI contention before it, namely, that that Board had no confidence that any of the TDIs would operate if needed until it had litigated contentions thereon (Tr. 21,631).

Subsequent to the conference, a "Memorandum and Order Scheduling Hearing on LILCO's Supplemental Motion for Low-Power Operating License" (unpublished) was issued April 6, 1984. Therein, it was held that the provisions of 10 C.F.R. § 50.57(c), which allow an applicant to request a license for low-power testing while the proceeding for full-power license is pending, must be read together with the requirements of GDC 17, harmonizing the two rules in order to reach a sensible result and respect the purposes of both. The Board established an evidentiary hearing for the purpose of determining whether or not there was "reasonable assurance that the low-power activities can be conducted with the protection to the public at least equal to the protection offered at full-power operations with the approved diesel generators" (Memorandum and Order at 12).

II. ISSUES CONSIDERED

Ultimately, the Commission considered the issues raised by the LILCO low-power motion and, after hearing the arguments of counsel, it issued an Order¹⁶ (May 16 Order). The Commission held that "10 C.F.R. § 50.57(c) should not be read to make General Design Criterion 17 inapplicable to low-power operation," and the Board's Order of April

¹⁵ In the Staff's Safety Evaluation Report, Supplement No. 5 (SSER-5), served on the Board on April 20, 1984, the Staff reiterated this position:

The basis for acceptance of the alternate AC power sources was conformance with the intent of the GDC for the low-power mode of plant operation. . . . The design provides a level of safety for 5% rated power operations at least equivalent to that required by GDC 17 and 18 for full-power operation, and is acceptable. . . .

Shoreham SSER No. 5, at 8-9.

¹⁶ CLI-84-8, 19 NRC 1154 (1984).

6, 1984, was vacated to the extent that it was inconsistent with such ruling (May 16 Order, 19 NRC at 1155). The Commission noted that LILCO had indicated that it would seek an exemption to NRC regulations under 10 C.F.R. § 50.12(a).¹⁷ The Commission stated that LILCO would have to show that operation of the facility at low-power levels without a qualified AC power source would be as safe as operation with such a source, and to demonstrate the "exigent circumstances" which favor the granting of this extraordinary form of relief. The Commission explained that:

A finding of exceptional circumstances is a discretionary administrative finding which governs the availability of an exemption. A reasoned exercise of such discretion should take into account the equities of each situation. These equities include the stage of the facility's life, any financial or economic hardships, any internal inconsistencies in the regulation, the applicant's good-faith effort to comply with the regulation from which an exemption is sought, the public interest in adherence to the Commission's regulations, and the safety significance of the issues involved.

(May 16 Order, 19 NRC at 1156 n.3.)

LILCO submitted its Application for Exemption on May 22, 1984, in which it requested an exemption under § 50.12(a) from the requirements of GDC 17, and from other applicable regulations, if any, which require that the TDI diesel contentions be fully adjudicated prior to conducting the low-power testing described in LILCO's March 20 Motion. On May 31, 1984, we issued our "Order Establishing Schedule for Resumed Hearing" (unpublished). The evidentiary hearing commenced on July 30, 1984, and the record was closed on everything except security issues (discussed *infra*, pp. 1356-58) on August 7, 1984.

A. Summary Disposition of Phases I and II

On May 22, 1984, following the issuance of the Commission's May 16 Order, LILCO filed motions for summary disposition on Phases I and II of its low-power testing program.¹⁸ LILCO stated that, in the words of GDC 17, the onsite AC power source must be of "sufficient capacity and capability" to assure the performance of the specified safety

¹⁷ Section 50.12(a) specific exemptions:

(a) The Commission may, upon application by any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

¹⁸ See p. 1349, *supra*, for definitions of the phases of low-power testing.

functions. LILCO's affidavits demonstrated that during Phase I fuel loading and precriticality testing, there are no fission products in the core and no decay heat. Therefore, core cooling is not required because with no fission product inventory, fission product releases are not possible. Thus, LILCO contended that as to Phase I, no AC power, either off site or on site, is necessary to perform health and safety functions. The reliability of LILCO's onsite diesels is therefore not material, and hence a license for fuel loading and precriticality testing should be granted without any litigation.¹⁹

LILCO also requested summary disposition of its Phase II testing program. LILCO contended that during Phase II, which includes cold criticality testing of the plant at essentially ambient temperature and atmospheric pressure, the extremely low levels of fission products and decay heat in the core provide essentially unlimited available time before core cooling would have to be restored in case of an accident. Thus, LILCO said, in this Phase there is also no need for AC power, and the activities of Phase II should be authorized prior to litigation of other low-power issues.

On July 24, we issued our "Order Granting in Part and Denying in Part LILCO's Motions for Summary Disposition on Phase I and Phase II Low-Power Testing" (unpublished). In ruling on the LILCO motions, we gave weight to the guidance that the NRC Staff had provided in its June 13 Response to the motions. Therein, the Staff had opined that the Commission's May 16 Order (CLI-84-8) stands for the proposition that GDC 17 must be literally satisfied (or an exemption thereto must be obtained) before any license may be issued pursuant to 10 C.F.R. § 50.57(c). Thus, we granted summary disposition only as to some of LILCO's uncontroverted statements of material facts.²⁰ Those facts were of a technical nature, supported by affidavits, and not disputed by any other party. Those admitted facts are as follows:

Phase I:

- (1) During all of the activities in Phase I, the reactor will remain at essentially ambient temperature and atmospheric pressure. The reactor will not be taken critical. Any increase in temperature beyond ambient conditions will be due only to external heat sources such as recirculation pump heat. There will be no heat generation by the core.

¹⁹ The Commission has recently approved fuel loading and precriticality testing in *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-83-27, 18 NRC 1146 (1983).

²⁰ See Findings No. 7-19, *infra*.

- (2) Of the thirty-eight accident or transient events addressed in FSAR Chapter 15, eighteen of the events could not occur during Phase I because of the operating conditions of the plant. An additional six events could physically occur, but given the plant conditions, would not cause the phenomena of interest in the Chapter 15 safety analysis. The remaining fourteen events could possibly occur, although occurrences are highly unlikely given the plant conditions. The potential consequences of these fourteen events would be trivial.
- (3) During Phase I fuel loading and precriticality testing, there are no fission products in the core and no decay heat exists. Therefore, core cooling is not required. In addition, with no fission product inventory, no fission product releases are possible.
- (4) Even a loss-of-coolant accident would have no consequences during Phase I since no core cooling is required. No fission products exist and therefore no decay heat is available to heat up the core. The fuel cladding simply would not be challenged, even by a complete draindown of the reactor vessel for an unlimited period of time.

Phase II:

- (1) Under the plant conditions present in Phase II, many events analyzed in FSAR Chapter 15 could not occur or would be very unlikely. Even the possible Chapter 15 events would have no impact on public health and safety regardless of the availability of the TDI diesels.
- (2) Of the twenty-three possible Chapter 15 events reviewed, twenty would not be adversely affected by the loss or unavailability of offsite AC power. Therefore, the consequences of these events are unaffected by the unavailability of the TDI diesels.
- (3) The three events that are adversely affected by the loss or unavailability of offsite AC power are: pipe breaks inside the primary containment, feedwater system pipe break, and the loss-of-AC-power event.
- (4) Because of the extremely low power levels reached during Phase II testing, fission product inventory in the core will be only a small fraction of that assumed for the Chapter 15 analysis. The FSAR assumes operation at 100% power for 1000 days in calculating fission product inventory; inventory during Phase II low-power testing will be less than 1/100,000 (0.00001) of the fission product inventory assumed in the FSAR.

- (5) If a LOCA did occur during the cold criticality testing phase (Phase II), there would be time on the order of months available to restore makeup water for core cooling. At the power levels achieved during Phase II, fission product inventory is very low. At most, the average power output will be a fraction of a watt per rod, with no single rod exceeding approximately 2 watts. With these low decay heat levels, the fuel cladding temperature would not exceed the limits of 10 C.F.R. § 50.46 even after months without restoring coolant and without a source of AC power. Thus, there is no need to rely on the TDI diesel generators, or any source of AC power.
- (6) During Phase II cold criticality testing conditions, there is no reliance on the diesel generators for mitigation of the loss-of-AC-power event or the feedwater-system-piping-break event. For these events, no loss of coolant occurs and the decay heat is minimal. Core cooling can be achieved for unlimited periods of time without AC power using the existing core water inventory and heat losses to ambient.
- (7) The LOCA and the feedwater system piping break postulate the double-ended ruptures of a piping system. Because the reactor will be at essentially ambient temperature and atmospheric pressure during Phase II, it is extremely unlikely that such a pipe break would ever occur. The NRC Staff does not require double-ended ruptures to be postulated for low-temperature and low-pressure systems in safety analyses.
- (8) None of the events analyzed in Chapter 15 could result in a release of radioactivity during cold criticality testing that would endanger the public health and safety.
- (9) Even if AC power were not available for extended periods of time, fuel design limits and design conditions of the reactor coolant pressure boundary would not be approached or exceeded as a result of anticipated operational occurrences, and the core would be adequately cooled in the unlikely event of a postulated accident.

On September 5, 1984, we issued an "Order Reconsidering Summary Disposition of Phase I and Phase II Low-Power Testing," LBP-84-35A, 20 NRC 920. Therein, we concluded that the Staff's original advice to the Board regarding the summary disposition motions for Phases I and II was not correct. Accordingly, we reconsidered and revised our prior order.

The LILCO motions had asserted that because no emergency AC power was needed for protection of public health and safety during Phases I and II, there was no requirement that AC power sources be available during these phases. The Staff, in its June 13, 1984 filing said, "the Staff believes this argument runs afoul of the position taken by the Commission in CLI-84-8. In arguing that no AC power is needed during Phases I and II, LILCO is essentially arguing that GDC 17 does not apply at this level of operation" (Staff's Response at 4). The Staff mischaracterized LILCO's argument. LILCO did not assert that GDC 17 is inapplicable to Phases I and II; what LILCO said was that the requirements of GDC 17 (power capacity and capability sufficient to assure performance of safety functions specified by the criterion), *when applied*, are satisfied, even with no power source available during Phases I and II. This is not an attempt to "harmonize" GDC 17 and 10 C.F.R. § 50.57(c), contrary to the Commission's May 16 Order. Rather, we simply took the original requirements of GDC 17 as set forth in the regulation and applied a rule of reason in its interpretation as a matter of "simple logic and common sense" (September 5 Order, 20 NRC at 924).

B. Safeguards/Security

On June 2, 1984, LILCO filed a motion to preclude discovery upon security issues in this proceeding. The Board granted that motion based upon the fact that a Final Security Settlement Agreement had been signed by the parties on November 24, 1982,²¹ and ratified by a specially appointed Licensing Board on December 3, 1982.²² Our "Order Granting LILCO's Motion *In Limine*" (unpublished) was issued June 20, 1984.²³

Subsequently, the Commission found that some guidance on the litigability of security issues in this proceeding was appropriate. Although LILCO's exemption application was held not to be an occasion for parties to relitigate issues already decided in the main operating license proceeding, the Commission said parties would be permitted to raise new contentions that were: (1) "responsive to new issues raised by LILCO's exemption request"; (2) "relevant to the exemption application and the decision criteria as set forth in the Commission's Order of May 16, 1984"; (3) "reasonably specific"; and (4) "otherwise capable of

²¹ The agreement was signed by LILCO, Suffolk County and the NRC Staff. Although the State of New York was at that time a party to this proceeding, it chose not to participate in security issues.

²² "Memorandum and Order Canceling Hearing, Approving Final Security Settlement Agreement, and Terminating Proceeding," December 3, 1982 (unpublished).

²³ The Agreement itself containing safeguards information, was not before the Board; our ruling was based upon the discussion set forth in the December 3, 1982 Memorandum and Order, *supra* note 22.

on-the-record litigation.” The Commission further explained that security issues, if any, may only be litigated:

- (1) to the extent they arise from changes in configuration of the emergency electrical power system, and
- (2) to the extent they are applicable to low-power operation.²⁴

On August 13, 1984, Suffolk County and the State of New York filed seven proposed security contentions. These proposed contentions were designated as restricted “safeguards information” by the proffering parties. On August 17 we issued a Protective Order setting requirements for the restricted treatment of safeguards information. All subsequent filings on this matter have been designated as safeguards information and treated as such. After LILCO responded to the proposed contentions, the Intervenor filed replies which contained a new superseding set of seven “revised” contentions. At an *in camera* conference of counsel²⁵ on August 30, we heard the additional arguments of all parties.²⁶ On September 19, we issued a twenty-page “Restricted” Order Denying Revised Security Contentions, and a brief summary thereof for public release.

A pervasive issue throughout the proffered revised security contentions was whether LILCO’s power “enhancement” equipment should be treated as “vital,” thus located in “vital areas” under NRC regulations.²⁷ We held as a matter of law that under a request for *exemption* from certain regulations for the purpose of low-power testing, the power enhancements need not be treated as “vital.” To require this equipment to be treated as vital would, in effect, negate the exemption provisions. Thus, we rejected contentions which asserted that the enhancements must be so treated.

²⁴ Commission’s Memorandum and Order, entered July 18, 1984 (unpublished).

²⁵ All proceedings involving security issues were held *in camera*, and were reported in restricted transcripts numbered S-1 through S-333.

²⁶ Subsequent to that conference, but before this Board had ruled on the contentions, the NRC Staff (Division of Licensing, Office of Nuclear Reactor Regulation) issued a letter which apparently constituted an abrupt change in the previous position of the Staff on the issues of vital areas or equipment. We therefore found it necessary to hold another conference with counsel on September 14, 1984, to discuss the “effect and implications” of the Staff’s letter “upon substantive issues and scheduling” in this proceeding.

²⁷ Section 73.2 of 10 C.F.R. contains the following definitions:

(h) “Vital area” means any area which contains vital equipment.

(i) “Vital equipment” means any equipment, system, device, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation. Equipment or systems which would be required to function to protect public health and safety following such failure, destruction, or release are also considered to be vital.

The Intervenor also argued that the "change in configuration" wrought by the addition of the enhancements created new or different vulnerabilities for the site. However, these proffered contentions failed to show with reasonable specificity that they were not encompassed within the approved Security Plan, as to which the Intervenor has had detailed information for almost 2 years. The proposed revised contentions also failed to meet the six criteria described in the Commission's guidance in its July 18, 1984 Memorandum and Order, *supra*, and they were denied for reasons set forth with more specificity in our Restricted Order Denying Revised Security Contentions, entered September 19, 1984 (unpublished).

On October 2, 1984, LILCO informed the NRC Staff²⁸ that it would voluntarily implement certain "enhancements" to the physical security arrangements provided for the EMD diesels.²⁹ The "enhancements" would be in place prior to the commencement of Phase III of low-power operation, and would remain until the regular emergency power system (TDI diesels) was fully qualified. The NRC Staff indicated its belief that LILCO's commitments "adequately resolve the security concerns" which had prompted the Staff to determine that the subject power equipment must be treated as "vital."³⁰

C. "As Safe As"

In its May 16 Order, the Commission said that LILCO must show that "at the power levels for which it seeks authorization to operate, operation would be as safe under the conditions proposed by it, as operation would have been with a fully qualified onsite A/C power source" (19 NRC at 1156).

LILCO states that it has shown that "[o]peration of Shoreham as proposed by LILCO will be as safe as operation would have been with a fully-qualified onsite AC power source because the effect on public health and safety will be the same; there will be none."³¹ Suffolk County says that "reliance on the alternate AC power system substantially reduces the margin of safety and constitutes a severe reduction in the defense in depth protection which generally is central to the NRC's licens-

²⁸ Letter of October 2, 1984, from John Leonard, LILCO, to Harold Denton, NRC (SNRC-1090).

²⁹ The additional security arrangements were set forth in an attachment to LILCO's letter, designated "safeguards information," and will be documented in an Appendix to the Shoreham Security Plan.

³⁰ Letter of October 10, 1984, from Albert Schwencer, NRC, to John Leonard, LILCO.

³¹ Long Island Lighting Company's Post-Hearing Brief in Support of Application for Exemption, August 31, 1984, at 3.

ing concept.”³² Thus, LILCO would have us define “as safe as” to mean providing equivalent safety in the functional sense. The County on the other hand would hold us to a point-by-point comparison which would require the alternate power sources to be absolutely equivalent in all respects, such as qualifications, automation, and speed of response, regardless of whether they provide an equivalent level or amount of safety.

The NRC Staff approaches this question from the standpoint of function. The Staff states that it has been shown that, following a loss of off-site power (LOOP), LILCO would have at least 55 minutes to restore power necessary to mitigate a loss-of-coolant accident (LOCA). Because it has also been shown that there exists adequate assurance that power can be restored using alternate power sources well within 55 minutes, the proposed alternate power system provides as comparable level of protection as would a source in compliance with GDC 17 and thus it meets the “as safe as” standard set out by the Commission in CLI-84-8.³³ We adopt the Staff’s definition and application of the “as safe as” standard.

Staff witness Wayne Hodges described the concept of “margin of safety” as like driving on a four-lane bridge, being in the outside lane near the edge as opposed to the inside lane. There is no less margin of safety in crossing the bridge (Tr. 1751). Suffolk County points out that there are differences between the emergency electric power configuration as originally proposed (the TDIs) and LILCO’s proposed alternate. With a fully qualified power system, emergency power could be supplied to safety loads within 15 seconds; the alternate power sources could not supply power for several minutes, perhaps as long as 30 minutes.

There is unquestionably a lesser margin of safety provided by LILCO’s alternate power system. Nevertheless, evidence regarding the time needed to restore power³⁴ and the time in which the alternate system would be able to do it, shows that power will be restored in time to prevent harm to the public notwithstanding the reduction in margin of safety. The difference in “margins of safety” involved does not preclude a finding of “as safe as” when applied to operation “at the power levels for which it seeks authorization to operate” (May 16 Order, 19 NRC at 1156).

NRC regulations do not require that a licensee be able to restore emergency power within 10 seconds, or 15 seconds, or any other specific

³² “Brief of Suffolk County in Opposition to LILCO’s Motion for Low-Power Operating License and Application for Exemption,” August 31, 1984, at 3.

³³ Staff Proposed Findings at 23.

³⁴ This time — 55 minutes using the most conservative assumptions in the very worst case — is uncontroverted in the record.

time. Rather, an applicant makes analyses of a variety of accident scenarios and determines the times needed to prevent any resulting danger to the public. The Staff reviews the applicant's analysis, and tells it that it must be able to restore emergency power within a specified time.

The main purpose of emergency power relevant here is to get emergency cooling water to a reactor's core in order to avoid, or immediately reverse, uncovering the core. At full-power operation, equipment that can provide power in a matter of seconds, such as the TDIs, is essential.³⁵ However, in the limited circumstances before us, of low-power operations at not more than 5% of rated power, emergency power is not needed as quickly.³⁶ Since there are at least 55 minutes to restore emergency power before core damage results, it is not necessary to restore power within 10 seconds. Safety, after all, is the purpose of design requirements.

Suffolk County's arguments would have us conduct a point-by-point comparison of Shoreham's emergency power configuration with TDI diesels and without them. "As safe as" cannot be based on such a point-by-point comparison of the components of systems. In comparing any roughly equivalent power systems, neither is required to be better than the other in every respect; even two "qualified" systems would not be identical in every respect. If LILCO's original and alternate emergency power systems were identical in every respect, there would be no need for an exemption. The purpose of these systems is to provide protection for public health and safety, by whatever combination of features they possess. Even the General Design Criteria themselves are premised upon the idea of what a system must be able to do, not upon whether one machine might be somewhat better than another.

In short, the question of "as safe as" must be approached in a functional sense (does it serve the purpose of protecting public health and safety) rather than in an absolute sense (is it the very best possible machine available for the purpose). To make such a finding, we approach the question from the viewpoint of the time needed to restore power and the availability of power from the alternate system during that time.

The General Design Criteria set forth the functional requirements of what safety equipment must be able to do. In 10 C.F.R. § 50.46(b), concrete criteria are set forth. An operating reactor must be able to withstand postulated accidents and transients and remain within the limits

³⁵ The core of a reactor operating normally at full power can survive uncover for approximately 30 seconds before safety margins set forth in NRC criteria are violated.

³⁶ Nor is as much emergency power needed, in view of the capacity of mitigating systems, the lesser inventory of fission products, and lower decay heat.

specified in § 50.46(b) with regard to fuel cladding temperature, oxidation of fuel cladding, hydrogen generation, changes in geometry, and decay heat removal. The limits are set conservatively to provide a safety margin (Tr. 1786-87). Any plant operating with a fully qualified onsite power system in accordance with GDC 17 must meet the limiting criteria of § 50.46(b). Plants with differing onsite emergency power systems are all deemed to be safe once they have met those criteria, no matter by how small or great a margin.

In this case LILCO is asking authorization to operate its plant at low power with no emergency AC power system. There is evidence that in the event of a LOOP/LOCA while the plant is operating in the low-power mode, the core can be cooled before the limits of § 50.46(b) are exceeded. Thus, the requirements of the regulations are met notwithstanding that the challenge is met by "offsite" power enhancements rather than by a qualified "onsite" source. If the core will be cooled in time to satisfy the regulations, the system is as safe under our regulations as any other emergency power system (including Shoreham's TDIs) would be during low-power operation.

The term "as safe as" may be defined as presenting no greater potential harm to the public than would a plant operating at low power with a fully qualified power source. However, the NRC Staff has suggested that "as safe as" should be interpreted to mean "substantially as safe as."³⁷ In other words, that the system is *in substance* just as safe. The substance of safety is the actual protection provided to the public, and under this definition our finding herein would be the same. In any case, the standard set forth in the NRC Staff's proposed findings ("a comparable level of protection") clearly falls within the ambit of our interpretation of "as safe as."³⁸

The "as safe as" standard used by the Commission in CLI-84-8 is an articulation of what LILCO had said it could prove. The applicable regulation, 10 C.F.R. § 50.12(a), requires only a showing that the grant of an exemption "will not endanger life or property." If LILCO can show that it has met this higher standard, it will have done more than is necessary to make the safety showing required to support the grant of its requested exemption.

³⁷ Tr. 3045-47.

³⁸ Tr. 3043-47.

III. PUBLIC HEALTH AND SAFETY

A. Time Required to Restore AC Power

1. *Phases I and II*

LILCO described in its supplemental low-power motion before this Board the activities that would occur during each phase.³⁹ As discussed above (§ II.A, pp. 1352-53, *supra*), its request for summary disposition of Phases I and II included proposed statements of material fact which were uncontroverted and were therefore admitted.⁴⁰ In no case did either Intervenor challenge any technical aspect contained in the statements of material fact.

Phase I included loading fuel into the reactor and performing certain tests, summarized in the testimony of William E. Gunther.⁴¹ During Phase I, the reactor will be at atmospheric pressure and at essentially ambient temperature; the only additional heat would be from sources external to the core, such as the recirculation pump. Of the thirty-eight transient or accident events identified and analyzed in Chapter 15 of the Shoreham FSAR, almost half could not occur during Phase I because of the operating conditions of the plant. Of the remaining number, some could not cause the phenomena of interest in the safety analysis, and the potential consequences of the rest would be trivial. Since the reactor would remain subcritical, there would be essentially no fission products. Therefore there would be no decay heat and hence no necessity for cooling the fuel.⁴² Even should a LOCA occur, in the absence of decay heat there would be no means of increasing the temperature of the core; it could remain without water indefinitely without harm. It follows that if no cooling is required to mitigate any untoward event that might occur under the conditions that would exist during Phase I, there is no requirement for emergency AC power.⁴³

During Phase II the reactor would be taken critical and operated at very low power levels.⁴⁴ Otherwise the system conditions (temperature and pressure) would be the same as in Phase I. Many of the events analyzed in Chapter 15 of the FSAR could not occur or would be highly unlikely. Even the possible events could have no effect on the public health and safety regardless of the availability of AC power from any

³⁹ LILCO's Supplemental Motion for Low-Power Operating License, dated March 20, 1984.

⁴⁰ Order Granting in Part and Denying in Part LILCO's Motions for Summary Disposition on Phase I and II Low-Power Testing, entered July 24, 1984, slip op. at 10, *et seq.*

⁴¹ Gunther, Tr. 202-04, 214-17.

⁴² Findings No. 9, 10.

⁴³ Findings No. 11, 20.

⁴⁴ Finding No. 12.

source. Should there be a break in the feedwater system piping, the minimal amount of decay heat could be removed through the existing core water inventory and heat losses to ambient. The fission product inventory postulated in the Chapter 15 analyses is based on operation for 1000 days at 100% power, while Phase II power would be, at most, 0.001% of thermal rated power and for much shorter periods of time. Thus the decay heat would be appreciably lower than at full power and the limits on fuel temperature would not be approached, even should a LOCA occur and coolant not be restored for months.⁴⁵

Since there is no reasonable means of releasing the relatively few fission products that could be generated during Phases I and II, there can be no adverse impact of loss of AC power on the public health and safety. Accordingly, the Board reaffirms the findings and conclusions contained in its Orders of July 24 and September 5, 1984.

2. *Phases III and IV*

As set forth in LILCO's supplemental motion for low-power license as well as its exemption request, Phases III and IV would encompass increasing the power of the core to 1% and 5%, respectively, of rated power. During Phase III the system is taken, in steps, to the rated temperature and pressure conditions and the power raised to about 1% of the rated level. These conditions are beyond the essentially zero power and ambient temperature and pressure conditions of Phase II. Testing of systems and components will be carried out under plant operating conditions, except for heat output from the reactor core. Phase IV extends the thermal reactor power to 5%, thereby permitting testing and calibration of additional portions of the total system.⁴⁶ These activities are all necessary and conventional preliminaries to bringing a plant on-line at full design operating power, whether they be performed during a formally designated low-power program or as part of a full-power license.

Although LILCO separated Phases III and IV, they are discussed together here since they are bounded by Phase IV conditions with respect to the necessity of restoring AC power should offsite power be lost. In other words, if LILCO has demonstrated that AC power can be restored in a sufficiently short time to take care of the decay heat from the fission products resulting from operation at 5% power,⁴⁷ operation at

⁴⁵ Findings No. 13-20.

⁴⁶ Findings No. 31, 32.

⁴⁷ Although LILCO indicated that operation at 5% power would be for a time short of equilibrium conditions, the analyses on which our opinion is based assume, for conservatism, 5% power for essentially unlimited time.

1% power will be no problem because the required time in which power must be restored would be longer.

Chapter 15 of the FSAR identified and analyzed the transients and accidents that must be accommodated by the Shoreham plant, at full-power operation, in order to demonstrate compliance with NRC regulations. Two witness panels, one of LILCO and one of NRC Staff, presented testimony concerning those events that could occur during low-power operation.⁴⁸ Essentially all of those witnesses agreed that the thirty-eight accidents and transients of Chapter 15 fall into three categories: (1) those that cannot occur during low power, (2) a loss-of-coolant accident (LOCA), and (3) all others. Of these thirty-eight events, three could not occur⁴⁹ and, of the remaining ones, only four require the assumption of the unavailability of offsite power. These four events are: loss of AC power, LOCA, steam line break, and feedwater system piping break, of which the LOCA is obviously the one of most severe potential consequence.⁵⁰ For the purposes of this exemption request there is no need to discuss any save the four events, since the others are not affected by the assumption of loss of offsite power. In addition, their consequences are bounded by the Chapter 15 analyses, and therefore pose no undue threat to health and safety.

In the absence of a LOCA during low-power operation and without available AC power, the water in the reactor vessel would boil off slowly, dropping from the normal level to the top of the fuel over an extended period of time. Two systems would be available to provide makeup water: the Reactor Core Isolation Cooling (RCIC) System and the High Pressure Coolant Injection (HPCI) System. These systems, which operate automatically, are steam-driven and use DC (battery) power supplies that will last without recharging a minimum of 24 hours. Each system has sufficient coolant makeup inventory to supply any required core cooling.⁵¹ If either system acts even once during the first 4 days to restore the water level, the subsequent heat losses would compensate for the decay heat being generated in the core and thereby prevent the water level falling below the top of the fuel and the peak clad-

⁴⁸ Rao, *et al.*, Tr. 265, *et seq.*; Hodges and Quay, Tr. 1782-1800.

⁴⁹ Staff witnesses considered that five events could not occur. In addition to those identified by LILCO, Staff determined that control rod removal and fuel assembly insertion error during refueling could not occur by definition, since no fuel handling activity is contemplated during Phases III and IV (Hodges, Tr. 1789).

⁵⁰ Finding No. 32.

⁵¹ Finding No. 35: LILCO's DC power supplies will last a minimum of 24 hours providing sufficient power for at least 2 more days of core cooling. Using an onsite portable generator and battery chargers, the DC power can be maintained indefinitely.

ding temperature⁵² of 2200°F would never be reached. Containment and suppression pool limits would not be exceeded for approximately 30 days following loss of AC power.⁵³

For loss-of-coolant accidents, 10 C.F.R. § 50.46(b)⁵⁴ lists five limits that must be satisfied. These limits address maximum cladding temperature, cladding oxidation, hydrogen generation, core deformation, and the requirement for removal of decay heat for an extended period of time.

Both NRC Staff and LILCO witnesses testified that a LOCA is the most potentially damaging accident that can be anticipated at power levels up to and including 5% of rated power.⁵⁵ Analyses of the consequences of a LOCA occurring during either Phase III or Phase IV were performed to determine the times within which core cooling would have to be restored in order to meet these criteria. Using the conservative assumptions required by the models of Appendix K of Part 50 (including the accumulation of 1% of the fission products assumed in the FSAR for full-power operation, no convective heat transfer following the initial blowdown, and loss of inventory until spray or injection is initiated), the occurrence of a LOCA at 1% power would require restoration of AC power within about 6 hours. Using more realistic assumptions as input to the same models, more than 24 hours would be available for core cooling. Staff and LILCO differed slightly in the results of their analyses for a LOCA at 5% power using conservative assumptions, reporting 55 and 86 minutes, respectively. Values that more nearly reflect actual core conditions and history during operation at 5% power, such as peaking factor and 60 days equivalent operation rather than 1000 days, predict

⁵² This value delimits the peak cladding temperature in accordance with 10 C.F.R. § 50.46(b) for loss-of-coolant accidents.

⁵³ Finding No. 33.

⁵⁴ Section 50.46(b) states:

(b)(1) *Peak cladding temperature.* The calculated maximum fuel element cladding temperature shall not exceed 2200°F.

(2) *Maximum cladding oxidation.* The calculated total oxidation of the cladding shall nowhere exceed 0.17 times the total cladding thickness before oxidation. . . .

(3) *Maximum hydrogen generation.* The calculated total amount of hydrogen generated from the chemical reaction of the cladding with water or steam shall not exceed 0.01 times the hypothetical amount that would be generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react.

(4) *Coolable geometry.* Calculated changes in core geometry shall be such that the core remains amenable to cooling.

(5) *Long-term cooling.* After any calculated successful initial operation of the ECCS, the calculated core temperature shall be maintained at an acceptably low value and decay heat shall be removed for the extended period of time required by the long-lived radioactivity remaining in the core.

⁵⁵ Rao, *et al.*, Tr. 252, 297-98, 302, 313; Hodges, Tr. 1785.

times of 110 minutes and more than 3 hours by Staff and LILCO, respectively.⁵⁶

The potential need for the standby gas treatment system (SGTS) was investigated. The Staff assumed that this system would mitigate the consequences of the fuel handling accident and the LOCA. Since no fuel handling is anticipated during low-power testing, there is no need to consider that potential accident. The availability of the standby gas treatment system would be important in the case of a LOCA with breach of fuel cladding and consequent release of iodine to the environment. However, if core cooling can be restored within 55 minutes following a LOCA accompanied by loss of offsite power, the cladding temperature will not exceed 2200°F at any location, and there will be no cladding failure and no need for the SGTS.

It is possible that an oxidation limit would be reached before the fuel temperature limit is reached. However, this would occur at less than 5% power, and a substantially longer time would be available before any limits are approached. Therefore restoration of AC power within the time suggested by the most conservative assumptions, 55 minutes, would prevent reaching any of the limits of § 50.46.

The peak cladding temperature limit of § 50.46 is a conservative value chosen to assure that the cladding retains some ductility so that the fuel will remain in a coolable geometry when coolant is restored. Some data indicate that the cladding would retain some ductility at 2700°F and the fuel would not melt. At 2200°F the local cladding oxidation is 6.5% (the regulatory limit is 17%). Thus the fuel and cladding would remain intact and there could be no release of fission products.⁵⁷

It is apparent that the worst case would be a LOCA while operating at 5% power accompanied by a loss of offsite power. If AC power can be restored to move cooling water, in addition to that supplied by the HPCI and/or the RCIC systems, onto the core within 55 minutes (the most conservative estimate), the regulatory limits will not be exceeded. Therefore there will be no fuel or cladding damage and no release of fission products or effect on health and safety.

Neither Suffolk County nor the State proffered any witness who challenged these calculations or any technical aspect of low-power operation under the conditions of the requested exemption. The only challenge offered by the Intervenor to the above conclusions regarding times available for restoration of AC power had nothing to do with the validity of the results or with whether the criteria of § 50.46 would be met. Their

⁵⁶ Finding No. 36.

⁵⁷ Findings No. 37, 38, 39, 42.

sole assertion in this area was only that the enhanced AC power sources might not be available within the 15 seconds postulated for the "fully qualified" onsite emergency power. The Intervenor did not challenge the assertion of LILCO and Staff that it is unimportant whether core cooling starts within 15 seconds or 55 minutes as far as protection of the core and therefore public health and safety are concerned. We find the temperature difference between 550° and 1086° is of no consequence, because both are substantially less than the regulatory limit of 2200°F.⁵⁸

B. Availability of AC Power

This opinion has explored the circumstances under which AC electrical power could be required during fuel loading and operation up to 5% of rated power. Under the terms of the requested exemption from the literal requirements of the General Design Criteria, particularly GDC 17, for operation at low power, all electrical power for the site should be considered off site, including the enhanced power sources discussed *infra*. The Board has held that, for the purposes of this case, LILCO can take no credit for its TDI diesels, which were intended to be the source of emergency AC power, although the Board is aware that LILCO has rebuilt them and is in the process of again attempting to qualify them as onsite sources. The Board is also aware that LILCO has purchased Colt diesels and is preparing for their installation and subsequent qualification; these, also, are beyond the scope of the Board's consideration in this low-power decision. Thus for the purposes of this case, all sources of power are considered to be off site, no matter where they are physically located. It is therefore necessary to determine what and where the sources are, the diversity of routing to the Shoreham site, the reliability of the system, and the time within which AC power could be reestablished should it be lost.

1. Reliability of LILCO's Normal Offsite Power System

With respect to normal offsite electrical power sources, GDC 17 mandates two physically independent circuits, not necessarily on separate rights-of-way, which may come together in a common switchyard; functional requirements for these power sources are also specified.⁵⁹ LILCO has exceeded these physical requirements significantly, as the following

⁵⁸ Finding No. 39.

⁵⁹ GDC 17 states in pertinent part: "Electric power from the transmission network . . . vital safety functions are maintained." (See complete text at note 3, *supra*).

discussion indicates, which would presumably augment in like amount the realization of the functional requirements.⁶⁰

LILCO has at present 3721 MW of its own generating capacity consisting of baseload, mid-range, and peaking steam turbine units, and internal combustion units, both gas turbines and diesel generators.⁶¹ Four major steam power generating stations essentially surround Shoreham on three sides. Each of these stations is equipped with one or more blackstart⁶² gas turbines.⁶³ In addition to those on the sites of the steam generating stations, deadline blackstart⁶⁴ gas turbines are also at three other locations near the Shoreham site. Any one of the gas turbines is of sufficient capacity for Shoreham's emergency power needs. Should Shoreham receive an operating license, standing orders to the system operator will require restoration of power to Shoreham as a priority action; the times estimated or determined for this power restoration are between 6 and 25 minutes, depending on the transmission routing available.⁶⁵

In addition to its own generating capacity, LILCO has a single connection with the New England Power Exchange and three with the New York Power Pool.⁶⁶ It also has in place automatic load-shedding capabilities for removing loads from the grid and reducing voltages to prevent cascading outages on the system. The single outage on a substantial portion of LILCO's grid since the 1965 Northeast Blackout occurred in 1979, before all of the present equipment and procedures for power restoration were in place. Even so, power was restored to the system within slightly more than an hour.⁶⁷

Seven circuits from LILCO's system serve the Shoreham site through two switchyards. Four separate 138-kV lines enter the 138-kV switchyard, about 1300 feet south of the plant, over two separate and independent rights-of-way, each of which carries two circuits. This switchyard consists of two sections that can be electrically isolated from each other in case of trouble in one section. Each section receives two of the four 138-kV circuits, one from each right-of-way. From this switchyard, power is transmitted to the normal station service transformer (NSST).⁶⁸

⁶⁰ Findings No. 56, 57.

⁶¹ Finding No. 43.

⁶² Blackstart means that, when a loss of power exists, an independent source of starting power allows the systems operator to start a gas turbine from either a local or a remote location.

⁶³ Findings No. 44, 45, 46, 49, 51.

⁶⁴ Deadline blackstart means that the unit can recognize through its own circuitry that power on the line has been lost and can start automatically without operator action.

⁶⁵ Findings No. 45, 46, 49, 51.

⁶⁶ Finding No. 47.

⁶⁷ Finding No. 48.

⁶⁸ Finding No. 54.

The Wildwood Substation, approximately 1 mile south of Shoreham, is fed by three 69-kV circuits from two separate rights-of-way. From the Substation a single line, part of which has been placed underground, can supply power, via the 69-kV switchyard, to the reserve station service transformer (RSST), thereby providing independence between the NSST and the RSST. In addition, a bypass (partially overhead and partially underground) of the underground portion of this line, around the 69-kV switchyard, goes directly to the RSST. These provisions allow restoration of power to the RSST without the necessity of repairing the underground line from the switchyard or a fault in the yard itself.⁶⁹

In summary, seven power circuits enter the Shoreham site along two completely separate and independent corridors, with no ties or interconnections. One of the two switchyards fed by these circuits is apparently electrically equivalent to two yards, and the other can be bypassed completely. Witnesses for the NRC Staff affirmed that this design exceeds NRC requirements for offsite power systems.⁷⁰

With respect to loss of offsite power from natural phenomena, we observe that this has not been a significant problem in the past. The transmission system is designed to withstand winds in the range of 100 to 130 miles per hour; the system has not been extensively damaged by hurricanes in the last 10 years, although major storms have caused outages on individual lines.⁷¹ Similarly, the transmission system has not been adversely impacted by either tornadoes or earthquakes⁷² in the last 20 years.⁷³ The impact of ice storms and lightning strikes on the system has not been severe and has affected at most small segments of line.⁷⁴ Even so, LILCO has committed to initiate steps to place the plant in cold shutdown should any of the following events occur during low-power testing in order to minimize the possible consequences of loss of normal offsite power: a "hurricane warning," a "tornado watch," a "severe thunderstorm watch," a "winter storm watch," or a coastal flood warning for the Shoreham area; an indication of seismic activity of 0.01g on the Shoreham seismic monitors;⁷⁵ the prolonged or unscheduled outage of two

⁶⁹ Finding No. 55.

⁷⁰ Findings No. 56, 57.

⁷¹ Findings No. 58, 59.

⁷² See "Seismic Capability," § III.B.2.d, *infra*.

⁷³ Finding No. 58.

⁷⁴ *Ibid*.

⁷⁵ There was some discussion by the Intervenor's seismic witnesses, Meyer and Roesset, that this alarm would provide little protection in the event of a significant seismic event (Tr. 2797-99). This testimony reflected uncertainty that the alarm would precede larger seismic shocks by any appreciable length of time or, alternatively, that an alarm indicating small foreshocks might precede major shocks by so much time as to be meaningless. While there are clearly uncertainties, the commitment to shut

(Continued)

of the four LILCO interconnections to the New York Power Pool and the New England Power Exchange; or a low electrical frequency condition on the LILCO transmission system which reaches an alarm set point.⁷⁶ LILCO's procedures direct immediate commencement of a controlled shutdown upon notification from the system operator that any of these conditions exist.⁷⁷

The Board orders that these commitments shall become a part of the license conditions for low-power operation.

The Intervenor essentially ignored the normal offsite power system except for some attack on the vulnerability of transformers, insulators, and line poles to seismic events.⁷⁸ We note that the regulations contain no requirements for the seismic qualification of normal offsite power, and we find no justification for imposing such qualification for low-power operation, particularly in light of the commitment of LILCO to proceed to cold shutdown should ground motion of 0.01g be detected by the Station monitor.

We note that the offsite power sources and transmission system discussed above will be the same as that for full-power operation. In considering the exemption request before us for low-power operation, we must be concerned with availability of AC power for operation of those plant systems necessary to protect the public health and safety during low-power operation, regardless of the sources of that power. The Board finds that LILCO's substantial and diverse generating capacity, coupled with the multiplicity of paths through which power can be transmitted to the site, more than satisfies the requirements of GDC 17 with respect to normal offsite power and makes it unlikely that power would be unavailable to either the NSST or the RSST from normal offsite sources.

2. Offsite Enhancements at Shoreham

The enhancement of the offsite system which LILCO has put in place consists of two independent power sources, both located on the Shoreham site. One source, a 20-MW deadline blackstart gas turbine, is physically located in the 69-kV switchyard 300 feet south of the reactor

down the plant in the event of such an alarm indicates LILCO's willingness to avoid any hazard if possible and may, in fact, prevent the operation of the plant during a seismic event. In any event, as discussed below, it is unnecessary to postulate a seismic event concurrent with a LOCA and, therefore, plenty of time would be available to restore AC power even if a transmission line, transformer or other element of the offsite system were to be affected adversely.

⁷⁶ Finding No. 61.

⁷⁷ Finding No. 62.

⁷⁸ See, for example, Tr. 340, *et seq.*

building.⁷⁹ The other source is a group of four EMD diesel generators, also deadline blackstart, manufactured by General Motors. Each EMD is rated at 2.5 MW, and the total unit supplies 10 MW for emergency power.⁸⁰ The four units are grouped together in the protected area just southwest of the reactor building.

The gas turbine is equipped with a compressed air starting system. Air to the starter is supplied from a receiver which is kept pressurized automatically by a compressor.⁸¹ The EMD diesels have dual starting motors which are powered by a continuously charged battery.⁸² Upon loss of off-site power the two systems start simultaneously. If power from the gas turbine is available it is routed through a transformer in the 69-kV switchyard to the switchyard bus and then to the safety-related switchgear. If power from the gas turbine is not available, power from the EMD diesels is routed through a nonemergency switchgear room to the safety-related switchgear room. Power from the gas turbine could be established conservatively in 10 minutes; power from the EMD diesels in 30 minutes.⁸³

The starting reliability of the gas turbine, based on actual start attempts on a similar unit in 1982-83, was 97.6%. Actual start attempts for the EMD diesels over the same time period showed a reliability of 98.6% per diesel, with the reliability of the system approaching 100% that at least one diesel would start. These levels of reliability compare favorably with qualified emergency power systems, whose industry-wide starting reliability is between 92-99%.⁸⁴

The County offered testimony in the following areas: (a) the reliability of the EMD diesels; (b) the testing of both sources; (c) the vulnerability of both systems to single failure; and (d) the resistance of the sources to seismic events. We consider these, *seriatim*.

a. Reliability of the EMD Diesels

The starting reliability of the EMD diesels has been described above. Suffolk County alleges that occurrences such as breakage of the fuel line supplying all four EMD diesels, fire detection and mitigation of the EMDs, and common location of EMD electrical breakers, among others, show that the EMD diesels are not as reliable as a fully qualified

⁷⁹ Knox and Tomlinson, Tr. 2342.

⁸⁰ *Ibid.*; Schiffmacher, Tr. 332, 494.

⁸¹ Tomlinson, Tr. 2346.

⁸² *Id.* at 2347.

⁸³ Knox, Tr. 2349-52.

⁸⁴ Schiffmacher, Tr. 463; Tomlinson, Tr. 1863; Knox, Tr. 2346; SSER 6, p. 8-9.

system would be.⁸⁵ Even the County does not, however, reach the conclusion that the EMDs are so unreliable that they cannot be considered capable of performing their ultimate mission: that of acting as a backup to the gas turbine. The evidence shows that the EMDs have sufficient reliability to perform their intended function.

Both Staff and LILCO point out that a number of actions have been or will be taken to ameliorate the major concerns that have been stated in the record. These actions would either be executed voluntarily by LILCO or would be made conditions in any license which might issue.⁸⁶ Maintenance and repairs of the EMDs will be performed by experts who have a great deal of experience with EMD diesels and, indeed, performed the maintenance and repair of the instant diesels when they were used by New England Power Co. for unattended production of peaking power.⁸⁷ The reliability of the EMDs in this previous service was excellent.⁸⁸

b. Testing of the Sources

Suffolk County witnesses testified that the test procedures to be used for the gas turbine were not rigorous enough to demonstrate the availability of the source for capacity loads.⁸⁹ The Staff, in its review leading to SSER 6, determined that the proposed test procedure was not complete. The Staff will therefore require LILCO to perform a test of the turbine to full capacity before beginning Phases III and IV. The Staff will also require a monthly test to demonstrate that loads normally connected to certain buses used by the turbine are automatically disconnected, and that the gas turbine output will be automatically connected to the 69-kV bus within 2 to 3 minutes.⁹⁰ The Board finds that this requirement adequately addresses Suffolk County's concern.

The Staff also determined that more stringent testing is required for the EMD diesels. Before operation in Phases III and IV, a test will be required which will load each EMD diesel to its design load for 1 hour, and the voltage and frequency must be verified to be within required limits. The Staff will also require all four EMDs to be tested on a biweek-

⁸⁵ Intervenor's Proposed Findings No. 104-89.

⁸⁶ SSER 6, at 13-2, 13-3; Knox, Tr. 2354-55.

⁸⁷ Iannuzzi and Lewis, Tr. 1173-76.

⁸⁸ *Id.* at 1178-79.

⁸⁹ Minor and Bridenbaugh, Tr. 2580, 2614-15.

⁹⁰ SSER 6, at 8-2, 8-3.

ly basis and demonstrate that they can be normally reconnected to their loads if they are disconnected for any reason.⁹¹

c. Single Failure Criterion

Suffolk County's testimony was devoted almost exclusively to showing that each unit in the enhanced system (the gas turbine and the EMDs) was either inferior to the qualified system or, in the case of the EMDs, that the potential existed for a single failure which would disable all four of them.⁹² The Board finds this line of evidence to be irrelevant. The two units (the gas turbine and the EMDs) were planned as a system, and it is the system that the Staff has reviewed and has determined that the alternate power source was adequate.⁹³ The only potential common fault is that the output of both units gains entry to the nonemergency switchgear room through a concrete block wall, but even here they are separated by approximately 40 feet.⁹⁴ The EMDs also will have an independent line which allows their output to be delivered to the emergency switchgear room.⁹⁵ The Board therefore finds that the EMDs and the gas turbine are adequately independent of each other.

d. Seismic Capability

Extensive testimony concerning the seismic capability of the enhanced AC power sources was presented by both LILCO⁹⁶ and by Suffolk County.⁹⁷ While LILCO does not claim that either the 20-MW gas turbine or the EMD diesels meet the seismic qualification criteria for safety-related equipment, the record shows that it is reasonable to expect that this system will survive a seismic event⁹⁸ with little if any damage.⁹⁹

Suffolk County testimony and cross-examination of LILCO witnesses was directed toward establishing that a fully qualified system would be more resistant to seismic forces and therefore a safer system than the enhanced power system. It is, of course, obvious that a fully qualified system would have an established and documented higher resistance to

⁹¹ *Id.* at 8-4.

⁹² Eley, *et al.*, Tr. 2452, 2459-60; Eley, Tr. 2572, *et seq.*

⁹³ SSER 6, at 8-5; Smith, Tr. 2482.

⁹⁴ Knox, Tr. 1885-86.

⁹⁵ Schiffmacher, Tr. 842, 863.

⁹⁶ Christian, *et al.*, Tr. 962, *et seq.*

⁹⁷ Meyer, *et al.*, Tr. 2762, *et seq.*

⁹⁸ The operating basis earthquake (OBE) and the safe shutdown earthquake (SSE) for Shoreham were established as 0.1g and 0.2g, respectively.

⁹⁹ Findings No. 83-98.

seismic events than does the system proposed by LILCO for use during low-power testing. However, there is no need to consider the relative merits of the two systems *per se*, because for the purpose of the exemption request, it is only necessary to establish that the enhanced system is capable of performing its intended function.¹⁰⁰

A LOCA is by design an unlikely event. In addition, the plant, including the piping that would be affected to produce a LOCA, was designed to withstand any credible seismic event, the occurrence of which is considered unlikely. Thus a LOCA and a seismic event must be considered independent events. To have a LOCA concurrent with an earthquake, one must postulate the simultaneous occurrence of two unlikely events, and this is not required for licensing purposes.¹⁰¹

Although these power sources are not formally qualified to withstand possible seismic forces, they do have seismic capabilities as demonstrated by testing and analysis of similar units. These studies revealed some accessory items that might not be operable following a seismic event, and recommendations were made for corrective modifications. These modifications LILCO has either implemented or has indicated it will complete should an exemption be granted.¹⁰² As a result, the units should be capable, by analysis if not by test, of withstanding an SSE.¹⁰³

The portions of the RCIC system required for coolant injection are seismically qualified and modifications to the HPCI system to complete its seismic capability will be implemented prior to Phase III operation. These systems are steam-driven and use DC power supplies (see § III.A.2, *supra*).¹⁰⁴

There are no requirements in the regulations for seismic qualification of offsite power sources, transmission lines, or any other portion of the offsite system. The record indicates that there are no practices in the industry directed specifically toward mitigating the effects of ground motion on transmission systems, even in areas of frequent and more potentially severe seismic activity. It was noted *supra*¹⁰⁵ that the number and diversity of paths for supplying offsite power to Shoreham far exceed the regulatory requirements.

The Board has determined¹⁰⁶ that for any event that made the enhanced system inoperable but did not result in a LOCA, the plant has at

¹⁰⁰ Findings No. 99, 101.

¹⁰¹ Finding No. 102. See also *Southern California Edison Co.* (San Onofre Nuclear Generating Station, Units 2 and 3), CLI-81-33, 14 NRC 1091, 1092 (1981).

¹⁰² Findings No. 97, 98.

¹⁰³ Findings No. 83-100.

¹⁰⁴ Finding No. 104.

¹⁰⁵ Section III.B.1.

¹⁰⁶ Section III.A.2, pp. 1364-65, *supra*.

least 30 days in which to restore AC power.¹⁰⁷ The Board has also found that there is a high likelihood that this could be done. The Board therefore finds that it is not necessary that the enhanced system be able to withstand a seismic event.

The Board has reviewed all of the pertinent parts of the record in this proceeding. We have concluded that the enhanced offsite system has the required redundancy, meets the single failure criterion and has sufficient capacity, capability and reliability to supply adequate emergency power for low-power operation of the Shoreham unit. We find that there is adequate assurance that the enhanced system can supply sufficient power within 55 minutes in the event of a concurrent LOCA and loss of offsite power. We therefore further find that the enhanced system provides a comparable level of protection¹⁰⁸ as a fully qualified system would and thus meets the "as safe as" standard set by the Commission in CLI-84-8.¹⁰⁹

IV. EXIGENT CIRCUMSTANCES

Under the provisions of 10 C.F.R. § 50.12(a), the Commission may "grant such exemptions from the requirements of the regulations" as it determines are authorized by law, will not endanger life or property or the common defense and security, and are otherwise in the public interest. This regulation has a long history, as a version of it authorizing specific exemptions has been in existence for over 20 years. The specific exemption route of § 50.12(a) was used extensively to approve site preparation activities prior to the issuance of construction permits, until passage of the National Environmental Policy Act (NEPA) necessitated certain changes.¹¹⁰

In 1974, alternative methods were developed to handle early site preparation activities consistent with then-new NEPA responsibilities, by establishing limited work authorization (LWA) procedures under § 50.12(b). A specific exemption under § 50.12(a) was still maintained as an option, but the Commission stated that it should be used "sparingly" and only in cases of "undue hardship" or "extraordinary" circumstances.¹¹¹ After the LWA provisions became final in 1974, only one

¹⁰⁷ *Id.*

¹⁰⁸ See § II.C, *supra*, at p. 1361; Tr. 3043-47.

¹⁰⁹ Section II.C, "As Safe As," *supra*, at pp. 1358-61.

¹¹⁰ *United States Department of Energy* (Clinch River Breeder Reactor Plant), CLI-82-4, 15 NRC 362, 373 (1982).

¹¹¹ 39 Fed. Reg. 14,506, 14,507 (April 24, 1974).

§ 50.12(a) specific exemption for site preparation activities had been issued prior to *Clinch River I*, whereas that specific exemption route had been used for forty-nine facilities prior thereto.¹¹²

In the instant case, the Commission stated in its May 16, 1984 Order that it “regards the use of the exemption authority under 10 C.F.R. § 50.12 as extraordinary.” Citing a later *Clinch River* decision,¹¹³ the Commission further noted that “[t]his method of relief has previously been made available by the Commission only in the presence of exceptional circumstances. . . . A finding of exceptional circumstances is a discretionary administrative finding which governs the availability of an exemption” (CLI-84-8, 19 NRC at 1156 n.3). A reasoned exercise of such administrative discretion should take into account the equities involved in the surrounding circumstances of each situation.

The later *Clinch River* decision alluded to above was issued in order to clarify the Commission’s previous findings of “exigent and other extraordinary circumstances” which warranted the grant of an exemption for the initiation of early site preparation activities.¹¹⁴ The term “extraordinary” was used in the *Waterford*¹¹⁵ and *Shearon Harris I*¹¹⁶ decisions. In *Shearon Harris II*¹¹⁷ it was held that “the timely satisfaction of public needs by reducing unexpected delays in the realization of facility benefits and the avoidance of costs induced by such unexpected delays constitute exigent circumstances.”¹¹⁸ It thus appears that Commission precedent on the grant of exemptions provides some illustrations of exigent circumstances, and establishes that they are to be determined “by the totality of the particular circumstances in each case.”¹¹⁹

The Commission’s May 16 Order stated that a reasoned exercise of discretion governing the availability of an exemption should take into account the equities of each situation. Here, these

equities include the stage of the facility’s life, any financial or economic hardships, any internal inconsistencies in the regulation, the applicant’s good-faith effort to

¹¹² *Clinch River I*, CLI-82-4, *supra*, 15 NRC at 373, 380. See also 37 Fed. Reg. 5744, 5746 (March 21, 1972); 39 Fed. Reg. 14,506, 14,507-08 (April 24, 1974); 40 Fed. Reg. 8774 (March 3, 1975).

¹¹³ *United States Department of Energy* (Cinch River Breeder Reactor Plant), CLI-83-1, 17 NRC 1, 4-6 (1983) (*Clinch River II*).

¹¹⁴ CLI-83-1, 17 NRC at 2.

¹¹⁵ *Louisiana Power and Light Co.* (Waterford Steam Electric Station, Unit 3), CLI-73-25, 6 AEC 619, 622 n.3 (1973).

¹¹⁶ *Carolina Power and Light Co.* (Shearon Harris Nuclear Power Plant, Units 1, 2, 3 and 4), CLI-74-9, 7 AEC 197, 198 (1974) (*Shearon Harris I*).

¹¹⁷ *Carolina Power and Light Co.* (Shearon Harris Nuclear Power Plant, Units 1, 2, 3 and 4), CLI-74-22, 7 AEC 938 (1974) (*Shearon Harris II*).

¹¹⁸ *Clinch River II*, CLI-83-1, 17 NRC at 4.

¹¹⁹ *Id.* at 3.

comply with the regulation from which an exemption is sought, the public interest in adherence to the Commission's regulations, and the safety significance of the issues involved.

These equities, of course, do not apply to the findings on public health and safety and common defense and security required by § 50.12(a) (19 NRC at 1156 n.3).

A. Stage of the Facility's Life

The only evidence addressing the stage of the facility's life was the testimony of William Gunther, LILCO's operating engineer for the Shoreham facility. His uncontradicted testimony established that the plant is physically completed, and that it is being maintained in condition that would allow fuel to be loaded within 2-3 weeks of obtaining a low-power license.¹²⁰ Proceedings involving the application for an operating license have been pending in one phase or another for 180 hearing days over 8 years before seven different licensing boards. The facility has now been physically completed, and all contentions have been decided in favor of licensing except emergency planning and TDI diesel generator issues, now pending before two other licensing boards.¹²¹ Under these unusual circumstances, this equity favors the grant of a low-power exemption.

B. Financial or Economic Hardships

It is almost self-evident that there must be financial hardships to someone when there is a physically completed nuclear facility, standing unused and nonproductive because of substantial licensing delays. It is not necessary to allocate blame for such a situation, but the economic consequences and waste of resources make no sense. Someone has spent or is spending billions of dollars for capital investment or debt servicing in connection with the construction costs of the Shoreham facility, but it cannot produce electricity for a utility that uses chiefly oil as fuel. Consequently, Shoreham cannot earn revenues to compensate for its costs of construction and maintenance.

Financial data and analyses of Shoreham's operations were presented by Anthony Nozzolillo, LILCO's Manager of Financial Analysis and Planning Department.¹²² His testimony showed that LILCO has serious

¹²⁰ Tr. 866, Finding No. 105.

¹²¹ PID, LBP-83-57, 18 NRC 445 (1983).

¹²² Tr. 1377.

financial problems which make it difficult for it to obtain necessary external financing. In his opinion, the granting of a low-power exemption would send a positive signal to the capital markets that could help to alleviate LILCO's financial distress in obtaining vitally needed cash by the issuance of securities.¹²³ We find this testimony to be reasonable and credible.

If necessary low-power testing is completed 3 months earlier as a result of granting the exemption request, commercial operation could also commence approximately 3 months earlier. Earlier commercial operation would allow an equivalent earlier displacement of oil-fired generating capacity. The resulting fuel savings would be approximately \$50,000,000 over the 3-month period.¹²⁴ This reduced dependence on foreign oil as a fuel source at a rate of four to five million barrels a year, would also be consistent with our national policy in that respect.¹²⁵ A 3-month earlier commercial operation date could also result in an economic benefit of approximately 8 million dollars in terms of present worth of revenue requirements, assuming that LILCO receives conventional rate treatment.¹²⁶ However, a claimed benefit of \$45 million based on synchronization of the plant for federal income tax purposes in 1984 cannot be allowed, because licensing for full-power operation and connection to the LILCO grid, as required, cannot reasonably be anticipated to occur before the end of December 1984.¹²⁷ Low-power operations could not achieve this tax reduction result.

The costs of unusually heavy and protracted litigation may also properly be considered in evaluating financial or economic hardships as an equity in this exemption proceeding. Brian McCaffrey, LILCO's Manager for Nuclear Licensing and Regulatory Affairs, described the very lengthy and expensive litigation associated with the Shoreham licensing process.¹²⁸ The unremitting and often bitter opposition of Suffolk County as an intervenor has resulted in litigation of very extensive scope and depth. It is beside the point to argue that such litigation is permitted under NRC regulations. Although not illegal, such interminable litigation has resulted in great expense to LILCO, both in terms of time and resources.¹²⁹ These proceedings to date have cost LILCO more than \$33 million.¹³⁰ These proceedings have involved over 15,000 pages of

¹²³ Tr. 1377-82, 1385-86, 1395, 1398.

¹²⁴ Tr. 1393-94.

¹²⁵ Tr. 1322, 2889-91.

¹²⁶ Tr. 1354, 1407.

¹²⁷ Tr. 1357-62, 1373, 1406, 1410, 1904, 1988-92.

¹²⁸ Tr. 1715, *et seq.*

¹²⁹ Tr. 1722-23.

¹³⁰ Tr. 1726-27.

written testimony, 400 exhibits, 180 days of hearings, more than 310 witnesses, 34,000 pages of transcripts, and more than 160 depositions.¹³¹ From the record scope and intensity of this litigation, both direct and collateral,¹³² it can be concluded that Suffolk County's costs of litigation including attorneys' fees must also be measured in the millions of dollars.

The unusually heavy financial and economic hardships associated with the very protracted Shoreham licensing proceedings constitute a significant equity, which we hold can reasonably be held to amount to exceptional circumstances in the context of granting a low-power exemption.

C. Internal Inconsistencies in the Regulations

Another equity to be considered in exercising discretion regarding an exemption request is the presence of internal inconsistencies in the regulations. That inquiry includes an analysis of the prior interpretations and applications of the regulations, as well as the four corners and literal wording of the regulations standing alone. In that connection, the prior practice of the NRC Staff in handling licensing situations involving less than full compliance with the regulations, is illuminating.¹³³

For over 2 decades, the Staff had recognized that although a plant was ready for low-power operation, it might not fully comply with every regulation at full power. In those circumstances, "noncompliances" typically were dealt with by Staff-imposed license conditions requiring completion before a particular power level, or by a particular time. In issuing operating licenses, the NRC Staff only considered or explicitly granted exemptions in instances of long-term or permanent noncompliance with regulations. Recently in seeking guidance from the Commission on the standard for exemptions, the Staff stated that the *Shoreham* decision in CLI-84-8, "establishes practices and requirements for licensing which differ significantly from prior regulatory interpretation and practice."¹³⁴ The Staff cited this *Shoreham* decision as ruling (at least implicitly) that an exemption must be granted if Shoreham is to be licensed for low-power operation prior to compliance with GDC 17. The Staff further

¹³¹ Tr. 1726-27.

¹³² ALAB-777, 20 NRC 21; ALAB-779, 20 NRC 375 (1984). See also Memorandum by Nunzio J. Paladino, Chairman, CLI-84-20, 20 NRC 1061 (1984).

¹³³ These prior inconsistent practices and interpretations were discussed in our Order Reconsidering Summary Disposition of Phase I and Phase II Low-Power Testing, LBP-84-35A, 20 NRC 920, 923 (1984). That Order is pending before the Commission for an immediate effectiveness review pursuant to CLI-84-8.

¹³⁴ July 17, 1984 Staff Paper on "Need and Standards for Exemptions," SECY-84-290, at 1 and 2.

stated that in the context of exemptions, "these determinations regarding 'exigent circumstances' and 'as safe as' are wholly new requirements going beyond anything explicitly required by 10 C.F.R. § 50.12. (The concept of 'exigent circumstances' had previously been considered a factor only in exemptions granted pursuant to 10 C.F.R. § 50.12(b), issuing limited work authorizations.)"¹³⁵ The Staff further observed that the *Shoreham* exemption requirement "is a substantial departure from past staff interpretation and practice. . . ."¹³⁶ The Commission has under consideration the Staff's request for guidance, but it is clear that there are substantial inconsistencies between prior NRC interpretation and practice regarding exemption situations, compared with whatever guidance the Commission ultimately gives concerning the interpretation and application of the "*Shoreham* rule."

Another inconsistency in the treatment of *Shoreham* lies in the fact that both the Catawba and Grand Gulf facilities have unresolved questions about similar TDI diesel generators, yet they have received low-power and full-power licenses, respectively.¹³⁷

The Staff has also applied the security and safeguards regulations inconsistently in the case of *Shoreham*. For example, in SSER No. 5 filed in April 1984, the Staff stated that "there is no technical reason to protect the temporary diesels and the gas turbine generator as vital equipment because they are not required for safe shutdown (in the absence of a LOCA" (at 13-3). However, with admittedly no changes in circumstances, the Staff issued a letter September 11, 1984, directing LILCO to amend the previously approved Security Plan to protect the temporary alternative equipment as vital equipment. No adequate reasons were given for this abrupt change in the application of regulations, which was overruled by the Licensing Board as a matter of law.¹³⁸ Subsequently, LILCO voluntarily agreed to make certain security enhancements to its safeguards arrangements. The Staff has indicated that such commitments adequately resolve its security concerns.¹³⁹

¹³⁵ *Id.* at 3.

¹³⁶ *Id.* at 4.

¹³⁷ Catawba Nuclear Station, Unit No. 1, Issuance of Facility Operating License, 49 Fed. Reg. 30,611 (1984). See also our Order Reconsidering Summary Disposition of Phase I and Phase II Low-Power Testing, issued September 5, 1984, 20 NRC at 926.

¹³⁸ Order Denying Revised Security Contentions, issued September 19, 1984. At the same time the Board issued an expanded order containing the underlying reasons for overruling the Staff's actions in this case, but that order is Restricted because it might contain security or safeguards information.

¹³⁹ See § II.B, p. 1358, *supra*; Finding No. 25.

D. Good-Faith Effort to Comply with Regulations

The evidence shows that LILCO intends to comply fully with the requirements of GDC 17 for full-power operation. This proceeding involves only a limited and temporary exemption for the purpose of low-power testing. The testimony of Brian McCaffrey showed that the TDI diesels were purchased under specifications designed to comply with GDC 17. When problems were discovered, extensive efforts were undertaken to cure the deficiencies. LILCO is installing another qualified source of AC onsite power (Colt diesels) that are designed to meet all GDC 17 requirements. LILCO has also provided enhancements to its offsite power system to assure that AC power will be available during low-power testing.¹⁴⁰ The Intervenor attempted by cross-examination to show that in hindsight, LILCO might arguably have pursued some problems differently or more aggressively.¹⁴¹ However, the requirement established by the Commission involved "good-faith efforts" to comply with the regulations, not whether they were perfect or sufficiently prudent. LILCO's efforts as described in detail constitute the good faith to be considered in evaluating the equities, and support the grant of an exemption.

E. Public Interest in Adherence to Regulations

In view of the demonstrated safety of low-power testing as proposed under the circumstances of this case, there is minimal public interest in strict or mechanical adherence to the regulations. There is also a concurrent public interest in recognizing that the practice of granting exemptions from regulations "is in accord with both the Act and sound principles of administrative law."¹⁴² The U.S. Supreme Court has stated the principle as follows:

It is well established that an agency's authority to proceed in a complex area . . . by means of rules of general application entails a concomitant authority to provide exemption procedures in order to allow for special circumstances.¹⁴³

The low-power exemption requested in this proceeding is for a very limited period of time, about 3 months. The extensive evidentiary hear-

¹⁴⁰ Tr. 1703-15; Findings No. 106-112.

¹⁴¹ Tr. 1439-1510.

¹⁴² NRC General Counsel's Discussion of Exemptions, dated July 24, 1984 (SECY-84-290A), at 6.

¹⁴³ *United States v. Allegheny-Ludlum Steel Corp.*, 406 U.S. 742, 755 (1972). See also *United States v. Storer Broadcasting Co.*, 351 U.S. 192 (1956); *National Broadcasting Co. v. United States*, 319 U.S. 190 (1943).

ing record has demonstrated that the grant of the requested exemption would have no adverse effects upon the public health and safety. In view of the level of protection that will be provided to the public by the enhanced AC power sources and the limited nature of the low-power operations requested, this equity favors grant of the exemption.

F. Safety Significance of the Issues Involved

With regard to Phases I and II of the proposed low-power testing operations, we have already found that no AC power is needed to provide core cooling in the event of a postulated accident or transient.¹⁴⁴ Accordingly, if no emergency AC power is required, then the proposed changes or enhancements in the power source could have no effect upon the "functioning of structures, systems, and components important to safety," as required by GDC 17.

As to operations under Phases III and IV, the Board has found that operations at low power with the proposed enhancements for emergency AC power, will be "as safe as" operation would have been if a source in compliance with GDC 17 were used.¹⁴⁵ Therefore, there is no adverse safety significance of the issues involved, and this equity favors granting the exemption.

On balancing the equities identified by the Commission in its May 16 Order, the Board finds that they meet the "exigent circumstances" test there described, and warrant a discretionary finding of exceptional circumstances that justify the granting of the exemption requested.

V. FINDINGS OF FACT

In making these findings of fact, the Board has reviewed and considered the entire evidentiary record of this proceeding. The positions of the parties are set forth in their proposed findings and briefs as follows:

LILCO's Proposed Findings of Fact;

LILCO's Post-Hearing Brief;

Suffolk County and State of New York Proposed Findings of Fact;

Brief of Suffolk County in Opposition to LILCO's Motion;

¹⁴⁴ Section II.A, pp. 1352-56, and § III.A.1, pp. 1362-63, *supra*. See also our Order Reconsidering Summary Disposition of Phase I and Phase II Low-Power Testing, LBP-84-35A, *supra*.

¹⁴⁵ Section II.C, pp. 1358-61, and § III.A.2, pp. 1363-67, *supra*.

Brief of State of New York in Opposition to LILCO's Motion;

NRC Staff Proposed Findings of Fact and Conclusions of Law (all dated August 31, 1984); and

LILCO's Reply to Suffolk County/State of New York Proposed Findings of Fact, dated September 7, 1984.

Matters examined during the evidentiary hearings which are not discussed herein were considered by the Board and found to be without merit or immaterial to our decision. Those proposed findings not incorporated below, either directly or by fair implication, are rejected as being unsupported by the record or unnecessary to the rendering of this decision.

1. LILCO tendered its application for an operating license for the Shoreham Nuclear Power Station in August 1975 (Tr. 1715). As of the middle of 1984 there had been over 180 days of prehearing conferences and hearings, with approximately 310 witnesses testifying, 15,000 pages of written testimony and 400 exhibits, resulting in over 34,000 pages of written transcript. There have been over 160 persons deposed, and the written rulings of various boards and the Commission exceed 2900 pages (Tr. 1726).

2. On June 8, 1983, LILCO submitted its original motion for low-power operating license. The motion was denied in a Partial Initial Decision issued on September 21, 1983 (LBP-83-57, 18 NRC 445), in which another Licensing Board said that a low-power operating license could not be granted prior to conclusion of litigation on outstanding contentions regarding the TDI diesels. At a conference of the parties on February 22, 1984, the Chairman of that Board indicated that LILCO was not precluded from proposing ways it might qualify for low-power operation without reliance on the TDI diesels (Brenner Board, Tr. 21, 630-61).

3. LILCO filed a "Supplemental Motion" for low-power operating license on March 20, 1984. On March 30 this Board was established to hear and decide issues relevant to that motion (49 Fed. Reg. 13,611).

4. LILCO proposes to test Shoreham at low power employing "power enhancements" to provide emergency AC power in lieu of the TDI diesels. The "enhancements" are four EMD diesels and one 20-MW gas turbine. LILCO's low-power testing program consists of four discrete phases: Phase I is loading fuel into the reactor vessel and precriticality testing; Phase II is initial criticality and testing at power levels of 0.0001% to 0.001% of rated power at essentially ambient temperature and atmospheric pressure; Phase III is reactor heatup and pressurization to rated temperature and pressure conditions at approxi-

mately 1% of rated power; and Phase IV is testing at up to 5% of rated power (Gunther, Tr. 201-11).

5. The Commission in CLI-84-8 said LILCO must apply for and obtain an exemption to the requirement for an "onsite" source of emergency AC power, as set forth in GDC 17. LILCO sought an exemption by filing its Application for Exemption on May 22, 1984.

6. This low-power proceeding has involved 9 days of hearings, and 6 days of conferences with counsel. Transcript pages generated have been 3118, plus pages S-1 through S-333 *in camera* proceedings on security issues.

7. LILCO moved for summary disposition on its proposed Phases I and II on May 22, 1984. We granted summary disposition as to certain statements of material facts on July 24, 1984. On September 5, upon reconsideration, we granted summary disposition as to the ultimate issues by authorizing commencement of Phase I and II activities.

8. Phase I of LILCO's proposed low-power testing program involves placing fuel in the reactor vessel and conducting various tests of reactor and support systems (Gunther, Tr. 162, 164, 201-02).

9. During Phase I, the reactor will not be taken critical. It will remain at essentially ambient temperature and pressure. There will be no decay heat generated, and there will be no fission products in the core. Therefore, core cooling will not be required, and no fission product releases are possible (Rao, *et al.*, Tr. 279, 284).

10. Of the thirty-eight accident or transient events addressed in Chapter 15 of Shoreham's FSAR, eighteen could not occur during Phase I, another six could physically occur, but would not cause phenomena of interest in Chapter 15 safety analysis. The remaining fourteen events could possibly occur, although their occurrence would be highly unlikely. The potential consequences of these events would be trivial from a safety standpoint (Rao, *et al.*, Tr. 279-80).

11. A LOCA would have no consequences during Phase I. In the absence of fission products and decay heat, the fuel cladding would remain unchallenged, even in the event of a complete draindown of the reactor vessel for an unlimited period of time. Since no core cooling is required during Phase I, no AC power is necessary to cool the core (Rao, *et al.*, Tr. 284-85).

12. Phase II of LILCO's proposed low-power testing program involves achieving criticality at 0.0001% to 0.001% of rated thermal power utilizing a specified control rod withdrawal sequence. Criticality is maintained for periods of up to 5 minutes during this Phase (Gunther, Tr. 204-06).

13. Of the thirty-eight transients and accidents addressed in Chapter 15 of Shoreham's FSAR, fifteen cannot occur during Phase II. Of the remaining twenty-three that could occur, twenty are independent of onsite or offsite power. The three events that would be adversely impacted by loss of offsite AC power are: pipe breaks inside the primary containment (LOCA), feedwater system pipe break, and the loss-of-AC-power event. Even the possible Chapter 15 events would have no impact on public health and safety regardless of the availability of TDI diesels (Rao, *et al.*, Tr. 286-96).

14. The fission product inventory in the core during Phase II will be less than 1/100,000 (0.00001) of the fission product inventory assumed in the FSAR (Rao, *et al.*, Tr. 295).

15. A LOCA would be the most serious FSAR event that could happen during Phase II. If a LOCA did occur, there would be time on the order of months available to restore makeup water for core cooling. With power output averaging a fraction of a watt per rod, with no single rod exceeding approximately 2 watts, the fuel cladding temperature would not exceed the limits of 10 C.F.R. § 50.46 even after months without restoring coolant. Thus, there is no need to rely on the TDI diesel generators, or any source of AC power (Rao, *et al.*, Tr. 292-93, 295-96).

16. During Phase II no reliance on the diesel generators is necessary for mitigation of either the loss-of-AC-power event or the feedwater-system-piping-break event. During these events, no loss of coolant occurs and the decay heat is minimal. Core cooling can be achieved for unlimited periods of time without AC power using the existing core water inventory and heat losses to ambient (Rao, *et al.*, Tr. 293-94).

17. The LOCA and the feedwater-system-piping-break events postulate double-ended ruptures of a piping system. With the essentially ambient temperature and atmospheric pressure during Phase II, it is extremely unlikely that such a pipe break would ever occur. The NRC Staff does not require double-ended ruptures to be postulated for low-temperature and low-pressure systems in safety analyses (Rao, *et al.*, Tr. 294).

18. Even if AC power were not available for extended periods of time, fuel design limits and design conditions of the reactor coolant pressure boundary would not be approached or exceeded as a result of anticipated operational occurrences, and the core would be adequately cooled in the event of a postulated accident (Rao, *et al.*, Tr. 295-96).

19. None of the events analyzed in Chapter 15 could result in a release of radioactivity during Phase II that would endanger the public health and safety (Rao, *et al.*, Tr. 295).

20. If no AC power is needed, a change in or the absence of emergency power sources has no effect on the safety of operation (Hodges, Tr. 1792; Rao, *et al.*, Tr. 293).

21. A Final Security Settlement Agreement was signed by LILCO, Suffolk County and the NRC Staff in November 1982. The site security plan is geared toward function, setting forth security principles, procedures and goals, rather than item-by-item specifics. It is readily adaptable to minor changes in plant configuration, such as the addition of the four EMDs and the 20-MW gas turbine.

22. Placement of additional equipment outside of and a reasonable distance from the Shoreham plant's vital areas, does not impair or impact upon established security procedures for protection of the vital areas.

23. Because the degree of potential danger to public health and safety at low-power operations is substantially less than at full power (Rao, *et al.*, Tr. 278), the need for security of emergency AC power systems during low-power operation is diminished. In the posture of a request for exemption from certain regulations for purpose of low-power testing, emergency AC power sources need not be protected as "vital" equipment.

24. LILCO's security arrangements provide reasonable assurance that its emergency power enhancements will be protected during the occurrence of a security-related event.

25. The NRC Staff believes that LILCO's voluntary commitment (as described by letter dated October 2, 1984) to implement "certain identified enhancements" to the physical security arrangements for the EMD diesels, operates to "adequately resolve the security concerns" that had led the Staff to suggest (by letter of September 11, 1984) that LILCO's emergency backup power equipment should be treated as "vital."

26. The main purpose of backup emergency power systems in the context of LILCO's proposed low-power testing program is to assure that cooling water can be provided in order to avoid uncovering of the core.

27. In comparing two roughly equivalent emergency AC power systems, neither is required to be better than the other in every respect in order to be found adequate for the purposes of protecting public health and safety.

28. NRC regulations do not require a licensee to be able to restore emergency power within any specified time. The time limit is determined by analysis of a variety of accident scenarios, based upon the functional determination of how much time is available to effect emergency core

cooling before damage results. So long as there is enough time to cool the core, any "margin of safety" in the form of some shorter time is irrelevant.

29. If a loss of offsite power were to happen concurrently with a LOCA, LILCO would have at least 55 minutes to restore emergency power in order to replace cooling water before core damages would occur (Hodges, Tr. 1786-88). Emergency power could be restored in order to run cooling pumps and other emergency equipment within 55 minutes of a loss of power (Knox, Tr. 2357; Staff Ex. 2 (SSER 6, at 8-9)).

30. Section 50.46(b) of 10 C.F.R. sets forth five specified limits within which an operating reactor must remain during postulated accidents and transients with regard to: fuel cladding temperature, oxidation of fuel cladding, hydrogen generation, coolable core geometry, and long-term decay heat removal. In the specific case of the limiting LOCA at 5% power, the peak cladding temperature limit (2200°F) would be reached prior to any other limit of § 50.46(b) (Hodges, Tr. 1795). In the event of a LOCA with no makeup at all, there are at least 55 minutes before the cladding temperature would exceed 2200°F (Hodges, Tr. 1786). Emergency power could be restored within that time (Finding No. 29). Thus, the plant during low-power operation meets the requirements of § 50.46(b), and is deemed safe regardless of the margin by which it meets or exceeds those requirements.

31. During Phase III, the temperature and pressure of the system are increased to intended operating conditions. This permits testing related to such items as thermal expansion of piping, verification of source range monitor calibration and response, establishment of overlap data between source range and intermediate range monitors, determination of scram time data for reactor control rods, as well as testing of approximately fifty-four plant systems and support systems and their integration into the total plant (Gunther, Tr. 220-27).

32. Operations and testing related to Phases III and IV are clearly separable in that some testing can be performed initially at one or the other power level. However, the consequences of misadventures are less at 1% than at 5% rated power and the time within which to respond is greater. At 1% power, assuming a LOCA and using conservative models and assumptions, power must be restored within 370 minutes, while at 5% power the corresponding time is 86 minutes (Rao, *et al.*, Tr. 251-52, 296, *et seq.*).

33. For a non-LOCA accident at 5% power, if either the Reactor Core Isolation Cooling (RCIC) or the High Pressure Coolant Injection (HPCI) system acts to restore water to the reactor core, a peak cladding

temperature of 2200°F would never be reached. These two systems depend on DC power sources and are completely independent of AC power (Hodges, Tr. 1785; SSER 6, at 15-6 and 15-7; Rao, *et al.*, Tr. 310-11).

34. Operation at low power (up to and including 5% rated power) results in reduced fission product inventory, increased time to take corrective or mitigative action, and reduction in required capacity of mitigative systems (Hodges, Tr. 1789-92; Rao, *et al.*, Tr. 298-301; Staff Ex. 2 following Tr. 721, at 15-4, 15-5).

35. For an accident other than a LOCA during Phases III or IV, water in the reactor vessel would boil off very slowly and the level would drop to the top of the fuel after an extended time, if no system acts to replace coolant. If either the RCIC or the HPCI system acts once during the first 4 days following an accident, heat losses to the environment, through the vessel walls to the containment, would equal the decay heat and the fuel would never be uncovered. The reactor vessel would depressurize slowly and the temperature of fuel and cladding would remain near the saturation temperature of the water (Hodges, Tr. 1785; Rao, *et al.*, Tr. 308-13).

36. Using the conservatisms of the approved evaluation model of Appendix K to 10 C.F.R. Part 50 and no makeup coolant from any source, calculations indicate that the core could be without cooling for 55 minutes before the peak cladding temperature would exceed 2200°F. Using "best estimate" models, this time would be more than 3 hours (Hodges, Tr. 1786; Rao, *et al.*, Tr. 298, 302-08).

37. Exceeding the 2200°F limit does not result in fuel or cladding damage. This value of the temperature is chosen conservatively in order to assure that the cladding would retain some ductility following reflooding of the core (Hodges, Tr. 1786-87).

38. Since oxidation is dependent on both time and temperature, it is possible that exceeding 2200°F could result in exceeding the oxidation limit. On the basis of very conservative analysis, the maximum local oxidation was calculated to be 6.5% (Hodges, Tr. 1787-88).

39. The peak cladding temperature following a LOCA with qualified TDI diesels was calculated to be 550°F and local oxidation 0.033%. If it is assumed that the 20-MW gas turbine fails to start and the EMD diesels are started within 30 minutes, the calculated peak cladding temperature would be 1086°F and local oxidation 0.034% (Hodges, Tr. 1788).

40. For operation up to 5% power, the fission product inventory will not exceed 5% of the equilibrium value given in the FSAR (Hodges, Tr. 1790).

41. The standby gas treatment system (SGTS) is not needed at 5% power (Quay, Tr. 1745, 1797).

42. In case of a LOCA at 5%, cladding integrity is maintained and thus no fission products are released if AC power is restored, from any source, within 55 minutes.

43. Without the Shoreham generating station, LILCO has a total generating capacity of 3721 MW, consisting of 2240 MW of baseload and 432 MW of midrange and peaking oil-fired steam turbine units, and 1049 MW from gas turbines and diesel generators (Schiffmacher, Tr. 4487-88).

44. LILCO has four major steam generating stations. Each station is equipped with at least one backup blackstart gas turbine (Schiffmacher, Tr. 486-508).

45. There are ten 50-MW gas turbines at Holtsville, about 15 miles southwest of Shoreham. Five are deadline blackstart. Any one of these gas turbines would be sufficient for Shoreham's emergency needs at low power. Actual tests under simulated conditions have shown that power can be restored to Shoreham from Holtsville in 6 minutes (Schiffmacher, Tr. 446-47, 488-89, 506-08).

46. Port Jefferson is a 380-MW generating station located about 11 miles west of Shoreham. It has a 16-MW gas turbine which starts in about 5 minutes. Switching operations necessary to get the power to Shoreham could take 25 minutes (Schiffmacher, Tr. 500-01).

47. In addition to its own generating capacity, the LILCO grid has three ties to the New York Power Pool and one to the New England Power Exchange. These interconnections provide, through both their normal and reserve capacities, the ability to respond rapidly to changing system conditions in order to provide reliable sources of power (Schiffmacher, Tr. 520-24).

48. LILCO's entire grid has not been lost since the 1965 Blackout. In 1979, it lost the portion of its grid east of the Holbrook Station due to vandalism, but power was restored completely in just over an hour. Since then, LILCO has implemented procedures whereby power could be restored in minutes by utilizing various blackstart gas turbines (Schiffmacher, Tr. 519-22).

49. A 14-MW gas turbine with deadline blackstart capability is located at Southold, about 27 miles east of Shoreham. Power could be restored to Shoreham within 10 minutes via 69-kV lines to Riverhead, thence via either 69- or 138-kV lines to Shoreham (Schiffmacher, Tr. 502-06).

50. The system operator has procedures requiring that power be restored to Shoreham on a priority basis. This requirement should enhance

the already very reliable system, to the benefit of Shoreham (Schiffmacher, Tr. 504-05).

51. A 20-MW gas turbine with deadline blackstart capability is located at East Hampton, about 35 miles from Shoreham. Power from it could be routed to Shoreham in about 15 minutes via 69-kV lines to Riverhead and then via either 69- or 138-kV lines to Shoreham. The transmission system from East Hampton to Riverhead is independent of the transmission system from Southold to Riverhead (Schiffmacher, Tr. 502-03).

52. Power from Holtsville can be routed to Shoreham over various transmission paths leading ultimately to any of the four 138-kV lines or the three 69-kV lines into the plant (Schiffmacher, Tr. 488-89, 508).

53. Three 69-kV circuits enter the Wildwood Substation, about one mile south of Shoreham, over two separate rights-of-way. From the substation, a single 69-kV circuit enters the 69-kV switchyard and has been placed underground in the vicinity of the 138-kV line from the 138-kV switchyard to the normal station service transformer in order to provide additional independence between circuits. The 69-kV line serves the reserve station service transformer (RSST) (Schiffmacher, Tr. 445-46, 517-18).

54. The Shoreham plant is connected to the LILCO system through seven 138-kV and 69-kV circuits. Four separate 138-kV transmission lines serve the 138-kV Shoreham switchyard, approximately 1300 feet south of the plant. The four circuits enter the 138-kV switchyard on two separate and independent rights-of-way, each containing two of the four 138-kV circuits. The 138-kV switchyard is arranged in a two-bus configuration with circuit breakers and switches arranged to permit isolation and/or repair of either bus section. This permits continuation of 138-kV power supplied from separate rights-of-way even in the event a bus section is out of service (Schiffmacher, Tr. 515-19).

55. A bypass 69-kV circuit, around the 69-kV switchyard and its associated cable, runs directly from the 69-kV overhead line from Wildwood to the RSST. This line makes it possible to restore power to the RSST without having to repair the underground cable or route power through the 69-kV switchyard (Schiffmacher, Tr. 371-74, 517).

56. Offsite power circuits enter the plant along two different corridors, with no common points between the corridors and no crossing or meeting. They do not pass through a common switchyard (Knox, Tomlinson, Tr. 2353-54).

57. The multiplicity of transmission lines into the Shoreham site and the use of two separate and independent switchyards decrease the

possibility of common failures and increase the reliability of maintaining normal offsite power.

58. Neither tornadoes nor earthquakes have had serious impact on LILCO's transmission system in the past 20 years. Ice storms and lightning have affected, at most, small segments of line (Schiffmacher, Tr. 511, 513).

59. The transmission system has suffered outages on individual lines but no major outage as a result of high winds or hurricanes in the last 10 years. The transmission system is designed to withstand winds in the range of 100 to 130 miles per hour, which exceeds the requirements of the National Electrical Safety Code (Schiffmacher, Tr. 513-14).

60. LILCO designs, constructs, and maintains its own transmission system, and therefore has the capability to restore any facilities that may become inoperative for any reason. LILCO can restore a mile of 69-kV line within 24 hours (Schiffmacher, Tr. 509-14).

61. LILCO has committed to initiate steps promptly to place the plant in a cold shutdown condition in the event of any of the following during Phases II, III and IV of the low-power testing program, thus further minimizing the probability that a loss of the normal offsite transmission system will occur and adversely affect operation of the plant from a safety standpoint:

- (a) a "hurricane warning" for the Shoreham area issued by the National Weather Service;
- (b) a "tornado watch" or a "severe thunderstorm watch" for the Shoreham area issued by the National Weather Service;
- (c) a "winter storm watch" for the Shoreham area issued by the National Weather Service, including ice storms;
- (d) a coastal flood warning for the Shoreham area issued by the National Weather Service predicting that a high tide greater than 5 feet above normal high water will occur within 24 hours;
- (e) an indication of seismic activity of 0.01g on the Shoreham seismic monitors;
- (f) the outage of two of the four LILCO interconnections to the New York Power Pool and the New England Power Exchange (except short outages of less than 8 hours of a second intertie required for inspection, testing, or minor maintenance where the intertie could be restored to service if needed); and
- (g) a low electrical frequency condition on the LILCO transmission system which reaches the alarm set point (Museler Tr. 558, 561-62, 574).

62. A cold shutdown condition can typically be reached in 6 hours from 5% power (Museler, Tr. 562; Gunther, Tr. 412-13; Gunther, ff.

Tr. 1214, at 17). The procedures direct immediate commencement of a controlled reactor shutdown upon notification from the system operator that any of the foregoing weather conditions is predicted (Gunther, ff. Tr. 1214, at 16). Upon notification, the operator is expected to begin insertion of control rods taking the reactor subcritical within 15 minutes. The operator is not precluded from initiating a more rapid shutdown if he feels an unsafe condition exists (Gunther, Tr. 414-15, 471-72).

63. LILCO's two "offsite power enhancements" are one deadline blackstart 20-MW gas turbine and a group of four deadline blackstart 2.5-MW EMD diesels, which supply a total of 10 MW. Both are located on the Shoreham plant site: the turbine in the 69-kV switchyard, approximately 300 feet south of the reactor building, and the EMDs near the southwest corner of the reactor building (Schiffmacher, Tr. 322, 494; Knox and Tomlinson, Tr. 2342).

64. The gas turbine is started using a starting motor which operates on compressed air. The compressed air is supplied from a receiver in which sufficient pressure is automatically maintained by a compressor (Tomlinson, Tr. 2346).

65. Each of the four EMD diesels has two starting motors, powered by a 112-volt, 420 AH lead acid battery (Tomlinson, Tr. 2347).

66. Power from the gas turbine could be established and operating cooling equipment within 10 minutes; from the EMDs, power could be established in 30 minutes (Knox, Tr. 2351-52).

67. Starting reliability of a gas turbine virtually identical to the one at Shoreham is 97.6% (Knox, Tomlinson, Tr. 2346; Schiffmacher, Tr. 497). Starting reliability of the EMD diesels is 98.6% (Tomlinson, Tr. 1863, 1882-84; Schiffmacher, Tr. 463), with reliability approaching 100% that at least one diesel would start (Tomlinson, Tr. 1863). Typical onsite nuclear power system diesel generators exhibit 92-99% reliability (Staff Ex. 2, SSER 6, ff. Tr. 721, at 8-9).

68. The EMD diesels have only a single electric output cable from the EMD control cubicle, a single starter system, a single fuel supply system, and a common location of breakers (Eley, *et al.*, Tr. 2581-91).

69. The EMD diesels contain no fire detection equipment and no fixed, remotely operated fire extinguishing system, and it is unlikely that if one diesel were on fire the other could be kept running (Eley, *et al.*, Tr. 2591-95).

70. The EMD diesels are sufficiently reliable in view of their function as backup for all the other available power sources, as the failure of all other sources of AC power must be assumed before the EMDs would be called upon for emergency power.

71. The EMDs are physically located far enough from the 20-MW gas turbine so that a fire in the EMDs would not incapacitate the turbine (Eley, Tr. 2493).

72. The shutdown of the EMDs would have no effect on the gas turbine (Smith, Tr. 2500).

73. Although the gas turbine and the EMDs are deadline black-start, manual operations are necessary to transfer their power output to the emergency buses. Demonstration showed that power could be restored to plant systems from the gas turbine in 4 minutes and from the EMDs in 9 minutes (Clifford, Tr. 1852).

74. LILCO will implement the following additional test procedures:

- (a) demonstrate on a biweekly basis through an actual test that the Holtsville blackstart gas turbines can supply power to Shoreham in less than 15 minutes;
- (b) demonstrate on a biweekly basis through an actual test that the 20-MW gas turbine at Shoreham can be manually started, synchronized and loaded to at least 13 MW on the grid;
- (c) demonstrate on a monthly basis that the 20-MW gas turbine at Shoreham will start automatically on a loss of grid voltage signal;
- (d) demonstrate on a biweekly basis that the East Hampton and Southold gas turbines can be manually started, synchronized, and loaded to at least 50% capacity of the grid; and
- (e) demonstrate on a biweekly basis that at least three of the four GM EMD diesel generators on site can be manually started and can supply power to plant systems (Museler, Tr. 577).

75. The EMD diesels have been adequately maintained and their maintenance and repair will be adequate to assure reliable operation in the foreseeable future (Iannuzzi and Lewis, Tr. 1175-76, 1201-11).

76. The reliability and availability of Shoreham's EMDs while in service at New England Power Company have been high (Iannuzzi and Lewis, Tr. 1178-79).

77. LILCO's performance of a test of the turbine to full capacity prior to Phase III and performance, on a monthly basis, of a test to demonstrate that loads normally connected to certain buses used by the turbine are automatically disconnected and that the gas turbine may be automatically connected to the 69-kV bus within 2 to 3 minutes (Staff Ex. 2, SSER 6, ff. Tr. 721, at 8-2, 8-3), will adequately address significant concerns regarding test procedures for the gas turbine (Minor and Bridenbaugh, Tr. 2580, 2614-15).

78. A test which will load each EMD diesel to its design load requirements for 1 hour and verify that voltage and frequency are main-

tained within required limits, will be performed prior to commencement of Phase III. Additional tests, to demonstrate that the EMDs can be manually reconnected to their loads following disconnection, performed on a biweekly basis (Staff Ex. 2, SSER 6, ff. Tr. 721, at 8-4), will adequately resolve concerns regarding the EMDs (Eley, *et al.*, Tr. 2579, 2597-2600).

79. The gas turbine and the EMDs are considered a system (Smith, Tr. 2482) whose two parts (turbine, EMDs) are adequately independent of one another for compliance with the single failure criterion (Staff Ex. 2, SSER 6, ff. Tr. 721, at 8-5, 8-6).

80. The cables carrying power from the gas turbine and the EMD diesels both go through the block walls in the nonemergency switchgear room (Knox, Tr. 1886). Sufficient independence exists because these two cables enter the nonemergency switchgear room separated by a distance of about 40 feet along the wall (Staff Ex. 2, SSER 6, ff. Tr. 721, at 8-6) and because the EMDs will have an additional, independent line allowing their output to be routed into the emergency switchgear room (Schiffmacher, Tr. 842, 863; Knox and Tomlinson, Tr. 1890).

81. If Shoreham were to lose power from LILCO's normal power grids, the power enhancements' deadstart feature will cause them to sense that there is no power on the grid and start up automatically (Schiffmacher, Tr. 333). Both the turbine and the diesels will start simultaneously. If power is available from the gas turbine the operator will open and close breakers from the control room to supply the safety loads through a transformer in the 69-kV switchyard to the switchyard bus and then to the safety-related switchgear. If power from the gas turbine is unavailable, power from the EMDs is routed through the non-emergency switchgear room to the safety-related switchgear room (Knox, Tr. 2349-51).

82. The gas turbine or one EMD diesel, acting alone, is capable of providing sufficient AC power for cooling the core at low power (Knox, Tr. 2352; Schiffmacher, Tr. 1868).

83. The 20-MW gas turbine and the four GM EMD diesels have significant seismic capabilities and are likely to be available following a seismic event (Staff Ex. 2, SSER 6, ff. Tr. 721, at 8-7 to 8-8).

84. The manufacturer of the 20-MW gas turbine has provided assurance that the machine would remain structurally sound during a design basis seismic event at Shoreham (Staff Ex. 2, SSER 6, ff. Tr. 721, at 8-7; *see also* Meyer, Tr. 2787).

85. Sargent & Lundy performed a study of the seismic capabilities of the four GM EMD diesels at Shoreham (Christian, *et al.*, Tr. 972-73). Sargent & Lundy had previously performed seismic qualifications for

more than twelve GM EMD diesels that are similar to the diesel generator sets installed at Shoreham (Meligi, Tr. 968).

86. Seismic capabilities of the diesel engine were evaluated using a combination of analyses and test results. Shock tests performed by the U.S. Navy on EMD engines similar to those at Shoreham confirmed that the engine block and internals could withstand loads in excess of the Shoreham SSE. In addition, supplemental analysis was performed to address external components attached to the engine. This combination of testing and analysis demonstrated that the engine assembly and all of its integral components would be able to function properly following an SSE-level earthquake at Shoreham (Meligi, Tr. 981-84). The EMD diesels which were used for the testing and analysis were comparable to the EMD diesels at Shoreham (Meligi, Tr. 956-57).

87. Accessory components are those items that are not an integral part of the engine assembly. These components were analyzed using bounding calculations which demonstrated that stresses and deflections of the components were within allowable limits. With some exceptions, all accessory items were found to be suitable to withstand an SSE-level earthquake and remain operable following the event. For the exceptions noted, Sargent & Lundy made recommendations for modifications which will result in those components being able to withstand the SSE (Meligi, Tr. 980-81).

88. LILCO has accepted the recommendations of Sargent & Lundy. The recommendations either have been completed or will be after an exemption is granted. Upon completion of recommendations made by Sargent & Lundy, the four EMD diesel generators at Shoreham will be capable of surviving an SSE-level earthquake and remaining operable following the event (Meligi, Tr. 986).

89. Electrical equipment was also analyzed as part of the Sargent & Lundy study of the seismic capabilities of the EMD diesels. First, a detailed, finite-element analysis was performed on the worst-case electrical panel to demonstrate the structural integrity of the panels (Meligi, Tr. 984). Second, the operability of electrical equipment was confirmed by determining that the elevated response spectra for Shoreham were bounded by the response spectra used by Sargent & Lundy in qualifying other EMD diesels. By confirming that certain electrical devices installed on Shoreham were similar to devices previously analyzed by Sargent & Lundy, it was possible to conclude that these devices would withstand the SSE. For electrical equipment that could not be analyzed using this technique, Sargent & Lundy used methods set out in NUREG/CR-2405, "Subsystem Fragility" February 1982. Additionally, a detailed check was performed of the mounting bolts on many of the instruments.

The overall results of the analysis demonstrated that electrical components and devices on the Shoreham EMD diesels will withstand the SSE (Meligi, Tr. 984-85).

90. In addition to the Sargent & Lundy study, Stone & Webster performed analyses of any aspect of the seismic capabilities of the machines not covered by Sargent & Lundy's study that would affect their ability to operate under seismic conditions (Christian, Wiesel, Tr. 988). The scope of the Stone & Webster work coupled with the Sargent & Lundy work was adequate to determine the overall seismic capabilities of the machines (Wiesel, Tr. 958).

91. A static sliding and overturning analysis was performed on the EMD diesel mounting. Earthquake-induced sliding forces were compared to the support system's capability to resist those sliding forces with friction. This analysis showed that sliding of the EMD diesels will not occur during an SSE. A similar analysis was done for overturning forces and demonstrated that the EMD diesels would not overturn in the event of an SSE (Wiesel, Tr. 941, 989-91).

92. Analysis also demonstrated that the wooden beam support structure for the diesel engines would not slide either (1) at the contact between the wooden beams and the gravel or (2) at a failure surface passing below this contact point through the gravel and soil (Christian, Tr. 992-93). Suffolk County's witnesses agreed that Stone & Webster had correctly concluded that the EMD diesels would not slide or overturn (Meyer, Tr. 2793-94).

93. Similar analyses demonstrated that the switchgear cubicle for the EMD diesels could resist sliding or overturning for a ground input of up to 0.13g (Wiesel, Tr. 991).

94. Stone & Webster evaluated the EMD diesel fuel oil line installation and recommended it be buried to improve its ability to withstand a seismic event (Wiesel, Tr. 991-92). Buried, it will have adequate seismic resistance (Christian, Wiesel, Tr. 998).

95. Stone & Webster also performed an assessment of the potential for soil liquefaction in the vicinity of the EMD diesel generators. Soils in that vicinity can withstand up to 0.13g, which exceeds the operating basis earthquake of 0.1g, without liquefaction. This does not mean that liquefaction will occur above 0.13g; it only means that it cannot be predicted with confidence that liquefaction will not occur (Christian, Tr. 993-95).

96. The ability of the GM EMD diesels and switchgear to withstand, at a minimum, an earthquake of 0.13g is significant because that level of earthquake exceeds the operating basis earthquake for Shoreham of 0.1g (Christian, Tr. 995). Moreover, although Shoreham uses a safe

shutdown earthquake of 0.2g, the procedures currently used for determining design basis earthquakes for nuclear power plants set out in 10 C.F.R. Part 100, Appendix A, would only require an SSE of 0.13g. In other words, if the NRC's existing standard procedures for relating earthquake intensities to peak ground acceleration had been applied to Shoreham, which they were not, Shoreham would have an SSE of 0.13g (Christian, Tr. 995).

97. The capability will exist to connect the EMD switchgear directly to Emergency Switchgear Room 102, through a cable routing independent of, and bypassing, the normal feed and normal switchgear room. Power can then be provided to the other Emergency Switchgear rooms from Room 102. This will provide added assurance of AC power availability in the event the normal switchgear room is unavailable. Installed raceway for the alternate feed will either be supported to withstand a seismic event, or installed after a seismic event. Conceptual design has been completed and feasibility has been verified. Final engineering and construction of pre-installed portions will be done if a low-power license exemption is granted, prior to commencing the Phase III testing program (Gunther, Schiffmacher, Tr. 813-15; Schiffmacher, Tr. 818-20, 832-37, 842, 863-65; Gunther, Tr. 832, 862-63; Knox, Tomlinson, Tr. 1890).

98. LILCO has committed to completing selected portions of this alternate tie-in prior to commencement of Phase III of the low-power testing program. Other elements of the modification will be installed after a seismic event if this tie-in is needed (Schiffmacher, Tr. 865).

99. LILCO has not qualified the EMD diesels for a seismic event (Schiffmacher, Tr. 349). The proposed TDI diesels are fully qualified (Minor, Tr. 2800).

100. If an SSE knocked out the 138-kV and 69-kV systems, there would still be three independent 3.5-MW seismically qualified systems available. Under the same conditions, for the enhanced system there would remain only the EMD diesels (Meyer, Rousset, Minor, Tr. 2801-02).

101. The EMD diesels, not being seismically qualified, also might not be able to survive an SSE due to potential for failure of the fuel line or the concrete block walls of the nonemergency switchgear room or from soil liquefaction (Meyer, Rousset, Minor, Tr. 2802).

102. It is not necessary to assume the simultaneous occurrence of a LOCA and a seismic event. The piping systems are designed to withstand seismic loads in combination with other loads. Therefore, seismic loads will not cause a piping failure causing a LOCA. Thus, a LOCA and an earthquake are independent events. As both an earthquake and a

LOCA are low-probability events, their combination is an extremely-low-probability event (Hodges, Tr. 1763, 1794).

103. LILCO's evidence showed that it can restore a mile of the 69-kV transmission line in 24 hours (Tr. 510, Schiffmacher).

104. The RCIC system is seismically qualified. Modifications are being made to the HPCI to ensure that all portions of it are also qualified. Both systems are steam-driven and utilize DC power supplies which will last at least 24 hours. There is on site a portable generator that can be used to maintain the DC power well beyond the 24 hours (Rao, *et al.*, Tr. 309-11; Hodges, Tr. 1766-67; Staff Ex. 2 (SSER 6), ff. Tr. 721, at 15-7).

105. The Shoreham nuclear plant is physically completed and is being maintained in a condition that would allow fuel loading within 2 to 3 weeks of the grant of a low-power license. The major requirement prior to fuel loading is the installation of neutron sources into the reactor vessel. These sources will be shipped upon receipt of a license and will be installed within 2 to 3 weeks, and final pre-fuel load testing will be completed during that period so that fuel loading activities may commence (Gunther, Tr. 866).

106. LILCO's exemption request is a short-term interim measure to allow fuel loading and low-power testing prior to completion of the litigation concerning the reliability of the TransAmerica Delaval, Inc. (TDI) diesel generators. Shoreham will be provided with fully qualified diesels prior to full-power operation (McCaffrey, Tr. 1704-05).

107. Prior to the crankshaft failure on one of the TDI diesel generators in August 1983, LILCO included in Shoreham's design three emergency diesel generators intended to meet all applicable regulatory requirements for onsite power sources. LILCO purchased three diesel generators from TransAmerica Delaval, Inc. (TDI), requiring that these machines be manufactured in accordance with approved specifications (McCaffrey, Tr. 1705). To ensure that TDI produced a machine that met the performance rating required in the FSAR and specifications, LILCO provided a specification which called for certain performance standards and assured through a preoperational test program that the machines were capable of running at the performance rating (McCaffrey, Tr. 1440-41, 1467-68). LILCO utilized its own and its architect-engineer's quality assurance program to oversee TDI's quality assurance programs (McCaffrey, Tr. 1459-60, 1468-69).

108. The preoperational test program identified problems needing correction. LILCO responded by correcting individual problems and by initiating a Diesel Generator Operational Review Program in March

1983 to review problems and make recommendations to improve reliability of the TDI diesel generators (McCaffrey, Tr. 1706-08, 1492-93).

109. Within a few days of the failure of the crankshaft of diesel generator 102 in August 1983, LILCO engaged the services of Failure Analysis Associates (FAA) to conduct a comprehensive investigation into the cause of the failure (McCaffrey, Tr. 1708, 1470-71). That effort included:

- (a) inspection of the crankshafts on DG 101 and 103 for indications of similar problems;
- (b) complete metallurgical analysis of the failed crankshaft;
- (c) strain gauge and torsigraph testing of one of the remaining original crankshafts to determine actual stresses on the shaft;
- (d) complete disassembly and inspection of all three diesel engines to replace the original crankshafts with crankshafts of an improved design and to assess any damage to the engines as a result of the crankshaft problem; and
- (e) design analysis using finite element modeling/model superposition analysis to ascertain dynamic torsional response of the original crankshafts.

(McCaffrey, Tr. 1708-09.)

110. At a November 1983 meeting with the NRC Staff, LILCO further undertook a comprehensive diesel generator recovery program consisting of four phases:

- (a) disassembly, inspection, repair and reassembly of each diesel;
- (b) failure analysis of defective components;
- (c) design review and quality revalidation (DRQR) program; and
- (d) expanded qualification testing.

(McCaffrey, Tr. 1531, 1709-10.)

111. The DRQR program is a detailed review of the design and quality of the TDI diesel engines including an assessment of the design of important components in the diesels which verifies important quality attributes for the requisite engine components. It has involved over 120 people from LILCO, Stone & Webster, Failure Analysis Associates, Impell and other consultants (McCaffrey, Tr. 1710).

112. LILCO has also undertaken to procure and install at Shoreham three diesel generators manufactured by Colt Industries. These machines are of the type in use at other nuclear power plants and are designed to satisfy the requirements of GDC 17. Stone & Webster has been retained to design a new building for the Colt diesels, to design support systems

and to analyze how to integrate the system into the existing plant (McCaffrey, Tr. 1712-13). The procurement of and engineering for the Colt diesels were pursued on an expedited basis. Construction of site facilities for the Colt diesel generators started in November 1983, after the August 1983 failure of the crankshaft in diesel generator 103. All three Colts have now been manufactured and delivered to Shoreham. Engineering work for the installation of the Colts is essentially complete and construction work is well under way, and construction and testing are scheduled for completion in May 1985 (McCaffrey, Tr. 1713-14).

VI. CONCLUSIONS OF LAW

Based upon the entire evidentiary record in this proceeding and upon the opinion and findings of fact set forth above, the Board makes the following conclusions of law:

1. The evidence establishes that no fission products will be released from the fuel if AC power is restored to the plant within 55 minutes in the event of a LOCA, and that there is adequate assurance that in the event of a simultaneous LOCA and loss of offsite AC power, power would be restored from either the gas turbine or the EMDs within 55 minutes. Thus, the Board finds that the alternate AC sources proposed for use at Shoreham at 5% power provide a level of protection comparable with a fully qualified onsite source of emergency AC power. The Board therefore concludes that reliance by LILCO on the proposed alternate sources meets the "as safe as" standards set forth by the Commission in CLI-84-8 (19 NRC 1154).

2. In view of the Board's conclusion that the Commission's "as safe as" test is met, the Board finds that the proposed exemption for low-power testing would not endanger life or property, within the meaning of 10 C.F.R. § 50.12(a).

3. The terms "common defense and security" as used in 10 C.F.R. § 50.12(a), mean the common defense and security of the United States (10 C.F.R. § 50.2(i); § 11g of the Atomic Energy Act, 42 U.S.C. § 2014(g)). The Commission has held that the terms refer principally to "the safeguarding of special nuclear material; the absence of foreign control over the applicant; the protection of Restricted Data; and the availability of special nuclear material for defense needs" (*Florida Power & Light Co. (Turkey Point Nuclear Generating Station, Units 3 and 4)*, 4 AEC 9, 12 (1967)). The United States Court of Appeals for the District of Columbia Circuit further stated that

the internal evidence of the [Atomic Energy] Act is that Congress was thinking of such things as not allowing the new industrial needs for nuclear materials to preempt the requirements of the military; of keeping such materials in private hands secure against loss or diversion; and of denying such materials and classified information to persons whose loyalties were not to the United States

(*Siegel v. AEC*, 400 F.2d 778, 784 (D.C. Cir. 1968)). The Board concludes that LILCO's exemption request has no impact upon and will not endanger the common defense or security of the United States.

4. After taking into account and balancing the equities identified by the Commission in footnote 3 of CLI-84-8 (19 NRC 1154, 1156 n.3), the Board finds that there are exceptional circumstances that warrant the granting of an exemption under the provisions of 10 C.F.R. § 50.12(a).

5. Based upon a balancing of the equities identified in CLI-84-8, 19 NRC 1156 n.3, *supra*, the Board finds that the Application for Exemption filed by LILCO and the evidence adduced in support thereof demonstrate the "exigent circumstances" that favor the granting of an exemption and show that, in spite of its noncompliance with GDC 17, the health and safety of the public would be protected (CLI-84-8, 19 NRC at 1155).

6. Based upon a finding that the Application for Exemption meets the "exigent circumstances" test set forth by the Commission, the Board concludes that the Application meets the "otherwise in the public interest" provision of 10 C.F.R. § 50.12(a).

7. The Board thus resolves all issues involved in the hearing on this proceeding in favor of authorizing the exemption requested by LILCO.

VII. ORDER

The Director of Nuclear Reactor Regulation is authorized, upon making the findings on all applicable matters specified in 10 C.F.R. § 50.57(a), to issue to the Applicant, Long Island Lighting Company, a license or licenses to authorize low-power testing (up to 5% of rated power) of the Shoreham Nuclear Power Station, Unit 1.

The Commission provided in its Order of May 16, 1984, that "[a]ny initial decision authorizing the grant of an exemption shall not become effective until the Commission has conducted an immediate effectiveness review" (CLI-84-8, *supra*, 19 NRC at 1156). Accordingly, this Initial Decision is transmitted directly to the Commission for its immediate effectiveness review.

The Appeal Board has held in the instant proceeding that in none of the orders entered by the Commission did it "announce that it was

removing us entirely from the appellate review chain" (ALAB-787, 20 NRC 1097, 1100). The Appeal Board further stated at page 1100:

But, as noted above, all that the Commission "reserved" in CLI-84-8 was its conduct of an immediate effectiveness review of any section 50.12(a) exemption that the Licensing Board might grant to the applicant. It is clear from the terms of 10 C.F.R. 2.764(g) that Commission immediate effectiveness reviews have no bearing upon the exercise by an appeal board of the general appellate review authority in 10 C.F.R. Part 50 proceedings that is conferred by 10 C.F.R. 2.785(a). Rather, if the Commission desires to preclude or to limit the exercise of that authority in a particular Part 50 proceeding, it must — and does — say so expressly.

Any party may take an appeal from this Initial Decision by filing a Notice of Appeal within ten (10) days after service of this decision. Each appellant must file a brief supporting its position on appeal within thirty (30) days after filing its Notice of Appeal (forty (40) days if the Staff is the appellant). Within thirty (30) days after the period has expired for the filing and service of the briefs of all appellants (forty (40) days in the case of the Staff), a party who is not an appellant may file a brief in support of, or in opposition to, any such appeal(s). A responding party shall file a single, responsive brief *only*, regardless of the number of appellants' briefs filed. [See, in particular, 10 C.F.R. § 2.762, as amended effective December 19, 1983, 48 Fed. Reg. 52,282, 52,283 (Nov. 17, 1984).]

THE ATOMIC SAFETY AND
LICENSING BOARD

Glenn O. Bright, Member
ADMINISTRATIVE JUDGE

Elizabeth B. Johnson, Member
ADMINISTRATIVE JUDGE

Marshall E. Miller, Chairman
ADMINISTRATIVE JUDGE

Dated at Bethesda, Maryland,
this 29th day of October 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Bloch, Chairman
Dr. Kenneth A. McCollom
Dr. Walter H. Jordan

In the Matter of

Docket Nos. 50-445
50-446
(Application for
Operating License)

TEXAS UTILITIES ELECTRIC
COMPANY, *et al.*
(Comanche Peak Steam Electric
Station, Units 1 and 2)

October 29, 1984

In this Memorandum, the Licensing Board requests information on certain welding issues.

MEMORANDUM
(In-Process Weld Repair Hold Point)

Applicants' Response to Board Request for Additional Information Regarding Weave Welding, October 25, 1984, refuses to respond to the Board question in full and exposes Applicants to a possible adverse finding unless this lack of responsiveness is promptly remedied by Applicants or is adequately addressed by Staff.

In this filing, at page 5, Applicants state that

when a *final* weld is found to be defective due to excessive weave width, the repair documentation generated requires a hold point after excavation to remove the defective weave weld prior to rewelding, and there is sworn testimony already in the record on this point (Tr. 10005, 10007). [Emphasis added.]

We find this filing nonresponsive for two reasons. First, the Board is concerned with hold points on *all* repairs, not just weave welds. Second, the Board is concerned with obtaining an explanation for why hold points are required on authorized welds but appear not to be required at all for in-process welds. What is there about repairs of in-process welds which makes it appropriate for the welders to make their own inspection of cleanliness, without a hold point, when such an inspection, solely by the welder, is not considered sufficient for repair of a final weld? This just does not seem to make sense and we need an explanation.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is, this 29th day of October 1984,

ORDERED

Texas Utilities Electric Company, *et al.*, may respond to this Order by November 9, 1984.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Sheldon J. Wolfe, Chairman
Dr. David L. Hetrick
Dr. James C. Lamb, III

In the Matter of

Docket No. 50-289-OLA
(ASLBP No. 83-491-04-OLA)
(Steam Generator Repair)

METROPOLITAN EDISON COMPANY,
et al.

(Three Mile Island Nuclear
Station, Unit 1)

October 31, 1984

In this Initial Decision, the Licensing Board authorizes the Director of Nuclear Reactor Regulation to issue to the Licensee, upon making requisite findings, an operating license amendment that revises technical specifications to recognize steam generator tube repair techniques other than plugging, specifically the kinetic expansion tube repair technique. The authorization is subject to satisfaction of conditions identified in the Initial Decision.

RULES OF PRACTICE: FINDINGS OF FACT

If a licensing board directs all parties to file proposed findings of fact and conclusions of law and rules that they would be deemed in default for failure to file, an intervenor is deemed to be in default with respect to a contention if it fails to file proposed findings upon that issue. *Florida Power & Light Co.* (St. Lucie Nuclear Power Plant, Unit No. 2), ALAB-280, 2 NRC 3, 4 n.2 (1975).

TECHNICAL ISSUE DISCUSSED

Steam Generator Tube Repair.

APPEARANCES

George F. Trowbridge, Esq., Bruce W. Churchill, Esq., Diane E. Burkley, Esq., and Wilbert Washington, II, Esq., for Metropolitan Edison Company

Joanne Doroshow, Esq., and Louise Bradford, for Three Mile Island Alert, Inc.

Thomas Y. Au, Esq., for the Commonwealth of Pennsylvania

Mary E. Wagner, Esq., for the U.S. Nuclear Regulatory Commission

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INITIAL DECISION

(Amendment to Operating License)

Opinion

I. INTRODUCTION¹

A. Background

1. Steam Generators' Description

Three Mile Island Nuclear Station, Unit No. 1 (TMI-1), located in Dauphin County, Pennsylvania, is a 776-megawatt pressurized water reactor having two vertical, straight tube and shell, once-through steam generators ("OTSG"). Each steam generator contains 15,531 Inconel-600 tubes. Each tube is 56 feet, 2-3/8 inches in length, with a 0.625-inch outer diameter and a 0.034-inch minimum wall thickness. The ends

¹ Part I sets forth certain uncontested facts.

were inserted into holes drilled in two 24-inch-thick carbon steel tube-sheets at the top and bottom of the steam generator. The tube was fully inserted, and protrudes about $\frac{1}{2}$ inch beyond the upper face of the Inconel-clad upper tubesheet and the lower face of the lower tubesheet, into the primary head at each end of the steam generator. There is a nominal 0.005-inch radial gap between the outer surface of the tube and the surface of the tubesheet hole. During manufacture of the steam generators, the tubes were sealed to the tubesheet at each end by rolling to a depth of about $1\frac{1}{4}$ inches, and welding on the primary side of the tubesheet surface. Primary coolant (at a pressure of about 2200 psig) flows within the tubes, and secondary system water and steam (at a pressure of about 950 psig) are heated outside the tubes. Thus the tubes, including the seal at each end, constitute part of the reactor coolant pressure boundary between the primary and secondary systems.

TMI-1 has been shut down since its last refueling outage in 1979 pending the outcome of restart proceedings before the Nuclear Regulatory Commission relating to the accident at TMI Unit 2, which occurred on March 28, 1979. In November 1981, primary-to-secondary leakage was discovered during testing of the TMI-1 reactor coolant system. This leakage was caused by intergranular stress-assisted cracking of steam generator tubes. Eddy current testing (ECT) revealed that 95% of the defects occurred within the top 7 inches of the upper tubesheet (UTS).

2. Description of the Kinetic Expansion Repair Process

Of the 31,062 tubes in both steam generators, 29,838 were repaired by kinetically expanding the tubes within the tubesheet to provide a new seal to the tubesheet below where the defects were detected. This was done by detonating an explosive cord encased in a polyethylene insert which had been placed into the tube. The resulting explosive energy was transmitted to the tube wall by the polyethylene insert, pressing the tube against the tubesheet. The tubes were expanded from the top of the upper tubesheet down either 17 inches or 22 inches, depending on the elevation of the lowest ECT indication within the upper tubesheet. This provided a 6-inch or greater ECT indication-free expanded length between the lowest-elevation ECT indication and the bottom of the expansion to serve as the new pressure boundary.

3. Proceedings

On May 9, 1983, the Licensee submitted to the Nuclear Regulatory Commission an application for an amendment to its operating license

requesting that it be permitted to revise the technical specifications to recognize steam generator tube repair techniques, other than plugging, and that the Commission approve the proposed kinetic expansion repair technique used at the facility. On May 31, 1983, at 48 Fed. Reg. 24,231, the Commission published a notice captioned "Issuance of Amendment to Facility Operating License and Proposed No Significant Hazards Consideration Determination and Opportunity for Hearing."²

In a Memorandum and Order of November 29, 1983, LBP-83-76, 18 NRC 1266, as amended by the Order of December 1, 1983 (unpublished), the Board admitted as intervening parties Three Mile Island Alert, Inc. (TMIA) and the Joint Intervenors (Ms. Jane Lee, Mr. Norman Aamodi)³ and admitted certain subparts of their contentions.

Thereafter, in a Memorandum and Order of June 1, 1984 (unpublished), the Board granted the Licensee's and the Staff's motions for summary disposition of the Joint Intervenors' contentions, and dismissed Joint Intervenors as a party. The Board granted in part and denied in part the Licensee's and the Staff's motions for summary disposition of TMIA's contentions. With respect to TMIA's Contentions 1.a and 1.b, the contentions which were not entirely dismissed, the Board identified specific issues as to which evidence was to be presented at the hearing. These issues are discussed below in Part II.

The evidentiary hearing was held on July 16-18, 1984.⁴ The Licensee, the Staff and TMIA participated, as well as the Commonwealth of Pennsylvania which, on July 9, 1984, had filed a motion for leave to participate as an interested State pursuant to the 10 C.F.R. § 2.715(c). Only the Licensee and the Staff presented witnesses.

The Licensee, the Staff and TMIA filed proposed findings of fact and conclusions of law — the Commonwealth of Pennsylvania did not.

B. Content of the Opinion and Findings

Part II of this Opinion discusses and resolves the contentions. Part III reflects our conclusions. The Board's underlying Findings of Fact and

² In a letter dated January 13, 1984, the Staff advised the Board and the parties that, at a meeting of the Commission on January 10, 1984, the Commission considered the question whether to concur in the Staff's proposed final no significant hazards consideration determination for the TMI-1 steam generator repair license amendment. The Staff also stated that, after voting 2-2 on the question, with one Commissioner not voting, the Commission then stated that no action should be taken by the Staff to issue the final determination or the amendment until the Commission had voted again and reached a decision on the matter.

³ A third joint petitioner, Dr. Bruce Molholt, withdrew his petition for leave to intervene during the course of the special prehearing conference held on October 17, 1983.

⁴ Limited appearance statements were also taken during the course of the hearing.

Conclusions of Law are appended and are incorporated by reference. An Order is also appended.

It should be noted that all of the proposed findings of fact and conclusions of law submitted by the parties that are not incorporated directly or inferentially in this Initial Decision are rejected as unsupported in law or fact or as unnecessary to the rendering of this Initial Decision.

II. CONTENTIONS

A. Contention 1.a⁵ (Fdgs. 1-65)

Issue 1.a. Reliability of Leak Rate Measurements (Fdgs. 2-20)

The Staff's proposed License Condition 4, as modified in Supplement 1 to the Safety Evaluation Report (SER), reads as follows:

The Licensee shall confirm the baseline primary-to-secondary leakage rate established during the steam generator hot test program. If leakage exceeds the baseline leakage rate by more than 0.1 GPM, the plant shall be shut down and leak tested. If any increased leakage above baseline is due to defects in the tube free span, the leaking tube(s) shall be removed from service. The baseline leakage shall be re-established, provided that the present Technical Specification limit of 1.0 GPM is not exceeded (SE Section 3.3).

The Board requested evidence on the above-captioned issue because the proposed license condition on leak rate limitations might not be effective if the measurements of leak rates were not sufficiently reliable. The Licensee and the Staff each presented a panel of witnesses to testify on this issue.

The Licensee determined the baseline primary-to-secondary leakage to be 0.02 gallons per minute (gpm) during the steam generator hot test program. The facility is to be shut down if leakage increases by 0.1 gpm above the baseline, i.e., if the leak rate reaches 0.12 gpm. This may be compared with the existing leak rate limit of 1.0 gpm. Subsequent tests may increase the baseline, provided that the limit of 1.0 gpm is not exceeded.

⁵ TMIA's Contention 1.a, as originally admitted, alleged with respect to the kinetic expansion repair technique that "post repair and plant performance testing and analysis . . . and proposed license conditions are inadequate to provide sufficient assurance that tube ruptures . . . will be detected in time and prevented . . ." As noted in Part I.A, above, in the unpublished Memorandum and Order of June 1, 1984, at page 23, the Board denied in part the Licensee's and the NRC Staff's motions for summary disposition of Contention 1.a, and identified seven issues with respect to which evidence was to be presented at the hearing.

Statistical variations and measurement sensitivities are such that these limits are feasible. However, the most sensitive on-line instrument channel (the RM-A5L monitor of radioactive gas in the secondary system) could be out of service for extended periods. Technical Specifications permit plant operation for 28 days with the on-line monitor RM-A5 inoperable. During such periods, grab samples for monitoring radioactive gas every 4 hours would provide notice of a small increase in primary-to-secondary leakage, while other plant indications would quickly register a sudden large increase in leak rate.

We are concerned that a small increase in leak rate, which could be the precursor of a more serious problem, might go undetected for a matter of hours. The Staff considered but rejected a possible license condition that would require operability of the RM-A5 system at all times. We direct that redundancy be supplied in the form of a duplicate RM-A5 system or suitable equivalent of comparable sensitivity and response time. We further direct that the Technical Specifications be modified to permit plant operation for a maximum of 28 days with one of these duplicate systems inoperable, and to require plant shutdown if both of these systems are inoperable. As an alternative to the installation of a duplicate system, we direct that the RM-A5 system must be operable at all times during plant operation. (*See Order, infra.*)

TMIA was concerned that leak-rate measurements might be misleading because of a tendency for some leaks to be self-sealing by buildup of corrosion products. This could occur only for very small leakage pathways between the expanded portion of a tube and the tubesheet. Accordingly, we are satisfied that this effect will not be significant from a safety standpoint. TMIA also questioned whether the loss of pretension in certain tubes might cause the measured leak rates to be reduced, potentially masking the detection of a critical size circumferential crack. Testing showed that such cracks do not exist in the tube pressure boundary. If such a crack were to appear, it would propagate only when the tube was placed in axial tension, which would tend to offset the effect of loss of pretension. We are satisfied that the loss of pretension will not be significant from a safety standpoint.

Issue 1.b. Frequency of Eddy Current Tests (Fdgs. 21-25)

The Staff's proposed License Condition 3, as modified in Supplement 1 to the SER, reads as follows:

The licensee shall conduct eddy-current examinations, consistent with the inspection plan defined in Table 3.3-1, either 90 calendar days after reaching full power, or 120 calendar days after exceeding 50% power operation whichever comes first.

The Board requested evidence on the above-captioned issue because TMIA alleged that the Staff changed its position without explanation. The Licensee and the Staff each presented a panel of witnesses to testify on this issue.

The Staff's early view was that eddy current tests (ECT) should be conducted 30-60 days after restart. This was later changed to either 90 or 120 days as reflected in the originally proposed license condition and in its modification.

Both Licensee and Staff testified that the change was justified in the light of extensive information about the condition of the steam generators that had become available in the meantime. Additional operational considerations and judgments about obtaining the maximum information from ECT were included in the decision. The Board accepts the explanations of the Licensee and Staff as sufficient rationale for the change in proposed timing of the ECT requirements.

The Board is concerned that the Staff's proposed license condition does not address the possibility of plant operation for an extended period at less than 50% power. In addition to the Staff's proposed license condition, we direct the Staff to require an assessment by the Licensee at the end of 180 days of operation at power levels between 5% and 50%, such assessment to contain recommendations and supporting information as to the necessity of a special ECT shutdown before the end of the refueling cycle. Based on this assessment, the Staff shall determine the time of the next ECT, consistent with the other provisions of the license condition. In the absence of an assessment, a special ECT shutdown shall take place before an additional 30 days of operation at power above 5%. (See Order, *infra*.)

Issue 1.c. Power Ascension Limitations (Fdgs. 26-30)

In the SER, the Staff proposed license conditions, which read as follows:

License Condition 1. The licensee shall complete its pre-critical test program in essential conformance with the program described in its Topical Report 008, Rev. 2, and shall submit the results of that test program and a summary of its management review, prior to initial criticality-

License Condition 2. The licensee shall complete its post-critical test program at each power range (0-5%, 5%-<50%, 50%-100%) in essential conformance with the program described in Topical Report 008, Rev. 2, and shall have available the results of that test program and a summary of its management review, prior to ascension from that power range and prior to normal power operation.

The Board requested evidence on the above-captioned issue because TMIA questioned whether the proposed power ascension program is in accord with the recommendations of the Third Party Review (TPR) Group. This group was composed of consultants from the industry retained by the Licensee. The Licensee and the Staff each presented a panel of witnesses to testify on this issue.

The TPR Group recommended two hold periods at less than full power. The Licensee accepted this recommendation. The TPR Group suggested operation with one steam generator at a higher power than the other. The Licensee explained that this was not feasible, and the TPR Group accepted the explanation.

The Licensee either accepted the TPR Group recommendations or provided adequate explanations. Accordingly, we find that the objections by TMIA concerning the issue of power ascension limitations are without merit.

Issue 1.d. Long-Term Corrosion Tests (Fdgs. 31-43)

In the SER, the Staff proposed a license condition which reads as follows:

License Condition 6. The licensee shall provide routine reporting of the long-term corrosion "lead tests" test results on a quarterly basis as well as more timely notification if adverse corrosion test results are discovered (SE Section 3.5).

The Board requested evidence on the above-captioned issue because TMIA asserted that accurate simulation of actual TMI-1 tube properties is virtually impossible in such tests. The Licensee and the Staff each presented a panel of witnesses to testify on this issue.

In its proposed findings, TMIA asserts that the long-term corrosion tests included a tube with a known defect but that there is no evidence with regard to the number of tube sections included in this test sequence. Although the exact number of samples was not stated, there is much evidence about the wide range of conditions simulated, and there is testimony that several samples had known defects. TMIA complains that other testing utilized archival tubes which had not been installed in a steam generator. However, this is not the case for the corrosion tests, and is relevant to a different issue (hardness tests).

TMIA asserts that Licensee has provided no assurance that tube rupture due to mechanical failure will not occur, although such assurance was outside the scope of the long-term corrosion tests and was, instead, the subject of the Licensee's and the Staff's motions for summary disposition that were granted. (Memorandum and Order, June 1, 1984).

Moreover, TMIA claims that Licensee has failed to account for the mechanical stresses present in the steam generators, and complains that Licensee has not introduced transient loads into the testing sequence.

TMIA asserts that because the Licensee failed to include stresses greater than 1100 pounds as part of the long-term corrosion program, the testing does not adequately predict operating conditions. However, the 1100-pound loads adequately simulated heatup, operation, and cold shutdown. The tests also took into consideration residual stresses produced by the kinetic expansion process. Furthermore, C-ring specimens were loaded to a stress level slightly below yield, which is significantly higher than the level seen by tubes in actual service. Consequently, the high stress on the C-rings bounds loads induced by accident transients (a maximum of 3140 pounds). We are therefore unable to follow the logic which TMIA uses to conclude that the maximum load that the tubes can tolerate is 1100 pounds.

Finally, we address the complaint that Licensee did not introduce transient loads into the long-term corrosion testing sequence. It is to be noted that the issue is "adequacy of simulation of operating conditions by long-term corrosion tests," and not the simulation of all operating conditions by every conceivable type of test. Thus, the complaint is irrelevant to the matter in issue.

We conclude that the questions raised on this issue have been adequately answered, and that the Licensee's long-term corrosion test program includes a wide variety of tests which, taken together, constitutes a reasonably accurate and valid simulation of steam generator operating conditions.

Issue 2. Inadvertent Initiation of Emergency Feedwater (Fdgs. 44-47)

The Board requested that evidence be presented on this issue because neither TMIA nor the Board felt that sufficient detail was presented in the motions for summary disposition. The Licensee and the Staff each presented a panel of witnesses to testify on this issue.

TMIA did not submit proposed findings of fact on this issue, although the Board had directed the parties to file, and ruled that they would be deemed in default if they did not file, proposed findings of fact, etc. (Tr. 684). Accordingly, TMIA is deemed to be in default on this issue. *Florida Power & Light Co.* (St. Lucie Nuclear Power Plant, Unit No. 2), ALAB-280, 2 NRC 3, 4 n.2 (1975).

However, the issue is addressed in this opinion because the Board had expressed an uncertainty about the maximum transient stresses associated with inadvertent initiation of emergency feedwater. Our uncertainty

has been resolved by the explanation that the high heat transfer rate from steam to subcooled water would cause the incoming water to be heated sufficiently that its effect on tube loads would be insignificant. Further, with respect to rapid cooldown following a loss-of-coolant accident, emergency feedwater injection was already included in calculating the maximum stress.

Issue 3. Hardness Tests on Repaired Tubes (Fdgs. 48-60)

The Board requested that evidence be presented on this issue because the absence of post-repair hardness tests on corroded tubes was not sufficiently explained by the Licensee. The Licensee and the Staff each presented a panel of witnesses to testify on this issue.

We are satisfied that hardness testing of repaired tubes in place is not feasible because of the size of the measuring equipment. We are also satisfied that removal of samples is impractical because of radiation exposure to workers.

Hardness testing was performed on archival tube samples that had undergone kinetic expansion. It was demonstrated in a reasonable number of tests that archival and actual tubes had the same mechanical properties, especially with regard to the key parameters of ductility and yield strength which are used to judge suitability for kinetic expansion. Hardness tests on the kinetically expanded archival tubing indicated less residual stress in the transition region than in the original as-fabricated rolled tubes.

In its proposed findings, TMIA asserted that the purpose of hardness tests is to determine the degree of embrittlement, and that embrittlement dictates loss of ductility and yield strength. Actually, hardness tests were conducted to assess the degree of "cold working" and the susceptibility to intergranular stress-assisted cracking (IGSAC). The small increase in hardness introduced by the expansion process produces essentially no change in ductility.

TMIA asserted that no meaningful conclusions can be drawn from a comparison of the results of tests conducted on different populations of tubing. While this may be true as a general principle, the three tests in question involved a prudent selection of archival tube samples. Other tests were performed on actual TMI-1 tubes.

TMIA tried to make an issue of the use of the words "identical" and "representative" in comparing various tube samples. It appears that responses to Board questions on different topics were taken out of context, and that no issue exists.

In response to other objections raised by TMIA, we find that the number of samples of actual tubes used for yield stress measurements was reasonable, and we find no safety significance in statistical variations among pull-out load tests using test samples under different test conditions.

We note that a number of these matters concern Licensee's qualification testing program, which was ruled to be outside the scope of Contention 1.a (Memorandum and Order, June 1, 1984, at 14). These matters are addressed here only because the Board asked some supplemental questions about how closely the archival tubes corresponded to the actual tubes in TMI-1. (Tr. 526-52.)

In our opinion, the Licensee has presented reasonable justification for not performing post-repair hardness testing on kinetically expanded TMI-1 steam generator tubes.

Issue 4. Industry Experience with Kinetic Expansion (Fdgs. 61-65)

The Board requested that evidence be presented on this issue solely because the Licensee's motion for summary disposition asserted that the use of kinetic expansions to seal heat exchanger tubes within tube-sheets has a broad base of successful experience. Licensee did not state whether this experience includes nuclear plant components, or whether the experience includes repair of damaged heat exchangers, manufacture of new heat exchangers, or both. Information was requested about whether tube integrity during subsequent operation depends on whether the process is a repair, or a manufacturing process using new materials. The Licensee presented a witness from Foster Wheeler Development Corporation. The Staff presented a panel of witnesses.

There is no evidence before us that the kinetic expansion process has been used for repairing steam generator tubes in nuclear power plants. The industry has had considerable experience with this process in other types of heat exchangers, both in field repairs and in fabrication. This experience indicates that the integrity of kinetically expanded joints depends primarily on key parameters (yield strength and ductility) irrespective of whether the process is applied to new equipment during fabrication or the repair of existing equipment.

However, the extensive repairs to the TMI-1 steam generators is a new, large-scale application of the kinetic expansion process. Because there is no directly relevant experience, approval of these repairs must be based on the other issues discussed in this opinion. Accordingly, we conclude that this issue has little significance in the resolution of this contention.

B. Contention 1.b (Fdgs. 66-75)

TMIA's Contention 1.b, as originally admitted, alleged as follows:

Because of the enormous number of tubes in both steam generators which have undergone this repair process, (1) the possibility of a simultaneous rupture in each steam generator, which would force the operator to accomplish cooldown and depressurization using at least one faulted steam generator, resulting in release of radiation into the environment beyond permissible levels, "isn't an incredible event," (see September 19, 1982 memorandum from Paul Shewmon, then Chairman of the ACRS), (2) and could lead to a sequence of events not encompassed by emergency procedures, (3) and in the course of a LOCA, such a scenario could create essentially uncoolable conditions.

As noted in Part I.A, above, in the unpublished Memorandum and Order of June 1, 1984, at page 32, the Board denied in part the Licensee's and the Staff's motions for summary disposition of Contention 1.b, and requested that evidence be presented at the hearing as to whether the kinetic expansion tube repair process increased the probability of simultaneous tube ruptures in both steam generators. The Board requested evidence on this one issue because it had been raised in an Advisory Committee on Reactor Safeguards (ACRS) memorandum concerning TMI-1 and because the Board wanted more information on which to base its decision. The Licensee and the Staff each presented a panel of witnesses to testify on this issue.

A steam generator tube rupture, as it is commonly understood in the industry, cannot take place at or in the vicinity of the repair joint. A break producing a large flow has no room to occur because the new joint is closely confined within the tubesheet hole. Moreover, the evidence justifies a conclusion that the repair did not significantly affect tube strength and ductility, so that the probability of tube ruptures has not been increased by the repair.

In its proposed findings, TMIA raises an issue for the first time, namely, that tube rupture caused by rubbing and wearing of adjacent bowed tubes could occur when compressive loads are applied to adjacent tubes that had lost preload. This seems very unlikely to cause a problem because contact between such tubes, even if possible, would not occur during steady operation, but only during heatup, which lasts about 8-10 hours.

TMIA would also have us rule that Licensee has not provided adequate assurance that the repair has significantly reduced the probability of simultaneous tube rupture. This is not the issue. The central issue is whether the repair process has increased the probability of such an accident. We find that reasonable assurance exists that the repair process

has not increased the probability of simultaneous tube ruptures in both of TMI-1's steam generators.

III. CONCLUSIONS

The Board concludes that the license conditions proposed by the Staff, as supplemented by the Board's two imposed conditions as discussed in § II, *supra*, and the Licensee's post-repair and plant performance testing and analysis provide reasonable assurance that the leaktight integrity of the repaired steam generator tube joints will be maintained. We further conclude that the uncertainties which led the Board to request the presentation of evidence on specific issues have been resolved, and that reasonable assurance exists that the repair process has not increased the probability of simultaneous tube ruptures.

Findings of Fact

A. Contention 1.a

TMIA Contention 1.a asserts the following:

Neither Licensee nor the NRC Staff has demonstrated that the kinetic expansion steam generator tube repair technique, combined with selective tube plugging, provides reasonable assurance that the operation of TMI-1 with the as-repaired steam generator can be conducted without endangering the health and safety of the public, for the following reasons:

- a. Post repair and plant performance testing and analysis including the techniques used, empirical information collected, and data evaluation, and proposed license conditions are inadequate to provide sufficient assurance that tube ruptures, including but not limited to those which could result upon restart, a turbine trip at maximum power, thermal shock from inadvertent actuation of emergency feedwater at high power or following rapid cooldown after a LOCA, will be detected in time and prevented to avoid endangering the health and safety of the public through release of radiation into the environment beyond permissible limits.

1. The Board's Memorandum and Order of June 1, 1984 (unpublished), in partially denying the Licensee's and Staff's motions for summary disposition of TMIA's Contention 1.a, identified the following issues as to which evidence should be presented at the hearing:

- (1) The rationale underlying certain proposed license conditions should be addressed, with attention to:
 - (a) Reliability of leak rate measurements.
 - (b) Method of determining frequency of ECT tests.

- (c) Method of determining power ascension limitations.
 - (d) Adequacy of simulation of operating conditions by long-term corrosion tests.
- (2) The effect of inadvertent initiation of emergency feedwater flow at high power or following rapid cooldown after a LOCA should be addressed, with attention to calculation of maximum transient stresses in steam generator tubes.
 - (3) The reasons for not including hardness tests on repaired tubes in the post repair testing program should be addressed.
 - (4) Recalling Licensee's statement in ¶¶ 6-8 [of its Statement of Material Facts as to Which There Is No Genuine Issue to Be Heard] that the use of kinetic expansions to seal heat exchanger tubes within tubesheets has a broad base of successful experience, information is requested about whether tube integrity during subsequent operation depends on whether the process is a repair, or a manufacturing process using new materials.

(Our findings of fact with regard to Contention 1.a are captioned according to the preceding list of issues.)

Issue 1.a. Reliability of Leak Rate Measurements

2. Primary-to-secondary leak rate measurements during PWR operation are made to document the absolute value of leakage and to document any trends which may be cause for concern. The absolute value is required to assess performance of steam generators and to ensure that technical specification limits are not exceeded. Trends are monitored because increasing leakage may indicate ongoing chemical or mechanical degradation. Increasing leak rates are investigated further to identify leak locations and take appropriate corrective action. (Licensee's Test., fol. Tr. 224, at 5-6.)

3. Technical Specifications 3.1.6.3 and 4.1 address primary-to-secondary leakage through TMI-1 once-through steam generator (OTSG) tubes. Technical Specification 3.1.6.3 requires that if this leakage exceeds 1 gpm total for both steam generators, the reactor shall be placed in cold shutdown within 36 hours. Technical Specification 4.1 requires that leakage be evaluated daily. (Licensee's Test., fol. Tr. 224, at 3.)

4. The Staff's proposed License Condition 4, as modified in Supplement 1 to the SER, reads as follows:

The licensee shall confirm the baseline primary-to-secondary leakage rate established during the steam generator hot test program. If leakage exceeds the baseline leakage rate by more than 0.1 GPM, the plant shall be shut down and leak tested. If any increased leakage above baseline is due to defects in the tube free span, the

leaking tube(s) shall be removed from service. The baseline leakage shall be re-established, provided that the present Technical Specification limit of 1.0 GPM is not exceeded (SE Section 3.3).

(Board's Exhibit 2, at 27.)

5. Licensee determined the baseline primary-to-secondary leakage to be 0.02 gpm (1 gallon per hour (gph)) during the steam generator hot-test program. This means that the facility is to be shut down if the leak rate reaches 7 gph total for both steam generators, as compared to the existing limit of 60 gph in Technical Specification 3.1.6.3. (Licensee's Test., fol. Tr. 224, at 4.) Because of recently discovered leakage and associated repairs, the baseline leakage rate will be re-established on restart of the plant. (Tr. 327.)

6. The TMI-1 leakage limitations in Technical Specification 3.1.6.3 are comparable to those at most other pressurized water reactors in the United States. The proposed new limit of 0.1 gpm is the most restrictive limit implemented at any plant. (Licensee's Test., fol. Tr. 224, at 5; Tr. 240; Staff's Test., fol. Tr. 589, at 8; Tr. 611.)

7. The steam generator hot testing results indicate that a monitored leak rate statistical variation (twice the standard deviation from the mean value) of approximately ± 0.01 gpm (± 0.5 gph) can be expected during steady-state operation. (Licensee's Test., fol. Tr. 224, at 7.)

8. Primary-to-secondary leakage is indicated by several diverse methods at TMI-1. These methods include measuring radioactive noble gas concentrations on the secondary side, and measuring chemistry and radiochemistry in secondary-side OTSG water. The radionoble gas concentration measurement is the most sensitive method of quantifying the primary-to-secondary leakage rate. The leakage rate is calculated periodically by utilizing data from on-line continuous monitors and grab sample analysis. (Licensee's Test., fol. Tr. 224, at 8.)

9. Continuous leak rate monitoring during operation is provided by a flow rate instrument and by a radiation detector. The radiation detector is monitored in the control room and is alarmed. (Tr. 240-41.) The response time for the radiation detection system RM-A5L is of the order of a few minutes. (Tr. 274-75.) The sensitivity of this system is at least 0.001 gpm (0.07 gph) during power operation and 0.003 gpm (0.2 gph) during plant cooldown. (Licensee's Test., fol. Tr. 224, at 10.) There are additional radiation monitors which are less sensitive than RM-A5L. At least one of the other monitors would come on scale before the leak rate would reach the Technical Specification Limit. (Tr. 267-68.)

10. Regular measurements of radioactivity in grab samples of condenser off-gas provide leak rate information even if the on-line monitors

are not functioning. (Tr. 268.) Ordinarily, these samples are taken every 8 hours. (Tr. 624.) The plant could conceivably operate at full power for as much as 8 hours without detection of a small increase in leak rate. (Tr. 642.) Technical Specifications permit plant operation for 28 days with the on-line monitor RM-A5 inoperable, provided grab samples are being taken. (Tr. 646.) Licensee has an administrative limitation that if RM-A5 is determined to be out of service, a grab sample will be taken immediately and repeated every 4 hours. (Tr. 647.) The Staff considered but rejected a possible license condition that would require operability of the RM-A5 system at all times. (Tr. 643.)

11. Two cold leak tests are used, the bubble test and the drip test. The bubble test is the most sensitive cold leak test, having a leak rate sensitivity of 0.000005 gpm for an individual leak. The bubble test was used on the upper portions of the OTSG tubes which included all the new kinetic expansion joints. (Licensee's Test., fol. Tr. 224, at 10-11.)

12. The entire OTSG tube length is leak-tested by the drip test. Sensitivity depends on location, being 0.0002 gpm near the lower tubesheet and 0.002 gpm at the high ends of the tubes. (Licensee's Test., fol. Tr. 224, at 11.)

13. Leak rate measurements determine total primary-to-secondary leakage, including the contribution from leakage through the joints. (Licensee's Test., fol. Tr. 224, at 12.) Some leakage is to be expected, and small leakage through joints does not relate to their load-carrying capability. (Tr. 269.) If the observed leak rate should increase by 0.1 gpm, the plant will be shut down and the individual leaking tubes, plugs and/or joints will be identified by means of the bubble and drip tests. (Licensee's Test., fol. Tr. 224, at 12.)

14. There may be a tendency for some leaks to be self-sealing, but only for leakage pathways between the expanded portion of the tube and the tubesheet. The joint is formed between the inconel tube and the carbon steel tubesheet. Corrosion products tend to plug up leakage paths in the tight tube-to-tubesheet crevice and to stop or slow leakage. This was confirmed by a trend of decreasing leakage with time for joints tested in Licensee's qualification program. (Licensee's Test., fol. Tr. 224, at 12; Tr. 245-46, 271-72.)

15. To be self-sealing, a leak past the joint would have to have a very small flow through a pathway sufficiently tight to enable the buildup of corrosion products adequate to seal the leak. A leak of this size would not adversely affect the load-bearing capability of the joint, or increase the probability of rupture within the joint. (Licensee's Test., fol. Tr. 224, at 12-13; Tr. 260-64, 269.)

16. Leakage past a repaired joint is independent of the loss of pretension. Pretension, or preload, was placed on the tubes by thermal expansion during the manufacture of the steam generators. At TMI-1, some tubes with complete circumferential cracks were freed from the original joints. These tubes contracted slightly, relieving all or part of the pretension. After kinetic expansion, these tubes were again fixed at both ends, but without some or all of the original pretension. This resulted in a reduction of axial tube load of several hundred pounds. (Licensee's Test., fol. Tr. 224, at 13; Tr. 257-58.)

17. The kinetic expansion process relies on horizontal (radial) forces to expand tubes, while pretension is an axial (vertical) load. These load components are perpendicular to each other, and the loss of pretension does not affect the ability to expand the tube and form the new joint. Kinetically expanded joints in tubes with loss of pretension are as tight, and no more prone to leakage, than joints in tubes with preload. Monitoring of leakage through such a joint is unaffected by a loss of pretension. (Licensee's Test., fol. Tr. 224, at 13-14.)

18. A tube without pretension might theoretically exhibit a lower leak rate than a tube with pretension for a circumferential through-wall crack of a given size, hence potentially masking the detection of a critical size crack. Testing already conducted shows that such cracks do not exist in the tube pressure boundary. If such a crack were to exist, it would propagate due to intergranular stress-assisted cracking (IGSAC) only when the tube was placed in axial tension, which would tend to offset the effect of loss of pretension. (Licensee's Test., fol. Tr. 224, at 14; Tr. 273.)

19. During the steam generator hot testing program, transients placed axial tensile loads of at least several hundred pounds on every tube in the steam generators, including those which had lost preload. Measured leak rates were compared with calculations. The results confirmed the conclusion that no large cracks remain undetected. (Licensee's Test., fol. Tr. 224, at 15; Tr. 276-83.)

20. If future cracks were to form and propagate due to IGSAC at normal operating conditions, the principal direction of propagation will be axial (along the tube). IGSAC propagation is perpendicular to the direction of highest stress, which is circumferential (hoop stress) at normal operating conditions. Therefore, a loss of pretension would not affect measurements of leakage from axial tube cracks. (Licensee's Test., fol. Tr. 224, at 15.)

Issue 1.b. Frequency of Eddy Current Tests

21. The Staff's proposed License Condition 3, as modified in Supplement 1 to the SER, reads as follows:

The licensee shall conduct eddy-current examinations, consistent with the inspection plan defined in Table 3.3-1, either 90 calendar days after reaching full power, or 120 calendar days after exceeding 50% power operation whichever comes first. (SE Section 3.3).

(Board's Exhibit 2, at 27.)

22. In recommending the change in eddy current test (ECT) frequency, which the Staff subsequently incorporated into the proposed license condition, the Licensee considered the condition of the generator, the type of repairs, the damage mechanism leading to the repairs, and the expectation that if any new damage were to occur, it would be at a slow rate. Additional considerations were plant accessibility, other operational sequences being conducted, and prudent operating practices which dictate that the opening of steam generators, with its attendant exposure to oxygen, should be minimized. (Licensee's Test., fol. Tr. 226, at 4-5.)

23. Since the ECT program is designed to characterize change, there is a need to allow reasonable operating time on the generators to allow any unforeseen mechanism to cause change. The full benefits of ECT can only be obtained after operation at some period of time to allow the system to approach chemical equilibrium. (Licensee's Test., fol. Tr. 226, at 7-8.)

24. The Staff recommended in May 1982 that the plant be operated for 30 to 60 days and then be shut down for eddy current tests to assess the progression of degradation. The Staff subsequently changed its position because a large amount of information on the rate of progression, the type of attacks, the corrosive species, etc., became available. (Tr. 606.)

25. The proposed license condition does not contain a requirement for a special shutdown for ECT in the event that the plant is operated for an extended period at less than 50% power. The Staff witness had not anticipated this possibility, but stated that if it were to occur he would be inclined, after approximately 180 or 200 days, to tell the Licensee that the Staff would like them to shut down and conduct eddy current tests, which he assumes they would be willing to do. (Tr. 672-73.)

Issue 1.c. Power Ascension Limitations

26. The subject of power ascension limitations is addressed in the Staff's proposed license conditions in the SER which read as follows:

License Condition 1: The licensee shall complete its pre-critical test program in essential conformance with the program described in its Topical Report 008, Rev. 2, and shall submit the results of that test program and a summary of its management review, prior to initial criticality.

License Condition 2: The licensee shall complete its post-critical test program at each power range (0-5%, 5%-<50%, 50%-100%) in essential conformance with the program described in Topical Report 008, Rev. 2, and shall have available the results of that test program and a summary of its management review, prior to ascension from that power range and prior to normal power operation.

(Board's Exhibit 1, at 46.)

27. The initial power ascension program was developed prior to knowledge of the damage to the steam generators. In conjunction with the steam generator repair program, special precritical tests were developed to demonstrate steam generator operability. These tests have now been performed and evaluated. It was determined, however, that two 30-day hold periods should be added to the power ascension program. (Licensee's Test., fol. Tr. 229, at 4-5.)

28. Proposed License Conditions Nos. 1 and 2 are not intended to limit power ascension. Rather, they are intended to require that test results be made available to the Staff at each stage of the test program. (Staff's Test., fol. Tr. 589, at 10; Tr. 639-40.)

29. In its report of February 18, 1983, the Third Party Review (TPR) Group, which was composed of consultants from industry retained by the Licensee, recommended consideration of a "substantially extended operation at low power" and of a "hold period of perhaps a month or more at 40 percent power . . . followed by another month or more at 70 percent power . . ." In accordance with the TPR recommendation, Licensee modified the power ascension program to add two 30-day hold periods, one at 48% power and one at 75%. In its report of May 16, 1983, the TPR Group stated that the GPU Nuclear response is satisfactory. (Licensee's Test., fol. Tr. 229, at 6-7; Staff's Exhibit 1, at 3.)

30. The TPR Group also recommended that Licensee "consider the possibility of deliberately running one steam generator at a higher power than the other during the first escalation hold periods." Licensee explained to the TPR Group that this suggestion was not feasible; in particular, it would involve mismatched reactor coolant flow, imbalanced feed flows, and different coolant levels in each generator. This could

mask changes in plant conditions, including any abnormalities in the plant response to transients. In its report of May 16, 1983, the TPR Group stated that the GPU Nuclear response is satisfactory. (Licensee's Test., fol. Tr. 229, at 7-8.)

Issue 1.d. Long-Term Corrosion Tests

31. Long-term corrosion tests are required in a license condition proposed by the Staff in the SER which reads as follows:

License Condition 6: The licensee shall provide routine reporting of the long-term corrosion "lead tests" test results on a quarterly basis as well as more timely notification if adverse corrosion test results are discovered (SE Section 3.5).

(Board's Exhibit 1, at 46.)

32. The purpose of the long-term corrosion test program, the operations phase of which has now been completed, is to verify that sulfur-induced intergranular stress-assisted cracking (IGSAC) will not reinitiate or propagate in the TMI-1 steam generators under actual operating conditions. The tests were designed to confirm that metallurgical, environmental, geometric and surface conditions which exist after the repair of the tubes are not detrimental to tube integrity. From the test program it will be possible to conclude whether the proposed chemistry limits are acceptable, whether the peroxide cleaning was beneficial or damaging, and whether the changes in electrochemical potential during operations will cause reinitiation of corrosion. (Licensee's Test., fol. Tr. 231, at 2-3.)

33. The long-term corrosion tests are accordingly related to the kinetic expansion repair process, but only insofar as they verify that the repair did not render the steam generators susceptible to reinitiation of IGSAC. This is tested by including kinetically expanded tube samples in the test loops. Except in this one respect, the long-term corrosion tests have no relationship to the adequacy of the kinetically expanded joint. The tests were not designed to confirm assurance against the possibility of mechanically induced tube ruptures caused by various transients, and the tests provide no information on this subject. (Licensee's Test., fol. Tr. 231, at 3.)

34. The long-term corrosion test program includes tests which closely simulate the typical operating environment of the steam generator tubing during steady-state and transient conditions. The program also includes comparative tests which closely simulate steam generator operation, but using tubes with high residual sulfur levels (not peroxide-cleaned) exposed to thiosulfate. The tests reproduced all the parameters

which influence IGSAC, i.e., susceptible material, environment, and stress. (Licensee's Test., fol. Tr. 231, at 4-5.)

35. To assure that the influence of prior operation and layup on tubing was adequately represented, only tube sections removed from the TMI-1 steam generators were used as specimens. These specimens were selected from various regions of each steam generator, including tube sections which had known defects. (Licensee's Test., fol. Tr. 231, at 5; Staff's Test., fol. Tr. 589, at 12.)

36. The tube sections for the long-term corrosion tests were selected from tubes that had been previously removed from the steam generators for use in the failure analysis. Sections were selected to provide a maximum range of properties. Tests specimens were selected from representative heats of material removed from the generator in order to provide a range of typical chemistry. Yield strengths of the specimens spanned the range of tubes in the steam generators. Specimens were selected that displayed various levels of susceptibility to corrosion damage; some came from tubes with no defects and others from tubes with as many as eight indications. (Licensee's Test., fol. Tr. 231, at 5-6; Staff's Test., fol. Tr. 589, at 11-12; Tr. 353-55.)

37. The test samples were representative of tubes from various axial locations in each steam generator. The samples were also representative of various heats, and bounded the heats of the metal in the tubes. No correlation could be found between heat number and any propensity for cracking. (Licensee's Test., fol. Tr. 231, at 6; Tr. 353-56.)

38. Certain samples were subjected to the explosive expansion process using mockup tubesheets and then subjected to peroxide cleaning. Other samples were not peroxide-cleaned, in order to test what could occur if the cleaning process had not been undertaken. Some C-ring samples made from actual TMI-1 tubes were also included. These samples provided a means for metallographic examination to observe any microstructural changes or incipient cracking. (Licensee's Test., fol. Tr. 231, at 6.)

39. Environmental chemistry parameters were selected to either simulate, or be more aggressive than, the water chemistry which will be maintained in the reactor coolant system. Three of the four test loops had 100 parts per billion (ppb) of sulfate, the maximum permitted under operating chemistry specifications. The fourth loop had 100 ppb of thiosulfate. Maximum permitted levels of chloride and fluoride were also used. (Licensee's Test., fol. Tr. 231, at 6-7.)

40. The tests included typical temperature cycles. Temperatures were raised from ambient to normal operating temperature (approximately 600°F). Temperatures were held constant at operating level, and

also cycled between 500°F and 600°F to simulate unit load changes. The test loops were also subjected to cooldown cycles, some of which included the introduction of oxygen. Tests also simulated the atmospheric and temperature conditions present at the time of the original IGSAC damage. (Licensee's Test., fol. Tr. 231, at 7.)

41. During heatup, operation, and cooldown, tubes in the steam generators undergo changes in stress. A net axial tensile stress could exist during cold shutdown and steady-state operation. The stress is reduced during heatup and increased during cooldown due to differential thermal expansion effects. In order to simulate the changes in axial load, full tube specimens were loaded at a level corresponding to steady-state loads during heatup, cold shutdown, and operation. During cooldown, loads were increased to approximate the maximum allowed cooldown rate. Full tube specimens simulating repaired joints were kinetically expanded to ensure representative residual stresses and then exposed to the axial loads described above. (Licensee's Test., fol. Tr. 231, at 8; Tr. 359.)

42. The C-ring specimens were loaded to a level just slightly below yield, which is significantly higher than the load seen by tubes in actual service. This would make them more susceptible to IGSAC than are the actual steam generator tubes. This also bounds any load that would be experienced under accident transients. (Licensee's Test., fol. Tr. 231, at 8; Tr. 369-70, 540-42.)

43. The tests were not designed to simulate fatigue damage. Results of the tests simulating heatup and cooldown cycles were sufficient to predict the effect of stress on corrosion. (Tr. 345-46.)

Issue 2. Inadvertent Initiation of Emergency Feedwater

44. In the unlikely event of inadvertent actuation of the emergency feedwater (EFW) pumps in conjunction with inadvertent opening of the EFW valves, resulting in injection of emergency feedwater into steam generators at full power, the resulting thermally induced axial tube load would not be sufficient to cause rupture of steam generator tubes. (Licensee's Test., fol. Tr. 421, at 4; Staff's Test., fol. Tr. 589, at 13-14.)

45. Emergency feedwater is injected horizontally into the steam generator tube bundle steam space via six auxiliary feedwater nozzles located at approximately equal spacing around the circumference of the steam generator shell. The injection points are near the top of the tube bundle, with nozzle centerlines 2 feet 11 inches below the bottom surface of the upper tubesheet. (Licensee's Test., fol. Tr. 421, at 4.)

46. As the EFW is injected into the steam space, the high heat transfer rate from the steam quickly heats the incoming water. By the time the EFW reaches the tubes, it is approaching the same temperature as the steam. The affected tubes experience only a small temperature change in the small portion of the tube being sprayed, which results in an insignificant axial load change in the tube. (Licensee's Test., fol. Tr. 421, at 4-5.)

47. Conservative calculations, which do not take into account the high heat transfer rate from steam to subcooled water, predict that the maximum change in load of the affected tubes would be 70 pounds tension. This would be comparable to loads at full power and much less than the loads in cooldown or design basis accident conditions. The maximum transient loads on the tubes following a loss-of-coolant accident (LOCA) have been conservatively calculated to be 2641 pounds, including the effect of EFW injection. This load is less than the design basis load of 3140 pounds. (Licensee's Test., fol. Tr. 421, at 5-6; Tr. 433-35, 439-40.)

Issue 3. Hardness Tests on Repaired Tubes

48. Hardness is a metallurgical term which defines the resistance of metals or alloys to plastic deformation, usually by indentation. Sometimes it also refers to resistance to scratching, abrasion or cutting. (Staff's Test., fol. Tr. 589, at 16.)

49. Hardness of a metal or alloy increases when the material is subjected to "cold working" as in mechanical deformation. This can result in higher residual tensile stress, which can be indicative of increased susceptibility to intergranular stress-assisted cracking (IGSAC). (Licensee's Test., fol. Tr. 423, at 3.)

50. The kinetic expansion process resulted in cold working of the expanded portions of the tubes, which increased the hardness of the material. The roll expansion process used in the original tube-to-tubesheet joint also produced cold working and increased the material's hardness. (Licensee's Test., fol. Tr. 423, at 3.)

51. Hardness testing during the qualification program showed the kinetically expanded joints to be less hard, and therefore to have less cold working, than nonstress-relieved rolled joints. Less cold working results in lower residual stresses. This suggests that the kinetically expanded joints will be less susceptible to IGSAC than are nonstress-relieved rolled joints. (Licensee's Test., fol. Tr. 423, at 4; Staff's Test., fol. Tr. 589, at 17.)

52. Hardness was not considered a parameter indicative of the adequacy of the kinetic expansion joint. The joint was qualified for a range of material tensile strengths bracketing those of the TMI-1 steam generator tubes and a range of possible tubesheet annulus geometries and conditions. (Licensee's Test., fol. Tr. 423, at 4.)

53. Hardness tests were performed on TMI-1 archival tubes which had been kinetically expanded in the same manner as the actual tubes in the steam generator. Archival tubes are tubes which were set aside as a matter of record from the same manufacturing lot or heat as those used in the steam generators. (Tr. 384, 441-42, 464-65.)

54. In using archival tubes in the qualification program, including hardness testing, Licensee selected heats of archival tubes which bracketed the range of properties of heats present in the steam generators. Licensee also tested tubing removed from the steam generators to determine that the relevant properties were unchanged such that valid and representative conclusions could be drawn from tests conducted on archival tubing. The tensile strength and ductility were determined quantitatively for TMI-1 tube specimens of varied heats, and compared with preoperational mill specification testing results for the same heats of materials. The specimens which had been in operation at TMI-1 performed within the range of expected behavior for the heat as manufactured. (Tr. 461-64, 514-15, 527, 546-48.) Strip specimens bent around mandrels exhibited the high ductility expected for Inconel-600 and showed no incipient damage. (Tr. 515, 572-73.) An actual TMI-1 tube specimen containing a crack was kinetically expanded, and the crack did not grow. (Tr. 472-75, 515-16.) Retention of yield strength and ductility is expected behavior for Inconel-600 in steam generators. (Tr. 528-48, 634-35.)

55. Hardness testing is done with relatively large equipment, and cannot be performed on the repaired tubes within the steam generator. To measure hardness, tubes would have to be severed, sectioned, and removed from the repaired steam generators. This is an extensive effort which would result in radiation exposure to workers. (Licensee's Test., fol. Tr. 423, at 4; Staff's Test., fol. Tr. 589, at 17.)

56. Inconel-600 tubing maintains its mechanical strength and ductility even after extended service in steam generators, and the material does not become embrittled. Sensitization does not significantly alter the mechanical strength or ductility. (Staff's Test., fol. Tr. 652, at 2-4; Tr. 655-56.)

57. Hardness tests were done on samples within the transition region and the fully expanded region of a kinetic expansion, a rolled expansion, and an unexpanded tube. Archival tubes were used for these

tests. Other hardness tests were performed on actual TMI-1 tubes. (Tr. 441-42, 542-43.)

58. Licensee's witness agreed that archival and actual tube samples were "identical" as far as one could tell in testing. (Tr. 465.) Another witness for Licensee later used the word "identical" in describing samples removed from the steam generators that were characterized in Board questions as "typical" or "representative" of corroded tubes. (Tr. 531.)

59. Of the twenty-seven tubes removed from the steam generators for testing, three heats and at least three tubes were tested for yield stress. (Tr. 572.) These are representative of the tubes remaining in the steam generators. (Tr. 668-69.)

60. Statistically significant differences among results of pull-out load tests were explained as resulting from differences in test conditions, and do not indicate that the tests failed to meet their objectives. (Tr. 567-70.)

Issue 4. Industry Experience with Kinetic Expansion

61. The kinetic expansion seal is an effective means of sealing heat exchanger tubes within tubesheets, whether performed as a field repair or as part of the original fabrication. The industry has had considerable experience with this process in both situations. (Licensee's Test., fol. Tr. 379, at 2.)

62. For a power station (nuclear or fossil), there are different kinds of heat exchangers (e.g., feedwater heaters, moisture separator reheaters), most of which are of the shell and tube type. A TMI-1 steam generator is one type of shell and tube heat exchanger. (Licensee's Test., fol. Tr. 379, at 3.)

63. Foster Wheeler initially used kinetic expansion to support its shop fabrication. Foster Wheeler has expanded some five million tubes. Since 1967, Foster Wheeler has adopted kinetic expansion as the primary means of tube expansion for high-pressure feedwater heaters. Since the mid-Seventies, Foster Wheeler has also applied kinetic expansion routinely to field repairs, including expansions similar to what was done on the TMI-1 steam generators. (Licensee's Test., fol. Tr. 379, at 3-4.)

64. Other manufacturers have used kinetic expansion. (Tr. 490, 511, 620, 630.) Kinetic expansion has been used in Japan, both in manufacturing and as a means of closing crevices. (Tr. 630-32.)

65. The integrity of kinetically expanded joints depends primarily on key parameters (yield strength and ductility), irrespective of whether the process is applied to new equipment during fabrication or to the repair of existing equipment. (Licensee's Test., fol. Tr. 379, at 5.)

B. Contention 1.b

TMIA Contention 1.b asserts the following:

Neither Licensee nor the NRC Staff has demonstrated that the kinetic expansion steam generator tube repair technique, combined with selective tube plugging, provides reasonable assurance that the operation of TMI-1 with the as-repaired steam generator can be conducted without endangering the health and safety of the public, for the following reasons:

* * * * *

b. Because of the enormous number of tubes in both steam generators which have undergone this repair process, (1) the possibility of a simultaneous rupture in each steam generator, which would force the operator to accomplish cooldown and depressurization using at least one faulted steam generator, resulting in release of radiation into the environment beyond permissible levels, "isn't an incredible event," (see, September 19, 1982 memorandum from Paul Shewmon, then Chairman of the ACRS), (2) and could lead to a sequence of events not encompassed by emergency procedures, (3) and in the course of a LOCA, such a scenario could create essentially uncoolable conditions.

66. The Board's Memorandum and Order of June 1, 1984 (unpublished), in partially denying the Licensee's and the Staff's motions for summary disposition of TMIA's Contention 1.b, requested that evidence be presented at the hearing upon whether the kinetic expansion tube repair process increased the probability of simultaneous tube ruptures in both steam generators.

67. A steam generator tube rupture, as it is commonly understood in the industry, cannot take place at or in the vicinity of the repair joint. A break producing a large flow has no room to occur because the new joint is closely confined within the tubesheet hole. Moreover, any leakage would be significantly restricted by the tight crevice formed by the tubesheet hole and the outside of the tube. (Tr. 476-77, 508-10.)

68. Inconel retains its strength and ductility despite previous operation of the steam generators. Test results indicate that the repair itself did not affect strength and ductility. The probability of simultaneous tube ruptures involving both steam generators is not significantly greater now than it was at the time of the original licensing. (Staff's Test., fol. Tr. 652, at 5.)

69. The design basis transients specified for the original design tube-to-tubesheet joint were specified as applicable to the repaired steam generator tube-to-tubesheet joint. The repair joint was qualified by testing and analysis for transients in a postulated main steam line break load of 3140 pounds tension, the maximum design basis loading of the tube-to-tubesheet joint. All other normal operating or postulated accident loadings are enveloped by this loading. Moreover, the only conceivable

failure of the kinetic expansion joint would be by slippage under applied axial load, rather than by tube rupture. (Licensee's Test., fol. Tr. 425, at 3-4; Tr. 509-10.)

70. The kinetic expansion repair produces a new transition zone between the expanded and nonexpanded portions of the tube. A similar transition zone existed previously at the original roll expansion. However, the transition for the kinetic expansion was carefully developed to be more gradual than that of the original shop roll expansion, and, in general, the kinetic expansion process tends to result in less cold working than the roll expansion process. While the residual stresses in the kinetic expansion transition may be slightly higher than those in roll expansions which have experienced the fabrication stress relief heat treatment, residual stresses and the amount of cold working in the kinetic expansion are both less than in nonstress-relieved roll expansion transitions for which there is a considerable body of satisfactory operating experience in nuclear power plants. (Licensee's Test., fol. Tr. 425, at 5; Tr. 410-13, 465-68, 489-97, 506, 634.)

71. The residual stresses within the transition zone are not a concern from a static or fatigue stress standpoint, but could affect the susceptibility of the material to intergranular stress-assisted cracking (IGSAC). The resistance of the kinetic expansion transition zone to IGSAC is demonstrated by operating experience of once-through steam generators containing nonstress-relieved roll expansions, and by Licensee's accelerated and long-term corrosion testing. (Licensee's Test., fol. Tr. 425, at 5; Tr. 497.)

72. To date, there have been no failures, by cracking in the transition zone, of tubes with nonstress-relieved roll expansions in B&W once-through steam generators in service. Short-term (accelerated) corrosion testing, which was performed as part of the TMI-1 qualification program, showed no evidence of cracking in either kinetic or nonstress-relieved roll expansion transitions during the simulated life of the repair when exposed to a caustic (10% NaOH at constant potential) environment. Thus, the likelihood of tube rupture of the new transition due either to loading or IGSAC is no greater than that for tubes currently operating in other once-through steam generators. (Licensee's Test., fol. Tr. 425, at 5-6.)

73. The potential effects of the kinetic expansion process on the balance of the tube were also carefully evaluated. The only effect warranting further analysis was the change in tube preload. The kinetic expansion repair process produces less than a 30-pound decrease in tube preload for normal steam generator tubes. A small percentage of the tubes in

the steam generators may have lost all preload due to the IGSAC completely severing the tube in or near the original roll expansion at the top of the tube. This allowed the tube to slip down slightly and relieve the existing preload in the tube. In some cases, vibrations from nearby kinetic expansions may have contributed to the slipping process. (Licensee's Test., fol. Tr. 425, at 6; Tr. 477-78.)

74. The increase in the compressive load due to loss of any or all of the tube preload when added to the maximum compressive load (which occurs during a normal heatup transient of 100°F/hr) is less than the compressive load required to cause contact between adjacent tubes. Accordingly, there is no increased potential for tube ruptures due to increased wear. Furthermore, the loss of the tube preload does not increase the likelihood of fatigue failure because preload, being a constant load, is not a factor in the fatigue load range and does not reduce natural frequency to a level which would be of concern. Total loss of tube preload reduces the tube natural frequency by approximately 15% which is less than the variation in natural frequency within some individual steam generators. Another plant with similar steam generators operates with tube natural frequencies 15% lower than those expected for TMI-1. Thus, the kinetic expansion repair process does nothing to the balance of the tube to increase the likelihood of tube ruptures. (Licensee's Test., fol. Tr. 425, at 6-7; Tr. 482-83, 499-502.)

75. Even if adjacent bowed tubes could come into contact because of compressive loads, such contact could not occur during steady-state operation because compressive loads adequate to produce bowing would exist only during heatup, which lasts about 8-10 hours. (Tr. 602-03.)

Conclusions of Law

The Board has considered all of the evidence presented by the parties. Based upon a review of the entire record in this proceeding and the foregoing Findings of Fact, the Board concludes that, pursuant to 10 C.F.R. §§ 2.760a and 50.92, the Director of Nuclear Reactor Regulation should be authorized to issue to the Licensee, upon making requisite findings with respect to matters not embraced in this Initial Decision, and subject to the satisfaction of the conditions identified in the Order, *infra*, an amendment to the operating license which revises the technical specifications to recognize steam generator tube repair techniques, other than plugging, specifically the kinetic expansion tube repair technique.

Order

WHEREFORE, IT IS ORDERED, pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's rules and regulations, that the Director of Nuclear Reactor Regulation is authorized to issue to the Licensee an amendment to its operating license which revises the technical specifications to recognize steam generator tube repair techniques, other than plugging, specifically the kinetic expansion tube repair technique, upon making requisite findings with respect to matters not embraced in this Initial Decision. Further, this authorization is subject to the satisfaction of Conditions 1, 2 and 6 as set forth in the Safety Evaluation Report, subject to the satisfaction of Conditions 3 and 4, as modified in Supplement 1 to the SER, and subject also to the satisfaction of the following conditions imposed by the Board in this Order:

1. A duplicate RM-A5 system or suitable equivalent of comparable sensitivity and response time for monitoring radioactive gas in the secondary system shall be installed. The Technical Specifications shall be modified to permit plant operation for a maximum of 28 days with one of these duplicate systems inoperable, and to require plant shutdown if both of these systems are inoperable. As an alternative to the installation of a duplicate system, we direct that the RM-A5 system must be operable at all times during plant operation.
2. In the event of plant operation for an extended period at less than 50% power, the Staff shall require an assessment by the Licensee at the end of 180 days of operation at power levels between 5% and 50%, such assessment to contain recommendations and supporting information as to the necessity of a special eddy current testing (ECT) shutdown before the end of the refueling cycle. Based on this assessment, the Staff shall determine the time of the next ECT, consistent with the other provisions of the license conditions. In the absence of an assessment, a special ECT shutdown shall take place before an additional 30 days of operation at power above 5%.

Pursuant to 10 C.F.R. § 2.760 of the Commission's Rules of Practice, this Initial Decision shall become effective immediately. It will constitute the final decision of the Commission forty-five (45) days from the date of issuance, unless an appeal is taken in accordance with 10 C.F.R. § 2.762 or the Commission directs otherwise. (*See also* 10 C.F.R. §§ 2.764, 2.785 and 2.786.)

Any party may take an appeal from this Decision by filing a Notice of Appeal within ten (10) days after service of this Initial Decision. Each

appellant must file a brief supporting its position on appeal within thirty (30) days after filing its Notice of Appeal (forty (40) days if the Staff is the appellant). Within thirty (30) days after the period has expired for the filing and service of the briefs of all appellants (forty (40) days in the case of the Staff), a party who is not an appellant may file a brief in support of or in opposition to the appeal of any other party. A responding party shall file a single, responsive brief *only* regardless of the number of appellants' briefs filed. (*See* 10 C.F.R. § 2.762.)

THE ATOMIC SAFETY AND
LICENSING BOARD

David L. Hetrick
ADMINISTRATIVE JUDGE

James C. Lamb, III
ADMINISTRATIVE JUDGE

Sheldon J. Wolfe, Chairman
ADMINISTRATIVE JUDGE

Dated at Bethesda, Maryland,
this 31st day of October 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Nunzio J. Palladino, Chairman
Thomas M. Roberts
James K. Asselstine
Frederick M. Bernthal
Lando W. Zech, Jr.

In the Matter of

Docket Nos. 50-322-OL
50-322-OL-4

LONG ISLAND LIGHTING
COMPANY

(Shoreham Nuclear Power Station,
Unit 1)

November 21, 1984

Upon review of the Licensing Board's September 5, 1984 Order authorizing fuel loading and precritical and cold critical testing at the Shoreham Nuclear Power Station, Unit 1, the Commission determines that the order may become effective only after another Licensing Board in this proceeding resolves certain issues remanded to it in ALAB-788, 20 NRC 1102 (1984) in favor of the applicant (or determines that they are not material to low-power testing), and the Staff resolves any remaining uncontested issues. The effectiveness of any Licensing Board order regarding the remanded (ALAB-788) issues is delayed by the Commission until 7 days after issuance.

OPERATING LICENSES: HEALTH AND SAFETY
REGULATIONS (LOW POWER)

Every health and safety regulation is not necessarily applicable to fuel loading and to every phase of low-power operation. Rather, simple logic

and common sense indicate that some regulations should have no application to fuel loading or some phases of low-power operation.

RULES OF PRACTICE: STAY OF AGENCY ACTION (CRITERIA)

In determining whether to grant a stay, the Commission or the adjudicatory boards consider (1) whether the moving party has made a strong showing that it is likely to prevail on the merits; (2) whether the party will be irreparably injured unless a stay is granted; (3) harm to other parties should a stay be granted; and (4) where the public interest lies. 10 C.F.R. § 2.788(e).

NUCLEAR REGULATORY COMMISSION: ADJUDICATORY RESPONSIBILITIES

The Commission is obligated under the Administrative Procedure Act and under principles of fair and efficient administration to act with reasonable dispatch on requests for licenses.

MEMORANDUM AND ORDER

This concerns the request of Long Island Lighting Company (LILCO) for a license authorizing it to engage in fuel loading and low-power testing pursuant to 10 C.F.R. § 50.57(c). On September 5, 1984, the Licensing Board designated to hear and decide LILCO's request (the "Exemption Board") granted LILCO's motion for summary disposition of safety issues related to Phases I and II of low-power testing (fuel loading and precritical and cold critical testing) (LBP-84-35A, 20 NRC 920). When considered along with the Exemption Board's September 19, 1984 Order (unpublished) dismissing physical security contentions, the effect of the Exemption Board's September 5 Order would normally be to permit the NRC Staff to issue a license for Phases I and II. Of course, Staff would also have to resolve any remaining relevant uncontested issues.

In this case, however, two events prevent the Exemption Board's order from becoming immediately effective: the Commission's decision

to conduct an immediate effectiveness review¹ and the Appeal Board's October 31, 1984 Decision in ALAB-788 (20 NRC 1102), which remanded three "minor" issues to the Licensing Board conducting the operating license proceeding (the Brenner Board).² For the reasons stated below, we conclude that the Exemption Board's September 5, 1984 Order may become effective, but only after the Brenner Board determines in writing, with supporting rationale, that issues remanded to it in ALAB-788 either are not material to Phases I and II of low-power operation or that these issues are resolved in favor of LILCO.

The Exemption Board found, based on uncontroverted facts, that no emergency AC power system was required for core cooling during Phases I and II, and thus that no AC power was needed to permit "functioning of structures, systems, and components important to safety," within the meaning of GDC 17. The Board concluded that LILCO should be permitted to conduct fuel loading and low-power testing as proposed in Phases I and II. Order of September 5, 1984, LBP-84-35A, *supra*, 20 NRC at 926.

As we read it, the Exemption Board found in essence that the purpose of GDC 17 — to ensure that there is sufficient AC power to provide core cooling in the event of a postulated accident — has no application to Phases I and II, and that GDC 17 was not intended to apply where there was no reason for its application.³ We agree with the Exemption Board.

In CLI-84-8, we held that "10 C.F.R. § 50.57(c) should not be read to make General Design Criterion 17 inapplicable to low-power operation." (19 NRC at 1155.) By this we meant only that § 50.57(c) does

¹ The Exemption Board referred its decisions to us for our review in light of our statement of May 16, 1984, that "[a]ny initial decision authorizing the grant of an exemption shall not become effective until the Commission has conducted an immediate effectiveness review." CLI-84-8, 19 NRC 1154, 1156.

The instant decision concludes our immediate effectiveness review for Phases I and II. As a separate matter, in an Order of November 19, 1984 (unpublished), we invited the parties to submit to us, by November 29, 1984, their comments concerning the immediate effectiveness of the Exemption Board's October 29, 1984 "Initial Decision" authorizing the grant to LILCO of an exemption from GDC 17 for Phases III and IV (LBP-84-45, 20 NRC 1343).

² In Orders of November 2 and 5, 1984 (unpublished), the Brenner Board directed the parties to file comments by November 15 concerning the effect of ALAB-788 on the issuance of a low-power license, and on any further actions required of the parties and that Board. On November 20, 1984, the Brenner Board conducted a conference with the parties on these issues, and ruled that the pendency of any remanded issues does not affect the possible issuance of a low-power license. The rationale for the Board's ruling is to be set forth in a future Board order.

³ Suffolk and the State argue that the lack of a qualified onsite AC power system violates 10 C.F.R. Part 50, Appendix B, and GDCs other than GDC 17, and that those violations must be adjudicated or exempted prior to issuing an OL. However, all of the other requirements cited are applicable only if GDC 17 requires LILCO to have a qualified onsite AC system for Phases I and II. The Exemption Board held that it did not, and we agree.

not, by itself, carve out an exception from all health and safety regulations that would otherwise be applicable to a low-power license. We did not mean to say, however, that every health and safety regulation, regardless of its purpose or terms, must be deemed fully applicable to fuel loading and to every phase of low-power operation, or that the pressures, temperatures, and other stresses associated with full power must be postulated in evaluating applicability of, or compliance with, regulations for low power. Each regulation must be examined to determine its application and effect for fuel loading and for each phase of low-power operation. Simple logic and common sense indicate that some regulations should, by their own terms, have no application to fuel loading or some phases of low-power operation. Indeed, this was recognized by counsel for Suffolk County in oral argument before us. *See* Oral Argument of May 7, 1984, transcript at 73-74.⁴ The Exemption Board followed this approach in its decision. Under CLI-84-8, our effectiveness review has focused on the special issues that have been raised in this case related to GDC 17. We have not considered the merits of the Exemption Board's September 19, 1984 Order on physical security contentions. Under 10 C.F.R. § 2.764(f), low-power decisions, including the September 19, 1984 Order, may become effective without prior Commission review.⁵

Based upon our review of the parties' comments of September 14, 1984, we also address the factors specified in 10 C.F.R. § 2.788(e): whether the State and County have made a strong showing that they are likely to prevail on the merits; whether there will be irreparable harm to the County and State if no stay is granted; whether LILCO will be harmed by a stay; and where the public interest lies.

We are unpersuaded by the arguments that we have no authority to issue a license for Phases I and II, or by any of the other arguments that have been made to us opposing issuance of the license.⁶ The State and

⁴ We note that Suffolk's counsel recognized in oral argument before us that GDC 4, concerning environmental qualification and missile resistance, is not fully applicable to low-power licenses. We see little distinction in this regard between GDC 4 and GDC 17 in the context of the Phase I and II license authorized by the Exemption Board.

⁵ We note that on November 13, 1984, Suffolk and the State noticed an appeal of the Exemption Board's September 19, 1984 physical security decision, and of its October 29, 1984 Initial Decision.

⁶ Suffolk and New York State argue that the Commission may issue only construction permits and operating licenses because these are the only types of authorizations contemplated by the Atomic Energy Act and by our regulations. The Commission may not, then, authorize an operating license which permits anything less than fuel loading and testing up to 5% of full power. They call the Phase I and II license an illegal "no power license." We reject this argument. The argument ignores the language of § 50.57(c), which defines low-power testing as "operation at *not more than 1 percent of full power for the purpose of testing the facility*" (emphasis added), and long-standing Commission practice of requiring issuance of a license before even fuel loading can be undertaken.

County have not made a strong showing that they are likely to prevail on the merits.

The County and the State argue that although they would not be irreparably injured by the "minimal" irradiation of the plant, issuance of a Phase I and II license would irreparably injure "the integrity" of the licensing proceeding. We interpret this to be an argument that once the Phase I and II license is granted, the eventual issuance of a full-power license is a foregone conclusion. We cannot agree with this implication. A full-power license will issue if and only if the Commission can make the findings that it must make prior to the issuance of such a license. Issuance of the Phase I and II license is completely without prejudice to later decisions on low- or full-power licensing, and we express no opinion at this time whether further licenses for low or full power can or will be issued.

Finally, the State and County have not demonstrated that the public interest will be harmed by the grant of a license for Phases I and II. We are obligated under the Administrative Procedure Act and under principles of fair and efficient administration to act with reasonable dispatch on requests for licenses. The hearing litigation in this case has been long and difficult, and where parts of it have been concluded and findings made, we believe the public interest requires that we accord those findings the legal effect they deserve.

For the above reasons, we have decided to approve the Exemption Board's September 5, 1984 decision, recognizing, as explained above, that no license can issue until some further consideration of the issues remanded in ALAB-788, and until Staff is satisfied with resolution of any remaining uncontested issues. To allow for the orderly processing of any request for expedited judicial review, any written order of the Brenner Board, with supporting reasons, (1) determining that the issues remanded to it are not material to Phases I and II of low-power operation, or resolving these issues on their merits in favor of LILCO, and (2) authorizing issuance of a license for Phases I and II, shall not become effective until 5:00 p.m., Eastern Standard Time, 7 days after the date of the authorizing order.

The Brenner Board's expeditious consideration whether the issues remanded to it in ALAB-788 have any effect on the issuance of a license for Phases I and II is reflected by its orders of November 2, 5, and 20, 1984. The Commission directs the Board to continue its expeditious con-

sideration of this issue by issuing its further order setting forth rationale as soon as practicable.

It is so ORDERED.

For the Commission

JOHN C. HOYLE
Acting Secretary of the
Commission

Dated at Washington, D.C.,
this 21st day of November 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Christine N. Kohl, Chairman
Gary J. Edles
Dr. Reginald L. Gotchy

In the Matter of

Docket Nos. 50-352
50-353

PHILADELPHIA ELECTRIC COMPANY
(Limerick Generating Station,
Units 1 and 2)

November 5, 1984

The Appeal Board denies intervenors' motions that seek a stay of the issuance of a low-power license for the Limerick facility. Treating the motions as requests to suspend the low-power license authorization (because the license had already issued by the time the Appeal Board received the motions), the Appeal Board finds that the stay criteria have not been satisfied and that one of the motions is untimely.

RULES OF PRACTICE: STAY OF AGENCY ACTION
(CRITERIA)

In ruling on a stay request, appeal boards are required by the Commission's Rules of Practice to consider the same four factors traditionally applied by courts in deciding similar motions: (1) whether the moving party has made a strong showing that it is likely to prevail on the merits; (2) whether the party will be irreparably injured unless a stay is granted; (3) whether the granting of a stay would harm other parties; and (4) where the public interest lies. 10 C.F.R. § 2.788(e).

RULES OF PRACTICE: STAY OF AGENCY ACTION (CRITERIA)

The second factor contained in 10 C.F.R. § 2.788(e), irreparable harm, is often the most important in determining the need for a stay. *United States Department of Energy* (Clinch River Breeder Reactor Plant), ALAB-721, 17 NRC 539, 543-44 (1983); *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-437, 6 NRC 630, 632 (1977).

OPERATING LICENSE: LOW-POWER LICENSE (EFFECT ON FULL-POWER LICENSE)

The issuance of a low-power license does not begin an “inexorable” process that threatens the public safety. A full-power license will not and cannot be issued to any utility until it has demonstrated that the plant in question can be operated safely and in accordance with myriad regulatory requirements.

OPERATING LICENSE: LOW-POWER LICENSE (SUSPENSION)

If a safety problem is revealed at any time during low-power operation or as a result of the merits review of a party’s appeal of authorization of that operation, the low-power license can be suspended. *See, e.g., Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Unit 1), CLI-81-30, 14 NRC 950 (1981).

OPERATING LICENSE PROCEEDINGS: ECONOMIC ISSUES

The Commission’s long-held view on economic concerns is that they are not within the proper scope of issues litigated in NRC licensing proceedings. A nuclear plant’s possible effect on rates, the utility’s solvency and the like are best raised before state economic regulatory agencies. *Public Service Co. of New Hampshire* (Seabrook Station, Unit 2), CLI-84-6, 19 NRC 975 (1984).

RULES OF PRACTICE: STAY OF AGENCY ACTION (TIMELINESS OF REQUEST)

Under 10 C.F.R. §§ 2.788(a) and 2.710, a party is obliged to seek a stay within 15 days of the service date of a licensing board decision.

RULES OF PRACTICE: STAY OF AGENCY ACTION

A party's motion for stay will be denied where the movant wholly fails to address the stay criteria of 10 C.F.R. § 2.788(e). *See Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-493, 8 NRC 253, 270-71 (1978).

APPEARANCES

Robert L. Anthony, Moylan, Pennsylvania, for intervenor Friends of the Earth.

Robert J. Sugarman, Philadelphia, Pennsylvania, for intervenor Del-Aware Unlimited, Inc.

Troy B. Conner, Jr., Mark J. Wetterhahn, and Robert M. Rader, Washington, D.C., for applicant Philadelphia Electric Company.

Benjamin H. Vogler and Ann P. Hodgdon for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

In its second partial initial decision in this operating license proceeding, the Licensing Board authorized the issuance of a low-power license to applicant Philadelphia Electric Company (PECo). LBP-84-31, 20 NRC 446 (1984).¹ In two subsequent orders, the Board declined to stay, and reaffirmed as well, the effectiveness of its low-power license authorization. Licensing Board Order of September 7, 1984 (unpublished); Licensing Board Memorandum and Order of October 15, 1984 (unpublished). In filings dated October 23 and 25, 1984, intervenors Friends of the Earth (FOE) and Del-Aware Unlimited, Inc., have asked us to stay, respectively, LBP-84-31 and the Board's October 15 order.² Although their precise requests differ, FOE and Del-Aware both seek the same ul-

¹ A low-power license permits fuel loading and low-power testing up to five percent of rated power.

² FOE has also appealed LBP-84-31 and a related order, and Del-Aware has appealed the Board's October 15 order.

timiate relief — a stay of the issuance of a low-power license to PECO. Applicant and the NRC staff oppose intervenors' requests.

On October 26, however — unbeknown to us and before we had received either stay request — the NRC's Director of Nuclear Reactor Regulation (NRR) issued a low-power license to PECO.³ Thus, in an order issued October 29, 1984, we indicated that we would treat the two stay requests as motions to suspend the underlying authorization for the license, and we expedited the time for filing replies. We also noted that the criteria applicable to deciding stay requests would apply.

As explained below, both FOE and Del-Aware have failed to satisfy their burden of demonstrating that PECO's low-power license should be suspended. Accordingly, we deny the motions.

1. In ruling on a stay request, we are required by the Commission's Rules of Practice to consider the same four factors traditionally applied by the courts in deciding similar motions:

- (1) Whether the moving party has made a strong showing that it is likely to prevail on the merits;
- (2) Whether the party will be irreparably injured unless a stay is granted;
- (3) Whether the granting of a stay would harm other parties; and
- (4) Where the public interest lies.

10 C.F.R. § 2.788(e). Further, in several decisions, we have noted that the second factor, irreparable harm, is often the most important in determining the need for a stay. *United States Department of Energy* (Clinch River Breeder Reactor Plant), ALAB-721, 17 NRC 539, 543-44 (1983); *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-437, 6 NRC 630, 632 (1977).

FOE has attempted, albeit briefly, to satisfy these criteria. It argues that (1) the reactor building is not able to withstand overpressures from postulated external explosions; (2) fuel was brought into the plant in violation of NRC regulations, the Atomic Energy Act, and the National Environmental Policy Act; and (3) once Limerick begins to operate, an inexorable process will start, which will threaten safety, increase electric rates, impair the region's economy, and force FOE's representative (Robert L. Anthony) to move from the area. FOE acknowledges that a stay will delay testing at Limerick, but contends that the safety and economic concerns it has raised must take precedence.

FOE provides no citations to the record or substantive argument in support of its view that the reactor building is not able to withstand over-

³ We do not suggest that the Director acted improperly in issuing the license.

pressures from external explosions. The Licensing Board addressed this matter at length during the hearing and in LBP-84-31 and a subsequent order denying FOE's motion to reopen on this issue. See LBP-84-31, *supra*, 20 NRC at 464-97; Licensing Board Order of October 5, 1984 (unpublished). We have reviewed the Board's decision in this regard and, although we express no view on the merits of FOE's appeal, see no cause to suspend the low-power license on this basis.

As for the assertedly unlawful delivery and transfer of the fuel into the plant, we ourselves have discussed this matter at length on two earlier occasions. See ALAB-765, 19 NRC 645 (1984); ALAB-778, 20 NRC 42 (1984). FOE gives us no basis on which we could alter our earlier judgment that the fuel was moved properly and does not present a safety risk. As FOE has pointed out, this matter (specifically, review of ALAB-765) is pending before the U.S. Court of Appeals for the Third Circuit. *Anthony v. Philadelphia Electric Co.*, No. 84-3409 (3d Cir. filed June 28, 1984). The court, however, denied Mr. Anthony's request for a stay on July 12, 1984.

FOE is mistaken in its belief that issuance of a low-power license begins an "inexorable" process that threatens the public safety. In the first place, a full-power license will not and cannot be issued to any utility until it has demonstrated that the plant in question can be operated safely and in accordance with myriad regulatory requirements.⁴ Further, if a safety problem is revealed at any time during low-power operation or as a result of the merits review of the parties' appeals, the low-power license can be suspended. See, e.g., *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Unit 1), CLI-81-30, 14 NRC 950 (1981). With respect to the economic concerns noted by FOE in this connection, they are not within the proper scope of issues litigated in NRC proceedings. The Commission has just recently reaffirmed its long-held view that a nuclear plant's possible effect on rates, the utility's solvency, and the like is best raised before state economic regulatory agencies. *Public Service Co. of New Hampshire* (Seabrook Station, Unit 2), CLI-84-6, 19 NRC 975 (1984). And, finally, an individual's decision to move away from the vicinity of a nuclear plant is necessarily a personal one.

FOE has therefore failed to show that it is likely to prevail on the merits of its appeal and that it will be irreparably harmed unless the low-power license is lifted. Nor has it shown that such action is within the public interest.

⁴ The Licensing Board has not yet completed the hearing on issues that must be resolved before a full-power license can be issued.

Even if FOE had succeeded in its burden, however, its October 23 request is untimely under the Commission's rules and could be denied on that ground as well. FOE has requested a stay of LBP-84-31, which was issued August 29. Under 10 C.F.R. §§ 2.788(a) and 2.710, FOE was obliged to seek a stay within 15 days of the service date of that decision — i.e., by September 13. FOE's motion to reopen, then pending before the Licensing Board, did not stay the effectiveness of the Board's unequivocal low-power license authorization embodied in LBP-84-31. Further, FOE was so advised of this in the Licensing Board's Order of September 7, *supra*. The delayed filing of FOE's appeal, pursuant to our permission, also did not stay the effect of LBP-84-31 or extend the time for seeking such a stay. See Appeal Board Order of September 28, 1984 (unpublished).

2. In ALAB-785, 20 NRC 848 (1984), we affirmed most of the Licensing Board's earlier partial initial decision and related orders concerning the supplementary cooling water system (SCWS) for Limerick. We remanded, in part, however, in order to give Del-Aware the opportunity to reformulate and to resubmit two of its SCWS contentions that the Board had excluded from consideration. *Id.* at 866-70, 874-76, 885. Following the issuance of ALAB-785, PECO asked the Licensing Board to confirm that, despite the partial remand of SCWS issues, the low-power license authorized in LBP-84-31 could nonetheless be issued. After obtaining the parties' comments on this matter, the Licensing Board agreed with PECO and reaffirmed the effectiveness of the license authorization made in LBP-84-31. Licensing Board Order of October 15, *supra*. It is that ruling that Del-Aware asks us to stay.

Del-Aware makes no effort to address the four factors in 10 C.F.R. § 2.788(e) pertinent to our decision. It asserts generally and without citation to the record that operation of the Limerick facility "may" be dependent on operation of the supplementary cooling water system. It claims further that supplemental cooling water is necessary for the safe shutdown of the plant in the event that a tornado were to destroy the cooling tower. In conclusion, Del-Aware simply states that "[a] stay is necessary and appropriate because of the environmental and safety implications of the low power testing without the supplemental cooling water system, as set forth in Intervenor's Answer to Applicant's Motion (dated October 10, 1984)."⁵

⁵ The other pleading to which Del-Aware refers, without even any particular page citations, is as generalized in its arguments as is the motion before us here.

PECO argues that Del-Aware lacks standing to make the arguments put forth in its petition for stay and that we lack jurisdiction to rule on them. We need not decide either question, inasmuch as we find
(Continued)

The Licensing Board earlier explained to Del-Aware that the SCWS is not needed even for *full-power* operation during certain times of the year (e.g., the fall through spring months) and that it is not needed at all for safe shutdown of the plant. A fortiori, the SCWS is not necessary for low-power operation. See Licensing Board Memorandum and Order of August 24, 1984 (unpublished), at 23-25. See also LBP-84-31, *supra*, 20 NRC at 492; Letter from V.S. Boyer to A. Schwencer (Oct. 19, 1984), attached to Applicant's Opposition to Motions for Stay (Nov. 2, 1984). Having wholly failed to show any error in the Board's reasoning, Del-Aware has not persuaded us that a suspension of the low-power license is warranted. Del-Aware's motion is therefore denied. See *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-493, 8 NRC 253, 270-71 (1978).

FOE's motion for a stay of LBP-84-31 and Del-Aware's petition for a stay of the Licensing Board's October 15, 1984, order, treated as requests to suspend the underlying low-power license authorization, are *denied*.

It is so ORDERED.

FOR THE APPEAL BOARD

Barbara A. Tompkins
Secretary to the
Appeal Board

no basis to grant Del-Aware's stay request. PECO remains free to raise these issues again in response to Del-Aware's brief on appeal. We note, however, our preliminary view that Del-Aware's arguments — though vague and generalized — thus far clearly relate to the SCWS that it challenged below, we addressed in ALAB-785, and the Licensing Board considered again in its appealable October 15 order in response to PECO's own motion.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Alan S. Rosenthal, Chairman
Gary J. Edles
Dr. Reginald L. Gotchy

In the Matter of

Docket Nos. 50-338-OLA-2
50-339-OLA-2

VIRGINIA ELECTRIC AND
POWER COMPANY
(North Anna Power Station,
Units 1 and 2)

November 20, 1984

Determining that, in the particular circumstances of the case, the appellant had sustained no present or potential injury by the Licensing Board's denial of its intervention petition, the Appeal Board dismisses its appeal from that denial.

NEPA: ENVIRONMENTAL IMPACT STATEMENT (NEED)

Section 102(2)(C) of the National Environmental Policy Act of 1969, 42 U.S.C. 4332(2)(C), requires a federal agency to prepare an environmental impact statement (EIS) in every recommendation or report on proposals for legislation or other major federal actions significantly affecting the quality of the human environment. If, however, after an initial environmental assessment, the agency determines that no significant impact will result from a proposed action, without additional analysis it may publish a statement indicating that such is the case.

RULES OF PRACTICE: STANDING TO APPEAL

It is well-settled that in Commission practice as in judicial proceedings, only a party aggrieved may appeal. *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 & 2), ALAB-644, 13 NRC 903, 914 (1981), and cases there cited.

APPEARANCES

James B. Dougherty, Washington, D.C., for Concerned Citizens of Louisa County.

Michael W. Maupin, Patricia M. Schwarzschild and Marcia R. Gelman, Richmond, Virginia, for the Virginia Electric and Power Company.

Henry J. McGurren for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

Concerned Citizens of Louisa County (CCLC) has appealed under 10 C.F.R. 2.714a from a portion of the Licensing Board's October 15, 1984 memorandum and order entered in two related proceedings involving proposed amendments to the operating licenses for the North Anna nuclear facility. In that order, the Board admitted CCLC as a party to one of those proceedings but denied it intervenor status in the other. Before us, CCLC urges that it was entitled to intervene in both. It appearing, however, that CCLC has sustained no present or potential injury in fact as a consequence of the challenged action below, we dismiss the appeal.¹

I.

The two license amendments in question are desired by the applicant Virginia Electric and Power Company (VEPCO) to ameliorate a severe

¹ We accordingly do not reach the merits of either CCLC's attack upon the October 15 order or the insistence of the applicant and the NRC staff that the order should be affirmed.

spent fuel storage problem at its Surry nuclear facility located near Newport News, Virginia. The first of the amendments, referred to as "OLA-1," would permit the receipt and storage of 500 Surry spent fuel assemblies at VEPCO's North Anna nuclear facility, located in Louisa County, Virginia, approximately 100 miles from Surry. The second amendment, referred to as "OLA-2," would permit the expansion of the capacity of the North Anna spent fuel pool to enable it to accommodate the received Surry assemblies.²

Insofar as here relevant, CCLC sought intervention in the OLA-1 and OLA-2 proceedings on the strength of identical contentions:

The proposed license amendment constitutes a major federal action significantly affecting the human environment, and thus may not be granted prior to the preparation of an environmental impact statement[;]

Neither VEPCO nor the NRC [s]taff has adequately considered the alternative of constructing a dry cask storage facility at the Surry station [; and]

The Environmental Assessment prepared by the NRC [s]taff is inadequate in [that] . . . it does not evaluate the risks of accidents (including sabotage) involving Surry-North Anna shipments[,] . . . the consequences of [such] credible accidents . . . [, and] the alternative of constructing a dry cask storage facility at the Surry station.³

Further, in large measure, the bases assigned in each proceeding for the contentions were the same. According to CCLC, the packing and transportation of the Surry assemblies will entail substantial safety and environmental risks.⁴ For this reason, CCLC maintained, the NRC staff was required by the National Environmental Policy Act of 1969⁵ to prepare a full environmental impact statement in which, among other things, it considered the alternative of constructing a dry cask storage facility at Surry.⁶

² This expansion would be accomplished by replacing the high-density fuel racks currently installed in the North Anna pool with neutron absorber fuel racks. The change would increase storage capacity of the spent fuel pool from 966 to 1737 fuel assemblies. Environmental Assessment, attached to July 3, 1984 letter from D. Hassel to Licensing Board, at 2.

³ Attachment to letter from J. Dougherty to Licensing Board (July 30, 1984) (hereafter Contentions) at 1, 3, 4, 6, 7, 8.

⁴ *Id.* at 1, 6.

⁵ 42 U.S.C. 4321. Section 102(2)(C) of that Act, 42 U.S.C. 4332(2)(C), requires a federal agency to prepare an environmental impact statement (EIS) "in every recommendation or report on proposals for legislation or other major Federal actions significantly affecting the quality of the human environment." A full EIS, however, is not always necessary. If, after an initial environmental assessment, the agency determines that no significant impact will result from a proposed action, without additional analysis it may publish a statement indicating that such is the case. This is what occurred in this instance. The NRC staff performed a single environmental assessment that considered both proposed license amendments and concluded that a complete EIS was unnecessary because neither amendment would have a significant environmental impact.

⁶ Contentions at 3, 4-5, 7-9.

With regard to the North Anna spent fuel pool, CCLC did not contend that the proposed modification would pose safety risks; nor did it identify any significant environmental impact that conceivably might flow from the modification. CCLC did assert, however, that the two sought amendments were so closely related that they could not be separated for purposes of environmental analysis.⁷

In its October 15 order, the Licensing Board concluded that the contentions and assigned bases were sufficient to allow CCLC's intervention in the OLA-1 proceeding concerned with the receipt and storage at North Anna of the Surry spent fuel. It reached, however, the diametrically opposite result with respect to the OLA-2 proceeding. As the Board saw it, the bases assigned for the contentions were inadequate to allow CCLC to be heard with regard to the proposed modification of the North Anna spent fuel pool. Thus, CCLC's petition to intervene in the OLA-2 proceeding was denied and, there being no other petitioners for intervention, the proceeding was dismissed.⁸

II.

It is well-settled that, "[i]n Commission practice as in judicial proceedings, only a party aggrieved may appeal."⁹ In the unique circumstances of this proceeding, we are satisfied that CCLC cannot be deemed aggrieved by the rejection of its endeavor to intervene in the OLA-2 proceeding. Our conclusion in this regard rests upon the following factors:

1. As we have seen, none of the three contentions that CCLC advanced in the OLA-2 proceeding is founded upon a particularized claim that the modification of the North Anna spent fuel pool might pose a health and safety risk to CCLC members or have a significant environmental impact. Rather, it is clear from the bases assigned for the contentions that CCLC's entire focus is upon the risks assertedly associated with the packing and transportation of the Surry spent fuel assemblies. Having been admitted (on the footing of the very same three contentions) to the OLA-1 proceeding which is specifically addressed to the receipt and storage of the assemblies at North Anna, CCLC will have a full opportunity to litigate those concerns before any of the assemblies might be packed and transported.

⁷ *Id.* at 6.

⁸ Memorandum and Order of October 15, 1984, *supra*, at 9.

⁹ *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 & 2), ALAB-644, 13 NRC 903, 914 (1981), and cases there cited.

2. Consequently, the only practical effect of the challenged action below is that the modification of the North Anna spent fuel pool might take place before the Licensing Board determines whether the receipt and storage of the Surry assemblies at North Anna should be authorized. Because, however, CCLC at least implicitly acknowledges that it would not have significant safety or environmental implications, the undertaking of the modification at this time perforce could occasion no harm to the organization or its members.

3. Finally, the OLA-2 authorization cannot affect to any extent either (a) CCLC's right to participate in the OLA-1 proceeding on the matters of concern to it; or (b) the outcome of that proceeding. As a matter of both fact and law, a modification of the North Anna spent fuel pool can and will have no bearing upon whether, over CCLC's objections, VEPCO is given the green light to transport the Surry assemblies for receipt and storage at North Anna. To the contrary, the fate of the OLA-1 application necessarily will hinge entirely upon the results of the independent safety and environmental appraisal of the receipt and storage proposal.¹⁰

For the foregoing reasons, CCLC's appeal from the Licensing Board's October 15, 1984 memorandum and order is *dismissed*.¹¹

It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the
Appeal Board

¹⁰ See *Duke Power Co.* (Transportation of Spent Fuel from Oconee Nuclear Station for Storage at McGuire Nuclear Station), ALAB-651, 14 NRC 307, 313-15 (1981). In this connection, it matters not that CCLC maintains that the environmental effects of the two proposals should be "summed" (i.e., added together). For, to repeat, CCLC pointed to no impact of the spent fuel pool modification that might be added to the asserted environmental impact of the receipt and storage proposal.

¹¹ This action moots CCLC's request for a stay *pendente lite* of the Licensing Board's dismissal of the OLA-2 proceeding and resultant authorization of the issuance of the pool modification license amendment.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Peter B. Bloch, Chairman
Herbert Grossman, Esq.
Dr. Walter H. Jordan

In the Matter of

Docket Nos. 50-445-OL-2
50-446-OL-2
(ASLBP No. 79-430-06A-OL)

TEXAS UTILITIES ELECTRIC
COMPANY, *et al.*
(Comanche Peak Steam Electric
Station, Units 1 and 2)

November 2, 1984

The Licensing Board vacates its order of September 17, 1984 (LBP-84-36, 20 NRC 928).

MEMORANDUM
(Request for Staff Analysis)

Pursuant to the suggestion of the Office of Investigation (OI) in its memorandum of October 25, 1984, we vacate our September 17, 1984 Order (LBP-84-36, 20 NRC 928) concerning OI documents. We also request the Staff to inform the Board about an appropriate deadline within which the Staff will advise the Board of its view whether all or part of the nineteen reports at issue (as well as other in-process OI investigations) are potentially relevant and material to the licensing proceeding,

including issues of intimidation and of management commitment to quality. We would appreciate the Staff taking special pains to explain, objectively and in as much detail as possible without violating confidences or rights to personal privacy, the possible relevance of all or part of the deleted materials.

ORDER

It is so ORDERED.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Morton B. Margulies, Chairman
Gustave A. Linenberger, Jr.
Dr. Oscar H. Paris

In the Matter of

Docket Nos. 50-424-OL
50-425-OL
(ASLBP No. 84-499-01-OL)

GEORGIA POWER COMPANY, *et al.*
(Vogtle Electric Generating
Plant, Units 1 and 2)

November 5, 1984

In this Memorandum and Order, the Licensing Board rules on Intervenor's objections to its Memorandum and Order deciding the admissibility of Intervenor's contentions. LBP-84-35, 20 NRC 887 (1984).

The Licensing Board further rules that Intervenor's request for an investigation into Applicants' practices provides no basis for broadening an existing contention relating to Applicants' quality assurance program.

MEMORANDUM AND ORDER

(Ruling on Intervenor's Objections to Order of September 5, 1984,
and Other Matters)

On September 5, 1984, we issued a Memorandum and Order, in the captioned proceeding ruling on the admissibility of proposed contentions of Intervenor's Campaign for a Prosperous Georgia and Georgians Against Nuclear Energy. LBP-84-35, 20 NRC 887 (1984). Intervenor's

timely filed objections on September 27, 1984, to the Board's rulings on Contentions 10.2 and 11. Pursuant to our recommendation Intervenor had consolidated their efforts and are acting jointly. We consider their contentions consolidated and movants as joint intervenors, hereinafter to be referred to as CPG/GANE.

Applicants, Georgia Power Company and the other owners, in accordance with our order, filed a reply to Intervenor's objections on October 12, 1984, and Nuclear Regulatory Commission Staff (Staff) did so on October 22, 1984.

In our Memorandum and Order of September 5, 1984, we asked the parties to confer for the purpose of rewording Contention 8, which relates to quality assurance. They were unable to agree and instead filed statements of position. This subject will be treated in this Memorandum and Order along with that above and a schedule will be set forth for submitting contentions on emergency planning for Plant Vogtle.

CONTENTION 10.2

Intervenor had asserted for their subcontention that synergistic effects in environmental qualification of equipment had not been considered by Applicants. We found Applicants had addressed synergistic effects on cable and that Intervenor had not identified any equipment or components which they believed to be susceptible to synergisms, and to which a contention would be directed. The subcontention was found to lack a specific basis and its admissibility was denied.

The September 27, 1984 objection to our ruling was in the nature of a petition for reconsideration. It offered nothing in support of their position that had not been previously submitted and considered. They continue not to identify any equipment or components that are alleged to be subject to environmental qualification requirements and for which synergism has a significant effect on equipment performance. Intervenor has not presented us with any valid grounds that would warrant the reconsideration of our prior ruling. The subcontention remains without basis and we reaffirm our prior ruling.

CONTENTION 11

Intervenor asserted in the proposed contention that Applicants failed to consider defects in the Vogtle steam generator system that constitute an undue risk to health and safety. In support, CPG/GANE cited an NRC summary of Unresolved Safety Issues (August 20, 1982) that

stated that the steam generator tubes, of a manufacturer that was to supply those for Plant Vogtle, had shown degradation from several causes.

To overcome some of the causes, the Vogtle FSAR recited specific measures which are to be taken to protect against water hammer effects and corrosion effects that include denting and stress corrosion cracking in the steam generator tubes. Intervenors failed to indicate in what specific manner any of these corrective measures, adopted by Applicants to overcome the possible deficiencies, are inadequate. Cited unresolved safety issues, consisting of bubble collapse or vibration-induced fatigue cracking mechanisms for tube degradation that could contribute to accidents associated with tube failure occasioned by these mechanisms were not addressed by Applicants in the FSAR.

Absent the submittal of basis by Intervenors to support a claim that deficiencies will exist in the Vogtle steam generator system arising from water hammer effects or corrosion effects, we narrowed the scope of Contention 11 to address only bubble collapse and vibration-induced fatigue cracking mechanisms for tube degradation.

Intervenors' objection to the Board's ruling is nothing more than a repetition of their original assertions made in support of the contention, which we found wanting. They provide no grounds for the Board to reconsider its prior ruling, which is affirmed.

CONTENTION 8

In our Memorandum and Order of September 5, 1984, we determined that further inquiry was justified to determine whether Applicants have formulated and implemented an adequate quality assurance program for the facility. At that time CPG and GANE were individually participating in the proceeding. We found grounds to admit a contention of CPG (CPG Contention 8) whose interest was in the area of welds; and of GANE (GANE Contention 8), the scope of which extended to matters in addition to welds. We instructed the parties to confer about the language of the contentions with the objective of rewording them in a manner that would permit more focused litigation on the issue. CPG and GANE were asked to consider consolidating the two contentions.

The parties reported back to the Board that their efforts have been unsuccessful. CPG/GANE on October 10, 1984, submitted a revised contention on quality assurance covering "proper welding, placement of concrete, the use of properly trained personnel, inspection/testing, material preservation, procurement, and adequate and complete corrective action in response to violations." Applicants proposed that the scope of

the contention be limited to welding of both the reactor coolant and containment systems. Staff asserted that the CPG/GANE revised contention was overly broad and lacked specificity. Its position was that the CPG contention involving welds, that had been initially submitted, was close to admissibility.

Our review of the bases previously submitted by CPG and GANE to support the contentions on quality assurance, in the area of welds, found them to be sufficient to raise the issue in a broad context extending to such matters as inspection and the adequacy of radiographs made of the welds. Additional bases exist for a contention focusing on improperly documenting the placement of concrete, the inadequate testing of concrete and falsification of concrete quality test records. Sufficient grounds were provided for inquiry into the procurement practices of the Applicants insofar as they may result in the acquisition of substandard materials and into whether corrective action by Applicants is timely accomplished. Another area warranting development in the quality assurance program is whether Applicants' procedures for the protection of equipment are followed.

Intervenors have provided the grounds for a litigable contention in the specified areas, as to the adequacy of Applicants' quality assurance program for safely operating the subject facility.

CPG/GANE in their October 10, 1984 submittal, seek amendment of the bases for Contention 8 in the area of Applicants' procurement practices predicated upon two newspaper articles, of late August and early September 1984. The articles raised the possibility of costs having been increased for the Vogtle facility because of favoritism in the bidding process having been extended to a supplier of the Applicants, through the unauthorized release of bid information. Georgia Power Company discharged seven employees because of the practice. Intervenors request that an investigation be pursued to ascertain if the alleged favoritism extended to the quality of materials and to ascertain why the quality assurance program did not uncover the program deficiency long ago.

Applicants object to the amendment because Intervenors do not allege any connection between the procurement irregularities and Applicants' quality assurance program. They claim no link is established between the irregularities and the need for an investigation. The owners contend that the request to amend the bases for Contention 8 is inexcusably late and untimely. Furthermore, in an affidavit submitted by the Vice-President and Project General Manager of the Vogtle Project, it was stated that Georgia Power Company conducted an investigation which disclosed that the bidding practices primarily involved the purchase from one vendor of expendable supplies, which were not part

of the power plant structure and systems and not related to the quality of the plant. It was further recited that there was a minimal amount of safety-related work and material provided by the vendor, which audits and reviews by Georgia Power Company disclosed conformed to quality standards. Affiant reported that Georgia Power Company had also determined that adequate controls existed and were applied at Plant Vogtle to ensure that the subject vendor met the requirements of the engineering requisitions and purchase orders.

In a response of October 22, 1984, Staff believes that Intervenor's requested amendment of the bases of Contention 8 "is a step in the direction of providing a basis for a properly focused contention on whether the recent firing of seven of Applicants' workers and alleged favoritism to equipment suppliers extends to or affects the quality of the materials purchased from the suppliers in question or other suppliers." Staff suggests that the Board grant the parties additional time within which to attempt to agree on the wording of a Contention 8 limited to the recent allegations reported in the press.

The Board finds no grounds to permit the amendment of the bases underlying Contention 8, as sought by CPG/GANE. The newspaper articles on which the request is predicated do not in any way relate the reported procurement irregularities to any safety inadequacies at Plant Vogtle. A concern expressed in the articles was how the practices affected the costs of the plant and their being passed on to ratepayers. The purpose of the Commission's requirement for a quality assurance program is to assure the safe operation of the plant and is not imposed to promote cost effectiveness. Intervenor's recognized the absence of an established nexus between the procurement irregularities and plant safety. At this stage what they seek is an investigation to determine if any exists. In that Applicants reported the findings of their investigation after Intervenor's request was made, it is unknown whether CPG/GANE now consider that further inquiry is unnecessary.

The request for an investigation does not provide the basis for broadening a litigable contention dealing with the merits of an existing quality assurance program. It would be premature to base a contention on matters that are wholly in the realm of speculation and may be non-existent. For that reason we deny the request to amend the bases of the contention, as requested.

Evidently Staff believes an investigation might establish a link between Applicants' procurement practices and the effectiveness of their quality assurance program. The action we have taken here should not in any way be construed as dissuading Staff from making an inquiry into this area. Licensing of the plant is dependent on Applicants' ability to operate

the plant safely. We should be advised of the results of any inquiry Staff makes and informed if action is required by the Board.

Based upon our findings in the Memorandum and Order of September 5, 1984, and the above, we restate the consolidated CPG/GANE Contention 8 as follows:

Applicants have not and will not implement a quality assurance program for Plant Vogtle for welding, for properly documenting the placement of concrete, for adequately testing concrete, for the preparation of correct concrete quality test records, for procuring material and equipment that meet applicable standards, for protecting equipment and for taking corrective action as required, so as to adequately provide for the safe functioning of diverse structures, systems and components, as required by 10 C.F.R. Part 50, Appendix B, such that reasonable assurance exists that operation of the facility will not endanger the public health and safety.

CONTENTIONS ON EMERGENCY PLANNING

In the September 5, 1984 Memorandum and Order, Intervenorrs were authorized to submit revised contentions on emergency planning, within 30 days of Applicants' issuance of the emergency plans. It was expected Applicants would do so about October 1, 1984. Applicants now expect to file onsite emergency plans in December 1984. Official State and county emergency plans are expected to be filed in May 1985 but a draft is expected to be made available before then. The parties have agreed and we concur that any CPG/GANE contentions relating to onsite emergency plans and the arrangements which Applicants have made with the Department of Energy Savannah River Project, concerning the latter's response within the Savannah River site to an emergency at Vogtle, shall be filed within 30 days after each of the respective filings are made with the parties. Contentions related to the State and county emergency plans shall be due within 30 days of the time of their filing with the parties, or if draft plans are provided, within 30 days after furnishing of the draft.

Order

Based upon all of the foregoing, it is hereby Ordered:

1. Intervenorrs' objections to the Board's Rulings on Contentions 10.2 and 11, in the Memorandum and Order of September 5, 1984, are overruled.
2. Intervenorrs' Contention 8 is restated and admitted as set forth above. The request to amend the bases of Contention 8 is denied.

3 The time for filing revised contentions on emergency planning is as set forth above.

**THE ATOMIC SAFETY AND
LICENSING BOARD**

**Morton B. Margulies, Chairman
ADMINISTRATIVE LAW JUDGE**

**Gustave A. Linenberger, Jr.
ADMINISTRATIVE JUDGE**

**Dr. Oscar H. Paris
ADMINISTRATIVE JUDGE**

**Dated at Bethesda, Maryland,
this 5th day of November 1984.**

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Peter B. Bloch, Chairman
Herbert Grossman, Esq.
Dr. Walter H. Jordan**

In the Matter of

**Docket Nos. 50-445-OL-2
50-446-OL-2
(ASLBP No. 79-430-06A-OL)**

**TEXAS UTILITIES ELECTRIC
COMPANY, *et al.*
(Comanche Peak Steam Electric
Station, Units 1 and 2)**

November 16, 1984

The Licensing Board refuses to honor a grant of privilege for some documents created by Joseph J. Lipinsky and said to be covered by attorney-client privilege. The Board finds that Applicants' lawyer could not properly represent Mr. Lipinsky, who had previously taken a position adverse to Applicants' and who therefore had an irreconcilable conflict of interest. In addition, the Board honors a limited claim of privilege for documents for which attorney work product privilege was claimed but denies the privilege for other documents for which the Board found an overriding interest in obtaining the documents because of their importance in the proceeding.

RULES OF PRACTICE: EVIDENCE (ATTORNEY-CLIENT PRIVILEGE)

Documents are not privileged pursuant to an attorney-client privilege if they were generated in the course of an attorney-client relationship that appeared to exist but could not exist because of an irreconcilable conflict-of-interest. An attorney-client relationship cannot be used to draw down a mask of secrecy over an attorney's relationship with an individual whose position was adverse to the position of another client whom the attorney continues to represent.

RULES OF PRACTICE: EVIDENCE (WORK PRODUCT PRIVILEGE)

A claim of work product privilege may be overridden with respect to documents for which there is an important evidentiary need.

MEMORANDUM **(Lipinsky Privileges)**

I. INTRODUCTION

The "O.B. Cannon issue" arose in this case because of an internal O.B. Cannon memorandum (Lipinsky Memorandum) that mysteriously "leaked" and became public knowledge. That memorandum was prepared by Mr. Joseph J. Lipinsky, who was O.B. Cannon's quality assurance manager. The information contained in the memorandum was collected by Mr. Lipinsky in fulfillment of O.B. Cannon's contractual commitment to review Comanche Peak's painting program as a consultant to Applicants' management.

Among the more damaging conclusions stated in the Lipinsky Memorandum are:

preliminary assessment that Comanche Peak has problems in the areas of material storage, workmanship (quality of work and painter qualification and indoctrination), not satisfying ANSI requirements and possibly coating integrity.

* * *

to some extent a parallel can be drawn with Comanche Peak and Zimmer. Comanche Peak is doing inspections to the degree that they . . . are comfortable or will tolerate.

* * *

often the writer felt that B&R wanted to buy the "right" answer. This is substantiated to some extent by the fact that they did not try to utilize the expertise and/or experience of the writer with regard to Quality Assurance/Quality Control, and the attitude of the B&R management (specially Quality Assurance).

Subsequent to this "leak," Mr. Lipinsky met with Applicants' personnel and lawyers. For a substantial portion of this time, Mr. Lipinsky appears to have continued to assert the validity of his conclusions. However, when he appeared for a sworn statement before a Nuclear Regulatory Commission (NRC) investigator, he was represented personally by a lawyer who also represents Applicants. In that interview and subsequently, Mr. Lipinsky testified that his preliminary conclusions were hastily drawn and do not raise serious problems.

The Board is concerned about whether Mr. Lipinsky's preliminary conclusions may be correct and about the process through which Mr. Lipinsky appears to have changed his mind.

Accordingly, on October 4, 1984, the Atomic Safety and Licensing Board in the harassment/intimidation portion of the operating license proceeding issued subpoenas duces tecum to O.B. Cannon executive personnel Robert B. Roth, John J. Norris, and Joseph J. Lipinsky. The Board's subpoenas requested the production of

All records, including notes or recordings, in the possession or control of O.B. Cannon or its agents and relating directly or indirectly to: (1) work planned, discussed or conducted by O.B. Cannon for Texas Utilities Electric Company or its successors and their agents (Comanche Peak) during or after 1983, (2) the purpose or process of planning for the "Lipinsky Memo Meeting of November 10-11, 1983," and (3) the contractual or informal relationship between O.B. Cannon and Comanche Peak, including payments between them.

Attached to the subpoenas was a memorandum issued by the Board providing an explanation of the Board's request and defining the breadth of documents the Board determined was encompassed by each subpoena.

The schedule of documents attached to the subpoena to the witnesses should be broadly interpreted in light of the purposes for which we are seeking testimony. For example, records relating to meetings prior to November 11 in which the witnesses discussed the Lipinsky report or its basis should be included in (2) of the schedule. Notes or recordings made at such prior meetings or memoranda or letters discussing those meetings are relevant. Similarly, any records that shed light on the termination or suspension of work under Applicants' purchase order are clearly relevant. Nothing in this paragraph should be interpreted to limit the scope of the attached schedule.

Memorandum (Testimony of O.B. Cannon Witnesses) at 2, October 4, 1984.

Counsel for O.B. Cannon submitted several documents in response to the Board's request but withheld one memorandum and 3 days of calendar diary notes, all prepared by Mr. Lipinsky. (Brief in Support of Lipinsky Privilege, November 5, 1984). Applicants informed the Board that they reviewed the O.B. Cannon files and cited fifteen documents for which they asserted attorney-client privilege or work product privilege. (Letter, McNeil Watkins, II, to Atomic Safety and Licensing Board (ASLB), October 18, 1984; Applicants' Motion to Supplement Statement as to Privileged Trial Preparation Materials, October 19, 1984.) Intervenor CASE submitted a Brief in Opposition to Applicants' nondisclosure of the materials designated by the Applicants as privileged. CASE alleged that those documents not produced bear heavily on the question of whether Mr. Lipinsky was "pressured, coerced or influenced into recanting and changing the conclusions that he originally reached about coatings and related quality control at Comanche Peak." CASE Brief in Opposition to Applicants Request for Nondisclosure of Relevant Lipinsky Documents, October 26, 1984.

We accept CASE's above statement of the issue. We find a reasonable nexus between it and Applicants' management's character, an issue which has arisen in the course of litigation in this part of the case. See *Houston Lighting and Power Co.* (South Texas Project, Units 1 and 2), LBP-84-13, 19 NRC 659 (1984).

In ruling on the motion for production now before the Board, we must determine (1) whether the privileges asserted are properly claimed, and (2) if the material is privileged, whether there is an overriding necessity for production to overcome the traditional policy considerations in favor of withholding privileged documents.

II. ATTORNEY-CLIENT PRIVILEGE

We begin with a discussion of the attorney-client privilege claimed by Mr. Lipinsky. The substance of Mr. Lipinsky's assertion is that attorneys with the firm actively representing Applicants (Texas Utilities Electric Company) in the licensing proceeding also represented Mr. Lipinsky in his capacity as a consultant to Applicants, and as his personal counsel during a deposition conducted by the NRC on January 4, 1984.

Based on a letter dated November 14, 1984, from counsel for O.B. Cannon to CASE Attorney Anthony Roisman and on a confirming entry in his diary, Mr. Lipinsky allegedly formally requested the legal representation of Mr. Reynolds and his firm on November 29, 1983. From the facts presently before the Board we cannot determine whether Mr.

Lipinsky was represented by Applicants' counsel as of November 29, 1983.

Before delving into the facts of whether and when an attorney-client relationship existed, the Board expresses serious concern over this matter because it appears that the Code of Ethics section on Conflict of Interest and Impermissible Representation may have been transgressed. Rule 1.7(b)(1) states:

(b) A lawyer shall not represent a client if the representation of that client may be materially limited by the lawyer's responsibilities to another client or to a third person, or by the lawyer's own interests, unless:

(1) the lawyer reasonably believes the representation will not be adversely affected;

We believe, given the content of the Lipinsky report (as discussed *in-fra*), that it would not be reasonable for attorneys for Applicants to believe they could properly represent Mr. Lipinsky. His interest as a non-party deponent (which he amply illustrated in his diary notes) was solely to prevent his being forced into making fraudulent statements (potentially actionable against him) favorable to Applicants' coatings program in order to protect his position with O.B. Cannon. This interest was not compatible with the primary interest of Applicants in having Mr. Lipinsky assist Applicants in discounting the importance of the Lipinsky Memorandum.

Prior to the time he allegedly engaged counsel, Mr. Lipinsky had argued that an audit would be required to settle his uncertainties. He had learned at a meeting with Applicants on November 10 and 11, 1983, that they did not share his view. This apparent divergence of opinion meant that Mr. Lipinsky required legal advice about whether to maintain his original views and risk possible business or legal consequences or whether to reconsider his position. This latter course also had its perils because Mr. Lipinsky needed to consider in detail whether he could legitimately testify under oath that information he had collected and conclusions he had drawn were not valid.

Although the letter from O.B. Cannon's counsel states Mr. Lipinsky was advised of the potential conflict of interest but that he voluntarily consented to the representation, we see representation by Applicants' attorneys as impermissible.

We are persuaded by two comments contained in the Model Rules of Professional Conduct, adopted by the American Bar Association on August 2, 1983. The comments are contained under Rule 1.7, the general rule pertaining to conflict of interest. These comments compel the conclusion that it was impermissible for Applicants' law firm to have

agreed to accept Mr. Lipinsky as a client. The first statement references loyalty to a client:

Loyalty to a client is impaired when a lawyer cannot consider, recommend or carry out an appropriate course of action for the client because of the lawyer's other responsibilities or interests. The conflict in effect forecloses alternatives that would otherwise be available to the client.

The test whether a conflict precludes representation involves a determination that:

it will materially interfere with the lawyer's independent professional judgment in considering alternatives or foreclose courses of action that reasonably should be pursued on behalf of the client.

We are unconvinced that Mr. Nicholas S. Reynold's firm could represent Mr. Lipinsky adequately in light of the firm's relationship to Applicants. The firm could not fully pursue with him the option of continuing to support his story. This conclusion is buttressed by the other statement crucial to our view:

An impermissible conflict may exist by reason of substantial discrepancy in the parties' testimony, incompatibility in positions in relation to an opposing party or the fact that there are substantially different possibilities of settlement of the claims or liabilities in question.

Applicants' counsel had a serious incentive not to defend the validity of the evaluations and conclusions contained in Mr. Lipinsky's Memorandum. Had they taken Mr. Lipinsky's view as accurate or reasonable, the position in which Applicants would have been placed would be a difficult one to defend to the Board and Staff in the licensing proceeding.

Even if we concluded that there was no ethical barrier to representing Mr. Lipinsky, for the Board to accept the attorney-client privilege, it must be established initially that an attorney-client relationship existed during the period in which the documents in question were generated. To help it to make that determination, the Board earlier inquired directly of Mr. Watkins and Mr. Norris as to the nature of the relationship between the Applicants' law firm and O.B. Cannon personnel. (*See* Tr. Oct. 1, 1984, at 18,721-27.) Based on the testimony elicited, the Board finds that for the extended period of time as suggested in the briefs submitted by Applicants and O.B. Cannon, no attorney-client relationship existed between the law firm retained by Applicants and O.B. Cannon employees working as Applicants' consultants.

At the October 1, 1984 hearing, counsel for Applicants and the O.B. Cannon witness, Norris, were asked repeatedly about the existence of any attorney-client relationship between Applicants' counsel and O.B. Cannon personnel. They were questioned specifically about past or present relationships and any or all relationships between the law firm and the O.B. Cannon firm or its individual employees. Tr. 18,721, 18,725-27, 18,734-37. Counsel and witness Norris were precise in their responses that the only attorney-client relationship between the law firm and the O.B. Cannon firm or personnel, other than a possible derivative one based on O.B. Cannon being a consultant for Applicants, was the representation by counsel Watkins of Mr. Lipinsky on only the date of January 4, 1984, at the deposition taken of Lipinsky by the NRC. *Ibid.* (Although the testimony of Mr. Norris is subject to a motion to strike, he has had the opportunity to contradict these statements and has not filed any testimony to that effect.)

During the course of the discussion on the transcript pages noted above (Tr. 18,721-27, 18,734-37), counsel had ample time to provide the Board with a full and complete explanation of the relationship between O.B. Cannon and Applicants' counsel if any existed in the past, or at the time of the hearing. Applicants' counsel would persuade the Board that there has been an ongoing attorney-client relationship based on O.B. Cannon's employment as a consultant to Applicants. The Board does not agree, and we conclude that O.B. Cannon, by virtue of its being a consultant to Applicants, does not thereby simply become a client of Applicants' counsel. Further, we find no evidence of any document establishing an attorney-client relationship between Applicants' law firm and O.B. Cannon. No contract or retainer agreement was mentioned by Mr. Watkins at the October 1984 hearing or by Mr. Lipinsky in his affidavit dated November 1984. Although O.B. Cannon now appears to have paid for the legal expenses, there is no indication that the firm had retained counsel prior to January 4, 1984, that Mr. Lipinsky had any belief other than that Applicants were paying for "his" counsel, or that Mr. Lipinsky ever intended to pay for counsel. See letter from Joseph Gallo, counsel for O.B. Cannon, to Anthony Roisman, counsel for CASE, November 14, 1984 (Gallo Letter).

While we recognize that Applicants' counsel represented Mr. Lipinsky on January 4, 1984, we do not find credible other statements indicating an attorney-client relationship between Applicants' law firm and O.B. Cannon during the preceding several months. Our determination is supported by Mr. Norris' testimony concerning the meeting he and Mr. Lipinsky attended on November 22, 1983, at the Washington, D.C. office of Applicants' counsel concerning so-called "Lipinsky Memorandum."

At the October hearing, Judge Bloch propounded several questions relating to the interaction at that conference between Messrs. Reynolds and Walker and Messrs. Norris and Lipinsky. Each of Mr. Norris' responses indicates the attorneys were acting solely on behalf of Applicants.

Q. Was he [Mr. Watkins] giving you legal advice?

A. Negative.

Q. What did he say?

A. Well, they were asking Joe the details about the memo, as I remember it. I was an observer there. It's Joe's memo; you know, it's Joe's to defend, if he has to defend it, and prove it if he has to prove it.

Q. *Were they giving Joe legal advice?*

A. *No, not to my knowledge. I think Joe as I remember it, mentioned just in passing that he felt like he was going to retain his own attorney. And to the best of my knowledge, I never discussed it with Joe. I think he probably retained somebody locally to give him legal advice.*

(Emphasis added. Tr. 19,882-83).

The Board notes that an understanding of legal advice given to a non-professional is not dispositive of whether legal advice was provided. However, the dialogue adds weight to the Board's determination by corroborating Mr. Watkins' statement that his firm's representation of Mr. Lipinsky took place solely on January 4, 1984. (*See infra* Tr. at 18,725). Mr. Norris' perception that Mr. Lipinsky may have desired a personal attorney different from Applicants' counsel also calls into some doubt Mr. Lipinsky's alleged sudden desire to retain Applicants' counsel just 7 days later.

Finally, the Board finds significant the diary notation by Mr. Lipinsky prior to his attendance at the November 22 meeting between Applicants' counsel and other O.B. Cannon personnel. In two separate entries Mr. Lipinsky described Mr. Reynolds as the "Tugco attorney."

Message from D.M. (In Houston — 1205 Hrs E Street 11/21/83) JJN on way to airport to Washington, D.C. to Tugco Attorney

* * *

Purpose of meeting with Tugco attorney — not sure.

We find it noteworthy that before Mr. Lipinsky allegedly engaged Mr. Reynolds as counsel, i.e., before November 29, 1983 (*see* Gallo Letter), the contacts between Mr. Lipinsky and Applicants' firm were initiated at the attorneys' behest. Generally, the steps one takes to retain an attorney are initiated by the potential client, and not by an attorney.

The conferences throughout November 1983 where the law firm representing Applicants met with Mr. Lipinsky were tense because they were an attempt to ascertain Mr. Lipinsky's position. These meetings could have set a tone that would have interfered with subsequent communications, which could not therefore be full and candid. Thus, it makes more questionable an open, unconstrained relationship between attorneys for Applicants and Mr. Lipinsky. Such freedom to discuss important matters is a crucial factor in the attorney-client relationship.

It is also clear to us that Mr. Lipinsky could not have fully discussed his concerns with Mr. Reynolds, who would have been immediately obligated to relay the information to Applicants. Furthermore, it was Mr. Lipinsky's understanding that he would immediately lose the assistance of counsel were he to take a position adverse to Applicants. Gallo Letter at 2.

The assertion of privilege with respect to Mr. Lipinsky's diary notes from November 29 to January 3 is especially troubling. According to Lipinsky's notes of November 14, 1983, the diary was initiated at the suggestion of NRC investigators to enable Lipinsky to protect his employment rights in the event he were fired over the Comanche Peak incident. Whatever claims of attorney-client confidentiality may be asserted with regard to communications between Lipinsky and Applicants' attorneys cannot extend to these diary notes even if they were prepared solely for Mr. Lipinsky's private use. See for example Weinstein's Evidence, ¶ 503(b)[03]. Here, where the documents were for potential public use, the claim for privilege is even weaker. We would not have expected Mr. Lipinsky to record truly confidential matters in this diary.

The significance of the diary notes kept by Mr. Lipinsky is that if counsel merely clarified his initial statements in the course of representation, those notes should support counsel's position. If, on the other hand, initial statements were modified to suit Applicants' needs, those notes would be expected to indicate the extent of Mr. Lipinsky's voluntary participation in that process. Hence, the notes are crucial to a full understanding of the truth.

We shall require the production of Mr. Lipinsky's diary notes for November 30, 1983, and for December 1 and 8, 1983. Mr. Lipinsky's January 9, 1984 memorandum, also sought to be withheld, clearly is not covered by attorney-client privilege. First, the relationship was asserted to exist only up to January 4. Second, we have found that the relationship never existed. This document also clearly is not covered as the work product of lawyers. It appears to be solely his product and there is no evidence that it contains lawyers' opinions or was produced in anticipation of litigation.

III. WORK PRODUCT IMMUNITY

As mentioned earlier, the Board received two letters from Applicants' counsel dated October 18, 1984, identifying fifteen documents for which work product immunity is claimed. Applicants contend that the items detailed are privileged, and thus not discoverable by Intervenor CASE because they "were prepared by Applicants' representatives in anticipation of litigation" or by Applicants' Counsel. (Watkins' Letters to the Board, dated October 18, 1984).

Applicants argue that the documents for which the work product immunity is claimed are exempted under NRC regulation 10 C.F.R. § 2.740(b)(2). This regulation encompasses the attorney work product doctrine set out in *Hickman v. Taylor*, 329 U.S. 495, 675 S. Ct. 385, 91 L. Ed. 451 (1947), and more recently codified in Rule 26(b)(3) of the Federal Rules of Civil Procedure. Section 2.740(b)(2) states:

(2) *Trial preparation materials.* A party may obtain discovery of documents and tangible things otherwise discoverable under paragraph (b)(1) of this section and prepared in anticipation of or for the hearing by or for another party's representative (including his attorney, consultant, surety, indemnitor, insurer, or agent) only upon a showing that the party seeking discovery has substantial need of the materials in the preparation of this case and that he is unable without undue hardship to obtain the substantial equivalent of the materials by other means. In ordering discovery of such materials when the required showing has been made, the presiding officer shall protect against disclosure of the mental impressions, conclusions, opinions, or legal theories of an attorney or other representative of a party concerning the proceeding.

Attorney work product is ordinarily given substantial deference in shielding from discovery an attorney's inner thought processes to enable the attorney to best prepare a client's case. It provides a "zone of privacy" within which attorneys may weigh the merits of their case and determine a litigation plan from which to proceed. (*Coastal States Gas Corp. v. Department of Energy*, 617 F.2d 854, 864 (D.C. Cir. 1980)). But the work product doctrine is not unlimited in scope. It provides immunity for material gathered or prepared by an attorney or other representative of a party only if the material is for the purpose of litigation, either presently on-going or reasonably anticipated at a future time. *Hickman v. Taylor*, *supra*; *Osterneck v. E.T. Barwick Industries*, 82 F.R.D. 81, 87 (N.D. Ga. 1979); 8 Wright & Miller, Federal Practice & Procedure § 2024 (1970).

The work product doctrine, while not easily overridden, is not intended to provide an absolute immunity from discovery. *United States v. Lipsky*, 492 F. Supp. 35, 44-45 (1979). See also *Nixon v. Sirica*, 487 F.2d 700, 714-17 (1973) (even the President's privilege is not absolute). It is

a qualified immunity requiring a balancing of the substantial need shown by the party seeking discovery for the materials sought and his inability to obtain the materials or their substantial equivalent by other means without undue hardship, with the policy considerations shielding an adverse party's counsel in the course of preparation of the case for litigation. *Hickman*, *supra*, 329 U.S. at 511-12, 675 S. Ct. at 393-94; Fed. R. Civ. P. 26(b)(3). If the documents sought are categorized by the Board as attorney work product, the Board must then proceed to determine "whether the party seeking discovery has demonstrated need and hardship as mandated by *Hickman* and the *Federal Rules*." *Lipshy*, *supra*, 492 F. Supp. at 46.

Although the Board is aware of the distinction drawn by some courts between ordinary work product and opinion work product in applying the above two-pronged test (*see Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1)*, LBP-82-82, 16 NRC 1144, 1162 (1982)), the distinction is not mandated by either Fed. R. Civ. P. 26(b)(3) or 10 C.F.R. § 2.740(b)(2). It is our view that such a distinction does not serve to further the analysis of the work product immunity as it applies to the discovery motion pending before us. Further, there is case law which supports the proposition that even opinion work product, while ordinarily afforded a high degree of immunity, is subject to discovery when the need for that information is at issue and compelling. *Boring v. Keller*, 97 F.R.D. 404 (1983).

The party resisting disclosure must bear the burden of proving that the privilege is properly applied. The party seeking disclosure of documents claimed to be privileged as attorney work product has the burden of establishing need and hardship. *See* 35 Ad. L. Rep. 3d 412, 526 (Supp. 1979). As noted herein, the substantive issue over which this discovery dispute arose concerned whether a witness was coerced or pressured into changing his testimony by Applicants or their counsel. To understand the significance of this witness' testimony, the Board recounts the relevant facts as shown in the record since August 1983.

The witness whose testimony is now in question is Joseph J. Lipinsky. Mr. Lipinsky is a quality assurance expert for O.B. Cannon Inc., a paint coatings firm that was retained by Applicants in 1983 to provide an analysis and evaluation of the paint coating program at Comanche Peak. In the course of his work in evaluating the quality assurance aspects of the coatings program, Lipinsky produced a "trip report" containing essentially unfavorable evaluations and judgments about the coatings program. This trip report was not intended to be disseminated outside Mr. Lipinsky's organization (O.B. Cannon, Inc.). However, through a series of unexplained events, the trip report surfaced among Comanche Peak

personnel and its contents became known to Applicants' management, causing them serious concern.

After the trip report (or "Lipinsky Memorandum") was brought to Applicants' attention, a series of meetings took place between O.B. Cannon personnel including Messrs. Lipinsky and Norris, and Applicants and their counsel. One purpose of these meetings may have been to gain an understanding of the reasons for Mr. Lipinsky's negative appraisal of Applicants' paint coatings program. It also appears, however, that Applicants understood the potentially damaging ramifications of the Lipinsky Memorandum to its position in the NRC licensing proceeding and met with O.B. Cannon representatives to control the possible damage done by the report. The facts in this case are also unusual in that, when Mr. Lipinsky had written a report describing Comanche Peak as "worse than Zimmer" and appeared to be a potential adverse witness, the Applicants hired O.B. Cannon and Mr. Lipinsky to provide services to it.

We find these facts to be troublesome in light of the work product privilege now claimed for Mr. Lipinsky and other O.B. Cannon witnesses. It does not seem logical that Mr. Lipinsky would be hired as an expert retained for litigation purposes, when O.B. Cannon's original contract provided that their services would be as consultants for the sole purpose of evaluating the paint program. Once Mr. Lipinsky's memo became known to Applicants and Intervenor, Mr. Lipinsky's testimony and his relevant documents could not be shielded from discovery by modifying Lipinsky's employment for the purpose of engaging him as an agent or representative within the meaning of 10 C.F.R. § 2.740(b)(2) or Fed. R. Civ. P. 26(B)(3).

At issue here is the modification of Mr. Lipinsky's views concerning the trip report. Intervenor claims there is no other way to determine whether Mr. Lipinsky was coerced or pressured into later claiming that the concerns he expressed were unfounded other than to see the documents leading to his denial of his own professional evaluation. (CASE Brief in Opposition to Applicant Request for Non-Disclosure of Relevant Lipinsky Documents, October 26, 1984.) That, Intervenor asserts, is the showing of substantial need to obtain the documents Applicants designate as privileged. We regard the threshold requirement of a "substantial need" showing as one to be rigorously applied by the judicial body. *Diamond v. Stratton*, 95 F.R.D. 503 (1982); *In re Doe*, 662 F.2d 1073. But even if the Board followed the extreme reasoning contained in the 1977 case, *In re Murphy*, 560 F.2d 326, 336 (1977), where the Court said "opinion work product enjoys a nearly absolute immunity and can be discovered only in very rare and extraordinary circumstances," we

find the facts surrounding the Lipinsky Memorandum to be extraordinary enough to meet the test *Murphy* sets out.

When substantial need for the contested documents is demonstrated, the immunity ordinarily accorded under the work product doctrine is overcome. Moreover, we see no other practical means to obtain the same facts about how Mr. Lipinsky's testimony evolved into his September 28, 1984 affidavit other than to view the documents related to the incident. It has always been stressed to the parties that it is the Board's strong preference to review documents as the best evidence of what occurred — documents are unmarred by risks inherent in live testimony such as lapses in memory or witness editorializing. Therefore, we do not feel that the same information or its substantial equivalent can be obtained by CASE by other means.

In balancing the relevant factors to determine whether the work product doctrine should shield the documents enumerated in Applicants' letters of October 18, we find that the weight of and unusual nature of the facts in this case tip the scale to the side of disclosure. However, we have not decided to order wholesale disclosure where it would clearly be inappropriate to do so. We exempt documents numbered 12, 13, and 14 as legitimately privileged under the work product doctrine. These documents were generated by Mr. Watkins, an attorney for Applicants, apparently for use internally by the law firm. It does not appear that distribution outside the law firm was contemplated.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is, this 16th day of November 1984,

ORDERED

That documents 12, 13 and 14, listed in Texas Utility Electric Company's letter to the Board of October 18, 1984, are privileged and need not be disclosed. In all other respects, privilege asserted by O.B. Cannon and by Applicants with respect to any O.B. Cannon or Lipinsky documents, is *denied*. Those documents must be delivered to the parties and the

Board by 12 noon tomorrow, November 17, 1984, at the locations specified in the course of this morning's telephone conference.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

B. Paul Cotter, Jr., Chairman
Dr. Richard F. Cole
Gustave A. Linenberger

In the Matter of

Docket Nos. 50-458-OL
50-459-OL
(ASLBP No. 82-468-01-OL)

GULF STATES UTILITIES

COMPANY, *et al.*

(River Bend Station, Units 1
and 2)

November 20, 1984

In this Memorandum and Order, the Licensing Board grants Intervenor's motion to withdraw its remaining contentions; grants Applicants' motion to withdraw their application as to Unit 2; and dismisses the proceeding.

MEMORANDUM AND ORDER
(Terminating Proceeding)

I. INTRODUCTION

On October 9, 1984, a prehearing conference was convened in Baton Rouge, Louisiana, preparatory to commencing the first phase of hearings on the remaining safety contentions in this operating license proceeding.

As a result of motions made at that time, all remaining issues in the proceeding are resolved in this decision, and the proceeding is terminated as to both units.

II. PROCEDURAL HISTORY

The proceeding arises out of petitions to intervene in the application by Gulf States Utilities and Cajun Electric Power Cooperative (Applicants) for a license to possess, use, and operate two boiling water reactors known as River Bend Station Units 1 and 2. The reactors are located in West Feliciana Parish, 3 miles southeast of St. Francisville on the Mississippi River and approximately 24 miles north-northwest of Baton Rouge. Each reactor is designed to operate at a power level of 2894 megawatts thermal with an equivalent electrical output of approximately 936 megawatts. Construction was authorized on March 25, 1977. Approximately 87% of Unit 1 was completed by April 30, 1984, with fuel load now scheduled for April 1985. Report on Termination of Construction Activities, at 1, attached to Motion for Withdrawal of Application for Unit 2. On or about April 15, 1983, Applicants halted construction on Unit 2 which was less than 1% complete. LBP-83-52A, 18 NRC 265, 267 (1983).

Notice of the Applicants' request for a facility operating license was published on September 4, 1981, in the *Federal Register*. 46 Fed. Reg. 44,539 (1981). Petitions to intervene were filed by the Louisiana Consumers League, Inc. (LCL), Louisianans for Safe Energy, Inc. (LSE), and Gretchen Reinike Rothschild, individually. The two corporate petitioners and the single individual petitioner were admitted to the proceeding and consolidated as Joint Intervenors. The State of Louisiana also petitioned to participate both as a party to the proceeding, and as an interested State pursuant to 10 C.F.R. § 2.715 (1981). Louisiana was admitted as an interested State, but a ruling on its status as a party was deferred. LBP-83-52A, *supra*, 18 NRC at 267.

The parties filed some thirty-three contentions of which five were rejected at the outset, eight were withdrawn, several were consolidated, and two were admitted for hearing. A ruling on the balance, including fourteen contentions concerning emergency planning, was deferred pending negotiations among the parties. Prior to the October 9, 1984 prehearing conference, the parties filed written testimony as well as proposed findings of fact and conclusions of law which they exchanged and

commented on pursuant to this Board's direction. All parties were extremely cooperative in following this Board's instruction to seek a negotiated,¹ rather than a litigated, resolution of the deficiencies and concerns underlying the contentions filed.

III. RESOLUTION OF CONTENTIONS

A. Old River Control Structure

The Old River Control Structure is a barrier approximately 70 miles north of Baton Rouge, maintained by the U.S. Army Corps of Engineers to prevent the Mississippi River from diverting some portion of its flow into the Atchafalaya River. All Intervenors contended initially that Applicants had not adequately considered the effect of a failure of the structure on the safe operation of the plant. They contended that the structure's failure would divert the Mississippi River to the present course of the Atchafalaya River and thus: (1) the volume of the Mississippi River would be greatly diminished; and (2) there would be an increase in salt content in the waters due to the intrusion of more saline waters from the Gulf of Mexico. The State raised this matter because it had received virtually no treatment in the FSAR and the State wanted the Board to know of this potentially significant event.

At the prehearing conference, the Joint Intervenors and Louisiana filed a motion to withdraw their contention concerning the possible failure of the Old River Control Structure. The motion states:

After discussions among the parties, review of the proposed testimony of the parties, and in consideration of the agreement of Gulf States Utilities Company to monitor the River Bend Station intake water for conductivity on a monthly basis and to establish procedures to receive information on a quarterly basis from the Corps of Engineers on the location of the salt wedge in the Mississippi River, the concerns raised by this contention have been resolved.

No other party objected to the motion. Tr. 272-75.² We concur that the agreement described in the motion resolves the concerns raised in the motion, and it shall be granted.

¹ Since the Applicants' Final Safety Analysis Report was docketed in 1981, it has been amended, revised or supplemented at least 13 times.

² Transcript references are to the October 9, 1984 prehearing conference.

B. Asiatic Clams

Intervenors initially contended that:

Applicants have failed to provide adequate assurance that the River Bend Station components and systems relying on Mississippi River water for their operation will be adequately protected against infestation of the Asiatic Clam (*Corbicula leana*). See I&E Bulletin 81-03, "Flow Blockage of Cooling Water to Safety System Components by *Corbicula* sp. (Asiatic Clam) and *Mytilus* sp. (Mussel)."

Asiatic clams are small freshwater shellfish that survive in low-salinity water and multiply at enormous rates. First identified in the northwest corner of the United States in the late 19th Century, the creature now inhabits thirty-five of the contiguous United States. The Asiatic clam was first noticed in Louisiana in the late 1960s. Applicants' Proposed Findings of Fact 1-4. In 1980, Arkansas Nuclear One was shut down due to extensive plugging of containment cooling units caused by the entry of Asiatic clams through the service water supply. Consequently, IE Bulletin No. 81-03 required utilities to determine whether the shellfish are present, identify what components they might threaten, and describe the prophylactic actions that would be taken. Thus, Asiatic clams present a generic safety issue. Staff Proposed Findings 4 and 5.

Following discussion among the parties and review of proposed testimony, Joint Intervenors filed a motion to withdraw their contention related to the Asiatic clam based on an agreement as to certain actions Gulf States Utilities would take. Tr. 288-93. The agreement prescribes a periodic exchange of information and reports satisfactory to the parties. *Id.* The Board finds that the agreement adequately resolves the concern raised and will grant the motion.

C. Emergency Planning Contentions

On September 28, 1984, Joint Intervenors served a Motion to Withdraw Emergency Planning Contentions. The motion recited, *inter alia*, that following discussions with Louisiana emergency planning officials, the contentions were resolved by

the enactment of legislation (State of Louisiana Acts 1984, No. 825), and by revisions which are to be made to the Louisiana Peacetime Radiological Response Plan ("Plan"). Plan revisions, which have been agreed to by the Louisiana Nuclear Energy Division, Louisiana Department of Environmental Quality, which is responsible for fixed nuclear facility emergency planning within the State of Louisiana, will be incorporated into the plan at an appropriate future time.

Motion to Withdraw at 1-2. Attached to the motion is a statement of the response to seven of the contentions and the action taken. These matters range from updating the response plan in light of the reorganization of State government agencies, to provision for an injunction to enforce an evacuation order, to provision for additional transportation. The motion recites that no other parties object to it. Motion to Withdraw at 2; Tr. 271-72, 275-87. This motion, too, shall be granted.

IV. WITHDRAWAL OF APPLICATION TO CONSTRUCT UNIT 2

On July 2, 1984, Applicants filed a Motion for Withdrawal of Application for Unit 2. The motion states that Gulf States, for itself and as agent for Cajun Electric, requests the issuance of an order authorizing the withdrawal without prejudice of the application for an operating license. The motion was based on notice to this Licensing Board on January 6, 1984 that the Board of Directors of Gulf States Utilities had voted not to build Unit 2 and a report submitted with the motion on termination of construction activities for the unit. The report describes Gulf States'

commitment to return disturbed site areas to an acceptable state under a program to be approved and supervised by the NRC Staff.

Motion at 2. The motion cited *Public Service Co. of Oklahoma* (Black Fox Station, Units 1 and 2), LBP-83-10, 17 NRC 410 (1983) as precedent for the relief requested.

The report describes a variety of site restoration activities to be completed in the first year, most having to do with restoration of areas excavated, for example the Unit 2 reactor and related buildings, as well as the disposition of related structures and equipment. Unit 2 was located on the same site as Unit 1.

The only response to Applicants' motion to withdraw came from the Staff who did not object to the motion. After describing the limited amount of work that had been performed at the site pursuant to a September 1975 Limited Work Authorization and the 1977 Construction Permit, Staff asserted that Applicants' commitment to repairs, monitored by the Staff, assured adequate site restoration. Staff's Response to Motion for Withdrawal of Application for Unit 2. We agree. The Board has personally inspected the site and finds that Applicants' commitment to perform restoration work, which will be monitored by the Staff, is adequate. Accordingly, the motion will be granted. *Black Fox, supra*.

V. CONCLUSION

For all the foregoing reasons and upon consideration of the entire record in this matter, the foregoing motions are granted and this proceeding is terminated as to both Unit 1 and Unit 2, subject to NRC Staff monitoring and approving implementation of the site restoration work for Unit 2 described in Applicants' Report on Termination of Construction Activities dated June 1984.

Order

Upon consideration of the findings and conclusions in the foregoing Memorandum and the entire record in this matter, and pursuant to the authority contained in 10 C.F.R. Part 2, it is, this 20th day of November 1984,

ORDERED

1. That Applicants' request to withdraw without prejudice the application to operate River Bend Station Unit 2 is granted, and the proceeding is terminated as to Unit 2, subject to NRC Staff approval of the implementation of site restoration work described in Applicants' June 1984 Report on Termination of Construction;

2. That the Director of Nuclear Reactor Regulation shall cause to be published in the *Federal Register* in accordance with 10 C.F.R. § 2.107(c) a notice of the withdrawal of the application for a construction permit for River Bend, Unit 2;

3. That Joint Intervenors' motions to withdraw their contentions concerning the Old River Control Structure, infestation by Asiatic clams, and emergency planning are granted, and this proceeding is terminated as to Unit 1.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

B. Paul Cotter, Jr., Chairman
ADMINISTRATIVE JUDGE

Bethesda, Maryland
November 20, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

James L. Kelley, Chairman
Dr. Richard F. Foster
Dr. Paul W. Purdom

In the Matter of

Docket Nos. 50-413

50-414

(ASLBP No. 81-463-06-OL)

DUKE POWER COMPANY, *et al.*

(Catawba Nuclear Station,

Units 1 and 2)

November 27, 1984

The Licensing Board issues a Partial Initial Decision resolving "foreman override" concerns in the Applicants' favor. The phrase "foreman override" denotes a situation where, for example, a foreman directs a welder to weld in violation of procedures in order to speed construction. *See* LBP-84-24, 19 NRC 1418, 1562-66 (1984). Following an evidentiary hearing, the Licensing Board found that instances of foreman override at Catawba had been isolated, and that in any event they did not represent a significant breakdown in quality assurance. In light of these findings and earlier findings favorable to the Applicants on various safety and emergency planning contentions, the Board authorizes the Director of Nuclear Reactor Regulation to issue full-power operating licenses for the Catawba Nuclear Station.

APPEARANCES

J. Michael McGarry, III, Anne W. Cottingham, and Mark S. Calvert, Washington, D.C., and **Albert V. Carr, Jr.,** Charlotte, North Carolina, for the Applicants, Duke Power Company, *et al.*

Robert Guild, Columbia, South Carolina, for the Intervenor, Palmetto Alliance.

Jesse L. Riley, Charlotte, North Carolina, for the Carolina Environmental Study Group.

George E. Johnson and Bradley Jones for the Nuclear Regulatory Commission Staff.

Richard P. Wilson for the State of South Carolina.

PARTIAL INITIAL DECISION RESOLVING FOREMAN OVERRIDE CONCERNS AND AUTHORIZING ISSUANCE OF OPERATING LICENSES

I. INTRODUCTION

In this Board's Partial Initial Decision of June 22, 1984 (LBP-84-24, 19 NRC 1418), we retained jurisdiction over one relatively narrow aspect of Palmetto Alliance's broad quality assurance contention alleging systematic deficiencies and pressure to approve faulty workmanship at Catawba. The aspect not then resolved has come to be known as "foreman override" and arose from the following circumstances. During the initial hearings, a volunteer Board witness, Howard S. Nunn, Jr., had alleged instances where a foreman had instructed welders to weld in violation of procedures. The Board resolved Mr. Nunn's specific concerns in the Applicants' favor. PID, 19 NRC at 1562-65. However, Mr. Nunn's concerns had also triggered an NRC Staff investigation which had uncovered further allegations of foreman override from a confidential source, designated as "Welder B" (Staff Ex. 27, at 27-28). Following further investigation of Welder B's allegations, the Staff requested that the Applicants initiate an extensive inquiry into these foreman override concerns. *See* Staff Ex. 31, P.A. Ex. 146. The Board subsequently determined that it could not resolve those concerns on the then-existing record.

Accordingly, we left the record open to receive the Applicants' and the NRC Staff's followup reports, and to consider further action at that point. PID, 19 NRC at 1565-66. We conditioned our order authorizing issuance of a low-power license upon:

Demonstration to this Board of a reasonable assurance that the "Welder B" and related concerns described in ¶¶ III.B.48-III.B.51 do not represent a significant breakdown in quality assurance at Catawba.

Id. at 1585.

Upon receipt of the anticipated reports,¹ the Board called for comments from the parties and determined that further discovery and hearings on the foreman override concerns on an expedited basis were warranted. Tr. 12,843-44. Consistent with the Commission's *Statement of Policy on Conduct of Licensing Proceedings*, CLI-81-8, 13 NRC 452 (1981), this Board has consistently sought to avoid or reduce delays in this licensing proceeding "whenever measures are available that do not compromise the Commission's fundamental commitment to a fair and thorough hearing process." *Id.* at 453. In that regard, Palmetto Alliance's request for discovery and a hearing on foreman override concerns was received on September 17, 1984, and granted, over objection, on September 21, 1984. At that time, the Applicants were predicting that Catawba's Unit 1 would be ready to go critical on October 17, 1984. Affidavit of Warren Owen dated September 12, 1984, and appended to Applicants' pleading of that date. Under the circumstances, and considering particularly the narrow scope of the foreman override concept, the Board put forward a tentative schedule for discovery, hearing, and findings, leading to a Board decision in late October. Tr. 12,845-48. After the parties had had an opportunity to consider the tentative schedule, we called for their comments. Tr. 12,867. Most of the comments concerned whether confidential sources should be disclosed. Tr. 12,867-12,905. Apart from a passing reference by Palmetto in that context to a "very speedy truncated process" (Tr. 12,889), no specific objections were made by any party and no alternatives were proffered to the Board's schedule, which was followed. *See also* Tr. 14,369-70.

The hearing took place in Charlotte, N.C., on October 9-12, 1984. The Board heard (a) a fifteen-member panel of Applicant witnesses and three Applicant rebuttal witnesses, (b) a four-member panel of Staff

¹ Applicants' "Investigation of Issues Raised by the NRC Staff in Inspection Reports 50-413/84-31 and 50-414/84-17," dated August 3, 1984 (App. Ex. 116), and the Staff's Inspection Report Nos. 50-413/84-88, 50-414/84-39, and an accompanying notice of violation dated August 31, 1984 (Staff Ex. 33).

witnesses, and (c) one expert and six employee (present and former) witnesses called by Palmetto Alliance. In order to provide maximum opportunities for questioning, all four hearing days ran into the evening hours, producing a transcript equivalent to about six hearing days.² The bulk of the time was allocated to Palmetto Alliance for cross-examination of the Applicant and Staff panels and for eliciting direct testimony from the employee witnesses. The Board believes that Palmetto had a fair opportunity to "make its case" on the foreman override concerns. At the conclusion of the hearing, the parties stipulated to a date for filing proposed findings.³ Findings of the Applicants, Staff and Palmetto Alliance were subsequently received and considered.⁴

II. FOREMAN OVERRIDE — SCOPE OF THE CONCEPT AND ULTIMATE ISSUE PRESENTED

"Foreman override" was the term of art defining the parameters of the hearing. In our June 22 Decision, we had described foreman override situations as those in which "foremen would order welders to do work in a manner contrary to prescribed procedures or to the welder's ideas of correct welding." PID, 19 NRC at 1562. The scope of foreman override was argued by the parties at the beginning of the October 1984 hearing (Tr. 13,051-71), with Palmetto Alliance urging an expansive view. Tr. 13,066. In order to provide further guidance for the hearing, the Board stated that:

We don't put this out as a definitive resolution that is designed to answer all questions, because what is or is not foreman override is partly dependent on the facts and circumstances [of] different cases, and it is not something we can judge down to a very fine point in advance . . . [T]he foreman override that we are dealing with basically is situations where an employee is directed, either explicitly or implicitly, to violate established procedures. Now this directive to violate procedures doesn't have to be in so [many] words; [it] can be implicit . . . But we want to emphasize,

² An average 9-to-5 hearing day usually generates a transcript of about 250 pages. The foreman override hearing generated a transcript of 1483 pages.

³ At the close of the hearing, the Applicants announced a slip in their criticality schedule from October 17 to November 8, 1984. Proposed findings and an anticipated Board decision date were then set with reference to that date. Tr. 14,369-82. By letter dated November 1, 1984, the Applicants reported certain unanticipated problems in Unit 1 and slipped their criticality schedule further, to early December 1984. With the benefit of hindsight, the foreman override hearing could have been held somewhat later than it was. Licensing Boards must, of course, set hearing schedules on the basis of presently available information.

⁴ Carolina Environmental Study Group (CESG) is listed as co-author of Palmetto's findings. However, CESG was not a co-sponsor of Contention 6 (of which foreman override is a part) and its participation in the foreman override hearing was intermittent. We treat Palmetto as the lead intervenor party in this decision.

on the other hand, that the mere fact that a foreman might have applied pressure for production and the employee then decides to bend to that pressure, and one way to bend to it is to violate procedures, that is not what we consider foreman override.

Now, that isn't to say that there wouldn't be situations that are outside our definition that reflect undesirable work practices. We are here to hold a hearing on a rather narrow concept

Tr. 13,159-60.

In addition to this guidance, we took the position — to which we had adhered throughout our consideration of Contention 6 (e.g., PID, 19 NRC at 1548) — that we would not consider alleged instances of foreman override involving work on nonsafety systems. Tr. 13,070, 14,081. Such allegations — for example, involving work in the turbine or administration buildings, or on the grounds — are remote, if not irrelevant, to nuclear safety issues. See *Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), ALAB-788, 20 NRC 1102, 1142 (1984).

Apart from these scope considerations, the focus of the hearing was affected by the ultimate factual issue — whether foreman override had been sufficiently widespread at Catawba that it represented a significant breakdown in the quality assurance system, such that we could not make the requisite safety findings. See *Union Electric Co.* (Callaway Plant, Unit 1), ALAB-740, 18 NRC 343, 346 (1983). Thus, a few instances of foreman override, or possibly even numerous isolated instances, would be expected at any nuclear construction site over time, but would not necessarily indicate a serious breakdown in quality assurance.⁵

III. STAFF AND APPLICANT INVESTIGATIONS OF FOREMAN OVERRIDE

A. NRC Investigations

The Staff has described its investigation of foreman override in its Proposed Finding (PF) 10, as follows:

As documented in the record of the Fall/Winter 1983 hearings, Region II conducted 25 interviews based on the Nunn⁶ allegations and these interviews pointed to Welder B's foreman. See Staff Ex. 27; Tr. 13,911, Blake. Between early January and

⁵ Similarly, proof indicating multiple instances for foreman override by a single foreman (such as the proof about Foreman Arlon Moore in this case) would not indicate a widespread breakdown in QA and, indeed, could quickly become cumulative in a hearing.

⁶ As noted above at p. 1485, Howard S. Nunn, a former Duke welder, had raised the foreman override issue in the first instance.

the beginning of March 1984, Region II interviewed a total of 53 people, 41 individuals whose interview summaries were provided to Palmetto Alliance on discovery, pursuant to protective order, and an additional 12 individuals, four being confidential sources, who provided information which tended to corroborate the original allegations of Welder B. See P.A. Ex. 146, Tr. 13,911, 13,883, Blake, Uryc; Tr. 13,786, Uryc. These last interviews were summarized in a special inspection report (Staff Ex. 31), and served as the basis for the March 13, 1984 meeting between Duke management and Region II officials and the initiation of the Duke inquiry. *Id.* Based on the twelve interviews, summarized in the special inspection report, Region II found evidence of problems involving: (1) violation of interpass temperatures, (2) removal of arc strikes without paperwork, (3) welding bead sequence [subsequently determined to be within procedure], (4) posting of "look outs" for inspectors while welding procedures were violated, (5) perception of foreman pressure for quantity, and (6) welding without proper documentation. Staff Ex. 31, at 2. The NRC's investigation did not turn up any evidence of such problems other than on Arlon Moore's second shift welding crew. *Id.* at 3-4; Tr. 13,181, Dick. However, Applicants were advised to begin an immediate review of the issues to independently determine what problems were raised, to investigate the possibility that the activities reported extended beyond the particular second shift welding crew, and to identify the corrective actions required for adequate resolution. Staff Ex. 31, at 2.⁷ Thus, before the Duke inquiry had begun, the Region II investigation had gathered evidence from 78 interviews, and found evidence of foreman override in only one crew.

Palmetto gives scant attention to the Staff investigation in their proposed findings although it asks why the information discovered was not found earlier in routine inspections (Tr. 14,392-93). The Staff attributed this to the fact that its inspections are conducted on a sampling basis. (Blake, Tr. 13,772). The Board also views the fact that these incidents were not found in sampling inspections as one indication of the low frequency of occurrence, as discussed later in this decision. We reject as unwarranted Palmetto's suggestion (Tr. 14,434), that Mr. Nunn's efforts to point the way to further evidence of foreman override have been rebuffed by the Staff.⁸

⁷ "The Board notes that the Staff's interviews with Individual B, Individual B-1, Individual B-2, and Individual B-3, contain allegations concerning actions by the second shift foreman, Mr. Moore, which could not be directly explored through cross-examination, inasmuch as their identities were not revealed by the Staff to the other parties. See Tr. 13,014-15. While the interview summaries in the Staff report (Staff Ex. 31) contain allegations of specific incidents in which Mr. Moore is said to have pressured welders on his crew to violate interpass temperatures (B, B-1, B-2), weld without possession of proper paperwork (B-1 [this incident was caught at the time for a missed hold point and written up as an NCI], B-2), and remove arc strikes without paperwork (B-2), it may be noted that similar incidents were explored on the hearing record, and the Board considers these matters to have received adequate consideration."

⁸ See *In Camera* Witness Statement (Bruno Uryc) dated October 11, 1984, taken in accordance with the Commission's "Statement of Policy, Investigations, Inspections, and Adjudicatory Proceedings," dated Sept. 7, 1984, at 6.

B. Duke Investigations

As requested by the NRC Staff, Applicants began their own investigation of foreman override, which was monitored by the NRC Staff. App. Ex. 113, at 7; Dick, Tr. 13,178. R.L. Dick, Vice President, Construction, was made responsible for investigating production/quality concerns. Mr. Hollins, who was not stationed at Catawba, was designated by Mr. Dick to manage the investigation. A separate board independent of the Construction Department was established by Mr. Owen, Executive Vice President of the Company, to review adequacy of findings and corrective action.

The investigation was to include the following:

- Interviews with craft and management personnel to corroborate and develop information received from the NRC relative to production/quality concerns.
- On a sampling basis, interviews of selected craft personnel to determine if production/quality concerns are broader than a specific crew/craft.
- An evaluation of findings and determination of corrective action programs that address any technical and/or personnel issues, including programs designed to promote open communications on quality concerns.

The investigative methodology and results are set forth in App. Ex. 116.

Duke personnel interviewed 217 people, some several times. These included:

- a. 65 of the 110 welders who had worked for a foreman mentioned frequently in allegations, Arlon Moore.
- b. 69 randomly selected other welders from a population of about 400.*
- c. 48 powerhouse mechanics from about 800.*
- d. 6 steelworkers from about 135.*
- e. 8 electricians from about 300.*

In addition, thirteen line foremen, two general foremen, four QC inspectors and two others who were thought to have relevant information were interviewed. (Hollins, prepared testimony, App. Ex: 115, at 2-3.) The interviews were structured in that guides and essential questions were supplied to the interviewers. (Dick, prepared testimony, App. Ex. 113, Attach. C, at 3.)

*These populations were workers employed at the time that foreman override incidents had allegedly occurred and assigned to work in critical areas.

Palmetto attacked the Duke methodology through the testimony of Raymond Michalowski, Ph.D., a Professor of Sociology at the University of North Carolina-Charlotte. (Direct testimony, ff. Tr. 13,927.) Dr. Michalowski's prepared two-page testimony summary (P.A. Ex. 147) was expanded at length in direct examination. (Tr. 13,927-57.) His testimony is fairly summarized by the Staff PFFs 13 and 14, as follows: Dr. Michalowski asserted that

the questions the study set out to answer were not clearly stated, the behaviors associated with foreman override were not initially specified (for example, the perception of pressure, or actual pressure), no criteria were specified in advance for judging significance (e.g., what would be considered "pervasive"), and the sampling was not done to assure appropriate representativeness of the total population being studied. *Id.* at 13,936-43. He viewed the study's reliability suspect due to the vagueness in the questions asked, the dependency of one question's answer on previous questions, the use of subjective terminology, and the use of Duke interviewers when seeking "high-risk" information (i.e., evidence of wrong-doing from one's employee.) *Id.* at 13,945-51.

While he initially was of the opinion that the study should not be relied on for any purpose, *id.* at 13,957, he narrowed his criticisms considerably on cross-examination, principally to the inappropriateness of making inferences about foreman override outside the welding craft. *Id.* at 13,976. First, he conceded the study may have been valid insofar as it undertook to find the extent of perception of violations. *Id.* at 13,965-67. He also granted that an investigative technique is a valid approach for finding actual violators. *Id.* at 13,969. He also agreed that if the study were attempting to generalize about the pressure an entire population is experiencing, and the sample was exclusively of sub-populations subject to high pressure, the evidence would likely overstate the incidence of high pressure being experienced by the entire population. *Id.* at 13,973. Similarly, if increased violations were associated with high pressure, generalizations about the population would tend to overstate the number of violations. *Id.* at 13,974.

In rebuttal, the Applicants presented the testimony of John E. Hunter, Ph.D., Professor of Psychology and Mathematics, Michigan State University (App. Ex. 120, Direct testimony, ff. Tr. 14,278). The Staff has fairly summarized Dr. Hunter's testimony in Staff PFF 15 as follows:

Dr. John E. Hunter ... disagreed with Dr. Michalowski's principal conclusion that the data did not justify drawing plant-wide conclusions. By taking the number of instances of foreman override as 10, and comparing that to the estimated number of transactions in which foreman override could occur, Dr. Hunter concluded that it was possible to validly conclude foreman override was a rare event. Tr. 14,342-47, Hunter. He said this would be true even if the sample were limited to the 33 non-welding craftsmen sampled by Duke. *Id.* at 14,347. He also noted that pooling the non-random and random samples as Duke did would be conservative, that is, it would tend to result in overstating the expected occurrences of foreman override, *id.* at 14,356-57, since the frequency of foreman override in the non-random sample would have been greater. App. Ex. 120, at 8. He also concluded that the questions

Duke asked elicited the observations needed to determine whether foreman override allegations were stated, Tr. 14,311-12, Hunter, the questions were appropriately phrased so as to provide the desired information, *id.* at 14,327-32, App. Ex. 120, at 3-4, the relative power-differential between the interviewers and the craftsmen, and the eliciting of "high-risk" information, did not affect the reliability of the information received, *id.*, and that the data generated provided adequate justification for the generalization made — i.e., that foreman override is a rare event. *Id.* at 14,339-42.

The Board finds that the "investigative" approach taken by Duke was not only appropriate, but necessary. We concur with Staff's PFF 17, in that Duke was obligated to pursue each lead. Thus, this was not a pure research project and the resulting sample of interviews would tend to be biased, but in a conservative direction. That is, the bias, if any, would be more likely to reveal a greater number of violations than would a pure random sample. As a cautionary measure, it was also incumbent on Duke to do some sampling of workers in other critical safety-related areas.

Palmetto was also critical of the size of the sample. Tr. 14,419-22. Dr. Hunter conceded that this criticism was partially valid (Tr. 14,356). Sample size goes to the degree of confidence one might have in the result, but does not necessarily negate the results. In this case a larger sample size would have been desirable, but considering all of the circumstances and Dr. Hunter's testimony, the Board finds the sample acceptable.

These academic criticisms of the Duke sample might have been more telling if a rigorous scientific study, with calculated standard error deviations and levels of confidence, had been necessary for Duke's purpose. But such a discriminating tool was not required. Unlike, for example, a finely tuned survey designed to determine divisions of public opinion within, say, a percentage point of accuracy, Duke was conducting a relatively gross analysis. To put it another way, if one is looking for the footprints of foreman override in a nuclear plant work force, one does not need a magnifying glass, only an open eye.

The Board's inspection of the interviewing guides and review of the testimony also lead us to conclude that Duke's methodology would tend to produce valid information. The Board is mindful of Dr. Michalowski's concern that fear of retaliation had the potential for blocking free expression by employee interviewees. In this regard, the Board noted the extreme anxiety and nervousness of the witness identified as Individual

31.⁹ I.C. Tr. 2099. However, workers' anxieties seemed to us to flow more from concerns about their immediate supervisors or fellow workers than the Duke management people (*see, e.g.*, Affidavit 8, App. Ex. 118). For example, several witnesses had no objection to testifying in public session, so long as the television cameras did not photograph their faces. *E.g.*, Tr. 14,070, 14,095. While the mores of the workers caused them to be reluctant to volunteer information, they responded candidly when asked direct questions, as was done in the Duke investigation (for example, *see* Carpenter, Tr. 14,233 and Individual 196, I.C. Tr. 2018, 2084 and 2086).

In sum, the Board's evaluation of the methodology of the Duke investigation considered the testimony and cross-examination of the Duke panel, the expert witnesses, the testimony of workers called by Intervenor, the reports, affidavits and exhibits. We also considered the independent investigation of the Staff and the consistency between Duke and Staff results, as well as the monitoring of the Duke investigation by the Staff (Uryc and Blake, Tr. 13,848, 13,865, 13,883). From all of this we find that the Duke investigative methodology was valid and an appropriate base for making generalizations and conclusions.

Palmetto also criticized Duke's investigation for incompleteness. We essentially agree with the Applicants on these points. The Board (with one wording change) adopts Applicants' Proposed Findings at "C," pp. 11 and 12, which read:

Intervenors alleged that the affidavits do not reflect all the matters raised during the interviews (*see, e.g.*, Tr. 13,148). This allegation was not substantiated by the testimony. Of the five Catawba employees called by Intervenor, four stated that the affidavits fully reflected their concerns (Tr. 14,142-43, McCall; Tr. 14,188-89, Braswell; Tr. 14,222-24, Carpenter; I.C. Tr. 2068-69, Ind. 196). Individual 31 did have two concerns which were not reflected on either of his affidavits, but this was only because he forgot to mention them in that he was a nervous individual and his mind would go blank at times (I.C. Tr. 2103, 2105, 2118-19, 2130-31, Ind. 31). He stated he was not intimidated by the interviewer, Mr. Bolin (*id.*). His claim that the interviewer told him "I don't want to hear about harassment" (I.C. Tr. 2105, Ind. 31) was denied; the interviewer testified that the affidavits of Individual 31 contained all the statements he made (Tr. 14,273-76, Bolin). This Board, having observed the demeanor of these witnesses appearing before it, credits Mr. Bolin's testimony. In any event, Individual 31 said he did not have anything to say about harass-

⁹ On October 2, 1984, the Board issued a Revised Protective Order to protect the names, addresses and telephone numbers of current and former Duke employees provided to Intervenor by either Applicants or the NRC in connection with the foreman override concerns. As a result, references herein to individuals whose identity is subject to nondisclosure under the protective order are made by reference to a number code supplied by Applicants. The Board determined that disclosure of NRC confidential sources, even under a protective order, was not required in order to probe the issues adequately. Tr. 13,014-15.

ment (I.C. Tr. 2105, Ind. 31), and he had never seen anything involving a foreman that he thought would adversely affect the safe operation of the plant (I.C. Tr. 2135-36, Ind. 31).

The Board concludes that these affidavits, which were relied upon by Applicants during their investigation, [adequately] reflect the concerns that the employees raised during their interviews. This conclusion is particularly reasonable in light of the fact that the employees themselves read and signed these affidavits and presumably would note inaccuracies (*see* App. Ex. 118).

In a similar vein, Palmetto criticized the Applicants for selective omissions. In that regard, the Board concurs in and adopts Staff's PFF 20:

Palmetto also attempted to show that the (Duke) report itself was incomplete, by toning down negative implications or leaving out significant details, particularly concerning the field testing of critical welds from Arlon Moore's crew (e.g., Tr. 13,436, 13,439-40, 13,510, 13,512, 13,514, 13,516, Guild), and concerning Duke's taking personnel action against a dozen supervisory personnel, Tr. 13,376, Guild, rather than the five individuals noted in the August 3, 1984 report. We agree that all the details of Duke's investigation are not contained in its report, which was intended to serve as a summary of a much larger amount of material. *See* P.A. Ex. 146 (9/4/84 Memo to File, B. Uryc, J. Blake). However, that is one of the principal reasons the Board ordered further discovery and hearings — to probe the bases for the Applicants' findings. We are satisfied that through this process the significant details, including those concerning weld testing and personnel actions, were not only made available to Palmetto, but the subject of extensive cross-examination.¹⁰ In the Board's view, the full scope of information uncovered and persons responsible, was available and the subject of the hearings.¹¹

IV. EMPLOYEE AFFIDAVITS AND WITNESS TESTIMONY

Affidavits from over 200 employees obtained as part of the Duke investigation were placed in the record as App. Ex. 118. The Board also heard testimony from six present and former employees called by Palmetto. The Board adopts much of the Staff's Proposed Findings as an accurate reflection of the substance of this testimony, as indicated in the following discussion.

¹⁰ The proposed employee action plan, which summarized proposed actions to be taken against about a dozen individuals, was fully probed. *See* P.A. Ex. 154; Tr. 13,372, *et seq.*; *see also* P.A. Exs. 152, 153, 155 (documenting certain personnel actions taken). Moreover, since the criteria for taking personnel action was "inappropriate supervisory action" (Tr. 13,220-21, Dick), and not foreman override, the disparity in reporting asserted by Palmetto is of little significance.

¹¹ However, as explained in Section V.B. below, we find that Applicants could have been more forthright in presenting the results of the field testing of welds.

A. Instances of Foreman Override

The Applicants conducted followup interviews and technical reviews, as appropriate, of allegations contained in the affidavits. Based on that analysis, they concede ten specific instances of foreman override based on first-hand employee knowledge. (Hollins, Tr. 13,256 and 13,259; *see also* App. Ex. 116, at 14.) The Staff's Proposed Finding 21 identifies thirteen specific instances which appear to meet the definition of foreman override. The instances and foremen involved are:

- four interpass temperature violations (Arlon Moore, three; John Gladden, one).
- four attempts to mislead inspectors (Halterman, Barker, Gladden, Chrisley).
- one lookout for QC inspector (Moore).
- three directions to work without process control paperwork (E. Cobb).
- one direction to work on a nonconformed item (B. Cobb).

B. Violations of Interpass Temperature

Allegations that the required interpass temperature limit of 350°F for welding on stainless steel (NRC Regulatory Guide 1.44; Duke Nuclear Guide 1.31, ¶ 4) was frequently exceeded was the most serious issue raised and received more attention than other issues at the hearing. The Staff's interviews with Welder B (Staff Ex. 31) and the followup investigations (Staff Ex. 33, at 2 and App. Ex. 116, at I-6; *see also* Llewellyn, Tr. 13,457-58) led Staff to conclude that "at least one welder violated interpass temperature on safety-related systems as a result of (production) pressure from [Foreman] Arlon Moore" (Staff PFF 23, at 12-13).

Individual 196 described in affidavits (App. Ex. 118) and testimony three incidents where he believed interpass temperature might have been violated. In one case, a welder had said he was welding too hot because "Arlon said I need to get them done tonight." (I.C. Tr. 2022, App. Ex. 118, Affidavit 196.) On another occasion, Arlon Moore replaced Individual 196 and another welder with two other welders in order to finish work by the end of the shift. Individual 196 believed that "for them to finish those welds so quickly, they had to work outside of procedure." I.C. Tr. 2074-76; App. Ex. 118, Affidavit 196. In a third incident, Individual 196 was concerned that W.M. Carpenter, a former Duke welder, had done work too quickly. I.C. Tr. 2034-35, 2073; App. Ex. 118, Affidavit 196. However, Individual 196 did not have personal knowledge whether procedures had been violated (I.C. Tr. 2034), and Carpenter subsequently testified that he had done the job rapidly by an

assembly-line approach that did not require excessive temperature (Tr. 14,213-14). Mr. Carpenter did relate another incident where foreman Moore had told him to make another pass when he could not "lay his hand on it" (Tr. 14,015).

Welder B informed NRC Inspector Uryc about 12 to 24 welds in the Unit 1 pipe chase that were overheated by Individual 70 and involved Foreman Arlon Moore. Another incident, involving John Gladden, was raised by Individuals 106 and 33. App. Ex. 116, Appendix A, at I-2, and App. Ex. 118. The Board concurs in the Staff's PFFs 23-26, which provide more technical details on this subject. We agree that these instances of interpass temperature violations are isolated, involving only two foremen who have since been removed from supervisory responsibilities.

C. Misleading Inspector/Defeating Inspection Process

The Board adopts Staff's PFFs 29-30, which describe an event involving C.W. Braswell, as follows:

As noted in the initial tally of allegations of foreman override found in Applicants' report, these were four alleged incidents in which a foreman gave a direction to a craftsman which served to mislead the inspector involved, or to defeat the proper functioning of the QA/QC system for maintaining quality construction. Each involved a different craft foreman. Two were the subject of cross examination.

C.W. Braswell, a powerhouse mechanic, related that a QC inspector had come to him asking him to identify some redheads (expansion bolts) which had been installed in the number one reactor loop a year before with a torque wrench which was the subject of a deficiency report (R-2A) for being out of calibration. App. Ex. 118 (Braswell); Tr. 14,175-77, Braswell. Braswell couldn't remember the exact location, but was able to point out the "loop" involved and the inspector was able to check the redheads on it. Tr. 14176, Braswell. Mr. Braswell said his foreman, Ed Halterman, told him just to point out some redheads; but he could not remember if he was told this before or after the loop was checked, and did not know whether Mr. Halterman was serious or kidding. *Id.*

Assuming that this event actually occurred, evidence of foreman direction to violate procedures is not clear. The QA program was not actually defeated. Under all the circumstances, we believe this is a trivial matter.

The Board adopts Staff's PFF 32, describing an event involving Individual 31, as follows:

Individual 31 related an incident in the Unit 1 pipe chase in which he had repaired the same weld four or five times because the radiograph kept showing a rejectable condition. The last time it came back, Individual 31 discovered that the x-ray department had been sending the wrong weld package. However, instead of telling Individual 31 to inform the Authorized Nuclear Inspector (ANI) that there had been a

mix-up, his foreman, H. Barker, told him to tell the ANI that he had found the defect and get the hold point signed off. Rather than do this, Individual 31 told the ANI of the mix-up, and both welds were red-tagged. App. Ex. 118, Ind. 31; I.C. Tr. 2107-10, Ind. 31. According to Individual 31, Mr. Barker had wanted to get the matter of the mix-up resolved without causing the radiographers involved any trouble (they both received disciplinary "A" violations as a result of this incident). I.C. Tr. 2110-13, Ind. 31.

This is an isolated incident in the record and represents no pattern of activity or general inclination to deviate from procedures.

Two other incidents involving Mr. Barker were related by Individual 31. We consider neither to involve foreman override. (See Staff's footnote 13 to PFF 33 for more detail.) One incident involved an order to remove a red tag after receipt of resolution papers, which is permitted. The other concerned a weld Barker approved that had looked acceptable to No. 131, but not to another welder. The weld had "shot" acceptably.

There were two other incidents described in affidavits (App. Ex. 118), but not subjected to cross-examination, which warrant discussion. Staff's PFFs 34 and 35 describe an incident found in the affidavits of two welders, Individuals 72 and 177, which involved

foreman Johnny Chrisley telling the two welders that one of them had done the welds (fastening angle iron clips to ceiling rails in the control room) and someone had to stencil them so they could be signed off. One (Individual 72) said he didn't do them and refused. The other (Individual 177) said he stenciled 35-40 welds which he had not done, but that those he didn't feel comfortable about, he rewelded or repaired. He said he did it (stenciling) because the foreman told him to. App. Ex. 116, App. A, Sec. VI; App. Ex. 118, Inds. 72, 177.

Applicants concede that, if true, this action violated a Duke, but not a code, procedural requirement. App. Ex. 116, App. A, Sec. VI. This is within our definition of foreman override. In addition, this incident was not detected by the QA program. However, as noted by Applicants, all appropriate inspections were made, all were acceptable, and all Duke welders are qualified to perform the welds in question. *Id.* The principal rationale for stenciling welds, as we recall from our earlier deliberations in the Fall of 1983, is to assure that if bad welds are made, the welder involved can be traced. If bad welds could not be traced to the appropriate welder, it would be difficult to either remove or retrain the problem welder . . .

We also adopt Staff's PFF 36 concerning the affidavit of Individual 94,

in which he discovered that a hold point had been missed, which he verified with a QC inspector. However, his foreman, John Gladden, told him to get another inspector, and that the other inspector might miss the problem and sign off the weld. Individual 84 informed the first inspector, who apparently alerted the second inspector, who told Mr. Gladden he would not sign off the work. Individual 94 considered this direction to violate a procedure. App. Ex. 118, Ind. 94.

A deliberate effort by a foreman to deceive or withhold information from an inspector by his own action or through orders or other guidance to subordinates is a serious matter. If it is not a clear violation of present procedures, it should be treated as such. If a widespread practice, such a proclivity could, if not detected, impair the functioning of the QA program. In this case, however, the record reflects only these isolated incidents, not representative of a pattern of improper actions. In and of themselves, these incidents were of no safety consequence.

D. Direction to Work Without Process Control

The Board adopts Staff's PFFs 39-42 on this subject.

Applicants' August 3, 1984 report notes five incidents in which craftsmen (Individuals 77, 94, 46, 95 and 88) stated they were directed to work on hangers or to fit up pipe without having the necessary paperwork (process control) in their possession. App. Ex. 116, Appendix A, Sec. III. According to the report, four of the five involved one powerhouse mechanic foreman, Ed Cobb, and the other, John Gladden. None of these incidents was the subject of cross-examination, but are discussed in the related affidavits. See App. Ex. 118. Further, Individual 196 testified he was told by Individual 109 that Arlon Moore told Individual 109 to start welding without process control. The affidavit of Individual 88 (mentioned in Applicants' report) also related an incident in which a welding foreman, Dave Williams, instructed a welder to make a tack weld without paperwork. Individual 88 said that, of his own accord, he watched to see that no one was coming. App. Ex. 118, Ind. 88. Finally, Individual 88 mentioned an incident in which he and Individual 77 had been working on a hanger but Individual 77 left with the paperwork, and in his absence two other powerhouse mechanics finished the work. *Id.* As noted by Applicants, in the incidents involving Individuals 46 and 95, the paperwork was nearby, App. Ex. 116, 118 (affidavits), and this appeared to be the case in one of the incidents recounted by Individual 88. Individual 94 related that he refused to follow Mr. Gladden's instruction. *Id.* Individual 77 said, with respect to his own concern, that he talked Mr. Cobb into waiting for the paperwork.

Applicants acknowledge that craftsmen were required by quality assurance procedures to have possession of the process control information while performing work, so that it is available for reference as necessary. App. Ex. 116, Appendix A, at III-2. Thus, direction to work without such paperwork is improper, and appears to constitute foreman override. Second, there is no evidence that these incidents were detected by the QC inspectors, although some craftsmen simply refused to go along with the violation. Third, there does appear to be a limited pattern here, which involves one particular powerhouse mechanic foreman, Ed Cobb. Although three other foremen are mentioned, the incidents appear isolated. The evidence suggests that Mr. Cobb had a practice of keeping the work going, even if paperwork was not with the craftsman, as required. Although both Arlon Moore and John Gladden were the subject of other foreman override incidents, the two incidents related do not demonstrate a proclivity to direct work without process control. The name of Mr. Williams, also mentioned here, does not appear again, to the Board's knowledge.

If craftsmen were regularly forced to work without being allowed to refer to the appropriate controlling procedures, the opportunity for workmanship error could reasonably be said to increase, and part of the quality assurance program would not be working. Nevertheless, if errors were to occur, defective work would be subject to inspection, as noted by Applicants. App. Ex. 116, Appendix A, Sec. III. We are not, however, prepared to say that the evidence shows that work without process control was pervasive, based on these few incidents involving mainly just one foreman. Moreover, we are also mindful of our earlier findings that, in general, Applicants' system of process control in the welding area worked rather well.

The Board therefore finds that although one foreman appears to have had a proclivity to direct that work continue in technical violation of procedures, this practice was not, in fact, widespread, and, because of the inspection process, is unlikely to have led to the quality assurance program failing to detect faulty work. These incidents do not demonstrate a significant breakdown of the QA program.

E. Cold Springing

The Board adopts Staff's PFFs 47-52:

Although Applicants included "cold springing" in Appendix B of their report, indicating their view that foreman override was not present, Palmetto Alliance nevertheless attempted to show that foreman override occurred in this activity. Tr. 14,095, *et seq.* (See also P.A. PFF Tr. 14,413-17.) Cold springing, which involves the use of come-alongs and chain falls to force-fit mismatched pipe ends so they can be welded, Tr. 13,567-68, Mills, was a subject considered and resolved in the initial PID.

James Boyd McCall, a powerhouse mechanic, alleged that he, a welder, and several inspectors had allowed the force fitting of a pipe using one come-along and three chain falls without first using a dynamometer to determine the force needed and without proper documentation, as required by CP-483. Tr. 14,101, McCall; Tr. 13,561, 13,564, 13,579-80, Mills. The welding foreman, Jim Johnson, was told the pipe could not be hand-fit, but told them to go ahead and pull it over. Mr. McCall contacted Ronald Kirkland, a QC inspector, who went to his supervisor, Bill Deaton, returned, and told them to proceed to make the fit. Tr. 14,103-06, McCall.

The crew members, foreman and QC inspector in this case all believed the cold springing was acceptable, under QA Procedure M-4. Tr. 14,110, McCall; App. Ex. 116, Attach. B, at III-1. However, NCI 18304 was originated on April 5, 1984, to document the cold spring, *id.*, and it was determined that the force used violated CP-483. Tr. 13,574-75, Mills. It appears that the foreman and QC inspector had mistakenly relied on QAP M-4, which states that jacks, jigs and other fixtures can be used to align a fit, but had not considered CP-483, which specifically addresses cold springing. Tr. 14,099-100, 14,110, 14,114, 14,135, McCall; Tr. 13,574-75, 13,580-81, Mills.

Mr. McCall also related an incident which occurred soon after, involving use of a porta-power hydraulic jack, but no foreman was involved, and, in any event, it was observed by a QC inspector and non-conformed. Tr. 14,116-20, McCall.

While two other cold-springing incidents were mentioned in affidavits, none of these involved intervention of a foreman. Tr. 13,561, 13,568-69, Mills; App. Ex. 118, Inds. 127, 163, 198, 168. See also Tr. 13,570-74, Hollins, Llewellyn.

None of the above incidents involve a direction by a supervisor to violate a procedure and thus do not state a case of foreman override. While in the first case, the QA process did not identify the violation, it appears from the second incident shortly thereafter, that a similar violation was indeed caught. In addition, design engineering determined the cold spring to be insignificant from a safety perspective. Tr. 13,581-83, Mills. From one isolated case, we cannot draw any inference that a significant breakdown of the QA program occurred.

F. Removal of Arc Strikes Without Process Control

Applicants define arc strike as:

Basically a welder's mistake. The electrode is inadvertently brought in contact with material to be welded. The welder immediately pulls the electrode away from the material. The material has been quickly heated and cooled with small discontinuity created on the material.

(App. Ex. 113, Attach. C, at 6.)

Witness McCall testified that arc strikes outside the weld zone usually occurred when a welder was dragging his rig from place to place and the tungsten electrode accidentally hit up against a pipe. (Tr. 14,126-28.)

The principal concerns associated with arc strikes are that (1) the possibility that a crack in the pipe will result, (2) grinding of a deep strike will substantially reduce the thickness of the pipe, and (3) undesirable material will be left on piping or valves. (Tr. 13,595.) For example, Staff witness Czajkowski noted a crack associated with an arc strike on one of the test socket weld specimens sent to BNL for examination. (P.A. PFF Tr. 14,410; Staff Ex. 34, at 5.) In response to questions from the Board, witness Van Malssen testified that, with the possible exception of fatigue in piping materials "we would leave arc strikes if they didn't violate the wall thickness of the material." (Tr. 13,652.)

Superficial arc strikes in the weld zone that are removed with a few strokes of a file do not violate Duke's process control procedures and do not require additional process control paperwork. (App. Ex. 116, Attach. B, at I-3.) Removal of deeper arc strikes or arc strikes outside the weld zone requires proper authorization and documentation on a M-4 Form and QC inspection. (Tr. 13,596.) QC inspectors are responsible for noting any questionable areas on a weld, including arc strikes, during the final system inspection. (App. Ex. 116, Attach. B, at I-5.) The M-4 procedure includes walkdown inspections of the piping system with the objective of finding any construction damage, including arc strikes. (Tr. 14,144.)

This Board adopts portions of Staff's PFFs 53-56:

Although the allegation that welders were improperly instructed to remove arc strikes from valves and piping without paperwork was raised by the April 1984 NRC inspection report, Applicants treated the matter in Appendix B of their report, based on their finding that there was no foreman override. *See* App. Ex. 116, Appendix B, Sec. I. . . .

While about a dozen individuals [expressed concerns about arc strike removal], *see* Tr. 13,591, Llewellyn, only one [incident] appeared to be a violation which had not been caught. In that case, Individual 109 stated that his foreman, Arlon Moore, had filed off several minor arc strikes on a valve under the I-A steam generator and instructed him to do the same. App. Ex. 118, Ind. 109. In a followup interview, he said he was unsure of the location of the arc strikes. App. Ex. 116, Appendix B, at I-2. Another welder, Individual 196, corroborated this account, but had no direct knowledge if there were any file marks or where they came from, although he had seen what appeared to be file marks on the body of the valve. I.C. Tr. 2038-40, 2060. Applicants conducted a further analysis in order to determine whether improper filing had been done on other valves welded by members of Individual 109's crew and to confirm the location of the valve he identified. Applicants confirmed the location of the valve with Individual 109 and their examination of 19 other accessible valves performed by this crew revealed that any filing or grinding marks outside the weld zones on these valves were performed by the manufacturer. Tr. 13,597-98, Kruse; *see also* App. Ex. 116, Attach. B, at I-2. Individual 196 also testified he was satisfied that the marks on the valve, raised in his and Individual 109's concern, occurred at the manufacturer. I.C. Tr. 2061. According to the evidence above, the foreman's decision to remove minor arc strikes was technically correct, since he is responsible for any arc strikes on components welded by his crew.

Additional concerns raised included: the removal of superficial arc strikes in the weld zone, which is not a procedure violation since no process control is required; the removal of deeper arc strikes or those outside of the weld zone without proper process control, which was detected by QA; or general allegations of arc strike removal in the past about which no specific information was available. App. Ex. 116, Attach. B, at I-3 to I-4; *see also* App. Ex. 118, Inds. 5, 37, 102, 131, 168, 176, 186, 191, 194, and 208.

The Board notes only one case where arc strikes were removed at the direction of the foreman. This was not a violation since the arc strike was in the weld area. The other allegations were not confirmed.

G. Scope of Foreman Override Concerns

Palmetto reviewed the employees' affidavits and summarized the results in three tables (Tr. 14,427-30). Table 1 is a basic table that lists worker affidavit number, nature of incident reported, craft, whether a direct witness, and supervisor involved. The other two tables are summaries of different information from Table 1. According to Palmetto,

Table 3 shows that “the scope of supervisors implicated in override concerns is well beyond Arlon Moore and his crew” (Tr. 14,429). — that twenty-three supervisors are implicated in foreman override, compared to the five supervisors implicated by the Applicants. Tr. 14,428-29.¹²

The Board believes that our detailed scrutiny of particular foremen and incidents (at pp. 1495-1501 of this opinion) is a sounder basis for assessing the extent of foreman override than the corresponding parts of Palmetto’s tables. Therefore, in order to assess the incremental significance of the tables, the Board disregarded all incidents in Table 1 which involved one of the foremen (supervisors) already discussed in this opinion. We then reviewed each of the remaining affidavits in Table 1. In our view, none of the remaining affidavits describes events clearly involving foreman override, although five describe debatable situations.¹³ Of these debatable situations, in one (No. 36) an employee was not required to do improper work, another was based on second-hand information (No. 66), and in the remaining three (Nos. 20, 163 and 182), insufficient information was provided.

Based on our analysis of Palmetto’s Tables 1, 2, and 3, we must reject the argument that foreman override at Catawba has been any more widespread than is reflected in the specific incidents discussed in this opinion. We agree with the Staff that those incidents reflect involvement by only eight foremen (among hundreds at the site), and that five of the eight were involved in a single incident, with no indication of patterns of improper conduct. Furthermore, the incidents of foreman override involved principally one foreman, Arlon Moore, while Moore was working for a particular General Foreman, Billy Smith. Both Moore and Smith have been relieved of their supervisory responsibilities. Even so, it was appropriate for Staff to issue the notice of violation because even one instance of foreman override could be a serious matter.

V. SAFETY SIGNIFICANCE OF FOREMAN OVERRIDE

A. Introduction

The allegations of foreman override referred to ten different kinds of construction procedures. Serious violations of such procedures could

¹² Palmetto erroneously states that Duke found six supervisors involved in foreman override. Tr. 14,428. The Staff implicated eight different supervisors, but five of the eight were associated with only one incident. See Staff PFF 21.

¹³ The Board’s reasons for rejecting the remainder included: nonsafety related work (e.g., 91, 118, 110, 168), no allegation of foreman override (e.g., 62), no specific incident cited (e.g., 28) person named not a foreman (e.g., 70, 180), bad decision but procedure followed (e.g., 228, 127, 131, 120), no instruction to violate procedures and none violated (e.g., 114).

result in substandard work. The procedure that received most attention at the hearing and that was most clearly associated with foreman override was the interpass temperature requirement for welding. We discuss the significance of exceeding prescribed interpass temperatures here.

We have examined the circumstances associated with the other nine construction procedures cited in the record and conclude that although a construction or quality assurance procedure violation was evident in several cases, either those cases were nonsafety-related or the safety implications were trivial.

B. Interpass Temperature

In order to prevent the base metal of welds from becoming too hot, procedures specify that welds should cool to at least 350°F between welding passes.¹⁴ Overheating of stainless steel could sensitize it, causing susceptibility to intergranular stress corrosion cracking (IGSCC). (Staff Ex. 34, at 1.) Witness Kruse pointed out that excessive heating of stainless steel can also result in undesirable constriction on the inside of socket welds after the weld has cooled and shrunk, or hot cracking of the weld metal because of the absence of ferrite control (Tr. 13,540).

In view of the many allegations of interpass temperature violations by Welder B and others, Duke undertook a combination of laboratory and field tests to investigate their significance. Duke thought that some of the welds in question might have cooled to 350°F or below, even if the welder thought otherwise. Therefore, one set of tests was made to determine how long it took 2-inch socket welds and 6-inch pipe to cool to 350°F. (App. Ex. 116, at I-3.) From these tests Applicants concluded that several of the interpass temperature violations perceived by the welders had not actually occurred. (App. Ex. 116, at I-4.)

Applicants also tried to identify specific welds in which an interpass temperature of 350°F had been exceeded by use of an etching technique that evaluates chrome carbide precipitation. This involved adapting ASTM A-262 Practice A to field use. (Tr. 13,634; App. Proposed Deci-

¹⁴ None of the technical witnesses could cite a scientific authority for the 350°F "standard." However, it appears to be a tradition in the industry (Tr. 13,538-42; 13,870-72). Staff witness Czajkowski testified that, for the type of welding involved here, interpass temperature is a nonessential variable according to the ASME Boiler and Pressure Vessel Code, § 9. If the interpass temperature were raised, it would not manifestly affect the mechanical properties of the weld. However, "you would have to worry about the stress corrosion cracking aspect . . ." (Tr. 13,871). Applicants point out that there is no ASME or AWS Code requirement regarding interpass temperature for stainless steel and, consequently, "allegations regarding exceeding maximum interpass temperatures do not in themselves represent violations of any Code requirements. However, Duke has committed to comply with NUREG-1.44 which recommends a maximum interpass temperature of 350°F for stainless steel welding." (App. Ex. 116, at I-5.)

sion at 16; Staff PFF 23.) Starting with a population of about 2000 safety-related welds on 2-inch and smaller pipe made by foreman Arlon Moore's crew (Tr. 13,451), design engineering identified 361 which they considered "critical." Because of time constraints, twenty-three of the "critical" welds were randomly selected for testing with Practice A (Tr. 13,452). The Staff's consultant, Mr. Czajkowski, recommended that some of Welder B's welds (where the interpass temperature apparently had been exceeded) also be tested with Practice A (Tr. 13,457) and some welds made by the person Duke believed to be Welder B were added to the sample. (Tr. 13,458.) A total of twenty-five sample welds was tested. (Tr. 13,466.)

In order to determine whether Practice A could distinguish between welds made with the prescribed interpass temperature of 350°F and welds made without allowing cooling between passes, Duke made sample welds under both conditions. Brookhaven National Laboratory (BNL) tested pieces of eight weld samples under Practice A and concluded that none of them was rejectable. "Even the specimens with no heat input control would be considered acceptable," BNL said. A second BNL conclusion was that, "practice A is a viable method of field metallography for determination of sensitization of stainless steels." (Staff Ex. 34, at 5.) This Board's interpretation of these BNL conclusions is that Practice A did not distinguish welds that had experienced high interpass temperatures because they did not become sensitized.

Applicants completed the field testing of welds made by Foreman Moore's crew and found at least three with microstructures which would not be acceptable under Practice A. (P.A. Ex. 161, at 3.) One of the welds that did not pass the Practice A test had been made by an individual believed to be Welder B. (Tr. 13,462; P.A. PFF Tr. 14,399.) Seeking an explanation for these unacceptable microstructures, Applicants welded four test sockets using pipe with the appropriate heat number and four different interpass temperatures: room temperature (72°F), 250°F, 350°F and uncooled (over 700°F). (Tr. 13,502-03.) When tested under Practice A, only the specimen with the 72°F interpass temperature exhibited acceptable microstructure. Even the weld made with an interpass temperature of 250°F (well below the procedural requirement) had unacceptable microstructure. (Tr. 13,503.)

Once again, Practice A was shown to be of little or no use in distinguishing between welds made within and in excess of the prescribed 350°F interpass temperature. In contrast to the Brookhaven results, however, the possibility of sensitization to IGSCC at temperatures at least as low as 250°F was indicated. In view of the disparate results produced by the BNL and Duke laboratory tests and the small number of

test specimens involved in each case, this Board is not convinced that the results of these tests are dispositive of this matter. Further testing aimed at determining the validity of the 350°F interpass requirement would be desirable.

Applicants' principal description of the interpass temperature tests is at page I-6 of App. Ex. 116. Applicants do not distinguish between the early tests, participated in by BNL, and the ones that followed discovery that some welds in the field did not pass Practice A. Applicants' main point is that interpass temperature did not appear to influence the degree of sensitization. Intervenor's view this portion of Applicants' report as an attempt to suppress the results of the field tests (P.A. PFF, Tr. 14,397, 14,401). We find some merit in Intervenor's position. Had the field testing with Practice A showed favorable microstructure in all cases, then safety concerns related to excessive interpass temperature would largely have faded away. When unfavorable microstructure was found in three out of twenty-five welds and also in test specimens made at interpass temperatures below 350°F, the potential for IGSCC could not be ruled out.

Intervenor's attempted to show that the field testing of welds using Practice A was insufficient and that the extent of sensitization was more prevalent than reported by Applicants. (P.A. PFF, Tr. 14,399, Tr. 14,402.) We need not reach these questions inasmuch as Applicants ultimately do not rely on the field tests for their conclusion that IGSCC will not be a problem at Catawba (App. PFF at 17).

Both Applicants and Staff explain that three factors must be present in order for IGSCC to occur: sensitization of the metal, stress, and a sufficiently corrosive environment. (App. PFF at 17-18; Staff PFF at 16 n.11.) In view of the unfavorable microstructure found on some of the welds examined in the field and also on the laboratory test welds examined by Duke, Applicants do not rely on the absence of sensitization to assure that IGSCC will not occur. Moreover, the second element in IGSCC, stress, may also be present because Duke does not heat-treat welds to relieve stress (Staff Ex. 30, at 2). Therefore, Applicants rely principally on the absence of the third element — a corrosive environment — as assurance against IGSCC. (Tr. 13,607.)

Applicants' witness Ferdon testified that IGSCC has occurred only infrequently in PWRs. Furthermore, the instances where it has been reported have been associated with aggressive environments, e.g., significant concentrations of oxygen, chlorides or other corrosive materials (Tr. 13,608-14; Staff Ex. 30). *See also* App. Ex. 116 at I-7. Mr. Czajkowski, an expert witness for the Staff, supported Mr. Ferdon and testified that, "despite exceeding interpass temperature and sensitization of

welds, IGSCC is not expected to occur [in the primary loop at] Catawba and those welds would nevertheless be safe in service.” (Staff PFF at 16 n.11.)

The record on interpass temperature concerns reflects that:

- (a) Only two (Moore’s and Gladden’s), or at most a very few, welding crews were subjected to foreman override in respect to interpass temperature.
- (b) Only a few individuals on Moore’s crew (where most of the specific complaints occurred) and only one on Gladden’s crew were personally involved in failures to adhere to interpass temperature procedures.
- (c) Only on rare occasions over their employment history at Catawba did the involved welders violate interpass temperatures.
- (d) The safety-related welds identified with high interpass temperatures were associated with the primary coolant system that will handle only noncorrosive fluids. We found no pattern of foreman override which would expand the area of concern to systems with aggressive environments.
- (e) There is a favorable track record of PWR primary loops in respect to IGSCC.

Therefore this Board concludes that foreman override causing violations of interpass temperature requirements has not significantly affected the quality of construction of the Catawba plant.

VI. CONCLUSION

As reflected in the foregoing discussion, the Board generally agrees with the major thrust and conclusions of the Applicants’ and Staff’s proposed findings. Conversely, we largely disagree with Palmetto’s proposed findings. The bases for our disagreements with Palmetto’s principal points, although not always labeled as such, are set forth in this decision. We note here one final point of disagreement.

Palmetto alleges that “the true extent and seriousness of the foreman override practices [at Catawba] . . . remain yet unknown” because that practice is “cloaked in an atmosphere of threat and intimidation against those who might disclose its existence.” Tr. 14,430. We are told that fear of reprisal has created a “chilling effect” on the expression of safety concerns (Tr. 14,391), and that the atmosphere at Catawba was “clearly repressive.” Tr. 14,429. In the context evoked by these allegations, we are asked to recall selectively some of our findings on harassment allegations in the June 22 Decision. Tr. 14,432-33. Having failed to show a pattern of foreman override (or to cast substantial doubt on the Applicants’ showing), Palmetto is falling back on the “climate of fear” thesis it advanced unsuccessfully earlier in this case. We reject that thesis once

more. We did consider the willingness of the foreman override witnesses to testify, particularly in light of the fact that they were being asked to criticize their supervisors. See p. 1493, above. Beyond that, however, broader claims of harassment and intimidation were resolved in the Applicants' favor last June, and are now pending on appeal. For the Appeal Board's information, we add only that we see no basis in the foreman override record for reopening those questions.

The Board summarizes its basic findings of fact and conclusions of law, as follows:

- The Applicants have met their burden of proof with respect to foreman override concerns at Catawba.
- Instances of foreman override at Catawba have been isolated; only one foreman has been involved in a pattern of foreman override; that foreman and his supervisor have been relieved of supervisory responsibilities.
- Instances of foreman override have not compromised plant safety.
- In view of the foregoing, the Applicants have demonstrated a reasonable assurance that foreman override (also referred to as Welder B and related concerns, as described in ¶¶ III.B.48-III.B.50 of our June 22, 1984 Decision) does not represent a significant breakdown in quality assurance at Catawba.

This Board's Partial Initial Decision of June 22, 1984 authorized issuance of operating licenses for Catawba Units 1 and 2, subject to (a) certain findings by the Director of Nuclear Reactor Regulation, (b) fulfillment of certain conditions imposed by this Board, and (c) resolution of certain emergency planning contentions favorably to the Applicants by a separate Board. The major conditions imposed by this Board (concerning foreman override and emergency diesel generators) have now been fulfilled or withdrawn, and the emergency planning contentions have been resolved favorably to the Applicants, subject to fulfillment of certain post-licensing conditions. As a practical matter therefore, this decision paves the way for issuance of full-power operating licenses for the Catawba Nuclear Station. Accordingly,

IT IS HEREBY ORDERED, pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's rules, that the Director of Nuclear Reactor Regulation is authorized, upon making the findings on all applicable matters specified in 10 C.F.R. § 50.57(a) and upon satisfaction of the conditions in ¶ 1, 19 NRC at 1585 of our Partial Initial Decision of June 22, 1984, to issue to Applicants Duke Power Company, *et al.*, licenses to authorize full-power operation of Units 1 and 2 of the Catawba Nuclear Station.

Upon issuance of this decision, the jurisdiction of this Board will terminate.

**THE ATOMIC SAFETY AND
LICENSING BOARD**

**Dr. Richard F. Foster
ADMINISTRATIVE JUDGE**

**Dr. Paul W. Purdom
ADMINISTRATIVE JUDGE**

**James L. Kelley, Chairman
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Helen F. Hoyt, Chairperson
Dr. Peter A. Morris
Dr. Oscar H. Paris

In the Matter of

Docket No. 50-344-OLA
(ASLBP No. 84-498-05-OLA)
(SFP Amendment)

PORTLAND GENERAL ELECTRIC
COMPANY, *et al.*
(Trojan Nuclear Plant)

November 28, 1984

In this Initial Decision the Licensing Board finds that the Licensee has adequately demonstrated that the expanded capacity of its spent fuel storage facility is designed to maintain discharges of radiation with specified limits and that such capacity is designed so that in case of accidents offsite radiation levels will not exceed 10 C.F.R. Part 100 guideline reference radiation dose values. The Board concludes that there is reasonable assurance that the Trojan Nuclear Plant can be operated without endangering the health and safety of the public under the expanded spent fuel pool capacity authorized by Amendment No. 88 to License No. NPF-1 issued by the NRC Office of Nuclear Reactor Regulation on June 8, 1984, affirms the issuance of the amendment, and additionally concluded that no modifications thereof or additional conditions are required.

INITIAL DECISION

I. INTRODUCTION

On August 1, 1983, Portland General Electric Company (PGE) filed an application for an amendment to License No. NPF-1 for the Trojan Nuclear Plant (Trojan or Plant), a Westinghouse pressurized water reactor, in order to expand the capacity of the plant spent fuel pool from the current 651 assemblies to 1408 assemblies.

On December 5, 1983, the Nuclear Regulatory Commission (NRC) published in the *Federal Register* a notice that it was considering issuing the requested amendment and a no significant hazards consideration determination, and it provided an opportunity for any person whose interest might be affected to request a hearing and to petition to intervene in the proceeding. 49 Fed. Reg. 54,550.

The State of Oregon (Oregon), by its Energy Siting Council and the Oregon Department of Energy jointly, filed a timely petition seeking a hearing and intervention under 10 C.F.R. § 2.714 and the opportunity to participate as a State agency under 10 C.F.R. § 2.715. The Coalition for Safe Power (CFSP) also filed a timely hearing request and intervention petition.

In the Memorandum and Order of February 13, 1984 (unpublished), the Board ruled that Oregon and CFSP had demonstrated standing to intervene in this proceeding and had thereby satisfied the requirements of 10 C.F.R. § 2.714(a)(2), and that Oregon also had standing to participate as an interested State agency.

In its Memorandum and Order of April 23, 1984 (unpublished), the Board accepted contentions advanced by each petitioner, admitted each as a party to the proceeding, admitted Oregon as a participant under 10 C.F.R. § 2.715(c) on all issues considered, and provided for further pleadings and a prehearing conference.

A June 12, 1984 prehearing conference was held to identify the litigable contentions and to establish an evidentiary hearing schedule. On the same date, CFSP filed a letter withdrawing as a party to the proceeding. This withdrawal request was granted in the Board's June 25, 1984 Memorandum and Order Following the Prehearing Conference (unpublished). Two Oregon contentions, as reformulated by the parties to reflect the Board's rulings at the prehearing conference, were admitted in the June 25 Order.

License Amendment No. 88 was issued by the NRC Office of Nuclear Reactor Regulation on June 8, 1984, as authorized by Commission regulation, upon its determination that the amendment involves a no signifi-

cant hazards consideration. Pursuant to this Board's June 25 Order, the evidentiary hearing in this proceeding was calendared to be held thereafter in order to decide the matters placed in controversy by the admitted Oregon contentions.

Evidentiary hearings were held on the Oregon contentions in Portland, Oregon, on October 10, 1984. Testimony was presented by witnesses for PGE and the Staff of the Nuclear Regulatory Commission (NRC Staff), and the two PGE exhibits listed in Appendix A to this Initial Decision were admitted into evidence by stipulation (Tr. 49). Oregon did not present a direct case, but cross-examined witnesses for PGE and the NRC Staff.

PGE filed "Portland General Electric Company Proposed Findings of Fact and Conclusions of Law in the Form of an Initial Decision" on October 10, 1984. In a letter to the Board dated November 6, 1984, Oregon indicated its acceptance, by reference, of the proposed findings filed by PGE. The NRC Staff, on November 13, 1984, filed "NRC Staff Proposed Findings of Fact and Conclusions of Law in the Form of an Initial Decision." Staff adopted the proposed findings filed by PGE, except for proposed changes or additions to several sections of PGE's proposed findings. By letter to the Board dated November 14, 1984, PGE indicated that it adopted Staff's modifications to the proposed findings. In view of the unanimity of all parties on the proposed findings as modified, and after reviewing the entire evidentiary record, the Board has found it unnecessary to perform an extensive rewrite of the findings. We have accepted the modified findings and made only such additional modifications as we deemed appropriate.

II. FINDINGS

A. Contention 1

1. *Matters in Controversy*

1-1. As admitted for litigation, Oregon Contention 1 states:

The licensee has not adequately demonstrated that the expanded capacity of the storage facility is designed to maintain discharges of radiation within the limits specified in the Nuclear Regulatory Commission license.

Bases:

- A. The full impact of failed fuel cladding is not addressed. The existing documentation does not address how much failed fuel cladding can be tolerated by the clean-up system and the impact of failed fuel upon discharges as a result of handling operations.

- B. The clean-up system may be used to process the existing radioactivity in the cask loading pit. If so, the impact on the clean-up system of additional radioactivity from the expanded capacity of the storage facility coupled with the existing radioactivity in the cask loading pit has not been addressed.

2. Summary

1-2. Oregon Contention 1 concerns specific aspects of the ability of the plant to maintain routine spent fuel pool radiological discharges within licensed limits as a result of the proposed capacity expansion. Oregon's concerns centered on the effect on the capacity of the spent fuel pool cleanup system of stored spent fuel with failed cladding (denominated Basis A) and of the processing of existing radioactivity in the cask loading pit (denominated Basis B).

1-3. The Board concludes that this contention has been fully addressed, and that, in response to the issues raised by Oregon, PGE has adequately demonstrated that the expanded capacity of the storage facility is designed to maintain discharges of radiation within the limits specified in the NRC license and the Commission's regulations. Specifically, with regard to Basis A of the contention, the uncontroverted evidence demonstrates that the Trojan spent fuel pool cleanup system has the ability to handle the contaminants produced by the present level of stored spent fuel assemblies, including ten with severe defects and some with "pin-hole" defects in their spent fuel rods. The system has been able to maintain acceptable activity levels even though the system was not operated on a full-time basis.

1-4. Separate analyses performed by PGE and NRC Staff bound the effects of the severely defected spent fuel on spent fuel pool water radioactivity levels, cleanup system capability, and effluent releases to the environment. These analyses demonstrate that the system is able to handle the amount of defected fuel expected over the operational life of the Plant, resulting in acceptable spent fuel pool water radioactivity levels and dose rates.

1-5. The evidence further demonstrates that it is unlikely that reracking operations will dislodge and then crush any loose fuel pellets from defected fuel in the spent fuel pool. Even if a pellet were crushed, the spent fuel pool water radioactivity levels would be comparable to previously measured levels, and radiation doses at the exclusion area boundary would be negligible.

1-6. With regard to Basis B of this contention, the cask loading pit is a small, concrete-walled, stainless-steel-lined pit immediately adjacent to and isolatable from the spent fuel pool. It contains varying levels of chemical and radiological contaminants from Plant modification work. A Plant procedure requires the use of an auxiliary cleanup system, in

series with the spent fuel pool cleanup system, to decontaminate the cask loading pit. The cleanup will be completed before the reracking begins or controls will be established to prevent the contaminants present in the cask loading pit from entering the spent fuel pool, and this pit cleanup will preclude any adverse impact on the ability of the spent fuel pool cleanup system to process spent fuel pool water.

3. General

1-7. PGE's direct case on Oregon Contention 1 consisted of the testimony of Thomas D. Walt (ff. Tr. 54), PGE Branch Manager of Radiological Safety, and portions of PGE Exhibit 2. The NRC Staff's direct case on Oregon Contention 1 consisted of the testimony of Bernard Turovlin (ff. Tr. 75), a chemical engineer in the Chemical Engineering Branch, NRC Division of Engineering.

1-8. Before discussing the specific concerns advanced in the bases for Oregon Contention 1, it is necessary to first place such concerns in the proper context by briefly describing the nature and operation of the plant cleanup systems as they relate to spent fuel pool water radioactivity levels and associated gaseous and liquid effluent releases.

1-9. The operating limits on the Trojan Plant radiological releases are contained in Appendix B of the operating license Technical Specifications. The design objective radioactive material release rates in the Trojan Technical Specifications are based on the following annual dose limits: 5 mrem to the total body or any organ of any individual in an unrestricted area, 10 mrad in air from gamma radiation at the exclusion area boundary, and 20 mrad in air from beta radiation at the exclusion area boundary. These values are consistent with the regulatory levels governing radiological releases to the public in 10 C.F.R. Parts 20 and 50. The Technical Specifications do not contain separate limits for radiological releases from the spent fuel pool. (Walt Testimony, ff. Tr. 54, at 3; Turovlin Testimony, ff. Tr. 75, at 2; Walt, Tr. 63.)

1-10. Spent fuel pool water chemistry and radioactivity levels are maintained by means of the Spent Fuel Pool Cooling and Demineralizer System (SFPCDS). The SFPCDS is a closed-loop system consisting of two subsystems: cooling and purification. The purification subsystem is also used for other purposes, such as to purify water in the refueling water storage tank, when not needed for spent fuel pool purification. (Walt Testimony, ff. Tr. 54, at 3-4; Turovlin Testimony, ff. Tr. 75, at 3; PGE Exhibit 2 at PGE-1037, § 3.2.1.)

1-11. The purification subsystem has the operational capacity to remove radioactivity and other contaminants from the spent fuel pool. It

is operated as needed to decontaminate the pool water to an acceptable level of clarity and purity. (Turovlin Testimony, ff. Tr. 75, at 3; Walt Testimony, ff. Tr. 54, at 4.)

1-12. Utilization of the purification subsystem during normal storage operations rests with the engineering judgment of the Plant radiation supervisor and the chemistry supervisor, with due regard to occupational exposure considerations. Radiation doses in the spent fuel pool area are not significant and the establishment of a spent fuel pool water radioactivity limit for activation of the cleanup system is not warranted. (Walt, Tr. 63-65.)

1-13. Radioactivity in the spent fuel pool water comes primarily from the introduction of reactor coolant water into the pool during refueling, the dislodged crud from the surface of the spent fuel assembly during handling of the assemblies and to a lesser degree from the leakage of fission products from within the fuel assembly. (Turovlin Testimony, ff. Tr. 75, at 2; PGE Exhibit 2 at PGE-1037, § 4.2.1.2.)

1-14. During normal storage periods, liquid radiological releases from the spent fuel pool are limited to normal leakage of spent fuel pool water from pumps, seals, valve packings, and other equipment in the SFPCDS. This liquid is directed to the liquid radwaste system for processing. It can be subsequently recycled for reuse or discharged to the Columbia River. (Walt Testimony, ff. Tr. 54, at 4, 11; PGE Exhibit 2 at PGE-1037, § 4.2.2.)

1-15. All liquid radiological releases to the Columbia River are monitored by a process and effluent radiation monitor (PERM-9). This monitor is set to alarm when the Technical Specification release rate is approached and again (high alarm) if the limit is exceeded. The liquid release is automatically terminated in the event of a high alarm. The valve in question is the discharge point from the liquid radwaste system to the river. (Walt Testimony, ff. Tr. 54, at 4-5.) The PERM-9 radiation monitor is located a sufficient distance upstream of this valve to allow the valve to close following an alarm prior to discharge of higher activity water to the environment. (Walt, Tr. 61, 70.)

1-16. During normal storage periods, the area above the spent fuel pool water surface is exhausted by the High Efficiency Particulate Air (HEPA)-filtered Fuel and Auxiliary Building Ventilation System (FABVS). Any gaseous radiological releases from the spent fuel pool are collected by this ventilation system for discharge to the environment. The FABVS is also monitored by a process and effluent radiation monitor (PERM-2). This monitor contains particulate, iodine, and noble gas channels which are set to alarm (alert alarm) if the Technical Specification instantaneous release rate is approached, and again (high alarm) if

the limit is exceeded. PERM-2 also contains sampling systems for determining iodine, particulate and tritium releases. (Walt Testimony, ff. Tr. 54, at 5.)

1-17. During fuel handling operations or while spent fuel racks are moved above the pool, the Spent Fuel Pool Ventilation System (SFPVS), which contains HEPA and charcoal filters, is used to exhaust the spent fuel pool area above the surface of the pool water. It exhausts into the FABVS. The SFPVS has its own noble gas process and effluent radiation monitor (PERM-3) which is set to alarm when Technical Specification noble gas release rate limits are approached or equaled. (*Id.* at 5-6; Walt, Tr. 57.)

1-18. If a PERM alarm occurs, Plant procedures require the operators to take action to verify the alarm, and to eliminate the cause of the release. (Walt Testimony, ff. Tr. 54, at 6; Walt, Tr. 56-57.) Spent fuel pool releases are not expected to be large enough to cause a PERM alarm, except in the unlikely event of a fuel handling accident. (Walt Testimony, ff. Tr. 54, at 6.)

1-19. In addition to the Plant cleanup systems, Plant procedures require sampling and monitoring of Plant effluent releases to ensure they do not exceed NRC limits. This allows the Plant to maintain an ongoing record of compliance with Technical Specification release limits and contributes to the ability to control future releases. (*Ibid.*)

4. Basis A: Effects of Defected Fuel

1-20. Oregon's first concern involves the impact of stored spent fuel with failed cladding on the cleanup system and resultant discharges. In considering such concern, it must first be recognized that the proposed higher density spent fuel storage racks increase only the storage capacity of the spent fuel pool and not the frequency or amount of newly discharged fuel to be stored per fuel cycle. Since the major introduction of radioactivity into the pool occurs during refueling, the amount of fission products and activated corrosion product released into the pool during any year will be about the same regardless of the total number of assemblies stored in the pool or their period of storage. (Turovlin Testimony, ff. Tr. 75, at 3.)

1-21. A limited number of Trojan spent fuel assemblies have exhibited cladding defects. Ten fuel assemblies (fifty-five rods) have severely damaged fuel rod cladding, and about five rods contain "pin hole" cladding defects. The former were damaged while in the reactor by a phenomenon called baffle jetting during the 1978-80 and 1981-82 cycles. The damage included ruptured cladding, broken rods, and missing fuel

pellets. The reactor internals were modified during the 1984 refueling outage to prevent future damage. (Walt Testimony, ff. Tr. 54, at 7; Turovlin Testimony, ff. Tr. 75, at 5-6; PGE Exhibit 2 at PGE-1037, § 4.2.1.2.)

1-22. Steps have been taken to correct the baffle jetting problem and no additional assemblies containing severe clad damage due to baffle jetting are expected to be stored in the pool beyond the ten assemblies now present in the pool. Additional fuel assemblies containing common "pin hole" defects may be stored in the pool in the future. (Walt Testimony, ff. Tr. 54, at 7-8; Turovlin Testimony, ff. Tr. 75, at 6.)

1-23. The Trojan cleanup system has demonstrated its ability to handle the contaminants produced by the present inventory of stored assemblies, including those with defected fuel rods. The system has been able to maintain acceptable radioactivity levels even though the system was not operated on a full-time basis. (Turovlin Testimony, ff. Tr. 75, at 4; Walt Testimony, ff. Tr. 54, at 9.)

1-24. Expansion of the storage capacity has the potential for a slight increase in fission products released into the spent fuel pool from clad defects and loose pellets, if any. This could increase the amount of radioactivity accumulated in the purification subsystem filters and resins and necessitate their change on a more frequent basis. (Turovlin Testimony, ff. Tr. 75, at 5; Walt Testimony, ff. Tr. 54, at 8, 10.)

1-25. PGE has performed an analysis of spent fuel pool water fission product radioactivity, including the effects of the defected fuel (both severe and "pin hole"). The analysis conservatively bounded both the amount of defected fuel expected in the spent fuel pool through the year 2003 (the year the pool is assumed to be full), and the fission product release rate from the defected fuel to the spent fuel pool water. (Walt Testimony, ff. Tr. 54, at 8; Walt, Tr. 58-59; PGE Exhibit 2 at PGE-1037, § 4.2.1.2.)

1-26. PGE concluded that the spent fuel pool purification system is capable of handling greater-than-expected levels of defected fuel without causing unacceptably high dose rates above and around the pool. (Walt Testimony, ff. Tr. 54, at 9; PGE Exhibit 2 at PGE-1037, Table 4-11.)

1-27. The NRC Staff performed an analogous evaluation of the defected fuel impact on spent fuel pool cleanup capability and drew a conclusion similar to that of PGE. It testified that failed fuel assemblies stored over a long period have a very minor impact on the level of radioactivity in the spent fuel pool and have no safety significance. Cleanup system resin changes might occur at shorter intervals than presently. (Turovlin Testimony, ff. Tr. 75, at 6-7.)

1-28. Krypton-85 is the only significant gaseous radiological release potentially affected by stored defected fuel. PGE performed a bounding analysis of the effect of defected fuel on such releases. The total calculated maximum yearly Krypton-85 release corresponded to an annual beta air dose (0.18 mrad/year) at the exclusion area boundary which is substantially less than the Technical Specification limit (20 mrad/year). Krypton-85 releases from the Fuel and Auxiliary Building, which houses the spent fuel pool, have actually proven too small to measure, even during years when severely damaged fuel assemblies were initially placed in the pool. (Walt Testimony, ff. Tr. 54, at 10; PGE Exhibit 2 at PGE-1037, § 4.2.2.)

1-29. The damaged fuel cladding has no significant effect on liquid radiological releases from the spent fuel pool, which are confined to normal leakage from SFPCDS components into the liquid radwaste system. This leakage is a small fraction of the normal processing rate of the liquid radwaste system. (Walt Testimony, ff. Tr. 54, at 11.)

1-30. In light of the foregoing, the Board finds that the spent fuel pool cleanup system is able to handle the amount of defected fuel expected over the operational life of the Plant, resulting in acceptable spent fuel pool water radioactivity levels and dose rates.

1-31. To the extent that Oregon expressed concern that fuel pellets may be dislodged from the severely damaged fuel during the additional handling required for reracking (State of Oregon's Response to Objections and Arguments Advanced by Licensee and NRC Staff (May 25, 1984), at 5), such a possibility was shown to be unlikely. The maximum number of movements expected to be required for an individual assembly during the reracking is two. Most assemblies will be moved only once. Such movements will not involve any tilting of the assemblies or any sudden motion or impact that could dislodge fuel pellets. (Walt Testimony, ff. Tr. 54, at 11-12.) Any loose pellets are likely to have been dislodged during the initial refueling activities in which these assemblies were removed from the reactor, upended twice, transported through the fuel transfer tube, and inspected before placement in the spent fuel pool. (*Id.* at 12.) No loose pellets have ever been found in the spent fuel pool. (Walt, Tr. 60, 66.)

1-32. Even if pellets were dislodged during fuel movement, they would fall either on the pool floor, if the existing racks have been removed, on the existing racks or on the new racks. (Walt Testimony, ff. Tr. 54, at 12.) Any pellets that are found on the pool floor by visual or radiation surveys during the reracking will be removed prior to placement of the new racks in the pool. (*Ibid.*; Turovlin Testimony, ff. Tr. 75, at 7.) These surveys entail both remote and diver radiation monitor-

ing and are performed with appropriate precautions, including those necessary to protect the divers conducting such activity. (Walt, Tr. 59-60, 67-68.)

1-33. Any pellets which might fall, or might have fallen, on an existing rack during fuel movement will be intentionally dislodged when the racks are removed from the pool and will then be removed from the pool floor. (Walt Testimony, ff. Tr. 54, at 12.)

1-34. Any pellet which might fall over a new rack is unlikely to fall in such a way that the subsequent placement of assemblies in the rack would crush the pellet. In order for this to happen, the pellet would have to fall down a storage cell and land on the base plate precisely where one of the feet of the bottom nozzle of a subsequently inserted fuel assembly would sit. (*Id.* at 13.)

1-35. Even if a pellet were crushed despite the foregoing precautions, it is likely that the fragments would fall through the cooling flow orifice onto the pool floor and remain there. (*Ibid.*)

1-36. PGE testified that the radiological consequences of the crushing of a pellet are not significant. Conservatively assuming that all of the cesium in the pellet was released, the spent fuel pool cesium concentrations would be comparable to previously measured values in the pool and, within 1 week, would be reduced to approximately normal pool concentrations by the cleanup system. (*Ibid.*) The NRC Staff agreed with the conclusions of PGE's analysis. (Turovlin Testimony, ff. Tr. 75, at 8.)

1-37. Assuming that all of the Kr-85 in one fuel pellet were released to the environment when the pellet is crushed, the beta air dose at the exclusion area boundary would be only about 4×10^{-8} mrad, a very small fraction of the annual Technical Specification design objective of 20 mrad. (Walt Testimony, ff. Tr. 54, at 14.)

1-38. Should pellet fragments become entrained in the water and leak from SFPCDS components, which is unlikely, they will be processed through the liquid radwaste system where they will be removed by the filters and demineralizer. (*Ibid.*)

1-39. In light of the foregoing, the Board finds that it is highly unlikely that reracking operations will dislodge and then crush any loose pellets from defected fuel in the spent fuel pool. Even if a pellet were crushed, the spent fuel pool water radioactivity levels would be comparable to previously measured levels and radiation doses at the exclusion area boundary would be negligible.

1-40. We also find that the Trojan liquid radwaste system is able to handle normal leakage from the SFPCDS. These systems, along with the Plant radioactivity effluent monitoring system and monitoring and sampling procedures, will ensure that releases from the spent fuel pool

during normal operation will not cause Plant releases to exceed the limits specified in the Trojan operating license.

5. Basis B: Cleanup of Cask Loading Pit

1-41. Oregon next expressed concern regarding the impact of processing existing radioactivity in the cask loading pit on the spent fuel pool cleanup system. The cask loading pit is a small, concrete-walled pit, lined with stainless steel, and located immediately adjacent to the spent fuel pool. The pit is connected to the pool, but may be sealed off from it by a leak-tight steel door. (Walt Testimony, ff. Tr. 54, at 15; Turovlin Testimony, ff. Tr. 75, at 8; PGE Exhibit 2 at PGE-1037, § 3.2.1.)

1-42. The cask loading pit was originally designed to serve as a location to place a spent fuel transportation cask while loading the cask with spent fuel. Currently the pit is being used as a temporary storage location for machining effluents resulting from Plant modification work conducted during the 1984 refueling. (Walt Testimony, ff. Tr. 54, at 16; Turovlin Testimony, ff. Tr. 75, at 8.)

1-43. A Plant procedure requires that the existing contaminants be removed from the cask loading pit using a temporary cleanup system. The system consists of a pump and a demineralizer. The discharge from the temporary demineralizer is routed to the spent fuel pool purification subsystem, which acts as a polisher, and then back to the cask loading pit through temporary connections. This temporary cleanup system will be used to recycle the cask loading pit water until sufficient decontamination has been achieved. The cask loading pit door will not be opened until the purification process is complete. (Walt Testimony, ff. Tr. 54, at 17, 19; Turovlin Testimony, ff. Tr. 75, at 9.)

1-44. During the cask loading pit cleanup, the spent fuel pool purification subsystem will be isolated from the spent fuel pool. (Walt Testimony, ff. Tr. 54, at 17.) The temporary isolation of the spent fuel pool cleanup system will not affect the ability of the Plant to maintain radiation discharges within the limits specified by the NRC. The cleanup system was designed to process water other than spent fuel pool water. Isolation of the cleanup system from the spent fuel pool is a normal operation and has been done previously during the interval between refuelings. (Turovlin Testimony, ff. Tr. 75, at 9; Walt Testimony, ff. Tr. 54, at 17.)

1-45. PGE testified that, if the cleanup is not completed prior to the reracking for some unforeseen reason, several controls will be established to prevent cask loading pit contaminants from entering the spent fuel pool and to prevent any adverse impact on the ability of the spent

fuel pool cleanup system to process spent fuel pool water. These include separate administrative controls to prevent the door which separates the cask loading pit and the spent fuel pool from opening and to prevent simultaneous lineup of the spent fuel pool purification system to the cask loading pit and the spent fuel pool. The water level in the cask loading pit will additionally be maintained sufficiently below that of the spent fuel pool to prevent leakage of contaminants from the former to the spent fuel pool. (Walt Testimony, ff. Tr. 54, at 18.) The Staff agreed that these controls are adequate to prevent cask loading pit contaminants from entering the spent fuel pool. (Turovlin, Tr. 79-80.)

1-46. In light of the foregoing, the Board finds that the cleanup of the cask loading pit will not adversely affect the ability of the spent fuel pool purification system to process radioactivity in the spent fuel pool under the expanded capacity conditions.

B. Contention 2

1. *Matters in Controversy*

2-1. As admitted for litigation, Oregon Contention 2 states:

The licensee has not adequately demonstrated that the expanded capacity of the storage facility is designed such that in case of accidents offsite radiation levels will not exceed 10 C.F.R. Part 100 radiation dose values.

Bases:

- A. The impact of an accident involving the drop of a fuel assembly containing dummy stainless steel fuel rods during the reracking has not been addressed.
- B. The conclusion that the free-standing racks will not contact each other or the walls during seismic events is based on theoretical analysis with large uncertainties. Therefore, the effect on fuel assemblies in the event of rack contact should also be analyzed.

2. *Summary*

2-2. Oregon Contention 2 concerns the ability to maintain accidental spent fuel pool radiological releases within regulatory levels following the proposed capacity expansion. The Oregon concern centered around two particular issues: the impact of the postulated drop of a spent fuel assembly containing dummy stainless steel fuel rods during reracking (denominated Basis A) and the validity of PGE's license amendment application analysis that the spent fuel racks will not contact each other or the spent fuel pool walls during a seismic event (denominated Basis B).

2-3. The Board concludes that this contention has been fully addressed, and that, in response to the issues raised by Oregon, PGE has adequately demonstrated that the expanded capacity of the storage facility is designed such that in case of accidents, offsite radiation levels will not exceed 10 C.F.R. Part 100 guideline reference radiation dose values.¹ Specifically, with regard to Basis A of the contention, the uncontroverted evidence demonstrates that the probability of dropping a fuel assembly containing stainless steel rods on another fuel assembly in the spent fuel racks is very low. Even if such an accident were to result in the breaking of all the rods in both affected assemblies, the radiological releases and resultant doses at the exclusion area boundary would not exceed those of the design basis fuel handling accident nor the guideline reference dose levels in 10 C.F.R. Part 100.

2-4. With regard to Basis B of the contention, the uncontroverted evidence demonstrates that the Trojan spent fuel racks will not impact each other or the spent fuel walls when subjected to an operating basis earthquake (OBE) or a safe shutdown earthquake (SSE). Even under assumed hypothetical contact between spent fuel racks or between the racks and the spent fuel pool wall, conservative analyses performed by PGE demonstrate that such impacts would not cause unacceptable consequences to the spent fuel pool, spent fuel racks, or spent fuel assemblies.

2-5. PGE's direct case on Oregon Contention 2 consisted of the testimony of Thomas D. Walt on Basis A (ff. Tr. 93) and a panel consisting of Jagdish H. Shah, Theodore E. Bushnell, and William J. Bryan on Basis B (Shah Panel) (ff. Tr. 111), and portions of PGE Exhibits 1 and 2. Mr. Shah is the Structural Design and Engineering Manager with Nuclear Energy Services (NES), the Trojan spent fuel rack supplier. Mr. Bushnell is the Civil Engineering Branch Manager of the PGE Nuclear Projects Engineering Department. Mr. Bryan is the Manager of Advanced Mechanical Development in the Westinghouse Electric Corporation (Westinghouse) Nuclear Fuel Division. The NRC Staff testimony on Oregon Contention 2 consisted of the testimony of Millard L. Wohl on Basis A (ff. Tr. 98) and Owen O. Rothberg on Basis B (ff. Tr. 130). Mr. Wohl is a nuclear engineer in the Accident Evaluation Branch of the NRC Office of Nuclear Reactor Regulation. Mr. Rothberg is an engineer

¹ Part 100, § 100.11(a)(1), n.2 of 10 C.F.R. The Board notes that Part 100, Reactor Site Criteria, applies to the evaluation of the suitability of proposed sites for stationary power and testing reactors subject to 10 C.F.R. Part 50, Domestic Licensing of Production and Utilization Facilities. It has become Staff practice, however, to apply Part 100 guidelines also to reactor license amendment proceedings. (Wohl, Tr. 102.)

in the Division of Engineering in the NRC Office of Nuclear Reactor Regulation.

3. Basis A: Fuel Assembly Drop

2-6. Oregon expressed concern over the possibility and consequences of the drop of a spent fuel assembly containing stainless steel rods during reracking. As a result of fuel cladding failures observed during the 1978-80 Plant operating cycle, two new fuel assemblies were modified for use in subsequent cycles such that three fuel rods in each assembly were replaced with stainless steel rods to protect them from vibrations induced by core baffle jetting. These two assemblies were discharged following the 1983 cycle, are currently in the spent fuel pool, and will remain there during the reracking. (Walt Testimony, ff. Tr. 93, at 2-3; Wohl Testimony, ff. Tr. 98, at 2.)

2-7. A fuel assembly containing stainless steel rods is not likely to be dropped on a stored fuel assembly during reracking and puncture it. This would require the coincidence of several improbable events. To begin with, the probability of dropping any spent fuel assembly during handling operations is very low. PGE fuel handling procedures contain administrative controls to avoid the drop of an assembly and the spent fuel pool manipulator crane and fuel handling tools are also designed to prevent this from happening. No assemblies have been dropped during the five refuelings and associated fuel movements at Trojan. This entailed over 1900 assembly movements. The probability of dropping an assembly containing stainless steel rods is even lower. There are only two such assemblies, out of the current 300, in the spent fuel pool. Most assemblies will only be moved once, with some moved twice, during the rack replacement. Lastly, the probability that a dropped assembly would strike another assembly is similarly low. (Walt Testimony, ff. Tr. 93, at 3-4; Wohl, Tr. 100.)

2-8. Despite the foregoing, both PGE and the Staff analyzed the hypothetical radiological consequences which could result from a postulated drop of a fuel assembly during reracking. As noted in the following findings, both analyses demonstrated that the resultant doses from such an accident would not exceed that of the design basis fuel handling accident or the guideline reference dose levels of 10 C.F.R. Part 100.

2-9. The Trojan Technical Specifications prohibit the reracking operation from beginning prior to 60 days following removal of the fuel from the reactor. This restriction was established to reduce the spent fuel assembly "gap" radionuclide inventory available for potential

release in the event of a fuel handling accident. (Wohl Testimony, ff. Tr. 98, at 3-4.) The fuel rod "gap" consists of the space between the fuel pellets and the fuel rod cladding and the plenum space at the top of the fuel assembly. The Technical Specifications also prohibit fuel from being removed from the reactor less than 100 hours following reactor shutdown. Therefore, both the PGE- and Staff-postulated accidents assumed a decay period of at least 64 days for the damaged dropped assembly. (Walt Testimony, ff. Tr. 93, at 4-5; Wohl Testimony, ff. Tr. 98, at 2-3.)

2-10. The accident scenario postulated by the Staff was the drop of one fuel assembly during handling onto a fully loaded section of racks and the release of the gap activity of all 264 rods in the fuel assembly. The presence of the three dummy unfueled rods in the dropped assembly was conservatively ignored. The Staff assumed that all of the iodine and noble gas inventory in the fuel rod "gap" of the one assembly is released. This latter assumption is conservative because a portion of the "gap" iodine will actually plate out on the inner surface of the cladding and will not, therefore, be released. (Wohl Testimony, ff. Tr. 98, at 2-3; Wohl, Tr. 100.)

2-11. The potential radiological consequences at the exclusion area boundary for the NRC Staff-postulated accident were estimated to be 0.16 rem to the thyroid and less than 0.1 rem to the whole body. The resultant doses would be twice these levels if it were assumed that all of the gap activity in both the dropped and stored assemblies was released. In either case, these doses are a very small fraction of the 10 C.F.R. Part 100 guideline values (25 rem to the whole body; 300 rem to the thyroid) and less than the doses resulting from the Trojan design basis fuel handling accident. (Wohl Testimony, ff. Tr. 98, at 4-5; Wohl, Tr. 99-101.)

2-12. The design basis fuel handling accident is a nonmechanistic rupture of the cladding of all fuel rods of one freshly discharged assembly which has decayed 100 hours. (Wohl Testimony, ff. Tr. 98, at 5; Walt Testimony, ff. Tr. 93, at 4; PGE Exhibit 1.)

2-13. PGE assumed that all of the rods would be broken in both the dropped assembly and the stored assembly which is assumed to be struck. The calculated doses at the exclusion area boundary were 0.002 rem to the whole body, 0.15 rem to the skin and 0.22 rem to the thyroid. These doses, like those postulated by the Staff, are considerably less than the doses calculated to result from the design basis fuel handling accident and are a small fraction of the guideline reference levels specified in 10 C.F.R. Part 100. (Walt Testimony, ff. Tr. 93, at 4-7.)

2-14. From a general standpoint, the additional storage capacity expansion does not significantly increase the total gap activity available for

credible accidental release. Krypton-85 is the only radionuclide in the spent fuel rod gap increased as a result of the storage capacity expansion, but it does not contribute significantly to offsite doses. Since the activities of all other noble gas and iodine isotopes in the spent fuel pool are not increased significantly, the total increase in fuel rod gap radioactivity corresponding to the increase in capacity from 651 assemblies to 1408 assemblies is only about 1.4% under uniform assumptions about the quantity and decay period of fuel discharged to the pool at a given time. (*Id.* at 6-8; Walt, Tr. 94-95.)

2-15. The Board finds that the potential offsite radiological consequences of a fuel handling accident involving an assembly containing dummy stainless steel fuel rods are a very small portion of the guideline reference dose levels of 10 C.F.R. Part 100 and thus do not represent a compromise to the public health and safety.

4. Basis B: Movement of Racks During Seismic Events

2-16. Oregon next expressed concern over the validity of PGE's license amendment application analysis that the spent fuel racks will not contact each other or the spent fuel walls during a seismic event.

2-17. A nonlinear time-history method dynamic analysis was performed by NES on behalf of PGE to ascertain the responses of the spent fuel racks under either an operating basis earthquake (OBE) or safe shutdown earthquake (SSE). This methodology follows a step-by-step integration technique. The dynamic parameters of the structure in question are determined at the beginning and at the end of each time-step; the response of the structure for each time-step is computed. For a given base motion, the analysis gives a realistic prediction of the response of the entire structure. This method has been utilized extensively in many industries. The NRC Standard Review Plan (SRP) (§ 3.8.4.) provides that this is an acceptable method for prediction of sliding and tilting of free-standing spent fuel racks. (Shah Panel Testimony, ff. Tr. 111, at 4-5; Rothberg Testimony, ff. Tr. 130, at 3-4.)

2-18. In response to Oregon's concern, PGE and the NRC Staff testified that the nonlinear time-history dynamic analysis does not have large uncertainties attached to it. It is the most rigorous, feasible and widely used method of performing dynamic analysis of structures such as free-standing spent fuel racks. The large number of time-steps and the conservative assumptions employed in the analysis done on behalf of PGE minimizes uncertainties and produces conservative results. For example, it was assumed that two racks approach each other such that they attain the maximum deflections (sliding, tilting, rotation, flexure)

simultaneously. (Shah Panel Testimony, ff. Tr. 111, at 6-7; Rothberg Testimony, ff. Tr. 130, at 4-6.)

2-19. The maximum sliding that the racks will experience was calculated using a very low coefficient of friction between the racks and the floor. Maximum rack tilting was also estimated by assuming a conservatively high coefficient of friction. Both the lowest and highest coefficients of friction were assumed to occur simultaneously despite this physical impossibility. All fuel assemblies within a spent fuel rack cell, regardless of their positioning within the cell, were assumed to impact the cell wall in which they are located in the same direction at the same time. Various loading cases, involving racks with partial and full inventories, were analyzed. The maximum sliding occurs for the fully loaded rack. Nonetheless, these two motions were both assumed to be applicable and were combined to obtain conservative analytical results. It is obviously not possible for a rack to be both partially and fully loaded at the same time. (Shah Panel Testimony, ff. Tr. 111, at 6; Rothberg Testimony, ff. Tr. 130, at 3-5; Shah, Tr. 117-19.) No credit was taken for additional damping that technical research shows exists for structures stored under water, as such additional damping is difficult to quantify and not provided for in Regulatory Guides. (Shah, Tr. 118-19.)

2-20. Although the use of computer codes to design the rack is a potential source of nonconservatism, the accuracy of the codes was verified in accordance with SRP (§ 3.8.1) criteria, and the codes are based on sound engineering principles and practices. Therefore, they are not regarded as a source of unconservative results that would compromise design. (Rothberg Testimony, ff. Tr. 130, at 5-6; PGE Exhibit 2, November 23, 1983 Letter from Broehl, PGE, to Miller, NRC.)

2-21. In light of the foregoing, the Board finds that the nonlinear dynamic analysis employed to determine the responses of the Trojan spent fuel racks under seismic conditions is a valid means for making such a determination and does not have large uncertainties attached to it.

2-22. The minimum design clearance between adjacent spent fuel racks is 2½ inches at the top and 2 inches at the bottom. The minimum design clearance between a spent fuel rack and the spent fuel pool wall is 1¼ inches at the top and 1½ inches at the base. (Rothberg Testimony, ff. Tr. 130, at 4; Shah Panel Testimony, ff. Tr. 111, at 7.)

2-23. The results of the Trojan nonlinear dynamic analysis demonstrated that, under the motion of the OBE or SSE, adequate clearances exist to preclude impacts between any two racks or between any rack and a spent fuel pool wall. During the SSE event (which governs in this instance), the maximum sliding and deflection was determined to be 0.76 inch at the top of the rack and 0.73 inch at the rack base plate. It

was conservatively assumed that adjacent racks were displaced toward each other by these amounts. A 0.98-inch minimum additional clearance at the top of the racks and 0.53 inch at the base plates was maintained in the design clearance. A minimum additional clearance of 0.99 inch between a rack and spent fuel pool wall at the top and 0.77-inch clearance at the base plate was established. (Shah Panel Testimony, ff. Tr. 111, at 8-9.)

2-24. As the Staff testified, the design clearance exceeds the maximum rack deflections under seismic conditions by a factor of 1.65 at the top of the racks and 1.37 at their bottom. Both safety margins are acceptably conservative. (Rothberg, Tr. 131-33, 137.)

2-25. In light of the above analysis and evaluation, PGE and the Staff concluded that neither rack-to-rack nor rack-to-wall contact will occur during an SSE. (Shah Panel Testimony, ff. Tr. 111, at 8-9; Rothberg Testimony, ff. Tr. 130, at 6; Bushnell, Tr. 116; Rothberg, Tr. 133-34; PGE Exhibit 2 at PGE-1037, § 3.3.3.) The Board agrees.

2-26. PGE, nonetheless, agreed to adopt a procedure to determine whether permanent rack movement has occurred following an OBE and to take any necessary remedial action. (Bushnell, Tr. 121-22.)

2-27. Despite analysis that demonstrated that the racks would not impact each other or the spent fuel pool wall during an SSE, PGE utilized simplified bounding case models to analyze the probable results should the racks hypothetically contact each other or the spent fuel pool wall in such an event. (Shah Panel Testimony, ff. Tr. 111, at 10; Bushnell, Tr. 116-17.) This would also envelope the Oregon concern about the impact potentially occasioned by the occurrence of multiple smaller post-SSE earthquakes. (Bushnell, Tr. 119-21.)

2-28. Under these models, a typical fuel rack was first considered to be supported on rack support pad frictionless sliding elements which essentially can be pictured as rollers. It was then hypothesized that the spent fuel pool structure was instantaneously put in motion with respect to the rack at a velocity equal to the peak horizontal SSE ground velocity. Rack relative movement was considered to continue until impact occurs with the spent fuel pool wall. (Shah Panel Testimony, ff. Tr. 111, at 9; Bushnell, Tr. 120-21.) These assumptions are extremely conservative. (Rothberg, Tr. 133.)

2-29. PGE considered the following energy absorption mechanisms: (1) deformation of the spent fuel pool liner plate, (2) penetration of the spent fuel pool wall concrete, and (3) deformation of the rack structure and possible effects on the spent fuel assemblies. (Shah Panel Testimony, ff. Tr. 111, at 10-11.) Using a number of conservatisms, the hypothetical impact effect on each of these energy absorption

mechanisms was analyzed utilizing an energy balance technique, where the impact energy is required to be balanced in the energy absorption mechanism. (*Id.* at 11-12.)

2-30. PGE measured the hypothetical rack impact against three basic acceptance criteria. The first criterion was preclusion of offsite radiation dose levels from exceeding the guideline reference dose levels specified in 10 C.F.R. Part 100. This criterion was converted to an acceptance limit of unacceptable damage to no more than all the fuel rods in one spent fuel assembly, the equivalent of the design basis fuel-handling accident. The second criterion was preclusion of permanent rack deformation to such a degree as to result in exceedance of the criticality constant (i.e., effective reactivity) $K_{eff} = 0.95$. The third criterion was preclusion of spent fuel pool wall cracking, coupled with spent fuel pool liner plate rupture, to such a degree as to cause loss of spent fuel pool water beyond makeup capability. (*Id.* at 13.)

2-31. The energy balance analysis demonstrated that each specified acceptance criterion was met and that no unacceptable damage to the spent fuel pool, spent fuel racks, or spent fuel assemblies would occur under the postulated impact conditions. (*Id.* at 14-18.)

2-32. PGE also calculated that the maximum deceleration of a spent fuel assembly upon impact of a rack with a spent fuel pool wall was approximately 6.5g.² Westinghouse then performed a separate evaluation of the effect of such impact on spent fuel assemblies, and concluded that structural integrity of the spent fuel assembly is maintained and fuel rods will not be damaged. Spent fuel assemblies can withstand an impact of 34g without localized fuel rod clad yielding and/or failure. No evidence of fuel rod damage was found in Westinghouse impact tests conducted on unirradiated prototype fuel assemblies to an impact load of approximately 20g. (*Id.* at 18-19.)

2-33. In light of the foregoing, the Board finds that neither rack-to-rack nor rack-to-wall contact will occur during an SSE, and that, even if hypothetical impacts of the spent fuel racks were to take place during a seismic event, no unacceptable damage would result to the spent fuel pool, spent fuel racks, or spent fuel assemblies.

III. CONCLUSIONS OF LAW

In reaching this decision, the Board has considered all the evidence submitted by the parties and the entire record of this proceeding. That

² One "g" is the acceleration of gravity.

record consists of the Commission's Notice of Hearing, the pleadings and testimony filed by the parties, the transcript of the hearing, and the exhibits received into evidence. All issues, arguments, or proposed findings presented by the parties, but not addressed in this decision, have been found to be without merit or unnecessary to this decision. Based upon the foregoing Findings which are supported by reliable, probative, and substantial evidence as required by the Administrative Procedure Act and the Commission's Rules of Practice, and upon consideration of the entire evidentiary record in this proceeding, the Board, with respect to the issues in controversy before us;

CONCLUDES that Portland General Electric Company has fully met its burden of proof on each of the contentions decided in this Initial Decision. In response to the issues raised by Oregon, PGE has adequately demonstrated that the expanded capacity of the storage facility is designed to maintain discharges of radiation within the limits specified in License No. NPF-1 and that such capacity is designed so that in case of accidents offsite radiation levels will not exceed 10 C.F.R. Part 100 guideline reference radiation dose values. As to these issues, there is reasonable assurance that the Trojan Nuclear Plant can be operated without endangering the health and safety of the public under the expanded spent fuel pool capacity authorized by Amendment No. 88 to License No. NPF-1 issued by the NRC Office of Nuclear Reactor Regulation on June 8, 1984. Accordingly, the Board affirms the issuance of said Amendment No. 88 and additionally concludes that no modifications thereof or additional conditions are required.

IV. ORDER

WHEREFORE, in accordance with the Atomic Energy Act of 1954, as amended, and the Rules of Practice of the Commission, and based on the foregoing findings of fact and conclusions of law, IT IS ORDERED THAT License Amendment No. 88 to License No. NPF-1 issued by the Office of Nuclear Reactor Regulation on June 8, 1984, authorizing an increase in the storage capacity of the Trojan spent fuel pool from 651 fuel assemblies to 1408 fuel assemblies shall remain in full force and effect without modification.

IT IS FURTHERED ORDERED, in accordance with 10 C.F.R. § 2.760, that this Initial Decision shall constitute the final decision of the Commission thirty (30) days from the date of issuance, unless an appeal is taken in accordance with 10 C.F.R. § 2.722 or the Commission directs otherwise. *See also* 10 C.F.R. §§ 2.785 and 2.786. Any party may

take an appeal from this Decision by filing a Notice of Appeal within ten (10) days after service of this Decision. A brief in support of such appeal shall be filed within thirty (30) days after the filing of the Notice of Appeal (forty (40) days in case of the Staff). Within thirty (30) days after the period has expired for the filing and service of the briefs of all appellants (forty (40) days in the case of the Staff), any other party may file a brief in support of, or in opposition to, the appeal of any other party. A responding party shall file a single responsive brief, regardless of the number of appellants' briefs filed.

**THE ATOMIC SAFETY AND
LICENSING BOARD**

**Helen F. Hoyt, Chairperson
ADMINISTRATIVE JUDGE**

**Peter A. Morris
ADMINISTRATIVE JUDGE**

**Oscar H. Paris
ADMINISTRATIVE JUDGE**

**Dated at Bethesda, Maryland,
this 28th day of November 1984.**

APPENDIX A

LIST OF EXHIBITS

I. PGE

Exhibit No.	Description	Admitted
1	Updated Trojan Final Safety Analysis Report Section 15.7.5 (as amended by Amendment 2 — July 1984)	Tr. 49
2	A. Spent Fuel Storage Rack Replacement Report (PGE-1037): §§ 3.2.1, 3.3.3, 4.2.1.2, 4.2.2; Figures 1-1, 3-6, 3-13; Tables 3-3, 3-10, 4-4 to 4-9, 4-11. B. PGE Responses to NRC Questions: 1. Excerpts from Attachment 2 to Letter from D.J. Broehl (PGE) to J.R. Miller (NRC), dated November 23, 1983, Responses to NRC Requests 6, 7, 9, and 13. 2. Excerpt from Attachment 1 to letter from B.D. Withers (PGE) to J.R. Miller (NRC), dated December 30, 1983, Response to NRC Request 4.	Tr. 49

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Lawrence Brenner, Chairman
Dr. George A. Ferguson
Dr. Peter A. Morris**

In the Matter of

Docket No. 50-322-OL

**LONG ISLAND LIGHTING
COMPANY**

**(Shoreham Nuclear Power
Station, Unit 1)**

November 30, 1984

Of three issues remanded to it by the Appeal Board — (1) housekeeping; (2) environmental qualification of nonsafety-related electrical equipment; and (3) control systems interaction — the Licensing Board finds that numbers (1) and (2) are adequately resolved by affidavits from the NRC Staff. Although the Appeal Board had remanded Issue No. (3) while under a significant factual misimpression (that two studies had not been done while, in fact, they had), it apparently wished to afford Intervenor some recent opportunity to come forward with litigable issues pertaining to the two studies. Thus, the Licensing Board grants the Intervenor additional time to frame such issues, although they could fairly be charged with delay. However, based on a balancing of the equities, the possible pendency of such issues does not provide a basis to stay the issuance of a low power operating license.

RULES OF PRACTICE: STAY PENDING REMAND

The test for determining whether a stay of activities should be imposed pending disposition of a remand is less stringent for the proponent than is the test applicable for stay pending appeal. The test balances: (1) seriousness of the remanded issue; (2) traditional balancing of equities; and (3) any likely prejudice to further decisions that might be called for on the remand.

RULES OF PRACTICE: STAY PENDING REMAND

Where facts material to a remanded issue had changed significantly during the pendency of appeal, parties were under some obligation to take steps to protect their interests in the interim.

RULES OF PRACTICE: UNTIMELINESS

Where Intervenor's had been in possession of documents setting forth the Applicant's and Staff's analyses for over a year, were on specific notice that the subject matter involved had been remanded to the Licensing Board for possible future adjudication for three weeks, were reminded five days prior to a scheduled conference of counsel that they would be expected to come to the conference prepared with specific substantive issues challenging the analyses, the Intervenor's' failure to come so prepared cannot be viewed as reasonable.

TECHNICAL ISSUES DISCUSSED

Control systems interactions

Environmental qualification of nonsafety-related equipment.

MEMORANDUM AND ORDER RULING ON REMAND ISSUES

BACKGROUND

On October 31, 1984, the Appeal Board issued its Decision (ALAB-788, 20 NRC 1102) on appeals from our Partial Initial Decision

(PID) of September 21, 1983, LBP-83-57, 18 NRC 445.¹ The Appeal Board decided essentially all issues on appeal in favor of the Applicant, Long Island Lighting Company (LILCO). However, it remanded three matters, which it characterized as "relatively minor" ones, for further consideration by this Board:

1. quality assurance implementation of "housekeeping" requirements;
2. identification of any nonsafety-related electrical equipment for which environmental qualification may be required by 10 C.F.R. § 50.49(b)(2);
3. safety of plant operation pending resolution of Unresolved Safety Issue (USI) A-47, known as "control systems interactions."

On the record during our November 2, 1984 hearing session (Tr. 25,682-84) and by unpublished written confirmatory order on November 5, we directed the parties to file reports addressing (1) the status of the three remanded issues, (2) any further procedural or substantive actions required of the Board or the parties, and (3) the effect of the three issues on the issuance of a low power license. We received those reports from LILCO, from Intervenor Suffolk County, and from the NRC Staff, on November 14.

The following day, at our November 15 hearing session, we informed Suffolk County that we were dissatisfied with its written report. Particularly with respect to USI A-47, we noted that the County's report was "unacceptably general" in view of the fact that LILCO had completed the two USI A-47 studies (discussed *infra*) that were required of it, and the Staff had completed its review of those studies and had reported its results to all parties in a supplement to the Shoreham Safety Evaluation Report (SER), issued over a year ago, by early October 1983. The County's Report merely recited that it was awaiting the receipt of materials to be filed with this Board by the Staff (presumably the Staff's two affidavits addressing USI A-47 which merely reiterated and referenced the September 1983 SER supplement), and described the commitments of the County's consultants, Messrs. Minor, Bridenbaugh and Hubbard, who would have to complete their analyses of the information on this issue prior to the County taking a substantive position.² We noted that we were raising the issue so that Suffolk County's counsel could consider

¹ In that PID we had found in favor of the Applicant on virtually all of the issues before us for decision, and we found that the pendency of the issues not decided in LILCO's favor would not prevent the issuance of a low power license (up to 5% of rated power) if and when problems regarding onsite emergency power sources were resolved.

² Suffolk County's Report at 2-3.

it prior to the conference of parties scheduled for November 20; and that while we might be willing to consider litigation on the merits of any specific issues under USI A-47 which may be set forth subsequent to a conference of parties, we were unlikely to stay issuance of a low power license in the absence of a basis to do so — such as identification by the County by November 20 of a specific control system interaction within the scope of LILCO's two long-completed studies (discussed *infra*). Tr. 26,680-81.

The conference of parties was held on the morning of November 20, 1984. Present were representatives of LILCO, Suffolk County and the NRC Staff. Notwithstanding our admonition of November 15, Suffolk County came with nothing concrete in the way of issue-framing under A-47. After hearing and carefully considering the position of each party, we made an oral ruling on the three remanded issues. We ruled that the "housekeeping" and the environmental qualification issues had been adequately resolved within the scope of the remand, and were thus closed. As to the USI A-47 issue, specifically as to the two relevant studies, we permitted the County to have until December 11, 1984 to propose one or more appropriate contentions adequately framed for possible litigation. Answers by LILCO and the Staff to any such County proposal will be due December 18 and 21, respectively. We further ruled that the possible pendency of any new issues arising out of the two thirteen-month-old USI A-47 studies (the only remanded matter remaining open) does not impede the issuance of a low power license for Shoreham. Tr. 27,075-78. That afternoon we issued a brief confirmatory Order (unpublished) setting forth our rulings; the instant Memorandum and Order will discuss our rationale for those rulings.

HOUSEKEEPING

NRC regulations require utilities to ensure that activities which affect quality during construction or operation of a nuclear power plant be accomplished under controlled conditions, including adequate cleanliness.³ LILCO had agreed, pursuant to an NRC Staff confirmatory action letter (CAL No. 83-01) of January 19, 1983, to implement certain procedures to resolve ongoing "housekeeping" problems at Shoreham. In light of that commitment, and in the absence of any identified safety questions

³ Criterion II of 10 C.F.R. Part 50, App. B.

relating to this issue, our PID found that the commitment adequately resolved LILCO's housekeeping problems.⁴

The Appeal Board, however, agreed with Suffolk County's assertion on appeal that, given LILCO's past lack of diligence in correcting housekeeping deficiencies at Shoreham, we had erred in relying upon the LILCO commitment to improve. The Appeal Board remanded the issue, with the requirement that the Staff certify to us that an appropriate level of cleanliness is in fact being maintained at Shoreham.⁵

In response to the Appeal Board's remand, the NRC Staff submitted the affidavit of Edward A. Greenman, Chief, Projects Branch No. 1 within the NRC's Division of Project and Resident Programs, Region I. Mr. Greenman had been a witness on this subject at the hearing. In his affidavit dated November 7, 1984, Mr. Greenman stated that the substantial commitments made by LILCO in accordance with CAL No. 83-01 had marked the turning point in LILCO's housekeeping conditions and practices at Shoreham. Greenman affidavit, ¶ 7. Since then, NRC Staff inspectors have observed and documented (in referenced inspection reports) a steady improvement in housekeeping and cleanliness at Shoreham. *Id.* at ¶ 8. He concluded that LILCO has met its commitments and that current housekeeping practices provide acceptable levels of cleanliness at Shoreham, and set forth adequate bases for his conclusion. *Id.* at ¶ 10. All parties and the Board agree that no further action is required before this Board with respect to the housekeeping issue, based on Mr. Greenman's certification on behalf of the NRC Staff. Tr. 27,014. Thus, the concerns of the Appeal Board have been satisfied and this issue is closed.

ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT

Section 50.49(b)(2) of 10 C.F.R. requires that nonsafety-related electrical equipment must be qualified to function in postulated environmental conditions (i.e., the harsh environments created during design basis accidents) where the failure of the equipment due to those conditions could prevent successful accomplishment of safety functions by safety-related equipment. Applicants must establish a program for qualifying any nonsafety-related equipment which falls under § 50.49(b)(2).

⁴ LBP-83-57, 18 NRC 445, 598-99 (1983).

⁵ ALAB-788, 20 NRC at 1144-46.

At the time of our hearing on this issue, the regulation was newly promulgated.

At our hearing, LILCO had testified that no nonsafety-related equipment was expected to require § 50.49(b)(2) qualification because Shoreham's design philosophy was to either classify all equipment that could prevent successful accomplishment of safety functions as safety-related (and thus to environmentally qualify it as such) or to sufficiently isolate electrical equipment to preclude interactions between safety-related and nonsafety-related systems. The NRC Staff testified, in agreement with LILCO, that Shoreham's design philosophy would have the effect LILCO described.⁶

We found that, notwithstanding the fact that criteria for the identification of § 50.49(b)(2) equipment had as yet to be developed, the Shoreham design philosophy has been such as to strive to preclude unacceptable interactions between safety-related and nonsafety-related equipment. Part of our basis for this was the in-depth litigation before us of the broad systems interactions contention, denominated 7B. We found, therefore, that if there were any items of § 50.49(b)(2) equipment that would require qualification, their number would be small and their effects minor.⁷ Prior to fuel load, LILCO was to (1) submit to the Staff a list of any equipment which must comply with § 50.49(b)(2), and to qualify that equipment or justify interim operations prior to qualification; or (2) inform and satisfy the Staff that no such equipment existed.⁸ In effect, we asked the Staff to confirm that LILCO had adequately fulfilled this requirement.

The Appeal Board agreed with us that the LILCO and Staff testimony regarding the effect of Shoreham's design philosophy had not been effectively undermined,⁹ that there was support in the record for our finding that there would be little or no § 50.49(b)(2) equipment at Shoreham,¹⁰ and that the delegation to the Staff of the authority to confirm that LILCO has either upgraded or properly isolated nonsafety-related equipment, so that none falls within the § 50.49(b)(2) category, was not improper.¹¹ However, the Appeal Board noted that, as to the potential small number of heretofore unidentified § 50.49(b)(2) items which might have to be included in the qualifications program, the County, "would be entitled to address" any efforts by LILCO to justify interim

⁶ LBP-83-57, 18 NRC at 538-39.

⁷ *Id.* at 539-40.

⁸ *Id.* at 544.

⁹ ALAB-788, 20 NRC at 1159.

¹⁰ *Ibid.*

¹¹ *Id.* at 1160.

operations prior to full environmental qualification (or, presumably, possible isolation). The Appeal Board then noted an ambiguity in the record: in a letter to the parties last August the Staff indicated that LILCO had submitted any necessary identification of equipment and that this matter "has been resolved by LILCO to the satisfaction of the NRC staff."¹² The Appeal Board pointed out that it was unclear whether the Staff's approval rested upon the permissibly delegated confirmation that no § 50.49(b)(2) equipment exists, or upon a substantive determination that LILCO had properly justified interim operations.¹³

At the November 20 conference, counsel for Suffolk County indicated her belief that what the Appeal Board had remanded to this Board concerning § 50.49(b)(2) was nothing less than an examination of the Staff's bases for its findings on what equipment is in that category. Tr. 27,018. The Board disagrees. The plain wording of the Appeal Board's decision tells us that no further action is required before us in this matter if the Staff's conclusion was based upon a determination that there is no equipment in the category. The Appeal Board only opened inquiry into the basis for the Staff's approval if there was any such equipment.¹⁴ In addition to the plain language of the Appeal Board, this interpretation follows from the Appeal Board's preceding determination that our delegation to the Staff, to confirm that no § 50.49(b)(2) equipment either existed or remains, was not improper.¹⁵

In an affidavit submitted by the NRC Staff, Robert L. LaGrange, Equipment Qualification Branch, Division of Engineering, NRR, certified that no equipment at Shoreham falls within the § 50.49(b)(2) category and pointed to Supplement 7 of the Staff's Safety Evaluation Report (SSER 7) for Shoreham (September 1984) ¶ 3.11.3.1, where the Staff's basis for that determination is set forth. LaGrange affidavit, ¶ 3.

As part of its analysis of this matter, the Applicant conducted two studies: (1) the effect of power supply, sensor and sensor impulse line failures on several control systems ("Control Systems Study"); and (2) the effect of high energy line breaks on control systems ("HELB Study").¹⁶ These studies are the same ones which are the subjects of the USI A-47 remand and will be considered in connection with our discussion of USI A-47, below. The County asserts that, in light of this interre-

¹² Note to Attached Service List from B. Bordenick, August 7, 1984, transmitting Memorandum to E. Reis from A. Schwencer, "Shoreham License Conditions," July 30, 1984, at 2.

¹³ ALAB-788, 20 NRC at 1160.

¹⁴ *Ibid.* The Appeal Board required the Staff to advise us: "*whether* any equipment falls into the section 50.49(b)(2) category and, *if so*, the basis for the staff's approval." (Emphasis added.)

¹⁵ *Ibid.* See p. 1536, above.

¹⁶ See SSER 7 (September 1984), ¶ 3.11.3.1 (at p. 3-8).

lationship between the A-47 and environmental qualification issues, the analysis of the two studies as afforded by the Appeal Board in the A-47 remand is necessary in order to evaluate the basis for the Staff's determination regarding § 50.49(b)(2).¹⁷ Thus, the County would have the environmental qualification issues held open pending resolution of any issues under the remand regarding the two USI A-47 studies.

We disagree. We have already answered Suffolk County's general assertion that it is entitled to test the bases of the Staff's conclusion regarding the absence of § 50.49(b)(2) equipment: within the limited scope of the remand it is not. Although we have closed this issue, if any litigation regarding the Control Systems and/or HELB studies ultimately takes place, and discloses that there are any unacceptable interactions involving nonsafety-related equipment which thereby falls under this § 50.49(b)(2) category, we will either require isolation or upgrading (to be functionally safety-related) of any such § 50.49(b)(2) equipment which is ultimately detected so as to remove it from the category, or full environmental qualification or justification for interim operation pursuant to the requirements of § 50.49.¹⁸

UNRESOLVED SAFETY ISSUE A-47 "CONTROL SYSTEMS INTERACTIONS"

USI A-47 concerns the potential that control system failures or malfunctions may interfere with the use of safety equipment and thereby make an accident or transient more severe than those anticipated in safety analyses. Its goal is to define generic criteria that can be used for plant-specific studies to detect such control systems interactions problems.¹⁹

In the Shoreham operating license hearing, A-47 was litigated before us as a subsidiary issue within a broad systems interaction contention, designated 7B.²⁰ That contention encompassed the methodology used by

¹⁷ Suffolk County's Report at 4.

¹⁸ This is the same as our common sense disposition in the PID of the County's similar claim that presently unidentified § 50.49(b)(3) post-accident monitoring equipment which may be required in the future after fuel load had to be environmentally qualified, and that therefore the record on LILCO's compliance with the § 50.49 environmental qualification requirements was incomplete. We held that equipment not even identified as being required for post-accident monitoring by Regulatory Guide 1.97, Revision 2 (and thereby falling into the § 50.49(b)(3) category), is perforce not required to be presently included in the environmental qualification program. We noted that if and when such equipment is identified as being required in the future, it will be required to comply with the environmental qualification rule. LBP-83-57, 18 NRC at 540. The Appeal Board found no basis for upsetting our decision on compliance with § 50.49(b)(3). ALAB-788, 20 NRC at 1060-61.

¹⁹ See ALAB-788, 20 NRC at 1135-36; LBP-83-57, 18 NRC at 552.

²⁰ See LBP-83-57, 18 NRC at 548-55.

LILCO and the Staff in the analysis of all systems interactions and the safety classification of structures, systems and components. On the issue of whether Shoreham can be safely operated prior to the generic resolution of A-47, we found that the Staff's review, post-hearing but prior to operations, of two studies (the Control Systems Study and the HELB Study) to be performed by LILCO, would reasonably assure that the possible occurrence of control systems failures at the Shoreham plant considered in the two studies would not represent an undue risk to the public health and safety. We believed that was sufficient to allow us to conclude that Shoreham can be safely operated.²¹ The pendency, with an uncertain post-operation completion time, of the generic quest of the A-47 task for criteria which could then uniformly be applied to all nuclear plants does not undermine this finding.²²

LILCO provided the two Shoreham-specific studies to the Staff with copies to Suffolk County and the Board on or about August 27, 1982 and November 8, 1982. Subsequent to its request for and receipt of additional information, the Staff published its Safety Evaluation Report finding that the concerns with regard to the subject matter of the studies' effect on Shoreham had been resolved, SSER 4, §§ 7.7.2 and 7.7.1 (September 1983). Unfortunately, no party had directly informed either this Licensing Board or the Appeal Board that the two studies had been completed by LILCO and evaluated by the Staff as part of one of its Safety Evaluation Report supplements.²³ The Appeal Board thus wrote its decision in the mistaken belief that these studies had not been performed by LILCO and evaluated by the Staff.

The Appeal Board disagreed with our conclusion that Staff review of the matter would be adequate. That Board compared USI A-47 with USI A-17,²⁴ where, again, both a generic analysis and Shoreham-specific studies were involved. On appeal, our decision that plant operation need not be precluded pending the Staff's completion of its USI A-17 generic

²¹ *Id.* at 552, 555.

²² *Virginia Electric and Power Co.* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-491, 8 NRC 245, 247-48 (1978); *Gulf States Utilities Co.* (River Bend Station, Units 1 and 2), ALAB-444, 6 NRC 760, 775 (1977); *Cf.* ALAB-788, 20 NRC at 1135.

²³ The parties — LILCO, Suffolk County and the NRC Staff — failed in their obligation to keep the Boards informed; routine submission to us or the Appeal Board of informational copies of technical materials is not sufficient to serve as notification of material changes in significant matters. The Staff's SSER was dated September 1983, and was received by us in early October 1983. However, the underlying technical data must have been available prior to the release of that printed, bound document — certainly prior to the September 21, 1983 date of our PID. Furthermore, Suffolk County's position on appeal of the USI A-47 sub-issue had rested upon the unavailability of the two studies and the lack of a Staff evaluation of them. *See* ALAB-788, 20 NRC 1136. Therefore, we are particularly disturbed by the County's failure to notify the Appeal Board in light of its position in its December 23, 1983 appellate brief, filed almost three months after the issuance of the Staff's SSER 4.

²⁴ USI A-17 involves the generic study of systems interactions in general in nuclear power plants.

confirmatory study was affirmed.²⁵ The Appeal Board noted that the A-47 issue:

bears some similarity to USI A-17 Like USI A-17, there has been no showing of a "discerned safety problem." [citing, *inter alia*, *North Anna* and *River Bend*, *supra* note 22] At the time of the hearing, the staff knew of "no specific control system failures or actions at Shoreham or any other plant which would lead to undue risk to the health and safety of the public." Further, . . . serious consequences, not included in those already analyzed for the plant, were of "low probability." Moreover, the staff indicated . . . that should such control system failures occur, they would not result "in serious events . . . or conditions" beyond the capability of the safety systems. (Footnotes omitted.)²⁶

The Appeal Board nevertheless found "one notable difference" between the A-47 issue and A-17: For A-47, "*in-depth studies have not been performed* to verify the staff's expectations" (emphasis added), and that the Staff had taken the position that before it could make the reasonable assurance finding on USI A-47 control systems interactions requisite for the issuance of a license, it needed more Shoreham-specific information.²⁷ However, as we have noted above, unbeknownst to the Appeal Board, by the time it issued its decision the in-depth Shoreham-specific studies had long since been performed, and the Staff had made its finding of reasonable assurance. Thus, when the Appeal Board noted its agreement with the County's assertion that LILCO must complete the two evaluations prior to the authorization of a license for Shoreham, and agreed that the results of the two studies must be made part of the adjudicatory record,²⁸ it did so while operating under an incorrect major premise.

The NRC Staff, in its November 14, 1984 report to us on the remanded issues, provided affidavits of Andrew Szukiewicz and Jerry L. Mauck, certifying that LILCO had completed the two studies and had provided the information to the Staff. The Staff in turn determined, based on its evaluations of the studies, that concerns in regard to the subjects of the two studies have been resolved. Absent any showing by the County of a basis to challenge the Staff's determination, the Staff indicated its belief that the only remaining matter was for this Board to accept the Szukiewicz and Mauck affidavits into the record.²⁹

²⁵ ALAB-788, 20 NRC at 1135.

²⁶ *Id.* 1136-37.

²⁷ *Id.* at 1137.

²⁸ *Id.* at 1136.

²⁹ Staff's Report at 2.

Suffolk County objected. The Appeal Board, the County argued, meant to entitle them to "test the basis of any conclusion regarding this matter, in the same manner as any other litigable issue."³⁰ Nevertheless, and in spite of our admonition on the record of the November 15, 1984 hearing (*see* pp. 1533-34, above), the County's counsel came to our November 20 conference of parties with no delineated issues for possible litigation. The County, in its written Report and at the conference, told us that its consultants were unavailable to analyze the pertinent Staff documents due to other commitments, but that they would be able to perform their analysis by December 7, 1984, which would allow the County to decide whether to file specific significant issues with bases for challenging the two studies by December 11.

We expected something more from the County at this point than a mere plea for additional time to examine the issue. As we have noted above, the relevant NRC Staff evaluation has been in Suffolk County's hands for over a year, and the bulk of LILCO's studies and information has been in Suffolk County's hands for over two years. Furthermore, the County has been on specific renewed notice as to the need to focus on this particular issue. The Appeal Board issued its Decision on October 31, 1984, three weeks in advance of our conference of parties. Moreover, the County's attention was directed to the studies and SSER 4 by other parties by November 9, 1984. It seems to us that by this time the County fairly could be charged with a failure to come forward with a specific well-based issue challenging the two studies.

Nevertheless, albeit laboring under a significant factual misimpression on the existence of the studies due to the parties' failure to notify it, the Appeal Board did remand the matter so as to apparently afford the County a recent opportunity to come forward with some substantive challenge to the two A-47 studies. LILCO's argument is, in effect, that the long availability of the studies and the Staff's evaluation renders any Suffolk County contention very untimely. If accepted by us, this would totally negate the remand. Although we believe LILCO's argument has merit, we believe that, to be fully accepted, it could and should have been made by LILCO in a motion for reconsideration of ALAB-788 timely filed before the Appeal Board. However, we do take the County's long-standing inaction into account below, in ruling that the possible pendency of remanded A-47 issues does not support a stay of the issuance of an operating license.

We therefore, at the November 20, 1984 conference, granted the County's request for more time, until a received date of December 11,

³⁰ ALAB-788, 20 NRC at 1137.

1984, to come forward with issues appropriate for further proceedings. Any such issue must be significant and be set forth with basis and specificity, and must deal directly with the Control Systems and/or HELB studies.³¹ Additionally, without deciding whether or not it will be considered in ruling upon proposed issues, we also required the County to set forth the nexus and significance of any proposed issue to Contention 7B, and/or to argue that such factors are not appropriate or necessary. LILCO and NRC Staff answers to the admissibility of any such issues shall be received by December 18 and 21, respectively. The parties were directed to conduct negotiations to attempt to settle, or to at least narrow and mutually understand, any proposed contentions. The parties were also encouraged to outline what evidence might be put forward at a hearing, and whether other procedural steps, such as further discovery or summary disposition motions, would be appropriate. See Tr. 27,075-79.

EFFECT OF REMAND ON ISSUANCE OF A LOW POWER LICENSE

On October 29, 1984, another Licensing Board (the "Miller Board") issued a decision authorizing low power testing, up to 5% of rated power, for Shoreham.³² LILCO had applied for an exemption to the requirement that a fully-qualified source of onsite emergency power be in place, and had provided an additional "offsite" emergency power configuration as further protection for the public health and safety. Upon analysis of the safety and equitable issues bearing upon the exemption request, the Miller Board granted the exemption, and pursuant to Commission directive transmitted it to the Commission for immediate effectiveness review.

Subsequent to the Miller Board's decision the instant remand came down, and it falls to us to determine whether the one potentially remaining remanded matter, the A-47 studies, should affect Shoreham's authorized low power license. Although we cannot say that no possible issue challenging the two USI A-47 studies which may be raised by the County and accepted for litigation on the merits by us could have any

³¹ The Appeal Board was concerned with the two specific studies whose results were to support the Staff's "reasonable assurance" finding, and any entitlement to additional litigation bearing on USI A-47 would thus be limited to litigable issues challenging the findings of those studies. Issues which more broadly approach A-47 (such as other types of studies that perhaps could have been done) would not appear to be within the scope of the Appeal Board's remand.

³² *Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), LBP-84-45, 20 NRC 1343 (1984).

significance for low power operations, we find that the possible future pendency of any issues arising out of this remand does *not* justify a stay in the issuance of a low power operating license.

As LILCO pointed out in its November 14 Report to this Board, it is merely fortuitous that Commission authorization of LILCO's low power operating license had as yet to be finally granted at the time of the remand decision issued over a year after our PID. This is particularly true as to the fuel load, precriticality and cold-criticality portions ("Phases I and II") of LILCO's low power testing program, which were authorized upon summary disposition by the Miller Board more than two months ago,³³ but for which, in a departure from normal practice, effectiveness approval was retained by the Commission and not granted until November 21, 1984.³⁴ Typically, where NRC cases have involved remanded issues, the Applicant has already received an operating license or construction permit prior to the remand, and the question has become whether an already-awarded license or permit should be suspended pending resolution of remanded issues. We agree with LILCO that the same analytical principles are applicable regardless of whether the question is one of a stay of issuance of a license following a remand, or a stay (suspension) of activities under an issued license following a remand.

The test applied in determining whether a stay of activities should be imposed pending disposition of a remand is less stringent for the party seeking such a stay than the test which is applicable to a stay pending appeal.³⁵ The test is one balancing:

1. the seriousness of the remanded issue;
2. a traditional balancing of equities; and
3. consideration of any likely prejudice to further decisions that might be called for by the remand.³⁶

³³ "Order Reconsidering Summary Disposition of Phase I and Phase II Low-Power Testing," *Shoreham*, LBP-84-35A, 20 NRC 920 (1984).

³⁴ CLI-84-21, 20 NRC 1437 (1984). When the Commission authorized LILCO's low power operating license for Phases I and II, it took note of our brief confirmatory order (November 20, 1984) stating in summary fashion our ruling that the future pendency of any issues arising out of the two USI A-47 studies does not affect the possible issuance of a low power operating license. However, the Commission determined that the license could not issue until seven days after the date of our instant order setting forth our rationale for that ruling. CLI-84-21, 20 NRC at 1441.

³⁵ The four well-known factors enumerated in *Virginia Petroleum Jobbers Association v. FPC*, 295 F.2d 921, 925 (D.C. Cir. 1958) ordinarily govern NRC disposition of motions for stay pending appeal. 10 C.F.R. § 2.788(e).

³⁶ *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-77-8, 5 NRC 503, 521 (1977). See also *Consumers Power Co.* (Midland Plant, Units 1 and 2), ALAB-458, 7 NRC 155, 159-60, 169-70 (1978).

In applying these criteria we find essentially no justification to impose a stay of any low-power operating license which might otherwise be authorized, pending our resolution of the remanded A-47 matter.

There is reasonable assurance that the remaining remanded issue is not serious from the standpoint of public health and safety and therefore does not present a basis to stay issuance of an operating license, particularly the low power one for up to 5% power now being contemplated by the Commission. The Appeal Board itself characterized all of the remanded issues, of which only one possibly remains, as "relatively minor ones." Undoubtedly, the Appeal Board in part considered the (mistakenly-believed) noncompletion of the two A-47 Shoreham specific studies relatively minor because of its agreement with our overall contention 7B systems interactions findings, of which USI A-47 was but a small part, that:

1. LILCO performed numerous and diverse studies bearing on systems (including control systems) interactions at Shoreham, which were extensively litigated at the hearing, and which in their totality demonstrate that systems interactions problems were adequately analyzed to assure that the Shoreham design protects the public from credible accidents;³⁷
2. The County had failed to identify (throughout the entire 7B litigation) any adverse systems interaction that had not been adequately considered;³⁸
3. There is no concrete suggestion of inadequacy of current NRC Staff review procedures and safety criteria to assure that the effects of overall potential systems interactions are within the design basis envelope of nuclear plants;³⁹ and
4. *See also* the Appeal Board's findings regarding the A-47 issue, quoted in this Order at p. 1540, above.

With the benefit of supervening knowledge of the actual facts — the "one notable difference," dictating the Appeal Board's remaining concern regarding USI A-47 as compared to its affirmance in LILCO's favor of the USI A-17 issue,⁴⁰ does not exist because the two Shoreham-specific studies and the Staff's evaluation have long been available to the County — we can say, at least, that a potential issue thought to be "relatively minor" in the absence of the studies and evaluation is

³⁷ ALAB-788, 20 NRC at 1127, 1128-29.

³⁸ *Id.* at 1132-34.

³⁹ *Id.* at 1134-35.

⁴⁰ *Id.* at 1137.

relegated to even lesser significance.⁴¹ In other words, there was never any finding of inadequacy of an analysis, only incompleteness in one particular area of systems interactions. That incompleteness did not exist in fact, although the adjudicatory record did not include this.

Moreover, albeit only as a supporting secondary rationale, it is fair to take into account the County's silence over this past year in weighing any possible County claim (which it has not made) that, contrary to the conclusions of LILCO and the NRC Staff, a new serious safety issue has been disclosed by the two studies. It strains credulity to believe that the County, a sophisticated, well-represented party-appellant, would remain silent for over a year if it had any such well-based claim.⁴² Wholly aside from its obligation, shared by all parties, to inform the Appeal Board of the studies and Staff evaluation, the County would not be content to rest on its mere claim of incompleteness due to lack of the studies if it had a basis to convert that claim to one that the now completed studies and evaluation raised a serious safety issue.

In addition to being supportive of our finding that the remanded issue of the two A-47 studies is not serious, the County's long-standing, and, since the remand, continued dilatory failure to raise any issue challenging the studies, weighs heavily against it and in LILCO's favor as part of the "traditional balancing of the equities" in deciding whether to stay the issuance of an operating license. As LILCO correctly points out, in allowing the issue to lie fallow all this time, the County is not in the same posture as the successful appellant where facts material to a remanded issue did not change during the pendency of the appeal and therefore there was no impetus or obligation to take steps to protect its interests in the interim.

Although we have agreed to allow Suffolk County more time to frame any issues challenging the A-47 studies, here we are faced with the County coming in at what is, for low power purposes, essentially the 12th hour, and asking that a license be delayed while the County takes additional time. As a final dilatory action, the County ignored our warning on November 15, 1984, that we would be unlikely to stay the issuance of a low power license in the absence of a basis to do so presented to us before or at the November 20 conference, such as by identifying a particular unacceptable interaction within the scope of the two studies.

⁴¹ *Mulland*, ALAB-458, *supra*, 7 NRC at 160-61, teaches that a Board should take advantage of the benefit of supervening knowledge of events after a remand in deciding whether the level of seriousness of the defects militate for or against a stay of actions under a license (in that case a construction permit).

⁴² We do ascribe to the County the good faith and responsible approach to the litigation before us such that it does not raise or continue to pursue issues in litigation which it does not believe to be well-based.

Tr. 26,680-81. See pp. 1533-34, above. The County's lack of diligence cannot be seen as reasonable when viewed in this light.⁴³

We must bear in mind that the license at issue here is a low power operating license. The degree of potential danger to public health and safety at low power operation is substantially less than at full power operation.⁴⁴ When this fact is viewed concurrently with the Staff's finding of reasonable assurance that present concerns with A-47 as applied to Shoreham have been resolved by the studies, and any future concerns which are incurred at the time A-47 is resolved generically can at that time also be resolved for Shoreham, and that "Shoreham can be operated *at any power level*, prior to this generic resolution of issue A-47,"⁴⁵ it is apparent that risk to public health and safety from low power operations should be slight. Indeed, our present analysis leads to the result that possible future operation of Shoreham at higher power levels should not be affected by the remanded issues, unless, of course, new information is raised during any future remand proceedings supporting a finding that a serious control systems interaction has been discovered.

In addition, it is noteworthy that LILCO, over two years ago, proceeded in good faith⁴⁶ to complete and submit the two studies in question, well in advance of possible operation of Shoreham, as it had promised to do in the record before us.⁴⁷ Likewise, the NRC Staff acted in good faith in issuing its safety evaluation of the studies well in advance of any fuel loading.

Other equities pertinent to issuance of a low power license for Shoreham were examined in detail in the Miller Board's Initial Decision which authorized the low power license.⁴⁸ Some of the Miller Board's reasoning directly supports a refusal to stay a low power license here, some supports it by analogy, and nothing in the Miller Board decision

⁴³ The position of the NRC Staff, as indicated at our conference, is that the Staff "believes none of the three [remanded] issues could affect the issuance of a low power license or a full power license" (Staff's November 14 Report at 4), particularly in view of the County's having provided no reasons to the contrary at the conference. Tr. 27,047-51.

⁴⁴ 46 Fed. Reg. 47,764, 47,765. See *Shoreham*, LBP-84-45, *supra*.

⁴⁵ Szukiewicz affidavit, ¶ 8; Staff's Report at 4.

⁴⁶ See *Midland*, ALAB-458, *supra*, 7 NRC at 170-72.

⁴⁷ LBP-83-57, 18 NRC at 552, 555, and unpublished slip opinion findings J-84 to J-91 (slip. op. at 492-95).

⁴⁸ *Shoreham*, LBP-84-45, *supra*, 20 NRC at 1375-82.

would work in favor of the imposition of a stay in the instant circumstances.⁴⁹

In view of all of the above, a "traditional balancing of equities" weighs against the imposition of a stay.

We can see no danger of prejudice to any substantive decisions to be made on remand. If future consideration of the A-47 matter leads us to discover any serious control systems interaction problem with Shoreham, which had not been previously uncovered by LILCO's or the Staff's studies or by the intensive litigation before us of the County's overall systems interaction issues under Contention 7B, low power (or, for that matter, full power) operations may be stopped until corrective measures are implemented. Furthermore, the Commission has often stated that grant of a low power operating license in no way presupposes the subsequent grant of a license for full power operations.⁵⁰

At our conference of parties, counsel for Suffolk County argued that the new emergency electrical power configuration which had been put in place for purposes of LILCO's low power exemption application had not been considered by the A-47 studies. Tr. 27,074. This, we point out, would be so even if we and the Appeal Board had reviewed and approved these studies prior to the exemption litigation. Any possible control systems, or other systems, interaction specific to the new emergency power configuration could and should have been raised as a health and safety issue before the Miller Board.

In conclusion, we are not saying that USI A-47 issues cannot possibly have any significance for low power and full power operations. However, the County has completely failed to raise any issue — let alone a significant, specific and well-based material one — which would have such impact. In view of the equities involved, particularly Suffolk County's lack of diligence and the reasonable assurance that no danger to public health and safety will arise from low power, or even full power, operation due to the possibility of an as yet undiscovered control system interaction, we find that this one potentially remaining remanded matter does not prevent authorization of an operating license for Shoreham.

⁴⁹ The specific circumstances considered were:

- stage of the facility's life
- financial or economic hardships
- internal inconsistencies in, or inconsistent application of, the regulations
- good faith effort to comply with the regulations
- public interest in adherence to regulations
- safety significance of issues involved.

⁵⁰ This statement was most recently made by a unanimous Commission in this case in *Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1)*, CL1-84-21, 20 NRC 1437, 1441 (1984).

Finally, we note that neither the County's report of November 14 nor its arguments at the November 20, 1984 conference of parties, addressed the equitable and other considerations bearing upon whether the remand should affect issuance of an operating license (at any power). It appears the County believes that by virtue of the remand the Appeal Board required that no operating license could issue until the County, waiting until a date of its choosing (December 11, 1984), could decide whether to raise issues admissible before us, and if the County did so that would automatically stay issuance of a license until completion of the litigation on the merits of any remanded issue. If this is the County's belief, despite the long existence of the A-47 studies, and the teaching of flexibility of the effect of a remand by *Seabrook* and *Midland* discussed above, then the County now has the opportunity and obligation promptly to appeal our instant decision not to impose a stay to the very Appeal Board which issued the remand. *Cf.* 10 C.F.R. § 2.788(h). It should do so well within the seven-day period from today which the Commission provided as an additional period for expedited appellate review before its November 21, 1984 Memorandum and Order approving the Miller Exemption Board's September 5, 1984 authorization of Phases I and II of low power testing could become effective. By virtue of the Commission's order, and given our denial of a stay grounded on the pendency of the A-47 studies remanded issue, those orders become effective on December 7, 1984, at 5:00 p.m., Eastern Standard Time, unless stayed by Appeal Board review of our instant order, or appellate review of the Miller Board and Commission orders authorizing the Phase I and II low power testing exemption.⁵¹

IT IS SO ORDERED.

FOR THE ATOMIC SAFETY
AND LICENSING BOARD

Lawrence Brenner, Chairman
ADMINISTRATIVE JUDGE

Bethesda, Maryland,
November 30, 1984

⁵¹ Copies of this decision were provided to representatives of LILCO, Suffolk County and the NRC Staff at the NRC Staff offices in Bethesda, Maryland on November 30, 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF INSPECTION AND ENFORCEMENT

James M. Taylor, Deputy Director

In the Matter of

Docket No. 50-441
(10 C.F.R. § 2.206)

CLEVELAND ELECTRIC ILLUMINATING
COMPANY, *et al.*
(Perry Nuclear Power Plant,
Unit 2)

November 15, 1984

The Deputy Director of the Office of Inspection and Enforcement denies a petition submitted by Susan L. Hiatt on behalf of Ohio Citizens for Responsible Energy (OCRE) requesting issuance of a show-cause order to revoke or suspend Cleveland Electric Illuminating Company's construction permit for Perry Unit 2.

**RULES OF PRACTICE: REVOCATION OF
CONSTRUCTION PERMITS**

NRC regulations do not require that a construction permit be revoked or suspended for slowing or stopping construction when there is no current threat to the public health and safety by the licensee's actions.

ATOMIC ENERGY ACT: REPORTING REQUIREMENTS

A slowdown in construction does not itself give rise to a reporting obligation.

DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206

By petition dated June 4, 1984, Susan L. Hiatt, on behalf of Ohio Citizens for Responsible Energy (OCRE), requested pursuant to 10 C.F.R. § 2.206 that the Director of the Office of Inspection and Enforcement (IE) order the Cleveland Electric Illuminating Company (CEI) to show cause why CEI's construction permit for Perry Unit 2 should not be revoked or suspended. OCRE asserts as bases for this request: (1) CEI's apparent abandonment of construction at Unit 2; and (2) CEI's silence to the Commission on the matter of the completion of the facility and its statements to the Regional Administrator, Region III, that corrective actions will be completed on Unit 2 within the year, in spite of its public statements that no work is being done or money is being expended on the facility. OCRE says that the latter circumstances raise the question of whether CEI has made a material false statement which would constitute grounds for revocation of its construction permit.

On July 3, 1984, the Director acknowledged receipt of the petition and informed OCRE that this request was being reviewed. A notice that the petition was under consideration was published in the *Federal Register*. 49 Fed. Reg. 28,484 (July 12, 1984). On July 31, 1984, CEI filed its response to the petition. The Staff has completed its evaluation of the petition and, for the reasons stated in this decision, OCRE's request is denied.

BACKGROUND

The Cleveland Electric Illuminating Company holds Construction Permits CPPR-148 (Unit 1) and CPPR-149 (Unit 2), issued by the Nuclear Regulatory Commission in 1977, which authorize construction of the Perry plant. The Perry plant is located on Lake Erie in Perry County, Ohio, approximately 35 miles northeast of Cleveland, and consists of two boiling water reactors of General Electric design and related facilities for use in the commercial generation of electric power. Construction started on both units in October 1974.

The construction permits originally specified December 31, 1982, as the latest date for completion of construction of Unit 1 and June 30, 1984, as the latest date for completion of construction of Unit 2. By letter dated July 21, 1982, CEI requested that the construction permits be amended to specify November 30, 1985, as the latest date for completion of construction of Unit 1 and November 30, 1991, as the latest date for completion of construction of Unit 2. The licensee sought this

amendment because construction had been delayed due to a reduced growth rate in the demand for electricity, the incorporation of changes for plant design and analysis, and the difficulty in obtaining capital funds. On December 29, 1982, the NRC extended the construction completion dates to November 30, 1985, for Unit 1 and November 30, 1991, for Unit 2 as CEI had requested. 48 Fed. Reg. 1128 (Jan. 10, 1983). The current Perry Unit 2 construction permit will therefore expire in 1991.

Concrete work for the entire Perry plant is 99% complete; all work on Unit 2 is approximately 44% complete. The licensee's periodic progress reports reflect that work is progressing on both Perry Units 1 and 2. By letter dated July 17, 1984, CEI advised NRC that minimal work is currently being undertaken on Unit 2. This work consists of completion of Unit 2 systems which are required to support Unit 1 operations, Unit 2 Division 1 and 2 diesel generators, and areas of the common plant facilities which are inside the initial Unit 1 operational security boundary. Although work is continuing, the licensee's completion date for Unit 2 is undetermined at this time. See Letter from Murray R. Edelman, Vice President, Nuclear Group, CEI, to B.J. Youngblood, Chief, Licensing Branch No. 1, Office of Nuclear Reactor Regulation (NRR) (July 17, 1984) (Attachment 1 to CEI's response to the petition).

ANALYSIS

Petitioner raises two issues as a basis for her request that CEI's construction permit for Perry Unit 2 be revoked or suspended. A discussion of each of these issues follows.

1. Whether CEI Has Stopped Construction on Perry Unit 2 and, if So, Whether This Constitutes Grounds for Revocation or Suspension of CEI's Construction Permit

Petitioner alleges that construction work has been halted, that no money is being spent on Perry Unit 2, and that CEI has been "parasitizing" Unit 2 for equipment for Unit 1, thereby reflecting the licensee's intention to abandon Unit 2. Petitioner argues that these actions constitute a basis for revocation or suspension of CEI's construction permit under NRC regulations. Specifically, petitioner argues that CEI's willful stoppage of construction on Perry Unit 2 can only be construed as a failure to construct that facility in accordance with the terms of its construction permit and, as such, triggers the sanctions of 10 C.F.R. § 50.100 which prescribes revocation or suspension of a construction permit for

failure to construct or operate a facility in accordance with the terms of the construction permit or license. The petitioner argues that since the Commission obviously would not issue a construction permit to a utility that had no intention of building a nuclear facility, the Commission should revoke or suspend a construction permit when its holder no longer intends to complete the facility.

In response to this argument, it should first be noted that available evidence does not suggest that CEI has abandoned construction of Perry Unit 2. The petitioner, in arguing that construction has been halted, relies primarily on newspaper reports of remarks made by Robert M. Ginn, Chairman of the Board and Chief Executive Officer of CEI, at CEI's annual shareholders' meeting on April 24, 1984. CEI has explained Mr. Ginn's comments in its letter dated July 30, 1984, to Richard C. DeYoung, Director, Office of Inspection and Enforcement, and the Staff does not consider Mr. Ginn's comments to constitute evidence that Perry Unit 2 will not be completed.¹ With regard to petitioner's allegations that CEI is "parasitizing" equipment, the Licensee's letter of July 30, 1984, also explains that, although CEI admits that three control modules were transferred from Unit 2 to Unit 1, such reallocation of equipment between units on multi-unit sites in order to meet construction schedules is a common industry practice. This is an acceptable practice. NRC regulations do not prohibit such reallocation, as long as the licensee installs such equipment and takes such actions in constructing the facility as are necessary for the safe operation of its facility. The Licensee's letter dated July 17, 1984, to B.J. Youngblood, *supra*, also indicates that work is progressing on Perry Unit 2, although at a slower pace than initially planned, with CEI manpower being concentrated on getting Perry Unit 1 licensed in 1985. Moreover, FSAR amendments submitted by the Licensee continue to be applicable to both Perry units. Additionally, internal monthly progress reports are voluntarily provided by the Licensee to the NRC resident inspector in order to keep him apprised of progress. These reports indicate that work is continuing on Perry Unit 2. Onsite inspections by the NRC resident inspector and

¹ Mr. Ginn addressed the status of Unit 2 both in his prepared statement to the shareholders and in an informal press conference following the meeting. He was quoted as saying in his prepared statement that CEI was spending only "limited funds" on Unit 2 and faces "many uncertainties as to the future of that second unit." Petition, Exhibit 2. A second article quoted him as saying during the press conference that CEI was "not spending any money on Unit 2." Petition, Exhibit 1. A third article did not quote Mr. Ginn on this point but concluded that CEI had essentially stopped building the second unit while concentrating all of its resources on Unit 1. Petition, Exhibit 3. As explained in CEI's July 30, 1984, letter to Mr. DeYoung, *supra*, the correct statement of the status of Unit 2 was Mr. Ginn's prepared statement that CEI is spending "limited funds" on Unit 2. The statement that CEI is "not spending any money on Unit 2" was an informal remark which was not intended to be taken literally but to emphasize CEI's concentration on Unit 1.

periodic inspections by other Region III staff have confirmed that construction work on Perry Unit 2 has not been discontinued.

Petitioner's argument that a halt or slowing of construction mandates show-cause proceedings was specifically rejected in a Director's decision on another petition under 10 C.F.R. § 2.206. See *Washington Public Power Supply System* (WNP Nos. 4 & 5), DD-82-6, 15 NRC 1761 (1982). In that instance, the petitioner requested that the Washington Public Power Supply System (WPPSS) be ordered to show cause why its construction permits should not be revoked on the basis of the WPPSS Board of Directors' adoption of a resolution terminating two nuclear units in the project. WPPSS intended to retain the construction permits at least during the first phase of its termination plan that called for an attempted transfer of the projects to a new owner. In denying the petition, the Director of NRR stated that WPPSS' postponement or cancellation of its plant constituted actions clearly not inimical to public health and safety under the Atomic Energy Act. As termination of the projects did not itself pose any hazard to public health and safety that would require issuance of an order to show cause, there was no reason for the NRC to take the requested action. *Id.* at 1767. This decision was distinguished from that involving the Tyrone Plant, see *Northern States Power Co.* (Tyrone Energy Park, Unit 1), CLI-80-36, 12 NRC 523 (1980), in which the co-owners of the project indicated no desire to retain the construction permit and in fact consented to revocation of the permit.

In the present instance, as in that involving WPPSS, there is no current threat to public health and safety by the Licensee's actions to slow the pace of construction. Thus, there is no reason for the NRC to take the action requested by petitioner of revocation or suspension of CEI's construction permit. Nor do NRC regulations require that a construction permit be revoked or suspended for slowing or stopping construction. While 10 C.F.R. § 50.100 provides for revocation or suspension of a construction permit for failure to construct a facility in accordance with the terms of the permit, failure to complete construction of the facility is governed by 10 C.F.R. § 50.55(b). That regulation states only that if the proposed construction is not completed by the latest completion date the permit shall expire. The Licensee may stop or slow down work due to subcontractor disputes, strikes, redesign efforts, funding limitations or other considerations. NRC Region III staff conducts periodic audits of construction activities to assure compliance with the terms and conditions of the construction permit. As the current construction permit for

Perry Unit 2 does not expire until 1991, there is no requirement that NRC take action because of a stoppage or slowing of construction.²

In sum, there is no indication that construction work has been stopped on Perry Unit 2. Moreover, as indicated in *Washington Public Power Supply System, supra*, 15 NRC at 1761, in the absence of clear abandonment of the project, a stopping of construction would not itself constitute grounds for revocation or suspension of CEI's construction permit. Even if the project were abandoned, the decision whether to take the formal step of revoking the construction permit or merely allow it to expire is largely discretionary.

2. *Whether CEI Has Made a Material False Statement to NRC*

Petitioner asserts that CEI may have made material false statements to NRC and that this constitutes a basis for revocation of its construction permit. Petitioner alleges that CEI may have made a material false statement in its failure to inform NRC, the Licensing Board, or the parties of the cessation of work and investment in Perry Unit 2. Petitioner also alleges that CEI's statements to the Regional Administrator, Region III, that corrective actions will be completed on Unit 2 within the year, contradict its public statements and may thus constitute a material false statement. Such material false statements could subject the Licensee to enforcement action up to and including revocation of its permit. *See* General Statement of Policy and Procedure for Enforcement Actions, 10 C.F.R. Part 2, Appendix C, *as revised*, 49 Fed. Reg. 8583 (March 8, 1984).

The first question to be addressed is whether CEI's failure to notify NRC of the slowdown of construction at Perry Unit 2 constitutes a material false statement. In answering this question, it should be noted that CEI has in fact informed the NRC that only a limited amount of construction is being done on Perry Unit 2. *See* Summary Report of Case-load Forecast Panel Meeting with CEI and Facility Tour (January 11, 12, and 13, 1983) at the Perry site dated March 17, 1983. As discussed above, CEI has not entirely halted construction on Perry Unit 2. Correspondence received from the Licensee indicates that work is continuing, as do CEI's internal monthly progress reports and inspections of the facility by the resident inspector and other regional staff.

² It should also be noted that in construction of a facility, a licensee proceeds at its own risk. If a licensee obtains a construction permit, the licensee bears the risk that it may expend considerable funds but never complete construction or be granted an operating license. *See Power Reactor Development Co. v. International Union of Electrical, Radio and Machine Workers*, 367 U.S. 396, 415 (1961); *Porter County Chapter of the Izaak Walton League, Inc. v. NRC*, 606 F.2d 1363, 1370 (D.C. Cir. 1979).

A slowdown in construction does not itself give rise to a reporting obligation. Under 10 C.F.R. § 50.55(b), the NRC must be informed if an extension of the completion date for a construction permit is desired. However, absent the need for such an extension, a licensee is under no obligation to notify the NRC of the status of construction. There is no required rate of completion, and a licensee is free to determine its own rate of progress as long as the date of the expiration of the construction permit is met.³ Thus, there has been no failure to provide material information to the Commission. See *Virginia Electric and Power Co.* (North Anna Power Station, Units 1 and 2), CLI-76-22, 4 NRC 480, 488-91 (1976), *aff'd sub nom. VEPCO v. NRC*, 571 F.2d 1289 (4th Cir. 1978).

Petitioner also alleges that CEI's statements to the Regional Administrator, Region III, that certain corrective actions will be completed within the year contradict CEI's public statements that no work is being done or money being spent on Unit 2, and thus constitute material false statements. The "statements to the Regional Administrator" referred to by petitioner consist of statements made in letters dated April 30, 1984, and May 1, 1984, which are included as Exhibits 5, 6 and 7 to the petition. These statements indicate that corrective work is being completed or has been completed on Governor Lube Oil Cooler relocation, tubing rework and relocation, installation of redesigned diesel generator exhaust piping/supports, and Bailey Utility Stations control modules. The "public statements" referred to by petitioner consist of the remarks made by Robert M. Ginn discussed earlier in this decision.

In a telephone conversation on November 13, 1984, with the NRR project manager, the Licensee informed the Staff that all of the corrective actions referred to by the petitioner have been completed with the exception of the installation of redesigned diesel generator exhaust piping. By letter dated June 29, 1984, CEI informed the Regional Administrator of Region III that remaining work was being rescheduled to be completed prior to pre-engine-start testing which is scheduled for early 1985. Thus, circumstances do not indicate that the Licensee has made material false statements regarding the status of corrective actions and the progress of work on Unit 2.

³ As indicated earlier, CEI voluntarily submits monthly progress reports of work being completed to the resident inspector, and the resident inspector would notify NRR if work were discontinued. NRR would then inquire as to the reasons why construction had ceased.

CONCLUSION

For the reasons stated in this Decision, I have concluded no adequate basis exists to issue an order to the Licensee regarding the Perry Unit 2 construction permit as requested by OCRE. Accordingly, the petitioner's request has been denied. A copy of this Decision will be filed with the Office of the Secretary of the Commission for the Commission's review in accordance with 10 C.F.R. § 2.206(c) of the Commission's regulations.

James M. Taylor, Deputy Director
Office of Inspection and
Enforcement

Dated at Bethesda, Maryland,
this 15th day of November 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

John G. Davis, Director

In the Matter of

(10 C.F.R. § 2.206)

SHIPMENTS OF SPENT NUCLEAR
FUEL

November 30, 1984

The Director of the Office of Nuclear Material Safety and Safeguards denies a petition filed by Mr. Lindsay Audin requesting that Certificates of Compliance for certain spent fuel shipping casks be modified to address oxidation phenomena and that additional analyses of transportation accident and sabotage scenarios be conducted.

RULES OF PRACTICE: SHOW-CAUSE PROCEEDINGS

The Director will not institute proceedings or undertake other actions in response to a petition under 10 C.F.R. § 2.206 to consider an issue the Commission is treating generically through rulemaking.

DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206

By letter dated July 30, 1984, Lindsay Audin, a private citizen, requested the Nuclear Regulatory Commission (NRC) to amend fourteen identified Certificates of Compliance for spent fuel shipping casks including three that were issued by the Department of Energy (DOE). The proposed amendment would require that the casks be inerted and that failed fuel be canned. The request is based on a Director's Decision under 10 C.F.R. § 2.206 (DD-84-9, 19 NRC 1087), issued on April 13, 1984, which specifically addressed oxidation phenomena for spent fuel in shipping casks and concluded that the Certificates of Compliance for

certain casks should be amended to require inerting. Further, Mr. Audin believes that present studies still do not sufficiently cover all relevant scenarios and requested that accident and sabotage computer simulations with various identified scenarios be conducted and appropriate action taken based on the results.

Notice of receipt of the request and NRC's intent to treat the request as a petition under 10 C.F.R. § 2.206 of the Commission's regulations was published in the *Federal Register* on September 7, 1984 (49 Fed. Reg. 35,446). For the reasons set forth below, I have determined that: (1) Certificates of Compliance issued by the NRC need not be further amended to consider the oxidation phenomena, (2) the NRC accident scenarios to evaluate potential impacts of transportation need not be reanalyzed, and (3) concerns about NRC sabotage scenarios will be taken into account in a rulemaking proceeding now in progress (Modification of Protection Requirements for Spent Fuel Shipments, 49 Fed. Reg. 23,867 (June 8, 1984)).

BACKGROUND

The NRC establishes safety and design standards for packages, known as Type B packaging, used to transport potentially hazardous radioactive materials, including spent reactor fuel. These standards require Type B packages to withstand conditions incident to normal transport (*see* 10 C.F.R. §§ 71.51(a) and 71.71) and certain hypothetical accident conditions, including impact and fire, without serious loss of containment and with only limited loss of shielding capability (*see* 10 C.F.R. §§ 71.51(a) and 71.73). The NRC reviews and specifically approves each Type B package design (10 C.F.R. § 71.31) to assure that the design meets applicable requirements. The approvals are issued in the form of a Certificate of Compliance for each package design. The NRC rules (10 C.F.R. Part 71) also require various procedural, administrative, and technical requirements to be followed for use of Type B packages. The NRC regulations also specify quality assurance standards under which packages must be designed, fabricated, and used and require an NRC-approved quality assurance program (10 C.F.R. § 71.101).

These standards are designed to assure that the following basic safety requirements are met when transporting radioactive materials:

1. Adequate containment of the radioactive material;
2. Adequate control of the radiation emitted by the material; and
3. Prevention of nuclear criticality.

In addition, the NRC has issued 10 C.F.R. Part 73 which provides requirements for the protection of certain radioactive materials against deliberate acts to seize, damage, or sabotage the shipments.

The NRC has conducted several studies of the environmental impacts of the transportation of radioactive materials, including spent fuel (WASH-1238, "Environmental Survey of Transportation of Radioactive Materials to and from Nuclear Power Plants," December 1972; and NUREG-0170, "Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes," December 1977). In each study, the risk of radiological effects from the transport of spent fuel under both normal and accident conditions was found to be small.

In addition, the spent fuel oxidation phenomenon and its potential impact on the transportation of irradiated power reactor fuel assemblies were further assessed in NRC Research Information Letter, "Potential Oxidation of UO_2 in Irradiated Fuel and Its Regulatory Implications," March 5, 1984 (RIL No. 139). Based on the RIL, Certificates of Compliance were revised to require that certain spent fuel cask cavities be inerted for shipment to prevent handling problems from oxidized fuel at facilities receiving spent fuel. Shipments of known or suspected failed fuel assemblies (rods) were also required to be appropriately canned for shipment, *see* DD-84-9, *supra*, 19 NRC at 1092. The increase in risk to the public health and safety from potential oxidation during transportation of spent fuel over that found in previous studies was considered in the RIL (*see* RIL No. 139, at 13-15, 19-23). It was estimated that consequences are not increased by more than a factor of 4.0 and that impact on risk was minor (<15% increase). This upper bound of increased risk was not considered significant. For example, based on 2182 spent fuel shipments/year (70% by truck and 30% by train), there is a likelihood of one latent cancer fatality in 2060 years from an extremely severe transportation accident in which oxidation occurs.

BASIS FOR DECISION TO DENY REQUEST TO AMEND CERTIFICATES OF COMPLIANCE FOR SPENT FUEL CASKS

A previous petition filed under 10 C.F.R. § 2.206 requested the NRC to take a number of actions with respect to the General Electric Company and Nuclear Assurance Corporation casks, Model Nos. IF-300, NLI-1/2, and NFS-4 (NAC-1), because of possible oxidation of spent fuel in the shipping casks. The NRC addressed the oxidation phenomena in RIL No. 139 and the Director's Decision on the earlier petition, DD-84-9, *supra*. The conditions necessary for UO_2 to achieve higher oxidation states are the presence of oxygen and sufficient heat. In address-

ing the previous petition, the Model Nos. TN-8, TN-8L, TN-9, and NLI-10/24 casks were considered in RIL No. 139. These casks are authorized for light water reactor fuel with sufficiently high decay heat such that there is a potential for UO_2 oxidation.

The petitioner believes that the previous decision (DD-84-9) is incomplete since research and submarine reactor spent fuel were not specifically considered. The NRC-certified casks identified in the present petition were not specifically addressed before because the authorized contents do not present a potential for UO_2 oxidation. There is no potential for oxidation because either (1) the physical form of the spent fuel is incompatible with oxidation or (2) under authorized shipping conditions, there is not sufficient heat to present a concern for handling problems from oxidized fuel at facilities receiving spent fuel. The petition included no new information which would raise additional concerns. For this reason, that part of the petition calling for amendment to the Certificates of Compliance issued by the NRC is denied.

BASIS FOR DECISION TO DENY REQUEST TO MODIFY SAFETY/ACCIDENT SCENARIOS AND SIMULATIONS

As noted in RIL No. 139 and DD-84-9, conditions beyond the hypothetical accident conditions of 10 C.F.R. Part 71 were considered. NRC studies cited in those documents show that the performance standards provide an adequate degree of safety. Only under highly unlikely conditions has a cask been predicted not to isolate its contents from the environment. Moreover, even in such remote and speculative circumstances, the estimated health consequences of an event are small. While the present performance standards have not been shown to cover all conditions that could be imagined, they provide adequate assurance that the health and safety of the public are protected. For these reasons, that part of the petition requesting modification of Staff scenarios and simulations is denied.

BASIS FOR DECISION NOT TO CONSIDER MODIFICATION OF SAFEGUARDS SCENARIOS AND SIMULATIONS IN CONNECTION WITH THIS REQUEST

Recently completed research indicates that interim NRC regulations to protect the public against malevolent acts directed against licensed spent fuel shipments are overly conservative. On June 8, 1984, the NRC issued a proposed rule that would moderate the interim require-

ments in 10 C.F.R. § 73.37 (49 Fed. Reg. 23,867). Public comments on the proposed rule are currently being analyzed as part of the rulemaking procedure now in process. Until a decision is taken concerning the proposed rule, the interim requirements will remain in effect.

The petitioner contends that there are material omissions or inadequacies in the supporting research. Comments similar to the safeguards-related comments in this petition are also contained in a separate letter of comment provided by the petitioner to the NRC in response to the NRC request for comment on the proposed rule. Neither the petitioner nor other sources have identified a clear and present danger to the public that suggests the need for an immediate decision on the contentions or for an immediate modification to current protection measures.

Because the petitioner's safeguards concerns will be addressed in connection with the rulemaking proceeding, they are not addressed in connection with this petition. *See Maine Yankee Atomic Power Co.* (Maine Yankee Atomic Power Station), DD-83-3, 17 NRC 327 (1983), and Director's Decisions cited therein at 329.

OTHER QUESTIONS

The petitioner raised several questions regarding DOE and Certificates of Compliance and research sponsored by that agency. Except to the extent that DOE facilities or activities of the types subject to licensing pursuant to § 202 of the Energy Reorganization Act of 1974 are involved (which are not involved here), the DOE and its prime contractors are exempt from licensing by the NRC. Questions regarding the activities of the DOE should be directed to that agency.

A copy of this Decision will be filed with the Secretary for the Commission's review in accordance with 10 C.F.R. § 2.206(c) of the Commission's regulations. As provided in 10 C.F.R. § 2.206(c), the Decision will constitute the final action of the Commission 25 days after the date of issuance, unless the Commission on its own motion institutes review of this Decision within that time.

John G. Davis, Director
Office of Nuclear Material
Safety and Safeguards

Dated at Silver Spring, Maryland,
this 30th day of November 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Nunzio J. Palladino, Chairman
Thomas M. Roberts
James K. Asselstine
Frederick M. Bernthal
Lando W. Zech, Jr.

In the Matter of

Docket No. PRM-71-6

**CRITICAL MASS ENERGY
PROJECT, et al.**

November 2, 1984

The Commission denies a petition for rulemaking which requested that the Commission amend its regulations pertaining to emergency response and planning for transportation accidents involving radioactive materials. The petition is denied because the issues raised in the petition have been substantially resolved by subsequent Federal action.

DENIAL OF PETITION FOR RULEMAKING

I. BACKGROUND

By letter dated October 31, 1977, Mr. Richard P. Pollock of the Critical Mass Energy Project, on behalf of the Critical Mass Energy Project; Congressman Theodore S. Weiss; Congressman Timothy E. Wirth; the California Citizen Action Group; Community Action Research Group of Ames, Iowa; Environmental Action of Colorado; Massachusetts Public Interest Research Group; Michigan Public Interest Research Group; National Intervenors, Inc; New York Friends of the Earth; New York Public Interest Research Group; North Carolina Public Interest

Research Group; Southwest Research and Information Center; and Vermont Public Interest Research Group, filed with the NRC a petition for rulemaking to amend NRC regulations.

The petitioners requested that the NRC adopt regulations that would, at a minimum, impose the following conditions on NRC licensees:

1. The use of special routes for the transportation of radioactive materials of all types to ensure that the shipments avoid densely populated areas and mountainous terrain.
2. The adoption of emergency plans for transportation accidents involving radioactive materials, including (a) the organization of emergency response units to carry out the plans and (b) semi-annual drills with local and State law enforcement officials.
3. The assumption of financial responsibility for any shipping accident that involves the dispersal of radioactive materials.
4. The adoption of a plan for informing drivers of vehicles about the nature of the materials they are shipping and about emergency actions they should undertake in the event of an accident.

As a basis for the requested action, the petitioners stated that experts both inside and outside the Federal Government have concluded that there is a need for emergency response plans to protect the public in the event of an accident in transporting radioactive materials.

The petitioners also stated that although there has not yet been a transportation accident resulting in widespread injury to the public, the experience of the September 27, 1977, accident in southeastern Colorado shows that the present system is "wholly inadequate to deal with the risk to the public health from a transportation accident, and that regulations by the Commission are essential."

The petitioners further stated that the NRC requires nuclear power reactor licensees to adopt emergency response plans, but "there is no similar requirement for licensees of nuclear materials to be transported, even though a transportation accident would involve shippers [meaning carriers or transporters] and localities wholly unfamiliar with radioactive materials."

II. PUBLIC COMMENTS

A notice of filing of petition for rulemaking was published in the *Federal Register* on December 1, 1977 (42 Fed. Reg. 61,089). Interested persons were invited to submit written comments or suggestions concerning the petition by January 30, 1978. The NRC received forty com-

ments in response to the notice: thirty-five from industry, industrial representative organizations, and industrial associations; three from individuals; and two from governmental agencies.

A majority of the commenters (thirty-four) opposed the petition. The main reasons cited by these commenters were:

1. The petitioners failed to provide sufficient safety, environmental, or legal justifications for implementing the actions proposed.
2. The implementation of the actions proposed would be extremely costly without corresponding public benefits.
3. Consideration should be given to transportation accidents for all hazardous materials, not just radioactive materials, and therefore, the Department of Transportation is the proper agency to address the overall transportation problem.
4. The current regulatory system is adequate to protect the public health and safety and, therefore, it is unnecessary to implement the actions proposed.

Of the remaining six commenters, four suggested that the proposed actions exempt shipments containing small amounts of radioactive materials for medical, research, or industrial uses. The fifth commenter stated that the proposed actions should apply to all hazardous materials. The sixth commenter disagreed with parts of the petition but suggested that action on the petition be deferred until NUREG/CR-0743 (Transportation of Radionuclides in Urban Environs: Draft Environmental Assessment) had been completed and issued for comment. The report was published in July 1980.

III. STAFF ACTIONS

The response to the petition for rulemaking was delayed because of the following related actions: (1) after a truck accident in 1977 which resulted in a spill of yellowcake (uranium concentrate), the Department of Transportation (DOT) and the NRC conducted a special study on packaging integrity and emergency response to transportation accidents. Because the study included all four issues raised in the petition, the response to the petition was delayed pending the completion of the study. The study report was published in 1980; and (2) the DOT initiated a rulemaking proceeding on highway routing of radioactive materials in 1978. The NRC forwarded a copy of the petition and the public comments thereon to DOT for its consideration because one issue raised in the petition addressed highway routing of radioactive materials. DOT

published its final rule in 1981, but this rule was challenged by the City and State of New York in Federal court. In February 1984, the rule was declared valid as originally promulgated. Each action is discussed below:

1. In June 1978, the NRC notified the petitioners that action on the petition would be delayed pending completion of a related NRC/DOT study on packaging requirements for yellowcake (uranium concentrate) shipments and on emergency response to transportation accidents.

This study was begun after a truck accident on September 27, 1977, near Springfield, Colorado, resulted in a spill of a large amount of yellowcake onto a highway. Members of the U.S. Congress representing the State of Colorado and other officials of that State expressed concern about the integrity of packages containing yellowcake and the emergency response to transportation accidents involving radioactive materials. Representatives of NRC and DOT met with Congressman Timothy E. Wirth at his request. As a result of the discussions, the two agencies agreed to conduct a special joint study on package integrity and emergency response to transportation accidents. The study considered, among other things, all four areas addressed by the petitioners.

The study group published a draft report for comment in April 1979. The comments received on this draft were incorporated in the final study group report, "Review and Assessment of Package Requirements (Yellowcake) and Emergency Response to Transportation Accidents" (NUREG-0535), which was published in July 1980.

2. In April 1979, the NRC notified the petitioners that a copy of the petition and the forty public comments received had been transmitted to the Materials Transportation Bureau (MTB) of the Department of Transportation (DOT). Since the first part of the petition concerned the use of special routes for highway transportation of radioactive materials, the NRC believed that the petition and the comments thereon should be considered by MTB in its rulemaking proceeding on highway routing of radioactive materials.

The MTB published an Advance Notice of Proposed Rulemaking on highway routing of radioactive materials on August 17, 1978 (43 Fed. Reg. 36,492). The notice stated that the MTB was considering promulgating routing requirements, under the authority of the Hazardous Materials Transportation Act, for highway carriers of radioactive materials. The MTB invited public comments on what Federal action would be justified. The large number of comments was reflected in the Notice of Proposed Rulemaking, published January 31, 1980, in the Federal Register (45 Fed. Reg. 7140). Public meetings on this proposed rule were held in several major cities. The final rule was published on January 19, 1981 (46 Fed. Reg. 5298), and was to become effective on February 1,

1982. (As a result of the litigation discussed below, the U.S. District Court stayed the effective date of the DOT rule until February 19, 1982.)

The final rule was challenged by the City of New York and the State of New York. On May 6, 1982, the District Court for the Southern District of New York declared invalid, in part, the highway routing regulations promulgated by the DOT. The DOT appealed the decision to the United States Court of Appeals for the Second Circuit. On August 10, 1983, the Circuit Court reversed and remanded the matter to the District Court for entry of a judgment upholding the DOT regulations. The City of New York and the State of New York then petitioned the United States Supreme Court for review of the Circuit Court's decision. On February 27, 1984, the Supreme Court denied the petition and refused to review the Circuit Court's decision. The result of the Supreme Court's action was to give validity to the DOT highway routing regulations as promulgated.

IV. REASONS FOR DENIAL

The petitioners' concerns basically relate to that portion of transportation when radioactive materials are in the care of the carriers. The Congress has authorized both the NRC and the DOT to regulate the transportation of radioactive materials. These two agencies have agreed, by Memorandum of Understanding (executed June 8, 1979), to partition their regulatory responsibilities. Generally, the DOT is responsible for regulating safety in transportation of all hazardous materials, including radioactive materials, and the NRC is responsible for review and approval of package designs for fissile materials and for other radioactive materials in quantities exceeding type A limits, as defined in 10 C.F.R. Part 71.

The NRC has considered the petition, the public comments thereon, the conclusions reached by the NRC/DOT study group, the DOT's rules on highway routing and financial responsibility, and other related information and has concluded that the issues raised in the petition have been substantively resolved by subsequent Federal action. The following discussion addresses each part of the petition.

Part 1: The use of special routes for the transportation of radioactive materials of all types to ensure that the shipments avoid densely populated areas and mountainous terrain

This issue has been considered in a rulemaking proceeding by the Department of Transportation, which is the Federal agency with jurisdiction in this matter. The Materials Transportation Bureau of the Department of Transportation has conducted a rulemaking proceeding on highway routing of radioactive material shipments. As stated above, NRC provided MTB a copy of the petition and public comments received thereon for consideration in the rulemaking proceeding. The final rule was published on January 19, 1981, and became effective on February 19, 1982. The final rule was challenged by the City of New York and the State of New York and was upheld by the Second Circuit Court of Appeals. On February 27, 1984, the U.S. Supreme Court refused to review the Circuit Court's decision. The result of the Supreme Court's action was to give validity to the DOT highway routing regulations as promulgated.

The DOT rule requires carriers to use an interstate highway or an alternate "preferred route" that minimizes radiological risk. The DOT rule was based in part on NRC advice and studies concerning transportation risks and was subject both to considerable public review and deliberation and to judicial scrutiny. The NRC does not believe it is necessary to require further restrictions beyond the DOT rule.

Part 2: The adoption of emergency plans for transportation accidents involving radioactive materials, including (a) the organization of emergency response units to carry out the plan and (b) semiannual drills with local and State law enforcement officials

The NRC considers the public health and safety to be adequately protected by current requirements for emergency response. Several organizations are involved in emergency response to transportation accidents: State and local personnel such as fire and police are responsible for emergency actions immediately following an accident; shippers are responsible for providing shipment hazard information; carriers are responsible for isolating and cleaning up the spilled radioactive materials; and certain Federal agencies are responsible for providing assistance to State and local governments. At the Federal level, the Federal Emergency Management Agency (FEMA) coordinates such Federal assistance;

the DOT and NRC provide assistance to FEMA; and the DOE maintains radiological assistance teams that respond to radiological emergencies when requested. It is not practicable or necessary to require shippers to duplicate the existing immediate emergency response capabilities to respond to the scene of a transportation accident.

The NRC/DOT study group considered the question of carrier's and shipper's emergency plans for transportation accidents. The study group found that, in general, the carrier (transporter) is responsible for proper care of cargo in transit. In an accident, the carrier is responsible for notifying the shippers and government authorities, isolating any spilled material from the public, and cleaning up any spilled material.

Since, in many cases, the carrier will have neither the technical expertise nor the experience and equipment to handle radioactive materials, the carrier may find it necessary to make arrangements with others to accomplish these duties. The carrier could make contractual arrangements with the shipper or any other organization that is capable of handling cleanup activities. However, the basic burden of ensuring that these provisions are made remains with the carrier.

Under existing DOT regulations (49 C.F.R. § 177.861), the highway carrier is responsible for promptly notifying the shipper (licensee) and the Federal Government of accidents; for isolating spilled radioactive material; and for ensuring that vehicles, buildings, areas, or equipment in which radioactive material has been spilled are not used until the radiation dose rate of any accessible surface is less than 0.5 millirem per hour and there is no significant removable radioactive contamination on the surfaces.

The shipper, on the other hand, is required by DOT regulations to comply with all applicable provisions concerning packaging, labeling, marking, and otherwise preparing the goods for transportation. For hazardous materials, the shipper is required to certify on the shipping papers that the goods are properly classified, described, packaged, marked, and labeled, and are in proper condition for transport (49 C.F.R. § 172.204). The shipper has no specific responsibilities for sending expert personnel to the accident scene but should be prepared to provide expert advice on the hazards of the shipment and any necessary precautions. However, since the shipper could be involved in a liability suit later, it may offer assistance in confining and cleaning up spills from any accident involving its shipment.

Concerning the request for semiannual drills with local and State law enforcement officials, it is impractical and probably not cost-effective to require each shipper or carrier to conduct semiannual drills with local and State personnel in localities through which the shipment might trav-

el. However, the training of local and State first-on-the-scene responders (such as law enforcement, fire-fighting, and rescue personnel) on handling transportation emergencies involving radioactive materials is important. The Department of Transportation, with assistance from other Federal agencies, including the NRC, continues to develop and update guidance and training materials for such first-on-the-scene responders. For these reasons, the NRC will not adopt the petitioners' suggestion concerning semiannual drills with local and State law enforcement officials.

Part 3: The assumption by licensees of financial responsibility for any shipping accident that involves the dispersal of radioactive materials

The NRC believes that the liability for damages should be determined by the courts considering both the applicable State tort law and the particular circumstances associated with the accident.

If the origin or destination of the radioactive material being transported were a facility (for example, a nuclear power plant) for which the NRC required the licensee to have and maintain financial protection, the provisions of the Price-Anderson Act (§ 170 of the Atomic Energy Act of 1954, as amended) would ensure a source of funds up to \$585 million for personal injury or property damage resulting from the transportation accident. The Price-Anderson Act does not preempt applicable State tort law, but in the event of an "extraordinary nuclear occurrence" a facility licensee may be required to waive certain defenses that would otherwise be available.

Section 30 of the Motor Carrier Act of 1980 (Pub. L. 96-296, as amended by § 406 of Pub. L. 97-424) requires the Secretary of Transportation, among other things, to establish regulations on minimum levels of financial responsibility for the transportation of hazardous materials by motor vehicles. The rule implementing this provision on minimum financial responsibility was published by DOT on June 11, 1981 (46 Fed. Reg. 30,974) and subsequently amended on February 7, 1983 (48 Fed. Reg. 5560), on June 28, 1983 (48 Fed. Reg. 29,699), and on July 2, 1984 (49 Fed. Reg. 27,288). For radioactive materials, the minimum levels of financial responsibility are \$1 million (\$5 million effective January 1, 1985) for any vehicle transporting large quantities of radioactive materials and \$500,000 (\$1 million effective January 1, 1985) for transporting radioactive materials in other than large quantities.

Aside from the question of ultimate financial responsibility, the carrier should be prepared to assume the initial costs required to discharge its

responsibilities in performing emergency response actions such as confining or cleaning up the spills. In terms of costs for emergency or protective actions that may be taken by the State or local governmental agencies, these agencies can reasonably be expected to be prepared to assume initial costs incurred as in other emergency situations such as fires and floods.

Part 4: A plan for informing the drivers of the vehicles about the nature of the material they are shipping and emergency actions they should undertake in the event of an accident

The NRC considers existing DOT regulations for driver information to be adequate. Present DOT regulations require that a shipment of radioactive materials be accompanied by a description of each radionuclide contained in the shipment including: the name and radioactivity of each radionuclide, the physical and chemical forms, and other information regarding labels, external radiation levels, and fissile class (49 C.F.R. § 172.203). These requirements involve a system of labels for packages, placards for vehicles, shipping paper descriptions, and other package markings.

In the final rule on highway routing of radioactive materials published by DOT in January 1981 (46 Fed. Reg. 5298), specific training requirements are mandated for persons transporting large quantities of radioactive materials. The training includes, among other things, a requirement that the driver receive training on properties and hazards of the radioactive material transported and procedures to be followed in case of accidents or other emergencies.

In view of the DOT requirements, there does not appear to be a need for NRC to require shippers to provide and carriers to maintain additional detailed emergency procedures for the driver to undertake in case of accident.

V. FINDINGS

Since each of the issues raised in the petition has been substantively resolved, the NRC has denied this petition.

For the Commission

Samuel J. Chilk,
Secretary of the Commission

Dated at Washington, D.C.,
this 2nd day of November 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Nunzio J. Palladino, Chairman
Thomas M. Roberts
James K. Asselstine
Frederick M. Bernthal
Lando W. Zech, Jr.

In the Matter of

Docket No. 50-289-SP
(Restart)

METROPOLITAN EDISON COMPANY,
et al.

(Three Mile Island Nuclear
Station, Unit 1)

December 13, 1984

The Commission denies the Intervenor's motion to defer a decision on restart of Three Mile Island Unit 1 pending investigation of alleged radiation effects of the March 1979 Unit 2 accident on the health of the local population, finding the motion and its supporting data insufficient to call into question results of previous scientific studies that indicated such radiation releases will pose minimal risks to the population.

ORDER

On June 21, 1984, Marjorie and Norman Aamodt filed a motion with the Commission alleging that releases of airborne radioactive materials from the March 28, 1979 accident at TMI-2 were substantially greater than have been acknowledged by the Licensee, the NRC Staff or the Commonwealth of Pennsylvania and that such led to health effects in the local population. The Aamodts further claim that Licensee probably

intentionally destroyed radiation release records to prevent the disclosure of the hazard the accident posed to the health of local residents. The Aamodts' assertions regarding purported health effects are based on their analysis of door-to-door interviews that Ms. Marjorie Aamodt, among others, conducted of residents of two areas near the TMI-2 facility. The Aamodts requested the Commission to investigate immediately their allegations and that the Commission defer a decision on Unit 1 restart until the issues they raise have been fully resolved.

Both the NRC Staff and the Licensee filed responses opposing the request. The NRC Staff notes that there have been allegations of adverse health effects raised by numerous groups in the aftermath of the TMI-2 accident, and that these allegations have been investigated by the NRC, independent investigatory bodies, and the Commonwealth of Pennsylvania, and found to be without merit. Staff concludes that nothing in the Aamodts' "survey" gives cause to question the conclusions previously reached. The Staff further notes that while health effects claims were not evaluated in the management phase of the restart proceeding, there was extensive testimony in the emergency planning phase of the proceeding on alleged thyroid abnormalities and potential fetal health effects downwind of the plant, and those claims were found by the Licensing and Appeal Boards to be without merit. The Staff believes that the charge that Licensee has intentionally destroyed radiation release records is sheer speculation unsupported by evidence and should be given no weight.

The Licensee acknowledges that radiation records are missing, but emphasizes that it informed the NRC Staff that records were missing shortly after the accident. It argues that if the Aamodts wished to raise allegations of intentional withholding of this data as a management integrity issue in the restart proceeding, they should have done so 5 years ago. The Licensee also states that the Aamodts' conclusions on health effects are a direct contradiction to numerous scientific studies performed by a variety of organizations and that the Commission has before it enough scientifically based information to determine that the issues which the Aamodts attempt to raise need not be further pursued.

After responding to the Aamodts' motion, the NRC Staff asked the Centers for Disease Control (CDC) to review the Aamodts' allegations. On September 7, 1984, CDC sent a three-page critique of the Aamodts' allegations to the Staff. CDC concluded that the Aamodts had not presented convincing evidence of increased cancer incidence, cancer mortality, or adverse pregnancy outcomes in TMI-1 area residents related to the TMI-2 accident.

At an August 15, 1984 Commission meeting, Ms. Aamodt informed the Commission of a relatively high radiation measurement she had taken somewhere in the vicinity of the TMI-1 site. Ms. Aamodt stated that she had measured "ten times background" with a Geiger counter. Subsequently, the NRC Staff, and representatives of EPA and the Commonwealth of Pennsylvania's Department of Environmental Resources went with the Aamodts to three locations selected by the Aamodts. At each of these locations informal field surveys were taken with portable instrumentation designed to monitor alpha, gamma and beta radiation. No radioactivity beyond background levels was found at any location. Soil samples were also collected at each location and a water sample was taken at one of the locations. The analysis of these samples did not produce evidence which would support the Aamodts' allegations.

Based on the available information the Commission agrees with the Staff and the Licensee that the Aamodts have not presented sufficient reliable information to show that previous, more comprehensive and scientific surveys of TMI-2 accident radiation releases are erroneous.¹ The Aamodts' informal survey is based entirely on recollections and opinions and has no scientific basis. The Commission finds this insufficient to raise serious questions about earlier studies. Those studies had found that radiation releases from the TMI-2 accident will pose minimum risks to the population. For example, one study found that the projected number of excess fatal cancers due to the accident that could occur over the remaining lifetime of the population within 50 miles of TMI-2 is approximately one.²

The Commission notes that the Pennsylvania Department of Health is continuing to conduct epidemiological research in the Harrisburg area and is cognizant of the Aamodts' allegations. We presume that this research will take these allegations into account. Should its studies or other scientific studies demonstrate that the radiation releases from the TMI-2 accident could pose risks to public health and safety, the Commission will not hesitate to take appropriate action. Accordingly, we do not believe that further investigation by the NRC into this matter is warranted at this time. Therefore, the Aamodts' motion is denied.

Commissioner Bernthal disapproved in part and provided separate views. Commissioner Asselstine disapproved and provided additional views.

¹ The Staff enclosed the list of these studies in an August 31, 1984 memorandum to the Commission.

² See NUREG-0558, "Population Dose and Health Impact of the Accident at the Three Mile Island Nuclear Station" (1979), at 2.

It is so ORDERED.

For the Commission*

SAMUEL J. CHILK
Secretary of the Commission

Dated at Washington, D.C.,
this 13th day of December 1984.

ADDITIONAL VIEWS OF COMMISSIONER ASSELSTINE

The Commission should do more to resolve the concerns raised by Mr. and Mrs. Aamodt. The Commission should request that the Pennsylvania Department of Health review the information submitted by the Aamodts as well as the various existing studies of the radiological releases from the TMI accident and their impact on the people surrounding the plant as part of the Department's ongoing epidemiological research efforts. To assist the Department in this effort, the Commission should provide the funds needed to hire an independent consultant who is expert in the fields of epidemiology and the health effects of ionizing radiation. I can think of no more upsetting concern to the people living in the vicinity of the Three Mile Island plant than the possibility that radiation releases from the accident were higher than estimated by previous studies and that such releases are causing serious health effects. Given the obvious seriousness of these concerns, we should do more than just rely on what appears to be a very cursory review of the Aamodts' information by the Centers for Disease Control. At the same time, I do not find sufficient evidence in the Aamodts' petition to justify a decision to defer further action in the TMI-1 restart proceeding at this time.

*Commissioner Zech was absent for the affirmation of this order; if he had been present he would have approved it. Commissioner Asselstine, in order to allow the will of the majority to prevail, did not participate in the formal vote.

SEPARATE VIEWS OF COMMISSIONER BERNTHAL

In my vote of 30 October 1984 on the above matter, I noted the suggestion of the Centers for Disease Control that "it might still be useful for NRC to fund additional scientifically valid followup studies in [the TMI area] population." While rejecting the Aamodts' paper as "not presenting convincing evidence of cancer incidence, cancer mortality, or adverse pregnancy outcome in TMI area residents following the [TMI-2] accident," CDC also provided guidance to the Commission on a worthwhile approach that might be taken for these "scientifically valid followup studies," to wit: "The proper way to address [these] concerns is through the Pennsylvania Department of Health's TMI followup program."

In my judgment, the Commission must continue to exercise extraordinary diligence, vigilance, and persistence in this matter, so that to the extent scientifically possible, all reasonable concerns regarding possible effects of the TMI-2 accident on citizens in the TMI area may be acted upon or laid to rest. To demonstrate its commitment to that goal, the Commission therefore should have carried through on CDC's suggestion, and should have offered direct support to the Pennsylvania Department of Health's followup program by contractual or other appropriate arrangement. It is worth noting in this regard that Dr. George Tokuhata, Director of the Division of Epidemiology Research of the Pennsylvania Department of Health, in a recent meeting with the TMI-2 Advisory Panel committed the expertise of his Department to continued monitoring of the possible long-term health effects of the TMI-2 accident.

I therefore cannot support the Commission's disposition of the Aamodt motion in the terms contained in the current order. I would have taken action consistent with my comments above.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Gary J. Edles, Chairman
Christine N. Kohl

In the Matter of

Docket No. 50-289-SP
(Restart Proceeding-
Management Remand)

METROPOLITAN EDISON COMPANY,
et al.

(Three Mile Island Nuclear
Station, Unit 1)

December 3, 1984

The Appeal Board, concluding that interlocutory appellate review is not warranted, denies intervenor's motion seeking directed certification and reversal of a Licensing Board ruling that prevented intervenor from introducing into evidence the testimony of two former NRC Commissioners.

ETHICS IN GOVERNMENT ACT: RESTRICTION

The Ethics in Government Act prohibits former federal officials from attempting to influence their former agencies with respect to particular matters in which they were personally and substantially involved while government employees. 18 U.S.C. § 207(a).

RULES OF PRACTICE: RESPONSIBILITIES OF PARTIES (DIRECTED CERTIFICATION)

Failure of a party to address the standards for directed certification in responding to a motion seeking such review may be construed as a waiver of any argument regarding the propriety of directed certification. *Cf. Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-734, 18 NRC 11, 14 n.4 (1983).

RULES OF PRACTICE: INTERLOCUTORY APPEALS (DIRECTED CERTIFICATION)

In deciding whether to exercise its directed certification authority, an appeal board considers whether a licensing board ruling either (1) threatens the party adversely affected by it with immediate and serious irreparable impact which, as a practical matter, could not be alleviated by a later appeal, or (2) affects the basic structure of the proceeding in a pervasive or unusual manner. *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-737, 18 NRC 168, 171 (1983), quoting *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-405, 5 NRC 1190, 1192 (1977).

RULES OF PRACTICE: INTERLOCUTORY APPEALS (EVIDENTIARY RULINGS)

Determinations regarding what evidence should be admitted rarely, if ever, have a pervasive or unusual effect on the structure of a proceeding so as to warrant interlocutory intercession by an appeal board. *See Long Island Lighting Co.* (Jamesport Nuclear Power Station, Units 1 and 2), ALAB-353, 4 NRC 381 (1976); *Toledo Edison Co.* (Davis-Besse Nuclear Power Station, Unit 1), ALAB-314, 3 NRC 98 (1976). *See also Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Units 1 and 2), ALAB-675, 15 NRC 1105, 1113 (1982) (error must fundamentally alter the very shape of the proceeding to warrant interlocutory review).

RULES OF PRACTICE: INTERLOCUTORY APPEALS (DIRECTED CERTIFICATION)

The fact that an evidentiary ruling involves a matter that may be novel or important does not alter the strict standards for directed certification. *See Virginia Electric and Power Co.* (North Anna Power Station, Units 1 and 2), ALAB-741, 18 NRC 371 (1983).

RULES OF PRACTICE: INTERLOCUTORY APPEALS (DIRECTED CERTIFICATION)

The Commission's *Statement of Policy on Conduct of Licensing Proceedings*, CLI-81-8, 13 NRC 452, 456 (1981), neither explicitly nor implicitly relaxes the standards for directed certification. Rather, it simply exhorts the licensing boards to put before appeal boards legal or policy questions that, in their judgment, are significant and require prompt appellate resolution. *North Anna, supra*, 18 NRC at 375. *See also Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), ALAB-780, 20 NRC 378, 382 (1984); *Arizona Public Service Co.* (Palo Verde Nuclear Generating Station, Units 2 and 3), ALAB-742, 18 NRC 380, 384 n.10 (1983).

RULES OF PRACTICE: INTERLOCUTORY APPEALS (DIRECTED CERTIFICATION)

The language regarding directed certification in § V(f)(4) of Appendix A to the Rules of Practice, like the Commission's Policy Statement, CLI-81-8, *supra*, 13 NRC at 456, does not relax the standards for directed certification.

APPEARANCES

Joanne Doroshow and Lynne Bernabei, Washington, D.C., for intervenor Three Mile Island Alert.

Ellyn R. Weiss, Washington, D.C., for intervenor Union of Concerned Scientists.

George F. Trowbridge, Washington, D.C., for licensee Metropolitan Edison Company.

Mary E. Wagner for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

This proceeding is pending before the Licensing Board pursuant to our remand of certain issues, including the so-called Dieckamp mail-

gram.¹ On November 9, 1984, during the course of a prehearing conference, the Licensing Board ruled that it would not permit intervenor Three Mile Island Alert (TMIA) to introduce into evidence the testimony of former NRC Commissioners Peter Bradford and Victor Gilinsky in connection with the Dieckamp mailgram issue. The Board's determination rested on several grounds, including unreliability, irrelevance, and inconsistency with the intent of the Ethics in Government Act.² That statute prohibits former federal officials from attempting to influence their former agencies with respect to particular matters in which they were personally and substantially involved while government employees.³ The Licensing Board also denied TMIA's request to refer its ruling to us.⁴

TMIA has filed a motion seeking directed certification and reversal of the Board's determination.⁵ We ordered the expeditious filing of responses to TMIA's motion.⁶ The licensee and the NRC staff oppose the motion.⁷ Intervenor Union of Concerned Scientists (UCS) supports it. Upon consideration of the pleadings and the relevant record, we conclude that interlocutory appellate review of the Board's ruling is not warranted.

In deciding whether to exercise our directed certification authority, we consider whether a licensing board ruling either (1) threatens the party adversely affected by it with immediate and serious irreparable impact which, as a practical matter, could not be alleviated by a later appeal, or (2) affects the basic structure of the proceeding in a pervasive or unusual manner.⁸ TMIA claims that the Board's ruling affects the basic structure of the proceeding in a pervasive manner because it effectively permits only the licensee to present evidence on some elements of the case.⁹ TMIA also argues that the Board's reliance on the Ethics in

¹ See ALAB-772, 19 NRC 1193, 1265-68, *stay denied*, CLI-84-17, 20 NRC 801, *review granted*, CLI-84-18, 20 NRC 808 (1984).

² Tr. 27,832-76.

³ 18 U.S.C. § 207(a).

⁴ Tr. 27,874-75.

⁵ TMIA invokes 10 C.F.R. § 2.771 as authority for its motion. That regulation, however, pertains to petitions for reconsideration of final decisions. Directed certification of interlocutory board rulings is pursuant to 10 C.F.R. §§ 2.718(i), 2.785(b)(1).

⁶ Order of November 20, 1984 (unpublished).

⁷ Curiously, the licensee confines its argument to the merits of the Licensing Board's evidentiary ruling. It does not address the standards for directed certification. Such omission could be construed as a waiver of any argument regarding the propriety of directed certification. Cf. *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-734, 18 NRC 11, 14 n.4 (1983).

⁸ *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-737, 18 NRC 168, 171 (1983), quoting *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-405, 5 NRC 1190, 1192 (1977).

⁹ TMIA Motion for Directed Certification (Nov. 19, 1984) at 14.

Government Act to bar the testimony presents a legal issue of first impression. In this connection, it contends that the Commission's Rules of Practice (specifically, 10 C.F.R. Part 2, Appendix A) provide for directed certification of novel and important issues when necessary to protect the public interest and to avoid serious prejudice to a party's interest.¹⁰

Virtually every adverse evidentiary ruling tends to skew the overall evidentiary presentation in favor of one or another party. Such rulings, however, may turn out to have little, if any, effect on a licensing board's ultimate substantive decision. Perhaps more important, even an erroneous, prejudicial ruling of this type can be corrected on appeal at the end of the proceeding. Thus, determinations regarding what evidence should be admitted rarely, if ever, have a pervasive or unusual effect on the structure of a proceeding so as to warrant our interlocutory intercession.¹¹ The Licensing Board's ruling in this case is no exception.

The fact that the ruling involves a matter that may be novel or important does not alter the strict standards for directed certification. We addressed this issue in our *North Anna* opinion.¹² In seeking directed certification of a ruling adverse to it, the applicant in that case relied on a Commission Policy Statement providing: "If a significant legal or policy question is presented on which Commission guidance is needed, a board should promptly refer or certify the matter to the Atomic Safety and Licensing Appeal Board or the Commission."¹³ Concluding that that reliance was misplaced, we explained that the Policy Statement neither explicitly nor implicitly relaxes the standards for directed certification. Rather, "it simply exhorts the licensing boards to put before us legal or policy questions that, in their judgment, are 'significant' and require prompt appellate resolution."¹⁴ The same is true of the comparable lan-

¹⁰ *Id.* at 13-15. Section V(D)(4) of Appendix A provides, in part: "A question may be certified to the Commission or the Appeal Board, as appropriate, for determination when a major or novel question of policy, law or procedure is involved which cannot be resolved except by the Commission or the Appeal Board and when the prompt and final decision of the question is important for the protection of the public interest or to avoid undue delay or serious prejudice to the interests of a party."

¹¹ See *Long Island Lighting Co.* (Jamesport Nuclear Power Station, Units 1 and 2), ALAB-353, 4 NRC 381 (1976); *Toledo Edison Co.* (Davis-Besse Nuclear Power Station, Unit 1), ALAB-314, 3 NRC 98 (1976). See also *Cleveland Electric Illuminating Co.* (Perry Nuclear Power Plant, Units 1 and 2), ALAB-675, 15 NRC 1105, 1113 (1982) (error must fundamentally alter the very shape of the proceeding to warrant interlocutory review).

¹² *Virginia Electric and Power Co.* (North Anna Power Station, Units 1 and 2), ALAB-741, 18 NRC 371, 374-75 (1983).

¹³ *Statement of Policy on Conduct of Licensing Proceedings*, CLI-81-8, 13 NRC 452, 456 (1981).

¹⁴ *North Anna*, *supra*, 18 NRC at 375. See also *Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), ALAB-780, 20 NRC 378, 382 (1984); *Arizona Public Service Co.* (Palo Verde Nuclear Generating Station, Units 2 and 3), ALAB-742, 18 NRC 380, 384 n.10 (1983).

guage in Appendix A to the Rules of Practice.¹⁵ We agree here with the Licensing Board that its ruling does not merit interlocutory review.¹⁶

TMIA's motion for directed certification is *denied*.¹⁷
It is so ORDERED.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the
Appeal Board

¹⁵ Our decision to accept a referral of an interlocutory Licensing Board ruling in *Duke Power Co.* (Catawba Nuclear Station, Units 1 and 2), ALAB-687, 16 NRC 460 (1982), *vacated in part on other grounds*, CLI-83-19, 17 NRC 1041 (1983), does not dictate a grant of directed certification here. In accepting the Board's referral in *Catawba*, we relied on the Commission's Policy Statement discussed above. We stressed, however, the generic implications and recurring importance of the legal question there involved (the standards for admitting late contentions). *See also North Anna, supra*, 18 NRC at 375-78. By contrast, neither the Licensing Board nor we see such important, generic considerations inherent in the Ethics in Government Act issue raised by TMIA's motion in this case.

¹⁶ TMIA states that the Licensing Board "acknowledged" that its ruling affected the proceeding in a pervasive manner. TMIA Motion at 14. In fact, the Board only agreed that its evidentiary ruling affected TMIA's case "in an important way," but stated that this was nevertheless not the type of ruling that should be referred to us for interlocutory review. Tr. 27,874.

¹⁷ In denying TMIA's motion, we offer no view on the merits of its claim.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Christine N. Kohl, Chairman
Dr. W. Reed Johnson
Howard A. Wilber

In the Matter of

Docket No. 50-382-OL

**LOUISIANA POWER & LIGHT
COMPANY**

**(Waterford Steam Electric Station,
Unit 3)**

December 12, 1984

The Appeal Board determines that it has jurisdiction to rule on intervenors' motion to reopen the record where the motion raises issues that have a reasonable nexus to other issues still pending before it.

**RULES OF PRACTICE: JURISDICTION (10 C.F.R. § 2.206
PETITION)**

Issues that cannot properly be raised in adjudication may be presented in a petition filed under 10 C.F.R. § 2.206 with the Director of Nuclear Reactor Regulation (NRR).

RULES OF PRACTICE: JURISDICTION (APPEAL BOARD)

If an appeal board has previously considered an issue and (by either the action or inaction of the Commission) the determination amounts to final agency action on that issue, the appeal board has no jurisdiction over a subsequent attempt to raise that matter once again. Such requests

are, in general, more properly directed to NRR, even though other issues in the same proceeding may still be pending before the board. When an issue sought to be considered anew, or to be reconsidered, has a reasonable nexus to a discrete matter still pending before an appeal board, the board has jurisdiction over it. See *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-782, 20 NRC 838, 840-42 (1984); *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), ALAB-766, 19 NRC 981, 983 (1984); *Louisiana Power & Light Co.* (Waterford Steam Electric Station, Unit 3), ALAB-753, 18 NRC 1321, 1329-30 (1984); *Florida Power and Light Co.* (St. Lucie Nuclear Power Plant, Unit No. 2), ALAB-579, 11 NRC 223, 224-26 (1980); *Virginia Electric and Power Co.* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-551, 9 NRC 704, 705-09 (1979); *Public Service Co. of Indiana* (Marble Hill Generating Station, Units 1 and 2), ALAB-530, 9 NRC 261, 262 (1979); *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-513, 8 NRC 694, 695-96 (1978).

RULES OF PRACTICE: JURISDICTION (APPEAL BOARD)

The fact that an appeal board's pending inquiry into an issue arises from a motion to reopen, rather than from an appeal from a Licensing Board decision, is of no moment to a determination of its jurisdiction over a related matter. Rather, as was stated in *North Anna, supra*, 9 NRC at 709, the decisive factor is whether, except for those limited issues as to which jurisdiction has been expressly retained, the case has been decided. The focus in determining jurisdiction is on whether and what issues remain before the board, not how they got there.

MEMORANDUM

On November 8, 1984, Joint Intervenor's filed their most recent of several motions to reopen the record in this operating license proceeding. The motion, which concerns primarily quality assurance at the Waterford facility, proposes the admission of three new contentions. In its reply to the motion, applicant argues that we lack jurisdiction to rule on the motion and urges that we dismiss it. Applicant's Answer (Nov. 30, 1984) at 4-6.

Joint Intervenors' 62-page motion, supported by 62 exhibits, raises important matters that may take several months to resolve.¹ We therefore believe it desirable to advise the parties and Commission, in advance of our merits decision on the motion, of our view on the jurisdictional question raised by applicant. For the reasons set forth below, we have concluded that we have jurisdiction over the motion.²

A. A brief synopsis of the procedural background and current posture of this case is a prerequisite to our discussion of why we have jurisdiction over Joint Intervenors' latest motion.

In ALAB-732, 17 NRC 1076 (1983), we considered Joint Intervenors' appeal from the Licensing Board's principal partial initial decision, which concerned mostly emergency planning and synergism issues. We affirmed the Board's decision. The Commission declined to review ALAB-732, and our disposition of the matters addressed there became "final agency action" on September 7, 1983. Memorandum from S.J. Chilk to Board and Parties (Sept. 14, 1983). There were no perfected appeals from the Licensing Board's second and last partial initial decision, which dealt solely with applicant's emergency planning brochure. Before we completed our customary *sua sponte* review of that decision, however, Joint Intervenors filed two motions to reopen the record. One concerned the adequacy of the concrete basemat on which the facility rests, and the other sought to relitigate the synergism issue. In ALAB-753, 18 NRC 1321 (1983), we denied the first motion, found we had no jurisdiction to rule on the second, and completed *sua sponte* review of the last Licensing Board decision in this proceeding.³

Several days after issuing this decision, we received an amendment to Joint Intervenors' motion to reopen on the basemat issue. This filing apparently crossed ALAB-753 in the mail. No party contested our jurisdiction to rule on this pleading, and it was thus treated by all as a new motion to reopen on the adequacy of the basemat. Although applicant replied to the motion in January 1984, preparation of the staff's reply (including work at the site) consumed many months and it was not filed until this past August. After reviewing the motion papers then before us, we determined that still more information from the staff was necessary before we could finally rule on the basemat motion. ALAB-786, 20

¹ In so characterizing the motion, we do not mean to imply any view whatsoever on its merits.

² We have reached this conclusion without the benefit of the views of the NRC staff and Joint Intervenors. As for the latter, because they filed their motion before us, it is safe to assume they would agree with our view of jurisdiction. As for the staff, it may or may not have planned to address the jurisdictional issue in its forthcoming reply, due December 21. We believe that, on balance, however, it is better for us to state our view of our own jurisdiction as promptly as possible rather than to await the staff's possible comments.

³ The Commission has not yet determined if it will review ALAB-753.

NRC 1087 (1984). The staff's answers to the questions we posed in ALAB-786 are now due December 17. In the meantime, Joint Intervenor have filed their latest motion to reopen on quality assurance. It is our jurisdiction over this motion that applicant challenges.

B. The confusing procedural circumstances of this proceeding, outlined above, present a situation not previously encountered by an appeal board. Although there are several decisions from which we can borrow useful guidance, none is directly on point. Applicant argues that, in general, we lose jurisdiction over a motion to reopen once we have reviewed and affirmed the decisions of the licensing board below. Because our review of the Licensing Board's decisions in this case was complete with the issuance of ALAB-753, applicant contends that we no longer have jurisdiction over the motion to reopen on the quality assurance contention. Applicant distinguishes the motion to reopen on the basemat because the original motion on that subject was filed in July 1983, before our review of the Licensing Board's last decision was completed. Thus, in applicant's view, we have relinquished jurisdiction over this case for all purposes, save one — the adequacy of the basemat. And, according to applicant, that has no reasonable relationship to the three quality assurance contentions Joint Intervenor now seek to raise through their November 8 motion to reopen. Applicant concludes that we must dismiss the motion.

Applicant does not suggest what would be the proper forum for the consideration of the matters raised by Joint Intervenor's motion, if it is not this Board. Because it cannot seriously be argued that no forum exists, the obvious alternative is a petition filed under 10 C.F.R. § 2.206 with the Director of Nuclear Reactor Regulation (NRR). The question before us here, then, is whether the matters raised by Joint Intervenor's quality assurance motion should be resolved within the scope of this adjudicatory proceeding or presented to NRR for more informal disposition.

As noted above, we have addressed somewhat similar issues on numerous prior occasions. The lessons of these decisions are clear. If we have previously considered an issue and (by either the action or inaction of the Commission) our determination amounts to final agency action on that issue, we have no jurisdiction over a subsequent attempt to raise that matter once again. Such requests are, in general, more properly directed to NRR. This is true despite the fact that other issues in the same proceeding may still be pending before us. On the other hand, when an issue sought to be considered anew, or to be reconsidered, has a reasonable nexus to the discrete matter still pending before us, we have jurisdiction over it. See *Pacific Gas and Electric Co.* (Diablo Canyon

Nuclear Power Plant, Units 1 and 2), ALAB-782, 20 NRC 838, 840-42 (1984); *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit No. 1), ALAB-766, 19 NRC 981, 983 (1984); ALAB-753, *supra*, 18 NRC at 1329-30; *Florida Power and Light Co.* (St. Lucie Nuclear Power Plant, Unit No. 2), ALAB-579, 11 NRC 223, 224-26 (1980); *Virginia Electric and Power Co.* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-551, 9 NRC 704, 705-09 (1979); *Public Service Co. of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-530, 9 NRC 261, 262 (1979); *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-513, 8 NRC 694, 695-96 (1978).

The matters raised by Joint Intervenors' motion to reopen on quality assurance have not been previously addressed by either the Licensing Board or us, or by the Commission. And, as in the case of each of the decisions cited above, one issue still commands our attention. The fact that that pending inquiry into the adequacy of the concrete basemat arose from a motion to reopen, rather than from an appeal from a Licensing Board decision, is of no moment to the jurisdictional query posed by applicant. As we stated in *North Anna*, *supra*, 9 NRC at 709, "the decisive factor is whether, except for those limited issues as to which jurisdiction has been expressly retained, the case has been decided." Moreover, it is not the specific legal mechanism that has occasioned our continued involvement with the proceeding, but rather the nature of our involvement that is determinative.⁴

Our inquiry is thus reduced to whether there is a reasonable nexus between Joint Intervenors' pending basemat motion and their latest motion to reopen on quality assurance. Although the latter motion is substantially broader, there is a clear overlap insofar as Joint Intervenors allege quality assurance deficiencies in connection with the construction of the basemat. *See, e.g.*, Joint Intervenors' Motion to Reopen (Nov. 8, 1984) at 39-44. Further, resolution of certain of the concerns raised by the staff in the so-called Eisenhower Letter of June 13, 1984, will be pertinent to our disposition of both motions to reopen. *See* ALAB-786, *su-*

⁴ In *North Anna*, *supra*, 9 NRC at 708, we stated that "once an appeal board has wholly terminated its review of an initial decision ... its jurisdiction over the proceeding comes to an end." *See also* ALAB-753, *supra*, 18 NRC at 1330 n.14. Applicant places undue stress on the references to initial decisions in these opinions, suggesting that the pendency of a licensing board decision before us is the *sine qua non* to our continued involvement. But neither case contemplates such a mechanical approach. The focus is on whether and what issues remain before us, not how they got there. *North Anna*, *supra*, 9 NRC at 708, 709. Indeed, in *North Anna*, we had not yet completed *sua sponte* review of the proceeding when a staff Board Notification triggered our further unsolicited inquiry into yet another matter. *Id.* at 705-06. Surely a party's pending motion to reopen gives us no less a tie to an adjudication than *sua sponte* review of a licensing board decision.

pra, 20 NRC at 1092-93. In this circumstance, we have no hesitation in finding “a rational and direct link” between the two motions so as to confirm our jurisdiction. *St. Lucie, supra*, 11 NRC at 226.

We conclude that we have jurisdiction over the November 8, 1984, motion to reopen filed by Joint Intervenors.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the
Appeal Board

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Alan S. Rosenthal, Chairman
Dr. Reginald L. Gotchy
Howard A. Wilber

In the Matter of

Docket Nos. STN 50-454
STN 50-455

COMMONWEALTH EDISON COMPANY
(Byron Nuclear Power Station,
Units 1 and 2)

December 20, 1984

The Appeal Board affirms the Licensing Board's authorization of the issuance of operating licenses for the two-unit Byron facility. It does so by affirming the Licensing Board's initial decision (LBP-84-2, 19 NRC 36 (1984)) in part and the supplemental initial decision (LBP-84-41, 20 NRC 1203 (1984)) issued by that Board pursuant to the Appeal Board's decision (ALAB-770, 19 NRC 1163 (1984)) on the applicant's appeal of the initial decision.

RULES OF PRACTICE: APPELLATE REVIEW

A party is always free to urge the affirmance of a trial tribunal's result on grounds other than those assigned by that tribunal. *See, e.g., Niagara Mohawk Power Corp.* (Nine Mile Point Nuclear Station, Unit 2), ALAB-264, 1 NRC 347, 357 (1975).

QUALITY ASSURANCE: REQUIREMENTS

Utilities engaged in the construction of nuclear power plants are required by the Commission's regulations to have a quality assurance program that, among other things, verifies that activities affecting the safety-related functions of structures, systems, and components have been performed correctly. 10 C.F.R. Part 50, Appendix B, Criterion I.

QUALITY ASSURANCE: REQUIREMENTS (DELEGATION OF RESPONSIBILITY)

While it must retain ultimate responsibility for full compliance with all quality assurance requirements, an applicant may delegate to its construction contractors the establishment and execution of individual quality assurance programs. *Ibid.*

QUALITY ASSURANCE: REQUIREMENTS (INSPECTOR QUALIFICATIONS)

An integral part of all acceptable construction quality assurance programs is confidence that the individuals carrying out the inspections have the qualifications to fulfill their responsibilities properly.

QUALITY ASSURANCE: REQUIREMENTS (INSPECTOR QUALIFICATIONS)

It is of crucial importance in the assessment of the adequacy of a quality assurance program that there be satisfactory proof of the inspectors' qualifications. Normally, that proof will take the form of quality assurance documentation establishing that the individual in question has the training and experience appropriate to his or her assigned function and has passed any requisite qualifying examinations.

NEPA: NEED FOR POWER AND ALTERNATIVE ENERGY SOURCES

Effective April 26, 1982, the Commission amended its regulations to prohibit the litigation of need for power and alternative energy source issues in operating license proceedings. 47 Fed. Reg. 12,940 (1982). The prohibition currently is found in 10 C.F.R. 51.53(c). *See also* 10 C.F.R. 51.23(e).

ADJUDICATORY BOARDS: DELEGATED AUTHORITY

Within this agency, only the Commission itself has the authority to invalidate one of its own rules or regulations. *See* 10 C.F.R. 2.758(a); *Kansas Gas and Electric Co.* (Wolf Creek Generating Station, Unit 1), ALAB-784, 20 NRC 845, 846 (1984); *Potomac Electric Power Co.* (Douglas Point Nuclear Generating Station, Units 1 and 2), ALAB-218, 8 AEC 79, 89 (1974).

LICENSING PROCEEDINGS: NEED FOR POWER AND ALTERNATIVE ENERGY SOURCES

Undergirding the 1982 amendment prohibiting litigation of need for power and alternative energy sources issues at the operating license stage was the Commission's belief that, as a general matter, no useful purpose is served by considering such matters at that time. *See* 47 Fed. Reg. 12,940.

ATOMIC ENERGY ACT: SEISMIC DESIGN

All nuclear power plants must be designed and built to protect the public from the hazards of radioactive releases should the plant be subjected to movements in the earth's crust. *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 & 2), ALAB-644, 13 NRC 903, 909 (1981), *quoting Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 & 2), ALAB-519, 9 NRC 42, 45 (1979).

ATOMIC ENERGY ACT: SEISMIC DESIGN

Under the Commission's regulatory scheme, protection from movements in the earth's crust is achieved in part through the requirement that the plant be designed to withstand the maximum vibratory ground motion (in terms of acceleration) that might result upon the occurrence of one of two different possible seismic events: the Safe Shutdown Earthquake (SSE) and the Operating Basis Earthquake (OBE). 10 C.F.R. 100, Appendix A, §§ III(c), (d).

ATOMIC ENERGY ACT: SEISMIC DESIGN (SSE)

The SSE is the most powerful earthquake *ever* expected to occur at a plant site. The plant must be able to withstand the forces of the SSE

without releasing dangerous quantities of radioactivity. *Diablo Canyon*, ALAB-644, *supra*, 13 NRC at 911.

ATOMIC ENERGY ACT: SEISMIC DESIGN (OBE)

The OBE is the strongest earthquake considered *likely* to occur during a plant's operating lifetime. The facility must be designed and built to function through the OBE without creating undue risk to the public health and safety. *Ibid.*

ATOMIC ENERGY ACT: SEISMIC DESIGN (OBE)

The vibratory ground acceleration assigned to the OBE must be at least one-half that assigned to the SSE unless a lesser value is justified. 10 C.F.R. 100, Appendix A, §§ II, V(a)(2); *Diablo Canyon*, ALAB-644, *supra*, 13 NRC at 989-92.

ATOMIC ENERGY ACT: SEISMIC DESIGN

Before selecting the SSE and OBE that are to serve as the design bases for its proposed facility, a utility is required to investigate in sufficient scope and detail, *inter alia*, the structural geologic conditions of the site and surrounding region, including its geologic history. 10 C.F.R. 100, Appendix A, § IV.

ATOMIC ENERGY ACT: SEISMIC DESIGN (FAULTS)

If there is a fault within 200 miles of a site that might be of significance in establishing the SSE, the applicant must further determine whether that fault is "capable." *Ibid.*

ATOMIC ENERGY ACT: SEISMIC DESIGN (FAULTS)

A fault is a large-scale dislocation or distortion within the earth's crust along which differential slippage of the adjacent earth materials has occurred parallel to the fracture plane. *Id.* § III(e).

ATOMIC ENERGY ACT: SEISMIC DESIGN (FAULTS)

A capable fault is defined in 10 C.F.R. Part 100, Appendix A, § III(g) as a fault which has exhibited one or more of the following characteristics:

1. Movement at or near the ground surface at least once within the past 35,000 years or movement of a recurring nature within the past 500,000 years.
2. Macro-seismicity instrumentally determined with records of sufficient precision to demonstrate a direct relationship with the fault.
3. A structural relationship to a capable fault according to characteristics (1) or (2) of this paragraph such that movement on one could be reasonably expected to be accompanied by movement on the other.

ATOMIC ENERGY ACT: SEISMIC DESIGN (FAULTS)

If there is a capable fault within 200 miles of a plant, it must then be evaluated for its potential for causing vibratory ground motion and surface displacement, and taken into account in establishing the SSE. *Id.* §§ IV(a)(7) and (8), IV(b).

ATOMIC ENERGY ACT: SEISMIC DESIGN (FAULTS)

If an investigation both demonstrates that a particular fault is structurally associated with geologically old structural features (such as many of those found in the eastern region of the United States) and uncovers no affirmative evidence of capability, that fault shall be presumed to be not capable. *Id.* § III(g).

RULES OF PRACTICE: BRIEFS

Failure of a party to brief issues adequately deprives the adjudicatory boards precisely of that assistance which the Rules of Practice are designed to have an appellant provide, i.e., to flesh out the bare bones exceptions with the precise portion of the record relied on in support of the assertion of error, 10 C.F.R. § 2.762(a), and to present the boards with sufficient information or argument to allow an intelligent disposition of the issues. *See Consumers Power Co.* (Midland Plant, Units 1 and 2), ALAB-270, 1 NRC 473, 475 (1975).

RULES OF PRACTICE: *SUA SPONTE* REVIEW

Under its long-standing practice, the Appeal Board reviews, *sua sponte*, any final disposition of a licensing proceeding that either was or had to be founded upon substantive determinations of significant safety

or environmental issues. *Offshore Power Systems* (Manufacturing License for Floating Nuclear Power Plants), ALAB-689, 16 NRC 887, 890 (1982); *Sacramento Municipal Utility District* (Rancho Seco Nuclear Generating Station), ALAB-665, 14 NRC 799, 803 (1981), *quoting Washington Public Power Supply System* (WPPSS Nuclear Project No. 2), ALAB-571, 10 NRC 687, 692 (1979); *Philadelphia Electric Co.* (Peach Bottom Atomic Power Station, Units 2 and 3), ALAB-509, 8 NRC 679, 683 n.8 (1978).

TECHNICAL ISSUES DISCUSSED:

Quality Assurance Program (and Reinspection Program);
Quality Assurance Inspector Certification and Qualification;
Seismic Design (Operating Basis Earthquake (OBE) and Safe
Shutdown Earthquake (SSE));
Capable Faults;
Earthquake Ground Acceleration;
Core Drilling;
Refraction Seismography;
Relative Age Dating of Fault;
Absolute Age Dating of Fault;
Scarp (or escarpment);
Modified Mercalli Intensity Scale;
Richter Scale;
Cable Tray Hangers;
Whole Body Counting and Strontium-90.

APPEARANCES

Michael I. Miller, Chicago, Illinois, for the applicant, Commonwealth Edison Company.

Jane M. Whicher and **Timothy W. Wright, III**, Chicago, Illinois (with whom **Douglass W. Cassel, Jr.**, Chicago, Illinois, was on the briefs), for the intervenors, Rockford League of Women Voters and Dekalb Area Alliance for Responsible Energy/Sinnissippi Alliance for the Environment.

Richard J. Rawson and **Stephen H. Lewis** (with whom **Mitzi A. Young** was on one of the briefs) for the Nuclear Regulatory Commission staff.

DECISION

This is an operating license proceeding involving the Byron nuclear power facility located in Ogle County, Illinois, about seventeen miles southwest of the City of Rockford. Last January, applicant Commonwealth Edison Company appealed from an initial decision in which the Licensing Board denied the operating license application by reason of determined construction quality assurance deficiencies.¹ Following consideration of that appeal, in ALAB-770² we remanded the proceeding to the Licensing Board for a further evidentiary hearing on particular quality assurance issues. In doing so, we (1) retained jurisdiction over the applicant's appeal, and (2) reserved judgment on certain other issues that the Licensing Board had resolved in the applicant's favor.³

In compliance with ALAB-770, the Licensing Board took further evidence and, on October 16, 1984, issued a supplemental initial decision in which, on the strength of that evidence, it concluded that the quality assurance deficiencies had been rectified.⁴ Accordingly, the Board set aside the result reached in its January 1984 initial decision and authorized the issuance of operating licenses for the two-unit Byron facility.

We have heard the intervenors' challenge to that outcome on an expedited briefing and oral argument schedule. For the reasons that follow, we affirm both (1) the Licensing Board's supplemental initial decision, and (2) its disposition of issues other than construction quality assurance as reflected in its January 1984 initial decision.

I. QUALITY ASSURANCE ISSUES IN CONTROVERSY ON APPEAL

A. Background

Utilities engaged in the construction of nuclear power plants are required by the Commission's regulations to have a quality assurance program that, among other things, verifies that activities affecting the

¹ LBP-84-2, 19 NRC 36 (1984). As employed in this opinion, the term "quality assurance" encompasses "quality control" as well.

² 19 NRC 1163 (1984).

³ In urging that the result reached in the Licensing Board's January 1984 decision should be affirmed, the intervenors (Rockford League of Women Voters and Dekalb Area Alliance for Responsible Energy/Sinnissippi Alliance for the Environment) challenged the disposition of those issues below. This was, of course, permissible. A party is always free to urge the affirmance of a trial tribunal's result on grounds other than those assigned by that tribunal. See, e.g., *Niagara Mohawk Power Corp.* (Nine Mile Point Nuclear Station, Unit 2), ALAB-264, 1 NRC 347, 357 (1975).

⁴ LBP-84-41, 20 NRC 1203.

safety-related functions of structures, systems, and components have been performed correctly.⁵ While it must retain ultimate responsibility for full compliance with all quality assurance requirements, an applicant may delegate to its construction contractors the establishment and execution of individual quality assurance programs.⁶ This practice was followed at Byron with the applicant providing oversight of its contractors through audits and surveillances of construction work and contractor inspection activities.⁷ As part of their quality assurance programs, the contractors were required to use properly qualified individuals to inspect safety-related work so as to provide assurance that no significant construction defects had gone undetected.⁸

In early 1982, when the facility was completed to a significant degree, an NRC Construction Assessment Team (CAT) carried out an in-depth inspection of Byron construction.⁹ The purpose of that inspection was to assess the adequacy of certain aspects of quality assurance and construction activities, including the training, qualifications, and certification of contractor quality assurance personnel.¹⁰ While the NRC staff did not identify any serious construction defects, deficiencies were found involving the methods used by the contractors to evaluate the capabilities of prospective inspectors, the documentation of inspector certification, and the criteria for the qualification of inspectors.¹¹ These deficiencies raised questions regarding the competence of the individuals performing quality assurance inspections of contractor work. Therefore, notwithstanding the fact that the CAT inspection did not itself reveal any serious construction defects, there were concerns that the contractor inspectors may have overlooked such defects.¹²

To determine whether the inspector certification practices at Byron were adequate despite the certification deficiencies identified by the CAT inspection, the applicant developed a program to reexamine a representative sample of the safety-related work previously found acceptable

⁵ 10 C.F.R. Part 50, Appendix B, Criterion I.

⁶ *Ibid.*

⁷ LBP-84-2, *supra*, 19 NRC at 128-29.

⁸ *Id.* at 128.

⁹ *Id.* at 196.

¹⁰ Applicant's (App.) Exh. 8 at cover letter and 65.

¹¹ *Id.* at 67; LBP-84-2, *supra*, 19 NRC at 196-97; Tr. fol. 7801 at 4 (Forney, *et al.*); Tr. 7964.

¹² Obviously, the CAT inspection did not, and could not with a reasonable expenditure of resources review all of the safety-related work at Byron.

by the inspectors in question.¹³ These reexaminations were performed by inspectors who had been properly certified.¹⁴

All safety-related work inspected in the first ninety-day period by the sampled inspectors was reinspected to the extent possible.¹⁵ If the individual performing the reinspection agreed with at least 95% of the original inspector's decisions for objective attributes and 90% for subjective attributes, the inspector was considered qualified regardless of any deficiencies in certification paperwork.¹⁶ If, on the other hand, the reexamination reflected an unacceptably high error rate in a particular area of inspection (e.g., welding), the inspector's work in that area over the next ninety days was examined. Should the acceptance criterion not have been met for that second period, all of the inspector's remaining work in the area was then reinspected and, for that area, the number of inspectors whose work was subject to reexamination increased by 50%.¹⁷

As of the end of 1983, the staff (and the Licensing Board) had in hand only a preliminary report on the results of the reinspection program.¹⁸ Rather than await the final results of the program (which became available in February 1984), the Licensing Board elected to issue its initial decision in January 1984, denying the application for an operating license.¹⁹ In explaining that denial, the Board noted that the applicant took advantage of the opportunity, allowed by the regulations, to delegate to its construction contractors the execution of a quality assurance program.²⁰ The applicant, however, was found by the Board to have "failed in its responsibility to assure that its contractors carried out their delegated quality assurance tasks."²¹ The Board was concerned particularly with the applicant's failure to assure that the contractors' quality assurance personnel were properly trained, qualified, and certified.²²

Although this concern extended to virtually all of the contractors, the Licensing Board's result rested upon the uncertainties respecting the

¹³ Tr. fol. 7549 at 5 (Stanish); Tr. fol. 7760 at 3-4 (Tuetken). The reexamination focused upon work inspected before September 1982. The inspections subsequent to that time were conducted by individuals whose qualifications were established through revised certification practices. Tr. 7964-65, 7978-79.

¹⁴ Tr. fol. 8406 at 20-21 (Del George); Tr. fol. 8408 at 14-17 (Tuetken).

¹⁵ Tr. fol. 7801 at 6 (Forney, *et al.*).

¹⁶ Tr. fol. 7760 at 5-6 (Tuetken). A subjective attribute is one that requires qualitative judgment by the inspector. The only subjective attribute covered in the reinspection program was visual weld examination. In contrast, objective attributes, e.g., as-built dimensions, require little judgment. *Ibid.*

¹⁷ *Id.* at 6.

¹⁸ See letter from Bruce D. Becker to Licensing Board (Nov. 3, 1983) with enclosure.

¹⁹ LBP-84-2, *supra*, 19 NRC at 36.

²⁰ *Id.* at 43.

²¹ *Ibid.*

²² *Ibid.* In its supplemental initial decision, the Licensing Board reiterated that its principal quality assurance concern at Byron was with respect to inspector competence. LBP-84-41, *supra*, 20 NRC at 1273.

qualifications of only those inspectors in the employ of the Hatfield Electric Company (electrical contractor) and Hunter Corporation (piping contractor). This was because, unlike that of the other contractors with quality assurance weaknesses, the work of those two companies was not subject to 100% reinspection.²³

The Board took pains to stress that, despite its denial of the operating license application, it had not concluded that the applicant was "institutionally unable or unwilling to maintain a reliable quality assurance program."²⁴ In addition, while expressing reservations about certain aspects of the reinspection program, the Board indicated that this could be a method of resolving its concerns with quality assurance at Byron.²⁵

On the applicant's appeal, we held that the Licensing Board correctly declined to authorize the issuance of an operating license when, by reason of lingering questions regarding inspector competence, legitimate uncertainty remained respecting whether the Byron facility had been properly constructed.²⁶ We further decided, however, that the Board should have awaited the receipt of the final results of the reinspection program before arriving at an ultimate determination regarding the application for an operating license.²⁷ Accordingly, we concluded:

In the totality of circumstances, the appropriate course is a further hearing to permit a full exploration of the significance of the program in terms of whether there is currently reasonable assurance that the Byron facility has been properly constructed. Stated otherwise, the focus of the inquiry should be upon whether, as formulated and executed, the reinspection program has now provided the requisite degree of confidence that the Hatfield and Hunter quality assurance inspectors were competent and, thus, can be presumed to have uncovered any construction defects of possible safety consequence.²⁸

In this connection, we posed several questions to be addressed by the Board at the remanded hearing. Among other things, the Board was to inquire into whether construction defects identified during the reinspection program had been properly "resolved" — i.e., either rectified or found upon analysis to be without safety significance.²⁹

²³ LBP-84-2, *supra*, 19 NRC at 196-97, 217. As a secondary matter, the Board also found Hatfield and Hunter to be documenting improperly discrepancies identified during the reinspection program. *Id.* at 200, 214-16. This matter is no longer in issue.

²⁴ *Id.* at 44.

²⁵ *Id.* at 43-44, 214-16.

²⁶ ALAB-770, *supra*, 19 NRC at 1169.

²⁷ *Id.* at 1169-70.

²⁸ *Id.* at 1178 (footnotes omitted).

²⁹ *Id.* at 1178-79.

B. Remanded Hearing

As contemplated by ALAB-770, with respect to the reinspection program, the remanded hearing focused upon Hatfield Electric Company and Hunter Corporation. The Licensing Board, however, also looked at the program results for the Pittsburgh Testing Laboratory (PTL) because of that organization's role as an independent testing contractor and its performance in connection with Systems Control Corporation.³⁰

All Hatfield, Hunter, and PTL inspectors included in the reinspection program passed the 95% acceptance criterion for objective attributes for their first three months of inspections. For visual weld inspection, Hatfield and Hunter each had one inspector and PTL had three inspectors who, for the first three months, failed to meet the 90% acceptance criterion for subjective attributes. Because these Hatfield and Hunter inspectors, and two of the PTL inspectors, had performed no inspections thereafter, other inspectors underwent reexamination in their stead. The substitute inspectors all met the acceptance criterion. The other PTL inspector who failed for the first three months also did not meet the acceptance criterion for the second three-month period. As a result, the balance of his accessible work was reinspected. Further, the sample of PTL inspectors was expanded to encompass every such inspector who performed accessible visual weld inspections. Each of these additional PTL inspectors passed the 90% acceptance criterion for the first three months of work.³¹

In accordance with our direction in ALAB-770 that evidence be presented to demonstrate that the discrepancies identified during the reinspection program were properly resolved, applicant witnesses described the engineering evaluations of those discrepancies that were performed by Sargent & Lundy.³² In conducting the evaluations, the discrepancies were first compared to current design parameters and tolerances.³³ Discrepancies found to be outside these design parameters and tolerances were analyzed by engineering judgment or calculations.³⁴ Evaluations by engineering judgment were performed by comparison of the particular discrepancy with the design margin to ascertain the discrepancy's

³⁰ Memorandum and Order (June 8, 1984) (unpublished) at 12-13. We discuss Systems Control Corporation later in this opinion, pp. 1625-27, *infra*.

³¹ Tr. fol. 840b at 27-28 (Del George); Tr. fol. 9510 at 8-10 (Little, *et al.*).

³² See generally Tr. fol. 9044 (French); Tr. fol. 9047 (McLaughlin); Tr. fol. 9051 (Branch). Sargent & Lundy is the architect-engineer for the Byron facility. Staff Exh. 1 (Safety Evaluation Report, Feb. 1982) at 1-b.

³³ Tr. fol. 9044 at 6 (French); Tr. fol. 9051 at 7 (Branch).

³⁴ Tr. fol. 9044 at 6 (French); Tr. fol. 9051 at 7 (Branch).

significance. All of the identified discrepancies (with the exception of discrepant Hatfield welds that were sampled) underwent evaluation.³⁵

None of the discrepancies was determined by Sargent & Lundy to have safety or design significance.³⁶ Nevertheless, all work subject to the American Society of Mechanical Engineers (ASME) Code and having discrepancies that exceeded its examination acceptance criteria was repaired.³⁷ All other discrepancies were either repaired or considered acceptable "as is" based on the results of the engineering evaluations.³⁸ The decision to repair discrepant non-ASME work was made on the basis of work status in the area.³⁹

While the reinspection program was developed for the specific purpose of demonstrating inspector competence, a secondary effort was undertaken to analyze the extensive data produced by the program to determine whether inferences could be drawn about the quality of Hatfield and Hunter work in general. Along this line, the applicant presented testimony that applied statistical principles to the reinspection data to arrive at reliability estimates of work quality.⁴⁰ The applicant concluded that the quality of work is adequate.⁴¹ It based this view, however, on engineering judgment, independent of the statistical analysis.⁴² The staff also considered the results of the reinspection program to have reinforced its positive conclusions about construction quality at Byron.⁴³ On the other hand, intervenors expressed considerable doubt whether the program was structured in such a manner as to allow inferences to be drawn respecting work quality.⁴⁴

³⁵ Tr. fol. 9044 at 6, 9 (French); Tr. fol. 9047 at 7-8 (McLaughlin); Tr. fol. 9051 at 8-14 (Branch); App. Exh. R-4 at VI-2.

³⁶ Tr. fol. 9044 at 8 (French); Tr. fol. 9047 at 12 (McLaughlin); Tr. fol. 9051 at 8-14 (Branch); Tr. 9282-85. Design significance is a lower threshold than safety significance (i.e., if a deficiency is not design significant, it will not be safety significant). Tr. 9159.

³⁷ Tr. fol. 8406 at 36 (Del George); Tr. 8719; App. Exh. R-4 at Exh. C-3 and Appendix F (at F-6).

³⁸ Tr. fol. 8406 at 36 (Del George); Tr. 8719.

³⁹ Tr. 8825-26.

⁴⁰ See Tr. fol. 9055 (Singh).

⁴¹ Tr. fol. 8406 at 47-53 (Del George); Tr. fol. 9336 at 13-14 (Behnke).

⁴² Tr. 9272-78.

⁴³ Tr. 9872-73; Tr. fol. 10,135 at 2 (Keppler). The staff testified that the primary purpose of the reinspection program was to determine whether inspectors had overlooked significant deficiencies. Tr. fol. 9510 at 4 (Little, *et al.*). But staff witness Little agreed that determining whether the inspectors had overlooked significant deficiencies was equivalent to determining whether they were competent. Tr. 9582-83. Staff witness Forney had some disagreement with other staff witnesses on the extent that inferences about the qualification of all inspectors and work quality could be drawn from the reinspection program but characterized these differences as "miniscule." Tr. 10,069; Tr. fol. 10,040 (Forney); Tr. 10,063-64.

⁴⁴ Tr. fol. 11,045 (Ericksen).

C. Licensing Board Determinations

Upon consideration of the evidence produced at the remanded hearing, the Licensing Board found in its October 16 supplemental initial decision that the sampling scheme for selecting inspectors whose work was to be reexamined was appropriate; that the choice of the first ninety days of an inspector's tenure was a proper time period for verifying the inspector certification process; that the acceptance criteria for establishing whether an inspector was competent were appropriate; and that reasonable assurance had been provided that all of the Hatfield, Hunter, and PTL inspectors in question were competent, even though deficiencies had existed in the certification practices at Byron.⁴⁵

The Licensing Board further found that the Sargent & Lundy engineering evaluations of discrepancies identified during the reinspection program were performed in accordance with proper engineering standards and that the assumptions used in the evaluations were sufficiently conservative. In addition, the Board was satisfied that the identified discrepancies had been properly resolved by either repair or disposition as acceptable "as is" based on engineering evaluations. The Board considered the Sargent & Lundy determination that none of the discrepancies was design significant to be a "strong indication" that the inspectors of concern (i.e., those employed before revised certification practices were implemented) had not overlooked any significant safety-related deficiencies.⁴⁶

With respect to construction work quality, the Licensing Board stressed that this matter was never directly in question during the hearings leading to its initial decision. Rather, the Board's concerns with quality assurance at Byron centered on the failure to demonstrate that the inspectors were properly trained, tested, and certified.⁴⁷ The Board further recognized that ALAB-770 emphasized the need to establish inspector competence.⁴⁸ Nevertheless, the Board believed it important to take advantage of the extensive data collected from the reinspection program to help assess the safety of the Byron facility.⁴⁹ While noting that the reinspection data were a byproduct of an inspector competence program and that their value as a measure of work quality was limited, the Board was impressed by the absence of any design-significant discrepancies in the large number of reinspections (covering a broad range

⁴⁵ LBP-84-41, *supra*, 20 NRC at 1248-49.

⁴⁶ *Id.* at 1264-65.

⁴⁷ *Id.* at 1273.

⁴⁸ *Ibid.*

⁴⁹ *Id.* at 1274.

of work).⁵⁰ As a result of the evidence produced throughout the entire proceeding, the Licensing Board found that the applicant had demonstrated that the quality of the Hatfield and Hunter work is adequate.⁵¹

Based on its detailed findings, the Board concluded that the applicant had prevailed on the quality assurance issue. The Board, therefore, set aside its prior denial of the operating license application. Interpreting our remand order to have returned to it full jurisdiction on the quality assurance issue in all substantive respects, the Board authorized the Director of Nuclear Reactor Regulation, upon making the findings on all applicable matters specified in 10 C.F.R. § 50.57(a), to issue full power licenses to Byron Nuclear Power Station, Units 1 and 2, subject to the provisions of 10 C.F.R. § 2.764(f).⁵²

D. Intervenor's Claims on Appeal

Except in one limited respect, the intervenors do not attack the Licensing Board's conclusion that the reinspection program was adequate to establish the competence of the quality assurance inspectors. Rather, the main thrust of their challenge to the result reached in the supplemental initial decision is that the reinspection program failed to demonstrate affirmatively that the inspectors had not overlooked construction defects of safety significance. In the intervenors' view, the ALAB-770 remand required a determination that the program satisfactorily served that purpose.

In addition, the intervenors complain of the Licensing Board's refusal to admit into evidence a part or the entirety of the proffered written testimony of four of their witnesses. Still further, the intervenors insist that the Licensing Board went beyond the scope of the remand in considering and making findings on matters of plant design and design margin. Finally, intervenors assert flaws in Sargent & Lundy's evaluation of the safety significance of the discrepancies found during the course of the reinspection.

⁵⁰ *Ibid.*

⁵¹ *Id.* at 1275. It should be stressed that, although our remand required the Licensing Board to focus upon whether the reinspection program established the competence of the quality assurance inspectors (see p. 1600, *supra*), ALAB-770 went on to authorize the Board to examine any other question that it deemed relevant to the ultimate issue of whether reasonable assurance existed that the Byron facility was properly constructed. 19 NRC at 1182 n.72.

⁵² LBP-84-41, *supra*, 20 NRC at 1294-95.

E. Analysis

1. As just noted, the primary argument advanced by the intervenors in support of their attack on the supplemental initial decision rests upon a specific articulated premise with regard to the ALAB-770 mandate. If we understand it correctly, intervenors' thesis is that our remand required the Licensing Board to determine whether the reinspection program brought about a second look at a sufficiently large percentage of the construction work of assertedly high safety significance to allow an informed judgment that it was unlikely that any of that work was in fact defective. In intervenors' view, the reinspection program did not satisfy this objective, with the purported consequence that the applicant failed to sustain its burden of demonstrating the existence of reasonable assurance that significant construction defects had not eluded discovery at the first inspection.⁵³

a. The complete answer to this line of argument is that the intervenors have misread ALAB-770. Our instructions to the Licensing Board were explicit: it was to focus its inquiry upon "whether as formulated and executed, the reinspection program has now provided the requisite degree of confidence that the Hatfield and Hunter quality assurance inspectors *were competent*."⁵⁴ If so, we stated, those inspectors could "be *presumed* to have uncovered any construction defects of possible safety consequence."⁵⁵

The intervenors did not ask us to reconsider this instruction when we issued ALAB-770; nor do they now attempt to argue that it was unjustified. And our own independent reassessment of the matter has given us no cause to alter our thinking on it. To the contrary, we remain fully persuaded that, *in the context of this case*, it was perfectly appropriate to confine the *required* inquiry to a determination as to the *competence* of the Hatfield and Hunter inspectors.

As earlier observed, the genesis of the reinspection program was not the discovery — either in the course of the staff's CAT inspection or on some other occasion — of actual safety-significant construction defects that apparently had escaped the notice of the quality assurance inspectors. Instead, to repeat, what brought about the reinspection program were ascertained quality assurance deficiencies of a quite different stripe — inspector certification.

⁵³ Intervenors' Supplemental Brief on Appeal (Nov. 6, 1984) (hereafter, Intervenors' Supplemental Brief) at 6-11.

⁵⁴ ALAB-770, *supra*, 19 NRC at 1178 (emphasis supplied).

⁵⁵ *Ibid.* (emphasis supplied).

An integral part of all acceptable construction quality assurance programs understandably is confidence that the individuals carrying out the inspections have the qualifications to fulfill their responsibilities properly: if there is any doubt in that regard, there necessarily must also be equal doubt respecting whether the inspectors in fact uncovered all significant construction defects. For this reason, it is of crucial importance in the assessment of the adequacy of a quality assurance program that there be satisfactory proof of the inspectors' qualifications. Normally, that proof will take the form of quality assurance documentation establishing that the individual in question has the training and experience appropriate to his or her assigned function and has passed any requisite qualifying examinations.

The rub here was that such proof was lacking; i.e., it could not be ascertained from the available documentation that the inspectors in question were fully qualified. Accordingly, even though there was no objective indication that those inspectors were unqualified and consequently might have overlooked safety-significant defects, that possibility could not be excluded.

It was this consideration that led to the establishment of the reinspection program. Similarly, the uncertainty as to the inspectors' competence stemming from inadequate documentation of their qualifications — rather than the discovery of any actual overlooked safety-significant construction defects — was at the foundation of the Licensing Board's rejection last January of the operating license application on quality assurance grounds.⁵⁶

It follows from the foregoing that the instruction to the Licensing Board to focus upon whether the reinspection program established inspector competence is fully consistent with the intervenors' own stated concept of "the central issue on remand." That issue, the intervenors insist, is whether "the new evidence [i.e., the results of the reinspection program] sufficiently cured or overcame the quality assurance failures identified in the initial decision such that there is now reasonable assurance that inspectors did not overlook construction defects of 'possible safety significance.' "⁵⁷ Once again, the identified "quality assurance failures" upon which the denial of the operating license rested related essentially to the demonstration of the inspectors' qualifications. And, in light of the fact that the CAT inspection did not disclose a previously undetected safety-significant defect, there no longer would be any reason to question the existence of reasonable assurance that the Byron facility

⁵⁶ See p. 1599, *supra*.

⁵⁷ Intervenors' Supplemental Brief at 6.

had been properly built if those “quality assurance failures” were overcome (i.e., the inspectors’ competence was established through the reinspection program). Indeed, it is highly improbable that, had there not been the discovered lack of proper documentation of the inspectors’ qualifications, an issue would ever have arisen regarding whether the inspectors might have overlooked significant construction defects.

b. The principal question before us is thus whether the Licensing Board correctly found that “as formulated and executed, the reinspection program has now provided the requisite degree of confidence that the Hatfield and Hunter quality assurance inspectors were competent.”⁵⁸ No ultimate conclusion on this score can be reached prior to consideration later in this opinion of the intervenors’ complaint regarding certain Licensing Board rulings excluding evidence. It can be said at this point, however, that the evidence that was received by the Board gives us no cause to disagree with the result below.

Inasmuch as the structure and fruits of the reinspection program are fully and accurately described in the supplemental initial decision, we need not detail that evidence here. Rather, we can confine our discussion to the one aspect of the program that the intervenors now appear to claim affects its worth as a determinant of *inspector competence*: the selection of an initial sampling period of ninety days.⁵⁹ According to the testimony of their witness Dr. Dev S. Kochhar, the overall level of performance of an inspector would not be reflected by a review of his or her work over such a short period. This is assertedly because, with the passage of time, a newly trained inspector will become increasingly bored and, thus, less attentive to the proper execution of what Dr. Kochhar characterized as a “repetitive, dull and unstimulating . . . inspection task.”⁶⁰

In the supplemental initial decision, the Licensing Board rejected this “fall-off theory” on the ground, among others, that it

is irrelevant to the issue pervading our Initial Decision and the proceeding on remand, i.e., whether the reinspection program reliably demonstrated that the inspectors were properly trained and tested and qualified at the beginning of their in-

⁵⁸ See p. 1600, *supra*.

⁵⁹ See p. 1599, *supra*. Although in ALAB-770 (19 NRC at 1178) we raised a question respecting whether the integrity of the reinspection program was affected by the fact that it was carried out by Hatfield and Hunter personnel, the intervenors do not challenge the Licensing Board’s answer in the negative. See LBP-84-41, *supra*, 20 NRC at 1235-39.

⁶⁰ Tr. fol. 10,538 at 8 (Kochhar). Similar testimony was submitted by another intervenors’ witness, Dr. William H. Bleuel. That testimony was, however, excluded by the Licensing Board. See pp. 1609-10, *infra*.

spection work. The period of interest for that issue is obviously the first few months of their employment as inspectors.⁶¹

We agree with that conclusion. In addition, although not necessary to reach the point, we share the Board's further view that Dr. Kochhar did not lay an adequate foundation for his theory. As the Board observed, the witness's short-term studies were insufficient to permit an informed judgment respecting whether the ninety-day period would provide a reliable measure of inspector performance.⁶²

2. We now move on to the intervenors' complaint about the Licensing Board's exclusion, in whole or in part, of the testimony of four of their witnesses: Dr. William H. Bleuel, Dr. Eugene P. Ericksen, Sargent Podworny, and Charles C. Stokes. The assigned basis (or bases) for the exclusion varied from individual to individual. We find it necessary to consider in each instance two questions. First, was the excluded testimony relevant to the disposition of any crucial issue? Second, if so, was it nonetheless cumulative and, accordingly, its exclusion not prejudicial?

In order to pass the test of relevance, the testimony would have had to bear upon one of the two principal issues that the ALAB-770 remand required the Licensing Board to explore. As just emphasized, one of those issues focused upon the reinspection program and called upon the Board to decide whether that program established the competence of the Hatfield and Hunter quality assurance inspectors. The other issue involved the disposition of any discrepancies brought to light by the reinspection program.⁶³

On the latter score, as earlier noted, the essence of the reinspection program was the reexamination by indisputably qualified inspectors of the work that had been previously accepted by the inspectors whose qualifications were in doubt because of lack of proper documentation. Needless to say, in most instances at least, there was not absolute agreement between the original inspector and the reinspector. Total agreement was, of course, not a condition precedent to a conclusion that the original inspector was competent (90 or 95% agreement was sufficient depending upon whether subjective or objective criteria were employed). But where the reinspector did find a deviation from established

⁶¹ LBP-84-41, *supra*, 20 NRC at 1229.

⁶² *Id.* at 1230-31.

⁶³ As discussed at p. 1625, *infra*, ALAB-770 also called upon the Licensing Board to explore an issue relating to the quality assurance program of the Systems Control Corporation. None of the excluded testimony was, however, directed to that issue.

standards that had not been recorded by the original inspector, the question naturally arose: was that deviation significant and, if so, had it been rectified? In ALAB-770, we directed the Licensing Board to address this question: "Have all identified discrepant conditions, such as poor welding, been properly resolved?"⁶⁴ And, in its supplemental initial decision, the Licensing Board answered the question in the affirmative based upon Sargent & Lundy's analysis that demonstrated that none of the identified discrepancies had design significance.

With these considerations in mind, we examine in turn each witness's excluded testimony.

a. Dr. Bleuel is a partner in the consulting firm of Zarkov & Gordon. He was described by the intervenors as a reliability and design assurance engineer with twenty-five years experience in design and quality assurance.⁶⁵ On July 24, 1984 (after the start of the hearing on remand), the Board was first notified that he might serve as a witness and his proposed testimony was thereafter filed on August 13, 1984.⁶⁶

That testimony offered three reasons why, in Dr. Bleuel's opinion, the reinspection program did not provide adequate assurance that Byron will be operated safely. The first reason was that a failure modes and effects analysis had not been employed in the formulation of the program.⁶⁷ Second, Dr. Bleuel asserted, the engineering evaluation that was performed by Sargent & Lundy should have been performed with either pre-established criteria or by an independent group. Finally, Dr. Bleuel stated that his professional experience contradicted the assumption underlying the program that inspectors would perform least well during the initial three months.⁶⁸

We need not decide here whether the Licensing Board correctly rejected this testimony as untimely.⁶⁹ Be that as it may, its rejection was not reversible error.

To begin with, intervenors' counsel explicitly conceded at oral argument that the failure modes and effects analysis called for by Dr. Bleuel did not address the question of inspector competence.⁷⁰ Further, there is

⁶⁴ 19 NRC at 1179.

⁶⁵ Intervenors' Supplemental Brief at 11-12.

⁶⁶ *Id.* at 15.

⁶⁷ The intervenors submitted Dr. Bleuel's description of such an analysis: "Failure modes and effects analysis is a tool of reliability engineering. Essentially it entails three steps: first, identifying each of the possible ways (modes) in which a system could fail; second, analyzing the effects of each such failure mode; and third, categorizing the failure modes according to their effects." *Id.* at 12A.

⁶⁸ *Id.* at 12.

⁶⁹ See Tr. 10,743-44.

⁷⁰ App. Tr. 27, 33 ("App. Tr." refers to the transcript of the November 29, 1984 oral argument on the intervenors' challenge to the supplemental initial decision).

no apparent connection between the analysis and the Sargent & Lundy evaluation of ascertained deviations. Accordingly, that portion of the Bleuel testimony simply lacked relevance.⁷¹

Dr. Bleuel's second point — addressed to the Sargent & Lundy evaluation — covered essentially the same territory as a portion of the admitted testimony of intervenors' witness Charles Stokes.⁷² In the circumstances, we see no prejudice to intervenors stemming from the fact that Dr. Bleuel was not permitted to rehearse that testimony. The same lack of possible prejudice attaches to the exclusion of so much of Dr. Bleuel's proposed testimony as mirrored Dr. Kochhar's assertion respecting the decline in inspector performance over a period of time. Apart from the consideration that the reinspection program was properly designed to determine inspector *competence* (i.e., capability) and not *performance*, Dr. Bleuel's foundation for offering his opinion on the subject was no firmer than that of Dr. Kochhar.⁷³

b. Dr. Ericksen is a senior sampling statistician for Mathematica Policy Research, Incorporated and a member of the Temple University faculty. He holds degrees in sociology, mathematical statistics, and mathematics. Those portions of his testimony that were excluded did no more than criticize one aspect of the structure of the reinspection program — (i.e., they did not relate to the Sargent & Lundy evaluation to any extent).

At oral argument, intervenors' counsel expressly conceded that the criticism had no bearing upon the efficacy of the program as a vehicle for determining inspector competence.⁷⁴ Thus, whether or not the Licensing Board was right that Dr. Ericksen was unqualified to appraise the program,⁷⁵ his criticism was wholly irrelevant.

c. The same lack of relevance attends upon the excluded proposed testimony of Mr. Podworny, an Authorized Nuclear Inspector in the employ of the Hartford Steam Boiler Inspection and Insurance Company. That testimony related primarily to practices utilized by Hartford in determining compliance with the ASME Code. At oral argument, intervenors' counsel expressly conceded that it would not "shed light" on the inspector competency issue.⁷⁶ And, manifestly, it had nothing to do with the Sargent & Lundy evaluation.

⁷¹ See p. 1608, *supra*.

⁷² See p. 1618, *infra*.

⁷³ See pp. 1607-08, *supra*.

⁷⁴ App. Tr. 29.

⁷⁵ Tr. 11,026.

⁷⁶ App. Tr. 40.

d. Mr. Stokes is a nuclear engineering consultant with a newly formed firm, P/S Associates. He holds a degree in civil engineering and has worked professionally as a civil and mechanical engineer for approximately ten years, principally in the design area.⁷⁷

Mr. Stokes's testimony was submitted in question and answer form.⁷⁸ Although certain other answers were similarly treated, the intervenors' complaint to us is directed solely to the exclusion of the answers to questions 19 and 29-33.⁷⁹

Question 19 probed Mr. Stokes's concerns about a broad range of Sargent & Lundy's design criteria applicable to such Byron components as safety-related pipe hangers.⁸⁰ In response to the question, Mr. Stokes criticized some of those criteria on the ground that they either failed to take into account certain stresses or made incorrect assumptions regarding the weight distribution of the component parts.⁸¹

As intervenors conceded at oral argument,⁸² this criticism had nothing to do with the determination as to inspector competence. Nor is there anything to indicate that Mr. Stokes's concerns on this score bear specifically upon Sargent & Lundy's disposition of the discrepancies revealed by the reinspection program. Indeed, while their brief advances the naked assertion of such a link, the intervenors have shed no light upon what they deem the connection to be. Moreover, it is worthy of note that, in their proposed supplemental initial decision below, the intervenors accepted the applicant's proposed finding that "in response to the issue added by the Board concerning [a]pplicant's repair of defects, the Board finds that all discrepancies were either repaired or dispositioned as acceptable 'as-is' based on engineering evaluation results, thereby resolving this issue."⁸³

In these circumstances, the answer to question 19 was not relevant to any issue on remand. The same may be said with regard to the excluded answers to questions 29-33.⁸⁴ In a word, those questions related to the reinspection of welding performed by Blount Brothers Corporation, the general contractor responsible for concrete work, post-tensioning, and

⁷⁷ Tr. fol. 10,770 at 1-3 (Stokes).

⁷⁸ See generally Tr. fol. 10,770 (Stokes).

⁷⁹ Intervenors' Supplemental Brief at 26-28.

⁸⁰ Tr. fol. 10,770 at 13 (Stokes). As far as we can tell, these criteria were early developed by Sargent & Lundy in its role as the architect-engineer for the Byron project, and not in the course of its engineering evaluation following the reinspection program.

⁸¹ *Ibid.*

⁸² App. Tr. 38.

⁸³ Intervenors' Proposed Supplemental Initial Decision (Sept. 18, 1984) at 85.

⁸⁴ See Tr. fol. 10,770 at 20-22 (Stokes).

containment structural steel.⁸⁵ As ALAB-770 makes clear, however, our remand to the Licensing Board did not extend to Blount because its quality assurance program had been found adequate.⁸⁶

3. In its supplemental initial decision, the Licensing Board did not confine itself to determining whether the results of the reinspection program demonstrated inspector competence. As earlier noted, it also concluded that those results (together with certain other evidence) affirmatively established the quality of the work performed by Hatfield and Hunter.⁸⁷ In reaching that conclusion, the Board made and relied upon, *inter alia*, findings regarding the safety margins included in the general design of the Byron facility.⁸⁸ According to the intervenors, that design was not in issue on the remand and thus was improperly invoked by the Licensing Board.⁸⁹

It is quite true that the general design was not open to challenge on the remand. To the contrary, any questions with regard to it had to be litigated in the hearings preceding the initial decision last January.⁹⁰ But it scarcely follows that the plant design and its associated safety margins, to the extent not successfully attacked in the prior hearings, could not be relied upon by the Licensing Board on the remand. Be that as it may, the underpinnings of the Board's findings regarding the affirmative evidence as to construction work quality are not of present importance. Once again, we determined in ALAB-770 that all the Board need determine in that regard was that the quality assurance inspectors were competent — if competent, the quality of the work could be presumed.

It should only be added in this connection that the intervenors were permitted to adduce evidence on the subject of design criteria and safety margins to the extent relevant to the other principal issue on remand: the Sargent & Lundy disposition of the deficiencies disclosed by the reinspection.⁹¹ This being so, they have no basis for complaint as to the scope of the Licensing Board's inquiry into design matters.⁹²

⁸⁵ See Affidavit of Kenneth T. Kostal (Aug. 18, 1984), appended as Attachment A to Motion to Exclude Testimony of Mr. Charles C. Stokes (Aug. 19, 1984). See also LBP-84-2, *supra*, 19 NRC at 149.

⁸⁶ 19 NRC at 1170 n.23.

⁸⁷ See pp. 1603-04, *supra*.

⁸⁸ LBP-84-41, *supra*, 20 NRC at 1261-64, 1274.

⁸⁹ Intervenors' Supplemental Brief at 23-26.

⁹⁰ As will shortly be seen, at least questions relating to the seismic design were in fact so litigated. See pp. 1616-24, *infra*.

⁹¹ LBP-84-41, *supra*, 20 NRC at 1262 n.10. See Tr. 10,668; Tr. fol. 10,770 at 16-20 (Stokes).

⁹² In its supplemental brief (at 26), the intervenors note in passing their disagreement with the Licensing Board's denial, in an unpublished November 2, 1984 order, of their September 12, 1984 motion to reopen the record on design issues. In a September 19, 1984 unpublished order, we expressed doubt that the motion came within the scope of the ALAB-770 remand inasmuch as "design quality assurance issues [are] separate and distinct from construction quality assurance issues." For this reason, we felt

(Continued)

4. In determining whether a particular deficiency identified during the reinspection had design significance, Sargent & Lundy sometimes employed what it characterized as “engineering judgment.”⁹³ The intervenors complain that that organization failed to “define” in advance the criteria to be used in making such judgments.⁹⁴ They insist that, given that failure, the evaluation should not have been performed by Sargent & Lundy but, instead, by an organization not previously associated with the project.⁹⁵ This thesis was advanced in both the accepted testimony of Mr. Stokes and the excluded testimony of Dr. Bleuel.⁹⁶

We agree with the Licensing Board’s rejection of the intervenors’ position. Our examination of the record has disclosed no evidence to suggest either that Sargent & Lundy’s engineering judgments were flawed or that the organization allowed its evaluations to be influenced by its prior association with Byron.⁹⁷ In this connection, although Mr. Stokes performed a detailed review of “many” of the evaluations, on cross-examination he was able to describe only one purported example of a relevant lack of objectivity by Sargent & Lundy: an alleged inconsistency between its structural engineering and mechanical engineering groups in the treatment accorded fatigue loading.⁹⁸ But, as the Licensing Board observed, no such inconsistency existed.⁹⁹ This was because the two groups were looking at different components and each adhered to the portions of the ASME and American Institute of Steel Construction (AISC) Codes applicable to those components under its examination.¹⁰⁰ Consequently, it is not surprising that, notwithstanding their appellate claims, the intervenors acknowledged below that the record did not support the need for an independent evaluation effort because of Sargent & Lundy’s association with the applicant.¹⁰¹

constrained to authorize explicitly the Licensing Board to entertain the motion. In these particular circumstances, if dissatisfied with the denial of the motion, the intervenors should have noted an appeal from it. They did not and, therefore, all that is now properly before us is the Licensing Board’s disposition of the remanded *construction* quality assurance issues.

⁹³ Tr. fol. 9044 at 6 (French); Tr. fol. 9051 at 7 (Branch); App. Exh. R-4 at VI-1, VI-2.

⁹⁴ Intervenors’ Supplemental Brief at 29A.

⁹⁵ *Id.* at 29.

⁹⁶ Tr. fol. 10,770 at 4-6 (Stokes); p. 1609, *supra*.

⁹⁷ We have earlier discussed the evaluation methodology. See pp. 1601-02, *supra*.

⁹⁸ Tr. fol. 10,770 at 4, 18-19 (Stokes); Tr. 10,893-94.

⁹⁹ LBP-84-41, *supra*, 20 NRC at 1264.

¹⁰⁰ Tr. fol. 11,158 at 8-9 (Erler).

¹⁰¹ Intervenors’ Proposed Supplemental Initial Decision at 85.

II. OTHER ISSUES IN CONTROVERSY ON APPEAL

As previously noted, in its response to the applicant's appeal from the January 1984 Licensing Board decision the intervenors challenged the Board's resolution of several non-quality assurance issues. In a June 13, 1984 memorandum and order (unpublished), we rejected one of those challenges — directed to the Licensing Board's refusal to allow the intervenors to litigate their contention that the applicant was not financially qualified to operate the facility. (The text of that memorandum and order is contained in the Appendix to this decision, *infra*, pp. 1627-29.) We now consider the intervenors' remaining claims, which we conclude to be without merit.

A. Need for Power and Alternative Energy Sources

Effective April 26, 1982, the Commission amended its regulations to prohibit the litigation of need for power and alternative energy source issues in operating license proceedings.¹⁰² The prohibition currently is found in 10 C.F.R. 51.53(c).¹⁰³

In unpublished memoranda and orders issued on August 5 and 26, 1982, the Licensing Board denied the intervenors' petitions seeking a waiver of or an exception to the prohibition. The Board pointed out that, under the terms of 10 C.F.R. 2.758(b), relief may be granted only upon a demonstration "that special circumstances with respect to the subject matter of the particular proceeding are such that application of the rule or regulation (or provision thereof) would not serve the purposes for which the rule or regulation was adopted." In the Board's view, the intervenors had failed to make a *prima facie* showing in this regard.

Before us, the intervenors not merely challenge this conclusion but, more fundamentally, maintain that 10 C.F.R. 51.53(c) contravenes the National Environmental Policy Act of 1969, 42 U.S.C. 4321, and therefore is unlawful. The latter claim is, of course, addressed to the wrong forum: within this agency, only the Commission itself has the authority to invalidate one of its own rules or regulations.¹⁰⁴ And we find nothing in the intervenors' assertions that might possibly establish the existence

¹⁰² 47 Fed. Reg. 12,940 (1982).

¹⁰³ See also 10 C.F.R. 51.23(e).

¹⁰⁴ See 10 C.F.R. 2.758(a); *Kansas Gas and Electric Co.* (Wolf Creek Generating Station, Unit 1), ALAB-784, 20 NRC 845, 846 (1984); *Potomac Electric Power Co.* (Douglas Point Nuclear Generating Station, Units 1 and 2), ALAB-218, 8 AEC 79, 89 (1974).

of the “special circumstances” required for a waiver of or exception to the section 51.53(c) mandate.

Undergirding the 1982 amendment was the Commission’s belief that, as a general matter, no useful purpose is served by considering need for power and alternative energy sources issues at the operating license stage. As the Commission put it in the statement of consideration accompanying the amendment:

[W]hile there is no diminution of the importance of these issues at the construction permit stage, the situation is such that at the time of the operating license proceeding the plant would be needed to either meet increased energy needs or replace older less economical generating capacity and that no viable alternatives to the completed nuclear plant are likely to exist which would tip the NEPA cost-benefit balance against issuance of the operating license.¹⁰⁵

Neither the intervenors’ filings below nor their brief to us presents nearly enough specific facts (as opposed to broad, unparticularized averments) to persuade us that the present and projected energy situation in Commonwealth Edison’s service area is sufficiently special that that rationale is inapplicable here.

Stated otherwise, the laying by intervenors of a proper foundation for their waiver or exemption request necessitated a substantial concrete demonstration that, notwithstanding the enormous economic investment in Byron, the NEPA cost-benefit balance might now tip in the direction of abandoning this essentially completed facility. For, assuredly, that proposition is far from self-evident. There may well be room for legitimate doubt regarding whether warrant exists to undertake the erection of a particular nuclear facility — i.e., whether the need for the electricity that the facility would generate is sufficient to justify assuming the environmental and other costs associated with its construction and operation. Thus, as the Commission pointed out, need for power and alternative energy sources issues remain of importance at the construction permit stage. But it is difficult to perceive many sets of circumstances that might lead one to a reasoned conclusion that the environmental costs of operating an already built facility would exceed the benefit to be derived from utilization of the electric power that the facility is capable of producing.¹⁰⁶ Accordingly, it does not seem unfair to expect a thresh-

¹⁰⁵ 47 Fed. Reg. 12,940.

¹⁰⁶ Needless to say, that the need for a facility’s generating capacity (either to meet increased demand or to provide replacement electric power) might not be sufficient to justify building the plant does not perforce mean that, if the plant has already been constructed, it should be abandoned. Nor does a present judgment that the construction of, e.g., a coal-fired facility might have been preferable to the construction of the nuclear facility have much significance in determining whether, having been built, the nuclear plant should be allowed to operate.

old particularization on the part of a party claiming the presence of such circumstances and, therefore, an entitlement to litigate whether NEPA requires that the facility be mothballed or dismantled. Once again, such particularization was absent here.

B. Seismic Design

All nuclear power plants must be designed and built to protect the public from the hazards of radioactive releases should the plant be subjected to movements in the earth's crust.¹⁰⁷ Under the Commission's regulatory scheme, this protection is achieved in part through the requirement that the plant be designed to withstand the maximum vibratory ground motion (in terms of acceleration) that might result upon the occurrence of one of two different possible seismic events: the Safe Shutdown Earthquake (SSE)¹⁰⁸ and the Operating Basis Earthquake (OBE).¹⁰⁹ The SSE is the most powerful earthquake *ever* expected to occur at the plant site.¹¹⁰ The plant must be able to withstand the forces of the SSE without releasing dangerous quantities of radioactivity.¹¹¹ The OBE is the strongest earthquake considered *likely* to occur during a plant's operating lifetime.¹¹² The facility must be designed and built to function through the OBE without creating undue risk to the public health and safety.¹¹³ The vibratory ground acceleration assigned to the OBE must be at least one-half that assigned to the SSE¹¹⁴ unless a lesser value is justified.¹¹⁵

Before selecting the SSE and OBE that are to serve as the design bases for its proposed facility, a utility is required to investigate in sufficient scope and detail, *inter alia*, the structural geologic conditions of the site and surrounding region, including its geologic history.¹¹⁶ If there is a fault¹¹⁷ within 200 miles of the site that might be of significance in estab-

¹⁰⁷ *Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 & 2), ALAB-644, 13 NRC 903, 909 (1981), *quoting Pacific Gas and Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 & 2), ALAB-519, 9 NRC 42, 45 (1979).

¹⁰⁸ 10 C.F.R. 100, Appendix A, § III(c).

¹⁰⁹ *Id.* § III(d).

¹¹⁰ *Diablo Canyon*, ALAB-644, *supra*, 13 NRC at 911.

¹¹¹ *Ibid.*

¹¹² *Ibid.*

¹¹³ *Ibid.*

¹¹⁴ 10 C.F.R. 100, Appendix A, § V(a)(2).

¹¹⁵ *Id.* § II; *Diablo Canyon*, ALAB-644, *supra*, 13 NRC at 989-92.

¹¹⁶ 10 C.F.R. 100, Appendix A, § IV.

¹¹⁷ A fault is a large-scale dislocation or distortion within the earth's crust along which differential slippage of the adjacent earth materials has occurred parallel to the fracture plane. *Id.* § III(e).

lishing the SSE,¹¹⁸ the applicant must further determine whether that fault is "capable."¹¹⁹ If so, it must then be evaluated for its potential for causing vibratory ground motion and surface displacement, and taken into account in establishing the SSE.¹²⁰ In this connection, if the investigation both demonstrates that a particular fault is structurally associated with geologically old structural features (such as many of those found in the eastern region of the United States) and uncovers no affirmative evidence of capability, that fault shall be presumed to be not capable.¹²¹

1. The Byron site is located in the Central Stable Region tectonic province — an area that extends from the Rocky Mountains east into New York State and south to Oklahoma. It is a region characterized, in general, by a relatively low level of seismicity.¹²²

Approximately six miles southwest of the Byron site lies the Sandwich Fault Zone, encompassing a noncapable fault. The existence of the Zone was known at the time the construction permit for the plant was issued. It was then thought to be the nearest major fault zone to Byron.¹²³ There are minor but no capable faults underlying the site itself.¹²⁴

Maximum accelerations of 0.2g for the SSE and 0.09g for the OBE were adopted as part of the design bases for the plant.¹²⁵ These values were determined to be sufficiently high based on an examination of the intensities and recurrence rates for earthquakes in the Central Stable Region.¹²⁶

Subsequent to the issuance of the construction permit, a study undertaken by the Illinois State Geological Survey (ISGS) identified the existence of the Plum River Fault Zone just 5.3 miles northwest of Byron,

¹¹⁸ *Id.* § IV.

¹¹⁹ A capable fault is defined in 10 C.F.R. Part 100, Appendix A, § III(g) as a fault which has exhibited one or more of the following characteristics:

1. Movement at or near the ground surface at least once within the past 35,000 years or movement of a recurring nature within the past 500,000 years.
2. Macro-seismicity instrumentally determined with records of sufficient precision to demonstrate a direct relationship with the fault.
3. A structural relationship to a capable fault according to characteristics (1) or (2) of this paragraph such that movement on one could be reasonably expected to be accompanied by movement on the other.

¹²⁰ *Id.* §§ IV(a)(7) and (8), IV(b).

¹²¹ *Id.* § III(g). For purposes of this regulation, "old" means at least "pre-Quaternary." *Ibid.* The Quaternary period starts with the Pleistocene (glacial) age, roughly one million years ago.

¹²² LBP-84-2, *supra*, 19 NRC at 241.

¹²³ LBP-74-87, 8 AEC 1006, 1036 (1974).

¹²⁴ LBP-75-64, 2 NRC 712, 716-17 (1975).

¹²⁵ Tr. fol. 479 at 3 (Singh); Tr. fol. 760 at 3-4 (Rothman); Staff Exh. 1 (SER) at 2-24. Earthquake acceleration is measured in units of gravity, or "g." One g, the acceleration of a free falling body due to gravity, is equal to an acceleration of 32.17 ft/sec/sec.

¹²⁶ Staff Exh. 1 at 2-26 to 2-28; LBP-75-64, *supra*, 2 NRC at 718.

which was earlier thought to be another type of geologic structure. Principally on the basis of the information developed by the ISGS study, the applicant and the NRC staff determined that the Plum River Fault Zone was not capable.¹²⁷

2. At the hearing below, the intervenors contested the seismic design of the plant.¹²⁸ In particular, they disputed the acceptability of the ground acceleration values selected for the plant's SSE and OBE, claiming that there was not sufficient information pertaining to either the causes of earthquakes in northern Illinois or the Plum River Fault Zone to arrive at those values. The Licensing Board rejected this claim and found the plant's seismic design to be in compliance with Commission regulations.¹²⁹

Before us, the intervenors renew their challenge to the adequacy of the plant's seismic design. They maintain that the Licensing Board erred in finding that the Plum River Fault Zone was not capable and in endorsing the 0.09g value for the OBE. On the latter score, the intervenors contend that the applicant did not show good cause for deviating from the requirement that the value assigned to the OBE be at least one-half of the value given the SSE. According to the intervenors, the OBE value should be at least 0.1g and not the 0.09g employed for seismic design purposes.¹³⁰

At the hearing, the only dispute concerning whether the Plum River Fault Zone is capable related to the first criterion for determining a capable fault: whether there had been movement at or near the ground surface at least once during the last 35,000 years or movement of a recurring nature within the past 500,000 years.¹³¹ In this regard, both the applicant and the staff presented considerable evidence supporting the absence of such movement. The intervenors insisted, however, that that evidence was inadequate to reach any conclusion respecting the fault's capability.

The intervenors continue to press that position before us. They maintain that the Licensing Board's finding that the Plum River Fault Zone was not capable rested upon information acquired by "inaccurate" and "indirect" methods (i.e., by core drilling and seismic refraction) "while

¹²⁷ LBP-84-2, *supra*, 19 NRC at 242-44.

¹²⁸ In actuality, it was only the League of Women Voters that pressed the matter before the Licensing Board. But because the other intervenors have joined the seismic arguments presented by the League to us, for convenience we are using the term "intervenors" throughout this discussion.

¹²⁹ *Id.* at 247-50.

¹³⁰ Brief of Intervenors (March 12, 1984) at 55-57.

¹³¹ See note 119, *supra*. The other two criteria for determining a capable fault were never seriously raised by the intervenors as issues in the proceeding.

¹³² Brief of Intervenors at 56.

an accurate and direct method (excavation and direct observation of the fault itself) is available.”¹³² But the intervenors neither explain why the core drilling and seismic refraction methods produced unsatisfactory results nor refer us to any evidence in the record that might support such an assertion. This being so, the intervenors could not have complained had we elected to treat as abandoned their challenge to the Licensing Board’s Plum River Fault Zone findings.¹³³

We have chosen, however, not to take that route but, rather, to consider the intervenors’ claim. Our review of the record persuades us that it is without merit.

One means of determining the age of a fault is the relative age dating method.¹³⁴ Basically, it consists of examining the material that overlies the fault and ascertaining when this material was deposited. The fault is then dated by tracing it upward through each stratum (or layer) of material to the point where the fault stops. An undisturbed stratum above the fault indicates that the fault is older than the overlying material.¹³⁵ Although not conclusive, an absence of signs of disturbance of the overlying material also provides some indication of the lack of fault movement since the time of deposit of the overlying materials.¹³⁶ On the other hand, evidence of displacement could indicate movement of the underlying fault since that time.¹³⁷

The Plum River Fault Zone was extensively studied by the ISGS,¹³⁸ which is the repository for all geological information gathered in Illinois and is staffed by well-recognized experts on the geology of that state.¹³⁹ Indeed, the intervenors’ own expert on geology, Dr. Henry H. Woodward, Chairman of the Geology Department, Beloit College, Wisconsin,

¹³³ See *Consumers Power Co.* (Midland Plant, Units 1 and 2), ALAB-270, 1 NRC 473, 475 (1975). True, the intervenors in that case failed to file any brief in support of their appeal. While the intervenors here did file one, nonetheless the observation we made in *Midland* applies to them as well: a failure to brief issues adequately

deprives us precisely of that assistance which the Rules of Practice are designed to have an appellant provide, i.e., to flesh out the bare bones exceptions “with the precise portion of the record relied on in support of the assertion of error,” 10 C.F.R. § 2.762(a), and to present us “with sufficient information or argument to allow an intelligent disposition of [the] issue[s].”

¹³⁴ 10 C.F.R. 100, Appendix A, § IV(a)(7) n.3; Tr. fol. 432 at 4 (Yonk). The other basic method (known as absolute age dating) employs radiometric studies of naturally occurring radioisotopes and their daughter products. Unlike the relative age dating method, it was not used in the ISGS study because of the absence of proper mineralogy at the site. Tr. fol. 432 at 3-4 (Yonk).

¹³⁵ *Id.* at 4.

¹³⁶ Tr. 567-68, 597-98, 762-64, 820-21.

¹³⁷ Tr. 816-17.

¹³⁸ The study is reported in Plum River Fault Zone of Northwestern Illinois, ISGS Circular 491 (hereafter ISGS Circular). See also Tr. fol. 753 at 3, 5 (Alterman); Tr. 791; Staff Exh. 1 at 2-22 to 2-24; Tr. 802-03, 822, 824.

¹³⁹ Tr. 436.

credits the ISGS with being the "foremost state geology group in the United States."¹⁴⁰

In using the relative age dating method, the ISGS study examined data acquired from field observations, existing well records, and cores obtained from the area of the fault zone. In addition, the ISGS made use of a limited amount of refraction seismography data pertaining to the area of the fault zone, principally to locate anomalies in the bedrock surface and determine the position of the zone.¹⁴¹ After that determination was made, two holes were drilled, one on each side of the fault zone, as interpreted from the refraction seismographic data. A core extending twenty feet into the bedrock was taken from one hole; a twenty-five foot core from the other. The underlying materials and bedrock obtained from the two drillings were analyzed and the relative position of layers of materials compared.¹⁴² No displacement of the overlying materials, consisting of soils of the Illinoian and pre-Illinoian ages (200,000 to 500,000 years ago) at the top of the bedrock, was observed.¹⁴³ The fault zone itself was determined to have been formed sometime in the interval between the Niagaran and Pleistocene periods.¹⁴⁴ The ISGS thought it likely that the fault zone was formed around the Pennsylvanian period.¹⁴⁵

The ISGS study was reviewed by, among others, Alan K. Yonk, a geologist retained by the applicant,¹⁴⁶ and Dr. Ina B. Alterman, an NRC staff geologist.¹⁴⁷ Relying on his own observations and investigations and the results of the ISGS study, Mr. Yonk concluded that there had been no movement of any fault near the Byron site for at least 200,000 years and no movement of a recurrent nature for 500,000 years. In his opinion, therefore, the Plum River Fault Zone was not capable within the meaning of the Commission's seismic regulations.¹⁴⁸ Dr. Alterman reached the same conclusion.¹⁴⁹ Apart from the information provided by

¹⁴⁰ Tr. 582.

¹⁴¹ ISGS Circular at 2, 16; Tr. fol. 753 at 5 (Alterman); Tr. 568-69, 791. Refraction seismography basically involves the use of seismographs at specific locations to record sound waves set off in the ground by explosives. The sound waves pass through the soil and rock and their arrival times are recorded. Calculations can then be made of the depths and structure of the various underlying formations. Tr. 792-93.

¹⁴² ISGS Circular at 15; Tr. 569-70.

¹⁴³ Tr. 815, 822; ISGS Circular at 16; Tr. fol. 753 at 2-4 (Alterman); Staff Exh. 1 at 2-22 to 2-24.

¹⁴⁴ ISGS Circular at 17; Tr. fol. 432 at 7 (Yonk). Roughly, the interval between the Niagaran and Pleistocene times translates into a period from 400 million to about one million years ago.

¹⁴⁵ ISGS Circular at 17. The Pennsylvanian period was roughly 290 million years ago. Tr. fol. 753 at 7 (Alterman).

¹⁴⁶ Tr. fol. 432 at 5-6 (Yonk).

¹⁴⁷ Tr. fol. 753 at 3, 5 (Alterman).

¹⁴⁸ Tr. fol. 432 at 2, 6-8 (Yonk).

¹⁴⁹ Tr. fol. 753 at 3 (Alterman).

the ISGS study,¹⁵⁰ she was influenced by the fact that there is no known seismicity associated with the fault zone, by the absence of any scarp at the fault zone, and by the tectonic history of the surrounding area indicating that any faulting in Illinois is no younger than sixty-five million years.¹⁵¹

The only witness presented by the intervenors on this issue was Dr. Woodard. His position appeared to be that any conclusion that the Plum River Fault Zone was not capable was premature because of the absence of information "one way or the other."¹⁵² He conceded that he knew of no evidence of fault movement within the past 35,000 years or movement of a recurring nature within the past 500,000 years.¹⁵³ But, as he saw it, that was not determinative because "critical information" had not been obtained. According to Dr. Woodard, the overlying material should have been excavated "right across the fault zone." This would have permitted "direct observation" respecting whether the material overlying the fault is or is not displaced.¹⁵⁴ In his view, the method followed by the ISGS did not provide this "critical information" because of the "relative inaccuracies" of the technique.¹⁵⁵ Dr. Woodard admitted, however, that his proposed method, like core drilling and seismic refraction, in and of itself would not provide absolute proof of fault movement.¹⁵⁶

The Licensing Board was not persuaded on the need for the "excavation" and "direct observation" insisted upon by Dr. Woodard. According to the Board, the evidence already in the record on the Plum River Fault Zone was "considerable and convincing," justifying the conclusion that the Plum River Fault Zone was not capable. As it explained:

The Board relied principally on testimony presented by the [s]taff based on and supported by the observation and analysis of data by the ISGS and reported in its Circular 491. These arguments by the [s]taff, leading to the conclusion that the overlay of till has not been disturbed in recent geologic times, include the absence of an escarpment at the fault, the equality of the elevation of the bedrock strata bordering the fault even though those strata are of different ages, and the tectonic history of the region which includes no record of local seismicity. Additionally, the finding of no fault in northern Illinois which has displaced overlying Illinoian-age soil and that

¹⁵⁰ The NRC staff routinely relies on state groups such as the ISGS because they are generally recognized as experts on the geology of their own states. Tr. 835-36.

¹⁵¹ Tr. 818. Scarp, or escarpment, is a steep face frequently presented by the abrupt termination of stratified rocks. Its presence over a fault is an indication of vertical fault movement. Tr. 821.

¹⁵² Tr. 565, 599.

¹⁵³ Tr. 561.

¹⁵⁴ Tr. 565-68, 574.

¹⁵⁵ Tr. 571.

¹⁵⁶ Tr. 568.

there are no known capable faults in the United States east of the Rocky Mountains assisted the Board in concluding that the noncapability of the Plum River Fault Zone has been sufficiently demonstrated to support our decision that no movement has occurred at Plum River within the past 0.13 to 0.40 MY [million years].¹⁵⁷

On the record before us, we see no basis for the rejection of the Board's analysis of the matter. The Plum River Fault Zone had been studied in detail by the agency undoubtedly most familiar with the geology of the area, which found no evidence suggesting that the fault might be capable. Similarly, studies of the area by the applicant's and staff's experts uncovered no such evidence. In the circumstances, the Licensing Board had an ample foundation for its conclusions, contrary to the opinion of Dr. Woodard, that the Plum River Fault Zone had been adequately investigated and that the Zone contained no capable faults.

3. As noted earlier (p. 1616, *supra*), a nuclear power plant must be designed to withstand the ground acceleration that might occur as a result of an SSE and OBE. To arrive at the SSE for the Byron facility, the applicant studied the seismic history of the area and ascertained that the greatest intensity earthquake to have occurred in that area was a Modified Mercalli (MM) VII-VIII earthquake at Anna, Ohio in 1937.¹⁵⁸ Although no earthquake of that intensity had ever been recorded closer to the Byron site, for conservatism (and at the request of the staff) the applicant postulated a MM VIII earthquake and associated ground acceleration of 0.2g as the basis for the Byron SSE.¹⁵⁹ It then confirmed the appropriateness of that value for the Byron site conditions. For this purpose, it utilized the data from an existing study conducted in connection with the establishment of the SSE for the Tennessee Valley Authority's Sequoyah Nuclear Power Plant located near Chattanooga, Tennessee.

As for the OBE for Byron, its value was arrived at following a study of the earthquakes known to have occurred in a 250-mile radius from the site during a ninety-year period.¹⁶⁰ On the basis of that study, it was determined that the largest earthquake that could be expected to affect

¹⁵⁷ LBP-84-2, *supra*, 19 NRC at 245.

¹⁵⁸ Tr. fol. 479 at 4-7 (Singh); Staff Exh. 1 at 2-24. Earthquakes are generally reported in terms of intensity (on the so-called Modified Mercalli Intensity Scale) or magnitude (on the so-called Richter Scale.) The Modified Mercalli Scale is based on sensed ground motion and observed damage to buildings, etc. The Richter magnitude is generally related to the total amount of energy released by the earthquake and is determined by movement on a standard seismometer. These movements are then corrected for distance from the epicenter of the earthquake. See R. Foster, *Physical Geology* (1971) at 311-14.

¹⁵⁹ Tr. fol. 479 at 4-7 (Singh); Staff Exh. 1 at 2-24 to 2-27.

¹⁶⁰ Tr. 491-92. The ninety-year period ran from 1880 to 1970. *Ibid.*

the Byron site during the operating life of the facility would have an intensity of MM VI with a corresponding ground acceleration of less than 0.07g at the site.¹⁶¹ For conservatism, the peak acceleration value was increased to 0.09g.¹⁶²

Both the applicant and (on behalf of the NRC staff) the Lawrence Livermore Laboratory independently calculated the likelihood of the occurrence of an earthquake that might produce a 0.09g acceleration at the site. The applicant's analysis indicated such an earthquake would occur once in every 2150 years;¹⁶³ the Livermore conclusion was a recurrence rate of once in every 200 to 1000 years.¹⁶⁴ Although not undertaken for Byron but rather as part of a general study, probabilistic estimates of earthquake hazards in the central United States were performed by Dr. Robert B. Herrmann of St. Louis University. His calculations showed a return period in the order of once every 1000 years for peak accelerations of about the 0.09g level in the site area.¹⁶⁵

On the basis of this evidence, the Licensing Board found the ground acceleration values of 0.2g for the SSE and 0.09g for the OBE to be appropriate. The intervenors do not challenge the former finding (except as discussed with respect to the Plum River Fault Zone) but do argue that sufficient justification has not been shown to support the Board's endorsement of a 0.09g value for the OBE.¹⁶⁶ As best as we can understand it, the gist of their argument is that the OBE was not correctly determined because its value was based on the Sequoyah study. That study could not be used for that purpose, according to the intervenors, for the reason that it was not "Byron specific" and, additionally, did not take into proper consideration the ground acceleration that resulted from a 1982 earthquake at Enola, Arkansas.¹⁶⁷

The short and complete answer to the intervenors' argument is that the Sequoyah study was never used for purposes of the OBE. Instead, it was employed only in connection with the formulation of the SSE value and, even then, solely to confirm the adequacy of the 0.2g value after it

¹⁶¹ Staff Exh. 1 at 2-27 to 2-28.

¹⁶² *Ibid.*

¹⁶³ Tr. 757; Tr. fol. 760 at 4 (Rothman). The site for purposes of the calculation was considered to be an area with an 18-mile radius from the plant. Tr. 493.

¹⁶⁴ Tr. fol. 479 at 6-7 (Singh). The difference in the estimates, according to Dr. Robert L. Rothman, NRC staff seismologist, is most probably caused by different techniques used and the assumptions made in performing the study. Tr. 757-58; Tr. fol. 760 at 5 (Rothman).

¹⁶⁵ Tr. fol. 760 at 5 (Rothman); Tr. 757-58.

¹⁶⁶ Brief of Intervenors at 57. The intervenors apparently recognize that Commission regulations permit exceptions to this requirement. ALAB-644, *supra*, 13 NRC at 989-92. Their only disagreement lies in the factual basis for the Licensing Board's approval of the exception here.

¹⁶⁷ Brief of Intervenors at 57.

had been established on the basis of data from a study of the seismological history of the Byron region and local site conditions.¹⁶⁸

In sum, we reject the intervenors' attack upon the 0.09g ground acceleration value assigned to the Byron OBE. In common with the Licensing Board, we conclude that that value has sufficient record support.

III. *SUA SPONTE* REVIEW

For the reasons set forth above, we have found the intervenors' challenges to the initial decision and supplemental initial decision to be without merit. Pursuant to our long-standing practice of reviewing, *sua sponte*, "any final disposition of a licensing proceeding that either was or had to be founded upon substantive determinations of significant safety or environmental issues,"¹⁶⁹ we have also examined the balance of the two decisions. We have found no error requiring corrective action.¹⁷⁰

¹⁶⁸ In any event, we find the intervenors' claim regarding the Enola earthquake without merit. According to Dr. Woodard, that earthquake recorded ground acceleration of 0.59g, far higher than the ground acceleration values adopted for the SSE and OBE. Tr. fol. 548 at 3-4 (Woodard). He thus maintains that, until ground acceleration data are available for any of the earthquakes that have occurred recently in northern Illinois, the effect on the Byron structure of potential earthquakes ranging in intensity from MM IV to VIII remains unknown. *Ibid.*

We disagree. As explained earlier (*see* p. 1622, *supra*), the 0.2g value for the SSE was based on studies of the intensities of earthquakes that had occurred in the Byron area. Tr. fol. 479 at 4-6 (Singh). The earthquake characteristics developed for the 0.2g Byron SSE were then confirmed by comparison with characteristics determined from real accelerograms of earthquakes of magnitudes of approximately 5.8 (equivalent to MM VIII earthquakes) at a site having features similar to those at Byron. Tr. fol. 760 at 2-3 (Rothman). We do not believe that the 0.59g value obtained from a single recording compromises the validity of the SSE and OBE. More than 20,000 small earthquakes have occurred in the Enola area and apparently only that one recorded a ground acceleration of 0.59g. *Id.* at 6. Another seismograph, co-sited with the first, recorded a ground acceleration of 0.19g. *Ibid.* The Tennessee Earthquake Information Center, which monitored the earthquake, attributed the 0.59g acceleration to "installation effect." *Ibid.* And most significant, the earthquake was of short duration (three seconds), had a ground motion of high frequency, and caused no damage to the shed in which the seismograph involved was located. *Id.* at 6-7. This suggests an earthquake with little energy and motion that would be well encompassed by the design of a nuclear plant. *Id.* at 7.

¹⁶⁹ *Offshore Power Systems* (Manufacturing License for Floating Nuclear Power Plants), ALAB-689, 16 NRC 887, 890 (1982); *Sacramento Municipal Utility District* (Rancho Seco Nuclear Generating Station), ALAB-665, 14 NRC 799, 803 (1981), quoting *Washington Public Power Supply System* (WPPSS Nuclear Project No. 2), ALAB-571, 10 NRC 687, 692 (1979); *Philadelphia Electric Co.* (Peach Bottom Atomic Power Station, Units 2 and 3), ALAB-509, 8 NRC 679, 683 n.8 (1978).

¹⁷⁰ Although not affecting the Licensing Board's decision to authorize the issuance of operating licenses for the plant, we note an incorrect statement made by the Licensing Board in its findings on the applicant's occupational radiation program for the Byron plant. In discussing the potential risks of radiation exposures during pregnancy, the Board concluded that "[p]re-conception internal accumulations of strontium-90 would have been detected by whole-body counting." LBP-84-2, *supra*, 19 NRC at 94. The typical industrial whole body counter cannot detect Sr-90. Nevertheless, our review of the record confirms that other types of monitoring and bioassay procedures used by the applicant would detect Sr-90 in the workplace and in the worker in the event such exposures were to occur. *See generally* Tr. fol. 1157 at 25-27 (Rescek); Tr. 1195-1212; Tr. fol. 1707 at Exh. 8 (Van Laere).

Only one issue warrants any further discussion. That issue relates to the quality assurance program of the Systems Control Corporation (SCC), a supplier of various electrical equipment for the Byron plant, and the actions of the applicant in overseeing that program.¹⁷¹

Serious quality assurance failures at SCC led the applicant to establish in 1980 an independent inspection program of SCC's work. In its January initial decision, the Licensing Board observed that the quality assurance program of SCC "broke down" but concluded that "100 percent reinspection of Systems Control work may remove the matter from a direct safety concern."¹⁷² Subsequent to the rendition of that decision, however, we received information from the applicant and staff indicating that the 100% reinspection predicate to that Board's safety conclusion may not have been correct.¹⁷³

At our urging, the matter was extensively explored further at the hearing on remand. It developed that the applicant had not conducted a 100% inspection of the SCC equipment but, rather, had looked at only a sample.¹⁷⁴ Because of deficiencies found in the equipment and the limited scope of the sampling employed, the staff required the applicant to undertake an evaluation and reinspection program sufficient to demonstrate that all equipment supplied by SCC was capable of withstanding required loads in conformance with applicable codes.¹⁷⁵

A number of witnesses were heard on the applicant's efforts in that respect.¹⁷⁶ Testifying were a representative of the Westinghouse Electric Corporation, which had evaluated the structural adequacy of the main control panels supplied by SCC; and representatives of Sargent & Lundy, which had both (1) evaluated the adequacy of the DC fuse panels, cable trays, cable tray hangers, and local instrument panels and (2) performed a statistical analysis of those evaluations.¹⁷⁷ Testimony was also received from the Manager of Projects (who was also a mechanical engineer) for Torrey Pines Technology (TPT), which had performed an independent third-party review of the various aspects of SCC's work.¹⁷⁸ In addition, three members of the NRC staff testified

¹⁷¹ See ALAB-770, *supra*, 19 NRC at 1179-80.

¹⁷² LBP-84-2, *supra*, 19 NRC at 135, 216.

¹⁷³ See ALAB-770, *supra*, 19 NRC at 1179-80.

¹⁷⁴ Tr. fol. 10,319 at 4 and Attachment A (Marcus); Tr. fol. 10,478 at 6 (Hayes, *et al.*).

¹⁷⁵ Tr. fol. 10,478 at 8 (Hayes, *et al.*).

¹⁷⁶ LBP-84-41, *supra*, 20 NRC at 1278.

¹⁷⁷ *Id.* at 1278-79.

¹⁷⁸ *Id.* at 1278. For each kind of SCC equipment, TPT collected and evaluated pertinent records, performed an engineering evaluation of the technical bases used to substantiate the acceptability of SCC work, reinspected samples of SCC work, and documented discrepancies found during such reinspection. *Id.* at 1279; see also Tr. fol. 10,294 at 9-12 (Johnson).

with regard to their own review of the reinspection and evaluation programs.¹⁷⁹

On the basis of the evidence adduced at the remanded hearing, the Licensing Board concluded in its supplemental initial decision that, except for cable tray hangers,¹⁸⁰ which were then still undergoing reinspection and analysis, the SCC-supplied equipment was adequate to accept design loads without exceeding the stresses allowed by applicable codes.¹⁸¹ All the parties agreed with this assessment. Without objection of any party, the Board left to the staff the responsibility for assessing and reviewing the adequacy of the inspection program relating to the cable tray hangers.¹⁸²

As staff counsel reported at oral argument last month, that program is now completed.¹⁸³ It originally called for the inspection of all accessible welded connections on cable tray hangers and two specified types of welded connections that were accessible only by removal of obstructions such as fireproofing material or block walls.¹⁸⁴ The program was later expanded to include additional types of hangers that also had to be made accessible, with the result that only 816 out of 31,583 SCC welded connections on cable tray hangers were not reinspected.¹⁸⁵ Of the more than 30,000 welded connections that were reinspected, it was determined that only 83 had missing portions of welds, and that none had design significance.¹⁸⁶

We have no reason to disagree with the Licensing Board's ultimate conclusion respecting the adequacy of SCC-furnished equipment. Specifically, we believe that the serious deficiencies that existed earlier with respect to SCC's quality assurance program, and the applicant's failure to

¹⁷⁹ LBP-84-41, *supra*, 20 NRC at 1279.

¹⁸⁰ Cable tray hangers are used to support the trays that, in turn, support and protect electrical cables. *Ibid.*

¹⁸¹ *Ibid.*

¹⁸² *Id.* at 1282. This inspection program is the third stage of applicant's program for verifying the adequacy of the cable tray hangers. The first was a computer analysis of the load capacity of three hangers, of 80 hangers inspected, which had the greatest reduction in load capacity due to discrepant welds. This analysis showed that all three hangers could bear at least two times design load without exceeding code-allowable stresses. *Id.* at 1280; Tr. fol. 10,159 at 14-15 (Kostal); Tr. 10,241. The second stage was a program of inspection and repair of about 3000 (out of 5637 hangers) selected hanger connections for missing portions of welds. Because at least one of these hanger connections was found to have load capacity reductions beyond the specified amount, the third stage of the program was instituted to inspect all of the remaining accessible connections plus others that could reasonably be made accessible. LBP-84-41, *supra*, 20 NRC at 1280-82.

¹⁸³ App. Tr. 84-85.

¹⁸⁴ LBP-84-41, *supra*, 20 NRC 1281; Tr. 10,489.

¹⁸⁵ Letter from L.O. Del George to the Regional Administrator, NRC Region III (Sept. 26, 1984), attached to letter from M.C. Furse to Licensing Board (Sept. 28, 1984).

¹⁸⁶ *Ibid.*

oversee it properly, have been cured. We base that belief upon the extensive reinspection program, the engineering evaluations and analyses of various equipment, and review of all of the types of SCC's work by an independent party and the NRC staff — in totality they provide reasonable assurance that the SCC-furnished equipment is acceptable. This conclusion applies equally to cable tray hangers. From the results of the reinspection program, there is nothing to suggest that the few uninspected welded connections have any deficiency of safety significance.

For the foregoing reasons, both (1) the Licensing Board's October 16, 1984 supplemental initial decision and (2) the portion of that Board's January 13, 1984 initial decision concerned with issues not covered by the ALAB-770 remand are *affirmed*.

FOR THE APPEAL BOARD

C. Jean Shoemaker
Secretary to the
Appeal Board

APPENDIX

June 13, 1984 Appeal Board Memorandum and Order in *Byron* proceeding.

[Caption Omitted]

In ALAB-770,¹ we remanded the record in this operating license proceeding to the Licensing Board with instructions to conduct a further evidentiary hearing on the quality assurance issues and to render a supplemental initial decision. In footnote 73 of our decision, we announced that:

With a single exception, our consideration of all non-quality assurance issues raised by the intervenors will abide the event of the rendition of the supplemental initial decision. The exception is the financial qualifications issue. The Licensing Board precluded the intervenors from pressing a contention that the applicant was not financially qualified to operate the facility. It did so because, effective March 31,

¹ 19 NRC 1163 (1984).

1982, the Commission had amended its regulations to remove financial qualifications issues from, *inter alia*, licensing proceedings such as this one, 47 Fed. Reg. 13750 (March 31, 1982). Last February, however, the Court of Appeals for the District of Columbia Circuit held the amended rule was not supported by its accompanying statement of basis and purpose, as required by the Administrative Procedure Act. Accordingly, the court remanded the rule to the Commission for further proceedings consistent with its opinion. *New England Coalition on Nuclear Pollution v. Nuclear Regulatory Commission*, No. 82-1581, [727] F.2d [1127] (D.C. Cir. February 7, 1984).

The court's mandate having been issued, we solicited the views of the parties respecting the course that now should be followed on the financial qualification question in this case. In addition, we expect generic Commission guidance to be forthcoming shortly. Once it has been received and considered, we will issue a further order on the matter.

On June 7, 1984, the Commission issued its generic guidance in the form of a Financial Qualifications Statement of Policy.² Noting that, in response to the Court of Appeals' decision, it had "initiated a new financial qualification rulemaking to clarify its position on financial qualification reviews for electric utilities," the Commission stated that it anticipated

that the new rule eliminating financial review at the operating license stage only will soon be in place. While there are no construction permit proceedings now in progress, there are several ongoing operating license proceedings to which the new rule will apply. It would not appear reasonable to construe the Court's opinion as requiring that the Commission instruct its adjudicatory panels in these proceedings to begin the process of accepting and litigating financial qualifications contentions, a process which would delay the licensing of several plants which are at or near completion, only to be required to dismiss the contentions when the new rule takes effect in the near future.

*Accordingly, the March 31, 1982 rule will continue in effect until finalization of the Commission's response to the Court's remand. The Commission directs its Atomic Safety and Licensing Board Panel and Atomic Safety and Licensing Appeal Panel to proceed accordingly.*³

Given this clear directive, all we need now consider is the intervenors' claim that they made a *prima facie* showing below of "special circumstances" warranting the conclusion that the application of the 1982 financial qualifications rule in the proceeding at bar "would not serve the purposes for which the rule . . . was adopted."⁴ We agree with the Licensing

² 49 Fed. Reg. 24,111 (1984).

³ *Ibid.* (emphasis supplied).

⁴ See 10 C.F.R. 2.758(b) and (c).

Board that the intervenors have not fulfilled their burden on that score: there is simply nothing in their averments that *materially* distinguishes this proceeding from any other in which a party might wish to put in issue the sufficiency of the applicant utility's economic resources. Hence, no cause exists to certify to the Commission the matter of whether the 1982 rule should be waived insofar as it precludes an inquiry into this applicant's financial qualifications.⁵

It follows that, absent some future development having the effect of reinstating the entitlement to raise financial qualifications questions in operating license proceedings, the intervenors' contentions addressed to that subject are not litigable. The hearing on the ALAB-770 remand will thus continue to be restricted to quality assurance issues.

It is so ORDERED.

FOR THE APPEAL BOARD

Barbara A. Tompkins
Secretary to the
Appeal Board

⁵ See 10 C.F.R. 2.758(d).

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Administrative Judges:

Alan S. Rosenthal, Chairman
Thomas S. Moore
Howard A. Wilber

In the Matter of

Docket Nos. 50-413-OL
50-414-OL

DUKE POWER COMPANY, *et al.*
(Catawba Nuclear Station,
Units 1 and 2)

December 24, 1984

The Appeal Board denies intervenors' application for a stay of the authorization of the low-power license issued in this operating license proceeding for Unit 1 of the Catawba facility. The Board determines that the stay criteria set forth at 10 C.F.R. 2.788(e) have not been satisfied.

RULES OF PRACTICE: STAY OF AGENCY ACTION

The established criteria to be applied in passing upon stay requests in NRC adjudicatory proceedings are set forth in 10 C.F.R. 2.788(e):

- (1) Whether the moving party has made a strong showing that it is likely to prevail on the merits;
- (2) Whether the party will be irreparably injured unless a stay is granted;
- (3) Whether the granting of a stay would harm other parties; and
- (4) Where the public interest lies.

RULES OF PRACTICE: STAY OF AGENCY ACTION

The NRC's stay criteria are the same as those applied by the courts. *See, e.g., Virginia Petroleum Jobbers Ass'n v. FPC*, 259 F.2d 921 (D.C. Cir. 1958); *Washington Metropolitan Area Transit Comm'n v. Holiday Tours, Inc.*, 559 F.2d 841 (D.C. Cir. 1977).

RULES OF PRACTICE: STAY OF AGENCY ACTION (LENGTH OF REQUEST)

Under NRC Rules of Practice, stay applications may not exceed ten pages in length. *See* 10 C.F.R. 2.788(b).

RULES OF PRACTICE: STAY OF AGENCY ACTION (IRREPARABLE INJURY)

The second factor contained in section 2.788(e) of 10 C.F.R., irreparable harm, is often the most important in determining the need for a stay. *Philadelphia Electric Co.* (Limerick Generating Station, Units 1 and 2), ALAB-789, 20 NRC 1443, 1446 (1984), and cases cited.

APPEARANCES

Robert Guild, Columbia, South Carolina, and **Jesse L. Riley**, Charlotte, North Carolina, for the intervenors Palmetto Alliance and Carolina Environmental Study Group.

J. Michael McGarry, III, **Anne W. Cottingham** and **Mark S. Calvert**, Washington, D.C., and **Albert V. Carr, Jr.**, Charlotte, North Carolina, for the applicant Duke Power Company, *et al.*

George E. Johnson for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

Before us are appeals from three partial initial decisions rendered by the Licensing Board in this operating license proceeding involving the two-unit Catawba nuclear facility. The first of these decisions, issued last June 22, determined a wide variety of questions, principally in the area

of quality assurance.¹ In doing so, it paved the way for the Director of Nuclear Reactor Regulation's July 18 authorization to the applicants to load fuel into Unit 1 and to conduct pre-criticality testing of that unit.² The second decision, issued on September 18, disposed of all emergency planning questions.³ The third, issued on November 27, resolved favorably to the applicants the single remaining question and brought to an end the Licensing Board's jurisdiction over the proceeding.⁴ It was followed by the NRR Director's issuance on December 6 of a license allowing the operation of Unit 1 at levels up to five percent of rated power.⁵

On December 11, intervenors Palmetto Alliance and Carolina Environmental Study Group filed an application under 10 C.F.R. 2.788 for a stay of the authorization for a license contained in the several partial initial decisions pending the completion of all appellate review (administrative and judicial) of those decisions.⁶ According to the intervenors, all four of the established criteria to be applied in passing upon stay requests support the grant of such relief here.⁷ The applicants and NRC staff disagree and urge that a stay be denied.

1. In arguing that there is a "strong likelihood" that they will prevail on the merits of their appeals, the intervenors cite a number of assertedly incorrect Licensing Board rulings and actions, both substantive and procedural. Although intervenors are emphatic in the statement of their belief that serious error has been committed, virtually all of their scatter-gun charges are put before us in the most cursory form. In any event,

¹ LBP-84-24, 19 NRC 1418 (1984).

² The construction of Unit 2 is not as yet completed and it is our understanding that that unit is not scheduled for fuel loading for at least another year.

³ LBP-84-37, 20 NRC 933 (1984).

⁴ LBP-84-52, 20 NRC 1484 (1984).

⁵ The Commission must itself approve the authorization of Unit 1 operation at higher power levels. See 10 C.F.R. 2.764(f). To date, it has not completed the so-called "immediate effectiveness" review that necessarily precedes the grant of such approval.

⁶ Intervenors' Application for a Stay Pending Administrative and Judicial Review (Dec. 11, 1984) (hereafter Stay Application). Previously, the intervenors had submitted successive oral stay applications to both the Licensing Board and this Board. In each instance, the application was denied after a telephone conference involving the Board and all parties — our denial being without prejudice to the subsequent filing of a written stay request. See Licensing Board December 3, 1984 order (unpublished); Appeal Board December 4, 1984 order (unpublished).

The justification offered by the intervenors for seeking stay relief orally was their understanding that the applicants planned to have Unit 1 achieve criticality within a matter of a few days. For reasons of no present moment, however, the applicants have now deferred that event until at least January 10, 1985.

⁷ Those criteria are set forth in 10 C.F.R. 2.788(e):

- (1) Whether the moving party has made a strong showing that it is likely to prevail on the merits;
- (2) Whether the party will be irreparably injured unless a stay is granted;
- (3) Whether the granting of a stay would harm other parties; and
- (4) Where the public interest lies.

The same criteria are applied by the courts. See, e.g., *Virginia Petroleum Jobbers Ass'n v. FPC*, 259 F.2d 921 (D.C. Cir. 1958); *Washington Metropolitan Area Transit Comm'n v. Holiday Tours, Inc.*, 559 F.2d 841 (D.C. Cir. 1977).

none is supported by enough analysis to comprise the required *strong* showing⁸ that one or more of the three partial initial decisions likely will be reversed in response to the intervenors' appeals.

We appreciate, of course, that stay applications may not exceed ten pages in length.⁹ This being so, the intervenors perhaps should have concentrated their attack upon those purported Licensing Board errors they deemed to be of particular gravity. Moreover, it is worthy of passing note that, to a considerable extent, the intervenors' fire is directed to the June 22 partial initial decision. Although the intervenors might have filed the brief in support of their appeal from that decision some time ago, they elected to obtain from us a deferral of all appellate briefing in this proceeding until after the rendition of the final (i.e., November 27) Licensing Board decision. Because of other asserted demands on their limited resources, this was a perfectly legitimate choice on their part. But they should not now be heard to complain that they have been deprived of the opportunity to place a full development of their position on the June 22 partial initial decision before us.¹⁰

2. As we very recently reiterated, "the second factor, irreparable harm, is often the most important in determining the need for a stay."¹¹ We thus have examined with particular care the underpinnings of the intervenors' insistence that they will suffer irreparable injury if a stay is not granted.

In this regard, the intervenors maintain that (i) the "irreversible radioactive contamination of the facility" will pose a "definite and significant" health and safety risk to workers and the public in the form of "routine releases, exposures and accidents"; (ii) the final agency decision will be prejudiced "in favor of licensing" by an "irretrievable commitment of resources"; (iii) intervenors will be deprived of their right of appeal because operation of the facility will risk "mooting any appeal since the *status quo ante* will be forever beyond reach"; and (iv) the National Environmental Policy Act (NEPA) will be violated because a decision will have been made "without taking into account the environmental impacts claimed by intervenors."¹² In support of their first point, the intervenors offer the affidavits of Dr. Michio Kaku, a Professor of

⁸ See note 7, *supra*.

⁹ See 10 C.F.R. 2.788(b).

¹⁰ To avoid any possible misunderstanding, we stress that all we now decide is that the stay application does not establish a likelihood that the intervenors will prevail on the merits of their appeals. After full briefing, it may turn out that the intervenors will persuade us that one or more of the partial initial decisions is fatally infected with error.

¹¹ *Philadelphia Electric Co.* (Limerick Generating Station, Units 1 and 2), ALAB-789, 20 NRC 1443, 1446 (1984), and cases cited.

¹² Stay Application at 9.

Nuclear Physics at the City University of New York, and David A. Schlissel, a consulting engineer with degrees in astronautical engineering (as well as one in law).¹³ The other three points are merely stated without any attempt at elaboration either in the stay application itself or in a supporting affidavit.

a. We turn first to the asserted threat to the public health and safety said to be established by the Kaku and Schlissel affidavits. For its part, Dr. Kaku's affidavit is essentially a collection of broad statements respecting (i) the potential consequences of nuclear power plant accidents; and (ii) the radiation exposure that plant personnel would receive during routine operations. Apart from a few passing references to Catawba's containment design and hydrogen mitigation system, the affidavit offers nothing that could not be equally said with regard to virtually every nuclear power facility now in operation.¹⁴ Further, it is totally lacking in specificity with respect to both (i) the manner in which the postulated accidents might be created and the probability of their occurrence; and (ii) the significance of the asserted occupational exposure. For these reasons, the Kaku affidavit does not aid intervenors' cause.

The thrust of Mr. Schlissel's affidavit is that, under certain conditions, intergranular stress corrosion cracking of stainless steel piping might develop if corrosives are introduced into the facility's primary system. But this scarcely is a startling revelation; indeed, the Licensing Board itself took note of that undisputed fact.¹⁵ The difficulty with the affidavit is that it does not go on to explain how the corrosives might enter that system; all we are told by Mr. Schlissel is that the intergranular stress corrosion cracking phenomenon "has occurred in previously unanticipated locations through previously unanticipated pathways." This plainly will not suffice to establish that the intervenors' members would be irreparably injured were Unit 1 to be allowed to go into operation. Further, the Schlissel affidavit is equally unilluminating with regard to how rapidly the assumed corrosive environment might produce an imminent threat to safety — i.e., whether there is any possibility of such a threat prior to the disposition of the intervenors' appeals.

b. The intervenors' other irreparable injury claims merit little discussion. There is simply no basis for the assertion that the outcome of their

¹³ Those affidavits are appended to the stay application as Exhibits 3 and 4, respectively. Each is followed by the affiant's biographical statement.

¹⁴ As a matter of fact, Catawba's ice condenser containment and associated hydrogen mitigation system are not totally unique. They are to be found, for example, at Duke Power Company's McGuire facility. In affirming the Licensing Board's authorization of operating licenses for McGuire, we discussed the hydrogen mitigation system at considerable length. See *Duke Power Co.* (William B. McGuire Nuclear Station, Units 1 and 2), ALAB-669, 15 NRC 453, 459-72 (1982).

¹⁵ LBP-84-52, *supra*, 20 NRC at 1505-06.

appeals might be unduly influenced were Unit 1 to be allowed to operate *pendente lite*. To the contrary, that factor cannot and will not be given any recognition in the consideration of the issues presented by the appeals.¹⁶ Nor is there substance to intervenors' insistence that the commencement of facility operation might serve to moot their appeals. Should those appeals be successful, we will have full authority to order a halt to operation or such other relief as might be appropriate in the totality of circumstances. True, the precise *status quo ante* will no longer be restorable once the reactor has achieved criticality. But that consideration is of no avail to intervenors, given the fact that they have failed to establish that their members might suffer irreparable harm from the achievement of criticality, low-power operation, or early-stage operation at full power.

3. In light of the foregoing, we need not dwell long on whether a stay would cause serious injury to the applicant. Nor need we delve deeply into public interest considerations. Suffice it to say that, even when viewed in its most favorable light, the intervenors' presentation on those factors does not approach balancing the shortcomings of its case on the other two factors. Indeed, standing by itself, the intervenors' failure to demonstrate that they might be irreparably injured in the absence of a stay is enough to call for the denial of their application.

The intervenors' application for a stay *pendente lite* is denied.
It is so ORDERED.

FOR THE APPEAL BOARD

Barbara A. Tompkins
Secretary to the
Appeal Board

¹⁶ In this connection, intervenors have failed to explain what "irretrievable commitment of resources" they believe would be associated with Unit 1 operation. Similarly, their bare assertion, without more, that the National Environmental Policy Act is violated clearly does not establish irreparable injury.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

John H Frye, III, Chairman
Dr. Harry Foreman
Gustave A. Linenberger

In the Matter of

Docket No. 50-70-OLR
(ASLBP No. 83-481-01-OLR)

GENERAL ELECTRIC COMPANY
(GETR Vallecitos)

December 17, 1984

Licensing Board denies request for readmission to a proceeding filed by petitioner to intervene which failed to respond to the Board's orders reactivating the proceeding after several years of inactivity and consequently was dismissed.

RULES OF PRACTICE: RESPONSIBILITY OF PARTIES

Parties may not step into and out of NRC proceedings at will. *United States Department of Energy* (Clinch River Breeder Reactor Plant), ALAB-761, 19 NRC 487, 493 (1984); *Consumers Power Co.* (Midland Plant, Units 1 and 2), ALAB-691, 16 NRC 897, 907 (1982). Where a party does not offer a sufficient excuse for its failure to respond to Board orders reactivating a proceeding (which failure led to its dismissal), it must satisfy the criteria related to untimely petitions to intervene in order to be readmitted.

RULES OF PRACTICE: CHANGE OF ADDRESS

A party appearing *pro se* must notify the secretary of any change of its address.

RULES OF PRACTICE: SERVICE OF DOCUMENTS

Service of documents upon a party is complete upon deposit in the United States Mail, properly stamped and addressed.

MEMORANDUM AND ORDER (Ruling on CalPIRG's Request for Readmission)

In this Memorandum and Order, we rule on the request of the California Public Interest Research Group (CalPIRG) for readmission to this proceeding. CalPIRG was one of the petitioners to intervene responding to the Commission's 1977 notice which commenced this proceeding. However, it did not respond to this Board's orders entered in the Fall of 1982 reactivating this proceeding and as a consequence was dismissed from the proceeding in our April 8, 1983 unpublished Memorandum and Order.

BACKGROUND

On September 15, 1977, there was published in the *Federal Register* (42 Fed. Reg. 46,427) a notice that the NRC had under consideration applications to renew the operating license for the General Electric Test Reactor (GETR) at the Vallecitos Nuclear Center and the special nuclear materials (SNM) license of the Vallecitos Nuclear Center. That notice provided an opportunity for interested persons to file requests for hearing by October 17, 1977.

A timely request and petition to intervene was filed by Jed Somit, Esq., on behalf of Nancy L. Lyon, Jack Turk, Alameda County Citizens Against Vallecitos, Joseph Buhowsky, Jr., East Bay Women for Peace, and California Public Interest Research Group (CalPIRG). Applicant, General Electric Company (GE), and NRC Staff filed responses to this petition. This Atomic Safety and Licensing Board was established to rule on the petition on October 21, 1977, and orally granted the petition at a Prehearing Conference of March 16, 1978 (Tr. 6-7). However, no written ruling was issued following that conference, nor were acceptable contentions identified. In a document entitled "Substitution of Intervenor

in pro per for Attorney of Record” which was served on June 22, 1981, Mr. Somit withdrew from his representation of CalPIRG. This document was signed by Jerry Skomer on behalf of CalPIRG as well as Mr. Somit.

On October 24, 1977, the NRC Staff issued an Order to Show Cause to GE which raised issues concerning the proper seismic and geologic design bases for the GETR and concerning whether modifications could be made to the GETR in light of these design bases. Neither CalPIRG nor Mr. Turk sought to intervene in the Show-Cause proceeding, although others did petition and participated in the ensuing hearing. The Show-Cause proceeding was terminated by an Initial Decision (LBP-82-64, 16 NRC 596 (1982)) which was affirmed (ALAB-720, 17 NRC 397 (1983)). During the Show-Cause proceeding, this license renewal proceeding was held in abeyance.

Following the issuance of LBP-82-64, this Board¹ reactivated this proceeding.² In the ensuing months, GE indicated its intent to proceed with the GETR license renewal application and Mr. Turk indicated his continuing interest in being a party to that proceeding. None of the other petitioners responded to the Board’s orders. Consequently, on April 8, 1983, we issued a Memorandum and Order in which we admitted Mr. Turk as a party, subject to the acceptance of at least one contention, and denied the petition to intervene with respect to the remaining petitioners, including CalPIRG.

After Mr. Turk filed his contentions on November 28, 1983, a conference among Mr. Turk, GE, and Staff was held. As a result of this conference, these parties agreed that the proceeding on GE’s application for renewal of its SNM license should be dismissed. Acting upon these parties’ request, the Board dismissed the proceeding on the SNM license on January 20, 1984, and on May 10, 1984, Staff renewed this license for a 5-year period expiring May 31, 1989. GE and Staff filed papers opposing Mr. Turk’s contentions on January 30 and February 10, 1984, respectively. Mr. Turk replied to these papers on April 16, 1984.

On June 8, 1984, CalPIRG filed a request for readmission to this proceeding. GE and Staff opposed this request on June 25 and July 13, respectively. Pursuant to this Board’s Order of July 3 (unpublished), CalPIRG replied to GE and Staff and filed its contentions on July 30.

It was against this background of events that a prehearing conference was held in San Francisco on August 9 and an unpublished Prehearing Conference Order issued on August 20, 1984. In light of the proximity

¹ This Board was most recently reconstituted on October 14, 1982. See 47 Fed. Reg. 46,916 (Oct. 21, 1982).

² See unpublished Memoranda and Orders of October 21, November 12, and November 19, 1982.

in time between the prehearing conference and the filing of the CalPIRG contentions, that Order required that further written submissions be made. In its submission, CalPIRG was to set out the chronology of the events relative to its involvement in this proceeding beginning with the 1977 petition to intervene. CalPIRG also was to address the five factors set out in 10 C.F.R. § 2.714(a)(1) in order to cover the possibility that we might conclude that it is necessary to treat its request for readmission as a tardy petition to intervene. Additionally, CalPIRG was to furnish the address of at least one member who has authorized it to represent his or her interest in this proceeding.

Following CalPIRG's submission, GE and Staff were to respond addressing CalPIRG's contentions as well as the points raised in CalPIRG's submission. CalPIRG was afforded an opportunity to reply to all points raised by the responses. CalPIRG filed its initial submission required by the Prehearing Conference Order, but has not taken advantage of the opportunity to respond to GE's and Staff's responsive filings.

DISCUSSION

In its June 8, 1984, request for readmission, CalPIRG stated:

Pursuant to 10 C.F.R. Part 2.714, CalPIRG hereby requests that the U.S. NRC ASLB (Atomic Safety and Licensing Board) readmit our organization to the status which we were granted by the U.S. NRC ASLB on March 16, 1978. We had then established our standing and we were designated "Petitioners/Intervenors" status. Apparently, last year you voted to dismiss our petitions, yet we were not informed of your decision until very recently. This past week our State Board first learned about the NRC's renewed interest in relicensing the GETR reactor in Alameda County, after a lapse of nearly seven years, and our Board voted unanimously to continue CalPIRG's participation in this proceeding which was begun when we filed our petition in 1977. Because the NRC shutdown the reactor in 1977, the relicensing proceedings had been dormant for many years.

Following GE's and Staff's opposition to its request, CalPIRG responded to the formers' objections under 10 C.F.R. § 2.714 and questions regarding CalPIRG's asserted ignorance of the activity commenced in this proceeding in October and November of 1982. With respect to the latter point, CalPIRG stated that "[i]t was not until July 16, 1984, that CalPIRG received a copy of the NRC Board's Orders of November 12 and 19, 1982, and of April 8, 1983. CalPIRG's address had been changed prior to the issuance of these orders."³ Accompanying Cal-

³ CalPIRG's Response dated July 30, 1984, at 3.

PIRG's response is a "Statement of Correct Address" dated July 31, 1984, which states:

The Docketing and Service Section of the Office of the Secretary of the Nuclear Regulatory Commission is hereby given notice that the correct addresses for service to the California Public Interest Research Group (CalPIRG) in this proceeding are:

Glenn Barlow, Project Coordinator
c/o CalPIRG, Santa Cruz
Activities A-Frame
University of California, Santa Cruz
Santa Cruz 95060

Jerry Skomer, Executive Director
c/o CalPIRG
46 Shattuck Square, Room 11
Berkeley, CA 94704

During the August 9 prehearing conference there was some discussion regarding CalPIRG's correct address. In that discussion Jerry Skomer, CalPIRG's Executive Director, stated that on August 1, 1982, CalPIRG had moved from the address furnished to the Commission Secretary by its attorney, Mr. Somit, on the occasion of the latter's withdrawal from the proceeding, and that CalPIRG had not advised the Secretary of its new address.⁴

GE, Staff, and apparently CalPIRG have overlooked the fact that this Board's October 21 and November 12, 1982, Memoranda and Orders were properly served by the Secretary on CalPIRG at 46 Shattuck Square, Berkeley, California 94704, marked for the attention of Jerry Skomer. This is, according to CalPIRG's "Statement of Correct Address," a correct address for service on CalPIRG. Subsequent memoranda and orders were, following an exchange of correspondence between the Board Chairman and CalPIRG's former attorney, served on the address which CalPIRG vacated on August 1, 1982.⁵

It is thus evident that CalPIRG was properly notified under the Rules of Practice that this proceeding had been reactivated. The October 21 Memorandum and Order called on GE to indicate whether it intended to pursue its applications, and the November 12 Memorandum and Order

⁴ Tr. 112-13. On June 22, 1981, Jed Somit (CalPIRG's attorney who had filed the petition to intervene) wrote the Docketing and Service Section, Office of the Secretary, indicating the address of each of the petitioners to intervene and requesting that they be added to the service list.

⁵ See our unpublished Memorandum and Order of November 19, 1982. After Mr. Somit advised us that he had notified the Secretary of the correct addresses on June 22, 1981, we requested the Secretary to update the service list. Unfortunately, the address given by Mr. Somit for CalPIRG was the one CalPIRG vacated on August 1, 1982.

called on the petitioners/intervenors (which included CalPIRG) to comment on GE's response. It was obvious that, in order to preserve its status, a petitioner/intervenor should respond to the comments called for by the November 12 Memorandum and Order.

CalPIRG maintains that it did not receive this Board's memoranda and orders until July 16, 1984.⁶ We think, however, that it is more likely that the initial two orders were received and simply forgotten in the 18 months that transpired between service of those documents and the occasion of CalPIRG's reawakened interest in this proceeding. Moreover, the Rules of Practice provide that, with respect to those two documents, service was complete upon deposit in the United States mail, properly stamped and addressed.⁷

Common sense, as well as the Commission's Rules of Practice,⁸ dictates that anyone with a continuing interest in a dormant proceeding would take the simple step of notifying the Secretary of any change of address. CalPIRG candidly admits that it did not take this step. Its failure in this respect alone is sufficient ground to treat its request for readmission as a tardy petition to intervene.⁹ And it reinforces the conclusion that at the time this proceeding was reactivated, CalPIRG had no interest in it.

It appears that CalPIRG's interest was rekindled by the occurrence of the Morgan Hill earthquake in April 1984. That event prompted the members of its Santa Cruz chapter, according to Mr. Skomer, CalPIRG's Executive Director, to request the CalPIRG Board of Directors "to reintervene, or to obtain intervention status and to move forward to intervene against the relicensing of the Vallecitos project."¹⁰

Staff and GE correctly point out that it is well settled that parties may not step into and out of NRC proceedings at will.¹¹ *United States Depart-*

⁶ CalPIRG's July 30 Response to GE and Staff at 3; Tr. 115-16; CalPIRG's September 7 Response to Prehearing Conference Order at 1. CalPIRG also maintains that the NRC should have made some effort to verify its correct address. (See CalPIRG's September 7 Response to Prehearing Conference Order at 2.) While we reject the notion that any such obligation exists on the part of the NRC, we note that such an effort was made in this case and resulted in the correct service of the October 21 and November 12 Memoranda and Orders by the Secretary. See footnote 2 to the Board's November 12, 1982 Memorandum and Order.

⁷ 10 C.F.R. § 2.712(d)(3).

⁸ 10 C.F.R. §§ 2.708(e), 2.712(b), and 2.713(b).

⁹ *Tennessee Valley Authority* (Hartsville Nuclear Plant, Units 1A, 2A, 1B, and 2B), ALAB-398, 5 NRC 1152 (1977).

¹⁰ Tr. 120; CalPIRG's September 7 Response to Prehearing Conference Order at 10. It is interesting that the petition to intervene indicated that CalPIRG sought to participate on behalf of its membership at the University of California at Berkeley. Its request for readmission was filed as a result of a request from its members at the University of California at Santa Cruz. There is no indication that the Berkeley members maintain any continuing interest in this proceeding although CalPIRG, in its response to GE and Staff of July 30, 1984, notes that they are among its members residing within 40 miles of the GETR.

¹¹ GE's Response to CalPIRG's Request for Readmission of June 25, 1984, at 5-6; Staff's Answer to CalPIRG's Request for Readmission at 11 n.16.

ment of Energy (Clinch River Breeder Reactor Plant), ALAB-761, 19 NRC 487, 493 (1984); *Consumers Power Co.* (Midland Plant, Units 1 and 2), ALAB-691, 16 NRC 897, 907 (1982). We conclude that that is precisely what CalPIRG is attempting to do in this proceeding. For this reason, as well as because of CalPIRG's unexplained failure to have advised the Secretary of the Commission of its new address, we conclude that CalPIRG's request for readmission must be treated as a tardy petition to intervene. Therefore, we move to a consideration of the five criteria required by 10 C.F.R. § 2.714(a) to be weighed in considering tardy petitions.

The first criterion is whether there is good cause for the tardy filing. CalPIRG's submission on this factor makes the following assertions:

1. Its original petition was timely;
2. Its original petition caused Staff to issue its Order to Show Cause which halted operation of the facility; and
3. Staff has consistently opposed public participation in this proceeding.

In its October 10 response (at 6-7) Staff points out that the timeliness of CalPIRG's original petition is not here at issue. We agree. Having failed to participate in this proceeding even to the minimal extent of informing the Secretary of its address, CalPIRG must now establish good cause why its belatedly rekindled interest in this proceeding should be favorably received. It has wholly failed to do so.

The second criterion is whether there is a lack of other available means to protect petitioner's interest. CalPIRG's presentation on this point consists of its assertion that "[t]here are no other means to protect the public interest, which CalPIRG represents, other than having public hearings and allowing CalPIRG to participate,"¹² and that Staff has not done its job. We agree with GE and Staff that this presentation misses the mark. CalPIRG's attempt to wrap itself in the mantle of the public interest does not answer the question of how it might protect the interest of its members outside of participation in this proceeding. Further, we agree with GE that CalPIRG could have sought to partially protect that interest through participation in the Show-Cause proceeding. For these reasons we must weigh this factor against CalPIRG.

CalPIRG asserts, in response to the third criterion requiring a showing of the extent to which its participation will contribute to the development of a sound record, that it will present expert testimony and has

¹² CalPIRG's September 7 Response at 5.

retained a staff person with extensive technical expertise in NRC proceedings and a background in Vallecitos. CalPIRG's assertion with regard to expert witnesses is clearly inadequate. What is required is a detailing with as much particularity as possible of the precise issues to be covered and the prospective witnesses who will testify on those issues together with a summary of their testimony. *Washington Public Power Supply System* (WPPSS Nuclear Project No. 3), ALAB-747, 18 NRC 1167, 1177 (1983).

CalPIRG's assertions with regard to its staff person (presumably Mr. Barlow) are somewhat stronger. Mr. Barlow participated on behalf of an intervenor in the Show-Cause proceeding and therefore must be presumed to have specialized background in the seismic aspects of the GETR. To the extent that seismic contentions are litigable in this proceeding, that background would assist in the development of the record. However, CalPIRG has made no showing, as required by ALAB-747, *supra*, as to how that background would assist with regard to other contentions. We conclude that this factor weighs slightly in CalPIRG's favor.

CalPIRG asserts in response to the fourth criterion that Mr. Jack Turk will not represent its interests because the latter represents only himself and his family, his resources are extremely limited, and he clearly does not have the expertise which CalPIRG can provide. Our observation of both CalPIRG and Mr. Turk cause us to question these assertions. While it is true that Mr. Turk represents only himself and his family, we agree with GE that he has demonstrated greater expertise than has CalPIRG and that there is no indication that his resources are less than CalPIRG's. However, we must also note, like Staff, that CalPIRG's contentions are broader than Mr. Turk's and conclude that because of this, this criterion weighs slightly in CalPIRG's favor.

The fifth criterion questions whether grant of the petition will broaden the issues and delay the proceeding. CalPIRG asserts that its participation will broaden the issues, a result which CalPIRG thinks necessary, but that it will not delay the restarting of the GETR. This criterion must be weighed against CalPIRG. By its own admission, its participation will broaden the issues which the parties have diligently sought to narrow. It is not relevant that the broadening of the issues might not delay reactor operation. Rather, the question is whether "the late petition is not apt to be a contributor to delay in the progress and completion of a hearing on the license application."¹³ Here CalPIRG's request clearly would be a contributor to such delay. This factor weighs against CalPIRG.

¹³ WPPSS, *supra*, ALAB-747, 18 NRC at 1180.

CalPIRG has wholly failed to establish good cause for its readmission. In these circumstances, CalPIRG was required to make a compelling showing on the remaining criteria in order to be successful. *Mississippi Power & Light Co.* (Grand Gulf Nuclear Station, Units 1 and 2), ALAB-704, 16 NRC 1725, 1730 (1982); *Cincinnati Gas & Electric Co.* (William H. Zimmer Nuclear Power Station, Unit 1), LBP-83-58, 18 NRC 640, 662-63 (1983). Only the third and fourth criteria weigh in CalPIRG's favor, and then only slightly. Consequently, CalPIRG's request for readmission to this proceeding must be denied.¹⁴

Order

In consideration of the foregoing, it is, this 17th day of December 1984,

ORDERED

1. CalPIRG's request for readmission to this proceeding is denied; and

2. CalPIRG may appeal this ruling by filing a notice of appeal and supporting brief with the Atomic Safety and Licensing Appeal Board within ten (10) days after service of this Memorandum and Order.

Dr. Foreman concurs but was unavailable to sign this Memorandum and Order.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD

Gustave A. Linenberger
ADMINISTRATIVE JUDGE

John H Frye, III, Chairman
ADMINISTRATIVE JUDGE

December 17, 1984
Bethesda, Maryland

¹⁴ Because of the result we reach, we find it unnecessary to consider GE's and Staff's other arguments against CalPIRG's participation.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Peter B. Bloch, Chairman
Dr. Kenneth A. McCollom
Dr. Walter H. Jordan**

In the Matter of

**Docket Nos. 50-445-OL
50-446-OL
(ASLBP No. 79-430-06-OL)**

**TEXAS UTILITIES ELECTRIC
COMPANY, *et al.*
(Comanche Peak Steam Electric
Station, Units 1 and 2)**

December 18, 1984

In this Memorandum, the Licensing Board decides certain welding issues.

EVIDENCE: CREDIBILITY

Significant inconsistencies in testimony and confidential background information are grounds for discounting the credibility of witnesses.

**VIOLATIONS OF CONSTRUCTION PROCEDURES:
INDEPENDENT SIGNIFICANCE**

Systematic violations of construction procedures may have independent significance regardless of their safety implications. When violations of procedures are tolerated, this adversely affects workers' perceptions of the seriousness of complying with other procedures.

WELDING PREHEAT REQUIREMENTS

Permitting welders to determine whether there is adequate preheat by employing a “hand warm” test may not be an adequate procedure to assure compliance with the preheat requirements.

TECHNICAL ISSUES DISCUSSED

- Weave welding
- Downhill welding
- Weld rod control
- Welding of misdrilled holes
- Repair welding (misdrilled holes)
- Preheat, welding
- Welding preheat.

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MEMORANDUM

(Concerning Welding Issues)

In this Memorandum, we decide issues raised by Darlene and Henry Stiner. Mr. Stiner was a welder at Comanche Peak. Mrs. Stiner, his wife, was both a welder and quality control inspector at the plant.

Because these witnesses have direct knowledge of the plant, we have taken their testimony with great seriousness, involving many hours of hearing time. In deliberating on what we have heard, we have reluctantly come to the conclusion that neither of the Stiners is a credible witness.

Our conclusion about the Stiners' credibility is more fully explained in the body of our opinion. Part of the basis for our conclusion came from our realization that both of the Stiners misunderstood the technical foundation for the weave welding procedure which was the crux of a substantial portion of their complaint about the plant. Furthermore, we find that Henry Stiner had a long-standing absentee problem at work and that he was discharged from the plant because of his absenteeism, not because he gave information to a QC inspector about a gouge in a pipe preceding the 3-day absence that precipitated his termination. As a result of reaching this conclusion about the Stiners' credibility, we have

found it appropriate to use Applicants' proposed partial initial decision as the framework within which to write our decision.

Despite the Stiners' general lack of credibility, they have raised questions about some welding practices that are of concern to us and that the Commission's Staff continues to investigate. To the extent that these concerns are corroborated by others, issues raised by the Stiners may later be found to be meritorious. For the time, however, these issues are the Staff's concern. We expect a Staff report following which we will make a determination concerning whether these should be issues in this case.

I. BACKGROUND

This is the third decision concerning allegations regarding welding at the Comanche Peak Steam Electric Station ("CPSES"), Units 1 and 2, raised by two witnesses of intervenor Citizens Associations for Safe Energy ("CASE"), Darlene and Henry Stiner. The first, LBP-83-43, Proposed Initial Decision, 18 NRC 122, 137-45 (1983), resolved all but four issues related to their allegations, *viz.*, weave welding, downhill welding, weld rod control and welding of misdrilled holes.¹ The second decision, LBP-83-60, Memorandum and Order (Emergency Planning, Specific Quality Assurance Issues and Board Issues), 18 NRC 672 (1983), discussed weave welding, repair of plug welds, downhill welding and weld rod control.

In response to objections to the July 29, 1983 Proposed Initial Decision (LBP-83-43, *supra*), filed on August 27, 1983, by Texas Utilities Electric Company, *et al.* ("Applicants"), by Memorandum and Order of September 23, 1983, LBP-83-60, *supra*, 18 NRC at 687-88, the Board closed the issue of weave welding raised by the Stiners in favor of Applicants. Subsequently, in a February 10, 1984 Licensing Board Order (unpublished), the Board reopened the weave welding issue.

To resolve these remaining open issues, hearings were held on February 23, March 19-23, and April 24, 1984. During these hearings, the Board expanded the issues to be addressed to include allegations made by Mr. Stiner regarding preheat of weld joints (CASE Exhibit 919 at 9; Tr. 10,799, 10,802, 10,825). In sum, the welding issues raised by the

¹ This first decision was based on testimony presented at hearings held on September 13, 1982, e.g., Testimony of Henry Stiner (CASE Exhibit 666) and Darlene Stiner (Case Exhibit 667) received into evidence at Tr. 4202 and 4124, respectively; Rebuttal Testimony of C. Thomas Brandt, *et al.* (Applicants' Exhibit 141), received into evidence at Tr. 4655; and NRC Staff Exhibits 13 (at 98-99) and 178, both received into evidence at Tr. 2336.

Stiners which are the subject of this Partial Initial Decision relate to weave welding, downhill welding, weld rod control, welding of misdrilled holes and preheat.

II. FINDINGS OF FACT — CONTESTED ISSUES

A. Witnesses and Testimony

1. CASE

Mr. and Mrs. Stiner each testified on welding issues addressed in the July 29, 1983 Partial Initial Decision, LBP-83-43, *supra*, i.e., CASE Exhibits 666 and 667, respectively. In addition, they jointly sponsored testimony introduced at the second round of hearings on this issue (CASE Exhibit 919, received into evidence at Tr. 9979). However, major sections of this testimony were stricken, including Attachment B of their testimony referencing a welding handbook (*see, e.g.*, Tr. 9937, 9960, 10,262, 10,282, 10,325, 10,494, 11,069).

The Stiners were offered as expert witnesses with regard to welding activities at Comanche Peak. Mr. Stiner was first hired on December 5, 1979, and shortly thereafter was trained as a welder. He was qualified as a structural welder on February 11, 1980. During his first period of employment at Comanche Peak, he worked 41 weeks during which he was absent a total of 6 weeks and worked 30 hours or less during an additional 8 weeks. Mr. Stiner's last day of work (for his first term of employment) was November 26, 1980. However, he was rehired and was again qualified as a structural welder on June 22, 1981. He welded for approximately 3 weeks before he was again terminated, following a 3-day absence from work.

Mrs. Stiner was in a qualified welding position (though not welding the entire time) from February 27, 1979 to August 3, 1980. (Applicants' Exhibit 177 at 5.) During the Summer of 1980, Mrs. Stiner began work as a welding QC inspector. Tr. 4130.

The Stiners stated that they were "certified to weld to both ASME and AWS D1.1" (CASE Exhibit 919 at 1-2). More specifically, they were qualified to two production welding procedures (Procedures 11032 and 10046), one relating to a portion of the ASME Code and one to a portion of the AWS D1.1 Code. These procedures qualified them to weld with the shielded metal arc process only on low-carbon-steel material such as pipe supports, and not on pressure piping joints, stainless steels or with other processes such as gas tungsten arc. (Tr. 9981-82.) Mr. and Mrs. Stiner's testimony was found to be qualified as expert welders within the limited areas of their qualifications. In addition,

based on Mrs. Stiner's experience in quality control inspection of welding at CPSES (CASE Exhibit 667 at 7-14), she was accepted as an expert witness concerning quality control.

Neither Mr. nor Mrs. Stiner was offered as an expert in metallurgy or any phase of engineering (Tr. 10,255, 10,774, 11,047), and the Board gives no weight to their testimony with regard to issues relating to those disciplines (Tr. 10,283, 10,776).

2. Applicants

Applicants presented ten witnesses (as described below) to respond to the allegations of Mr. and Mrs. Stiner. These witnesses jointly sponsored testimony during the second round of hearings on these allegations. (Applicants' Exhibit 177, received into evidence at Tr. 9976.)

Messrs. S. Fernandez, I. Pickett, and A.M. Braumuller are three welders still employed at CPSES who were on Mr. Stiner's crews. Each welder has at least 4 years of welding experience at CPSES, and Mr. Braumuller has a total of 28 years' experience as a welder. (*Id.* at 3-4.)

Messrs. F.E. Coleman and C.R. Brown are two welding foremen assigned to Mr. Stiner's crews during his employment at CPSES. The welding foreman was a nonsupervisory technician who would constantly monitor and assist the work of the five to fifteen welders on his crew. Mr. Coleman also worked as a welder in the same areas as Mrs. Stiner, and Mr. Brown welded in the same areas as Mr. Stiner during Stiner's first term of employment. Messrs. Coleman and Brown have each been employed at CPSES for over 4 years in welding-related positions. Both are currently QC Level II inspectors. (*Id.* at 2.)

Messrs. J. Green and E. Hallford were the foreman and general foreman, respectively, over Mr. Stiner's crew during Stiner's second term of employment. Both have been employed at CPSES for approximately 5 years. (*Id.* at 3.)

Mr. C.T. Brandt is the QA Staff Engineer at CPSES. He was formerly Mechanical/Civil QA/QC Supervisor responsible for all non-ASME Mechanical and Civil Quality Control Activities and had overall responsibility for training, staffing and personnel development of Civil and Mechanical inspectors and QA personnel, including Mrs. Stiner. He has been employed at CPSES in QA/QC-related work for 4 years. Mr. Brandt is also a member of the American Welding Society. (Applicants' Exhibit 141, Attachment A.)

Mr. W. Baker, Senior Project Welding Engineer at CPSES for 6 years, has over 28 years of diversified experience in the welding industry. His experience encompasses 15 years of pressure vessel and power plant

construction. He is a member of the American Welding Society and currently a Senior Project Welding Engineer at Brown & Root. (Applicants' Exhibit 177, Attachment A.)

Mr. M. Muscente has 25 years' experience associated with the design, engineering, fabrication, material selection, and examination and erection of engineered equipment and systems, including pressure vessels, pumps and piping. Mr. Muscente is a member of the American Welding Society, the American Society of Mechanical Engineers and is a registered Professional Engineer in Quality Engineering in California. He is currently the Manager of Materials Engineering at Brown & Root. (*Id.*, Attachment B.)

Applicants' witnesses Brown, Braumuller, Fernandez, Pickett, Coleman, Brandt and Baker are recognized by the Board as expert welding witnesses. Applicants' witnesses Baker and Muscente are recognized by the Board as expert witnesses in the area of metallurgy. Applicants' witnesses Brandt, Coleman and Brown are recognized by the Board as experts in quality control.

3. NRC Staff

The NRC Staff presented the testimony of Messrs. W. Collins, L. Gilbert, D. Smith and R. Taylor. These witnesses jointly sponsored testimony provided during this second round of hearings on welding allegations. (NRC Staff Testimony on Welding Fabrication Concerns Raised by Mr. and Mrs. Stiner ("NRC Staff Testimony") and Addendum to Page 27 of NRC Staff Testimony on Welding Fabrication Concerns Raised by Mr. and Mrs. Stiner ("Staff Addendum"), both received into evidence at Tr. 12,146.)

Mr. Collins is a Senior Metallurgical Engineer with the Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission. He has approximately 25 years' experience in metallurgy, 16 of which have been as a technical adviser in the area of metallurgy and metallurgical problems relating to construction, testing and operation of nuclear power plants. (NRC Staff Testimony at 1 and Attachment 1.)

Mr. Gilbert is expert in welding and nondestructive examination and is a Reactor Inspector responsible for inspecting nuclear power plants located in Region IV. He has 14 years' experience in welding and 7 years' experience as a Reactor Inspector. Mr. Gilbert is a registered Professional Engineer in Quality Engineering in the State of California. (*Id.* at 2 and Attachment 1.)

Mr. Smith is a materials engineer responsible for the review of materials and fabrication processes used in the construction of nuclear power

plants, as well as the evaluation of material and weldment failure in nuclear power plants. He has 17 years' experience as a materials engineer, including 4 years with the Materials Engineering Branch of the NRC. (*Id.* at 2-3 and Attachment 1.)

Mr. Taylor is employed by the NRC as a Reactor Inspector in the Division of Reactor Safety and Projects, Region IV. In this position, he coordinates all safety-related inspection efforts relative to the NRC Region and the site. He was assigned to Comanche Peak as Senior NRC Resident Inspector for Construction. Mr. Taylor is a registered Professional Engineer in the State of California. Prior to this, from 1976 to 1978, Mr. Taylor was the construction project reactor inspector at the South Texas Project. (Staff Exhibit 9.)

B. Credibility

Prior to the hearings, the Board determined that there were direct conflicts in the testimony of witnesses for CASE and the Applicants regarding important factual allegations. Accordingly, in an attempt to elicit accurate factual information with regard to compliance with welding procedures and the quality assurance program involving welding, the Board directed limited sequestration of all witnesses who would provide testimony on craft activities at CPSES regarding these issues. The purpose of this sequestration was to prohibit communication between the witnesses so that they would not know what one another had said at the time each testified. (Tr. 9916-17.)

Due to the extensive direct conflicts of factual evidence, the credibility of each witness was weighed carefully in evaluating the evidence in the record. Applicants' witnesses provided credible and consistent testimony on direct and in response to the cross-examination questions of all parties. In addition, in response to cross-examination questions Applicants' witnesses stated that they were instructed to tell the absolute truth when testifying and that if their testimony reflected problems with the plant, it would not adversely impact their employment at the plant (Tr. 11,518-19, 11,652, 11,703, and 11,744-45). In short, the Board finds no inconsistencies from Applicants' witnesses which would call into question their credibility. The Board makes a similar finding with respect to the Staff's witnesses.

However, the Board finds that Mr. and Mrs. Stiner's allegations must be considered in light of inconsistencies in their testimony and demonstrated lack of credibility.

1. *Henry Stiner*

Information regarding certain aspects of Mr. Stiner's background were received into evidence by the Board (Applicants' Exhibits 181, 182, 183; CASE Exhibit 965; Tr. 10,578, 10,579) and duly considered.

Mr. Stiner's testimony also indicates that he has had a tendency to elaborate on testimony adverse to Applicants as the proceeding progresses. For example, in earlier testimony filed in this proceeding, Mr. Stiner stated that he performed welds on misdrilled holes several times (CASE Exhibit 666 at 18). In subsequent testimony Mr. Stiner changed from several repair welds on misdrilled holes to at least twenty or thirty such welds (CASE Exhibit 919 at 22) and during redirect examination Mr. Stiner testified that he performed hundreds of "plug welds" throughout the plant (Tr. 10,672). Mr. Stiner subsequently testified that he had performed twenty or thirty plug welds in a single day (Tr. 10,699-70).

Mr. Stiner sometimes gave conflicting testimony. For example, during previous hearings, Mr. Stiner testified that he never left his weld rods out of the can (Tr. 4301-02). When asked this question again during the March 1984 hearings he directly contradicted his previous testimony by stating that he did leave weld rods out of the can as much as any other welder did (Tr. 10,856). In attempting to explain the obvious inconsistency in his testimony, the following discussion occurred:

BY MR. REYNOLDS:

Q. Do you have an explanation [for the inconsistency]?

A. Yes, I do. I believe at the time the line of questioning and the manner that it was being — the line of, I call it interrogation, was being handled, I think maybe I just misunderstood what you were trying to get to and in what reference you were trying to actually set me up or whatever. And that's probably the reasons for the inconsistencies in the testimony there and now.

JUDGE BLOCH: Mr. Stiner, your job is never to figure out what the lawyer is trying to get to. If he asked you "do you put things into a rod can," you just answer what the truth is. You have no business trying to figure out what he's trying to get to.

I don't understand that explanation.

Did you or did you not put these things into the — leave your rods out of the rod can?

THE WITNESS: I did leave them out.

JUDGE BLOCH: Why do you think you said you didn't in the last testimony?

THE WITNESS: Like I say, I was in such a fog when I was up here testifying the first time, that I'm liable to have actually said anything. That's why I try to go back and find all these inconsistencies. But I'm sure that I did skip over some of them that I didn't catch, like that one instance. I would have clarified it if I saw it when I read through the transcript.

It's not that I intentionally lied. It's just a case where at the time of the questioning it was not in my mind to grasp.

The Board Chairman noted at the time "that this seriously affects his credibility" (Tr. 10,861).

As another example of an inconsistency, Stiner stated in his prefiled testimony that his work always looked good to QC and they almost always ended up "buying it off" (CASE Exhibit 666 at 34; Tr. 10,674). However, during Mr. Stiner's cross-examination he stated that many of his welds were rejected (Tr. 11,009).

As another example, Mr. Stiner initially testified that workers violated weld rod control procedures regarding retention of rods because "they are under so much pressure to get the work done and get the hangers up that they try to do anything they can do to speed up work" (CASE Exhibit 919 at 19). However, in response to an inquiry that appeared to bring into question the logic of such a position, Mr. Stiner reversed himself and testified that he did not hold out rods because he was under time pressure (Tr. 11,126-28).

As another example, Mr. Stiner testified that under the direction of Cliff Brown and Jimmy Green, he performed a downhill weld on a particular hanger in a limited access area (Tr. 10,622). Significantly, when Mr. Stiner was confronted with conflicting testimony regarding whether Mr. Brown could direct him to perform a weld, he testified that Mr. Brown did not direct him to make this downhill weld; rather Mr. Brown made the weld himself (Tr. 10,967-75, especially 10,967 (which references Tr. 10,622) and 10,975).

As another example, Mr. Stiner testified that, while he was "illegally" repair-welding misdrilled holes, Messrs. Brown, Coleman and Green stood watch for QC (Tr. 10,685-86). Later however, he testified under cross-examination that only Fred Coleman had stood watch for him while he was repairing misdrilled holes (Tr. 11,031). Mr. Stiner testified that Mr. Brown never stood watch for him for QC inspectors in any respect (Tr. 11,031). Mr. Stiner after being informed by Applicants' counsel of an inconsistency with previous testimony then stated that Mr. Brown did stand watch for him once (Tr. 11,032).

Mr. Stiner also testified that it would take him approximately 2 minutes to perform a repair weld on a 1¼-inch hole in a 2-inch-thick plate,

excluding blending of the weld and base metal surface (Tr. 10,698). Further, Mr. Stiner stated that it would only take two weld rods to perform such a repair (Tr. 11,158). Staff's witnesses testified that based on simple volumetric calculations it was not possible to do what Mr. Stiner stated. They testified that disregarding all other factors, such as cleaning the weld surface, changing weld rods, or turning the member, it would take no less than 20 minutes and twenty to twenty-five weld rods to complete the weld on the misdrilled hole cited by Mr. Stiner. (Staff Testimony at 26; Tr. 12,250-51.) Based on independent testing, Applicants verified the Staff's testimony (Tr. 11,767-68).

Mr. Stiner testified that it was faster to weave weld than to perform a stringer (line) weld, and accordingly, supervisors directed welders to weave weld to accelerate production (Tr. 10,863, 10,896). However, in response to cross-examination of earlier testimony, Mr. Stiner stated first that it took approximately the same length of time to perform a stringer and weave weld; next, that the stringer weld took longer; and finally, that the weave weld took much longer (Tr. 4361-63).

In explaining how he knew that he was allegedly performing an illegal "plug weld" on ASME hangers, Mr. Stiner changed his position in mid-sentence as illustrated by the following discussion:

JUDGE BLOCH: Do you ever know of having done one [illegal "plug weld"] that was an ASME support?

THE WITNESS: Yes, sir.

JUDGE BLOCH: How do you know it was an ASME support?

THE WITNESS: Because it was a Class 3.

JUDGE BLOCH: How did you know it was Class 3?

THE WITNESS: The package numbers will indicate on the end of the package number, A35R or A33R, an A32R.

JUDGE BLOCH: They brought this material to you, which was an illegal weld, together with the package that legally went with it, just to show you that it was an ASME weld?

THE WITNESS: No, not to show me that the package — I mean most of the time you know when you're working in a particular area, according to what class of hanger you're working on.

[Tr. 10,673-74.]

Mr. Stiner's testimony concerning the relationship of "arc blow" to downhill welding is illustrative of bias, consisting of his willingness to provide adverse testimony to Applicants without sensitivity to whether

the matter is beyond his expertise. Mr. Stiner testified that downhill welding is useful to compensate for the "arc blow" caused by the magnetization of the welded metal. Tr. 4246-47, CASE Ex. 666 at 45. Metal, according to Mr. Stiner, becomes "magnetized" when cut with a welding torch. Tr. 4246. This assertion, however, indicates total lack of metallurgical expertise. "Arc blow" is the phenomenon resulting in the deflection of the arc due to a deformation in the magnetic field. Applicants' Exhibit 177 at 15 (Baker, Muscente). This deformation in the magnetic field is caused not by "cutting with a welding torch," but by welding close to ground or into obstructed areas such as corners. *Ibid.* Small amounts of arc blow are beneficial to the welder because it helps him form the bead shape, control molten slag, and achieve proper penetration. *Ibid.* Arc blow is a potential problem only when using amperage rates in excess of 250 amps, for rate more than double that specified (90-120 amps) for welders at CPSES. *Ibid.*

2. Darlene Stiner

With regard to her testimony, Mrs. Stiner apparently relied heavily on what her husband told her. For example, Mrs. Stiner relied on Attachment B to her testimony in responding to several questions concerning why she believed and testified that weave welding caused excessive heat input that would result in damage to the parent metal (*e.g.*, Tr. 10,305-10). However, in subsequent cross-examination she revealed that she had not even read Attachment B, but rather her husband had discussed it with her and she agreed with his views on the subject. She stated that the Attachment related to her husband's testimony, not her testimony (Tr. 10,542-45).

Mrs. Stiner responds to questions by significantly overstating the facts. For example, she testified that her supervisor told her that she "would be fired" if she didn't accept a certain hanger (Tr. 10,276). However, in responding to another question, she related the substance of the conversation, which did not include a threat to fire her (Tr. 10,276-77). The Board cautioned Mrs. Stiner to not overstate the facts (Tr. 10,277). As another example she stated that a QC inspector had the authority to order that a hanger be cut down. However, based on other questions she admitted that she didn't know if an inspector had that authority (Tr. 10,278-79). As another example, she testified that her supervisor had not given Tom Brandt certain weld rods that she had found; subsequently, she admitted that she did not know (Tr. 10,474-75). As another example, Mrs. Stiner testified that "she is sure" that Mr. Brown does not monitor his welders and watch them make their

welds so that he would know if they were weave welding contrary to procedures (Tr. 10,200). However, on cross-examination she testified that Mr. Brown was never her foreman, she did not know he was a foreman and she was simply speculating (Tr. 10,291).

Mrs. Stiner testified that welders did not generally have and could not easily obtain pencil grinders (Tr. 10,285-86). Other welders and foremen (Messrs. Pickett, Braumuller, Fernandez, Coleman, Brown and even Mr. Stiner) testified that they had pencil grinders and, when asked, they testified that pencil grinders were readily accessible in the areas in which they were working (Tr. 10,614, 11,469, 11,547, 11,621-22, 11,643, 11,666). On this direct conflict of testimony, we find that Mrs. Stiner lacks credibility.

In her testimony, Mrs. Stiner made one specific allegation regarding excessive weave welding by one of Applicants' witnesses, Mr. Braumuller. However, this testimony was inconsistent and lacking in credibility. Significantly, when testifying, Mrs. Stiner had notes allegedly made at around the same time as the events in question. (The notes were not admitted into evidence.) The Board notes below only a few of the inconsistencies in this testimony:

- Mrs. Stiner testified that on March 24, 1981, while inspecting a companion hanger, she first noticed Mr. Braumuller making excessive weave welds on hanger TWX-0397-14A35R (Tr. 10,161, 10,183-85). She testified that she inspected the hanger for a final inspection on March 26 and again saw Mr. Braumuller weave welding on the hanger (Tr. 10,156, 10,164). However, in earlier testimony she had stated that her initial inspection was on March 26 and the final inspection occurred later (CASE Exhibit 667 at 25; Tr. 10,185). Mrs. Stiner provided a long explanation attempting to reconcile the difference (Tr. 10,185-89). At bottom, however, her earlier testimony was, at best, incomplete. Mrs. Stiner testified that after her inspection on March 26, she returned on March 27 and wrote an NCR on the hanger (Tr. 10,173). Again, conflicting earlier testimony was presented that the NCR was not written until several days after the "initial" inspection of March 26. CASE Exhibit 667 at 25. This time Mrs. Stiner just admitted that the earlier testimony was wrong (Tr. 10,196). To summarize, at the conclusion of the hearing on February 23, 1984, Mrs. Stiner's story was that she had seen Braumuller weave welding on the hanger on March 24 and 26, 1981, and had written an NCR on March 27. (Tr. 10,196.) When the hearing reconvened over 3 weeks later, Mrs. Stiner, responding to a Board question precipitated by an inconsistency, testified that she had not seen Mr. Braumuller welding on the hanger on March 24; indeed, the first time she noted weave welding on the hanger was on March 26, 1981 (Tr. 10,454-56).
- Mrs. Stiner testified on many occasions that she had never approved the hanger due to her concern over the alleged weave welding (Tr. 10,273). Yet, Applicants presented an Inspection Report dated April 8, 1981 that was signed by her (Tr. 10,266) indicating that the hanger was satisfactory (Tr. 10,263-64).

Mrs. Stiner testified that while she doesn't remember signing it, she may have (Tr. 10,273). She testified that she must have signed it under threat of being fired (Tr. 10,265, 10,261). Later however, she admitted that there was no direct threat of firing (Tr. 10,276-77).

- Mrs. Stiner testified that the NCR she had written had been voided and Applicants had no record of it. The Board reminded Mrs. Stiner that even voided NCRs are given numbers. Mrs. Stiner did not know and could not find the number even though she kept a log of her significant work activities and stated that she had written it down. (Tr. 10,144-45.) On the Inspection Report for this hanger, that we conclude was signed by Mrs. Stiner on April 8, however, she had written "not applicable" under the section for listing outstanding NCRs. (Tr. 10,267.) She reconciled the testimony by stating that the NCR had been voided and she had no number to put in the box. However, she earlier testified that she had not known what had happened to the NCR. (Tr. 10,267.) Mrs. Stiner could not provide a satisfactory explanation as to why she wrote "not applicable" in this section of the Inspection Report if she had reported an NCR which, to the best of her knowledge, had not been dispositioned (Tr. 10,267-68).
- Mrs. Stiner's notes purported to be contemporary records of events taking place at the plant. However, key entries about the disputed hanger were in blue pen. These were the only entries in blue pen. Mrs. Stiner was unable to explain this aberration in a convincing way. We conclude that these blue-penned entries were not contemporaneous but were made at a later date to support Mrs. Stiner's testimony. (Tr. 10,172-74; *see also* Tr. 10,520.)

The record demonstrates that Mr. and Mrs. Stiner are individuals who possess memories that produce different versions of the same facts when questioned at different times and possess selective recall of facts and details favorable to their claims, accompanied by a failure of memory as to other facts regarding those claims.²

C. Contested Issues

The welding issues raised by CASE and addressed in this Partial Initial Decision relate to weave welding, downhill welding, weld rod control, weld repair of misdrilled holes and preheating of welds. In addressing each of these issues in the context of the quality assurance contention raised by the intervenor, the Board examined and weighed the testimony presented to determine if it reflected systematic or significant violations of the QA/QC program indicative of a breakdown in the program. In addition, in that resolution of many of the issues involved balancing con-

² While many additional inconsistencies are contained in their testimony (*see, e.g.*, Tr. 10,744-58, 11,153), the Board will not take the time to detail them. However, some additional inconsistencies in their testimony are noted below in discussions of specific allegations.

flicting testimony raising credibility issues, the Board attempted to address the probable impact on plant safety, assuming the allegations were well founded.

1. Weave Welding

Weave welding as defined by § IX of the ASME Code is a weld with significant transverse oscillation (NRC Staff Testimony at 4; Applicants' Exhibit 177 at 7). The AWS D1.1-1975 Code also defines a weave weld as a type of weld bead made with transverse oscillation.

Weave welding may be distinguished from a stringer bead, which is defined as a type of weld made without appreciable transverse oscillation. (NRC Staff Testimony at 5; Tr. 12,153.) Neither the ASME Code nor the AWS Code prohibits weave welding (Applicants' Exhibit 177 at 7; NRC Staff Testimony at 5; Tr. 11,222). Further, weave welding is not in itself contrary to applicable welding procedures used at Comanche Peak unless the final weave width is in excess of 4 times the diameter of the weld rod being used. For example, if the welding material specified to be used is 1/8-inch-diameter electrode, it would be acceptable to use an oscillating weld technique up to 1/2-inch wide (4 times the diameter of the weld rod). (Applicants' Exhibit 177 at 7-8.)

CASE's concerns regarding weave welding were based on Mr. and Mrs. Stiner's allegations that although excessive weave welding³ was contrary to procedures at CPSES, it was common practice and foremen even directed welders to use improper weave welds (Tr. 4147-48, 4210-11, 11,098-103; CASE Exhibit 919 at 9-10). Mr. and Mrs. Stiner were concerned that weave widths in violation of procedures could result in excessive heat input into the weld joint (CASE Exhibit 919 at 5; Tr. 10,305, 10,591, 10,785).⁴

As discussed more fully below, the record reflects that the allegations raised by Mr. and Mrs. Stiner regarding weave welding are not reflective of systematic or significant violations of the QA/QC program. In this regard, no specific instances where violations were alleged to have occurred were substantiated. Furthermore, the record reflects that even if

³ The record reflects that Mr. and Mrs. Stiner's initial allegations were based on a belief that all weave welding, no matter how slight, was unauthorized (Applicants' Exhibit 177 at 7-9; Tr. 9991, 10,589-90). Henry Stiner subsequently acknowledged that weave welding was not impermissible at Comanche Peak if the bead width did not exceed four core diameters. See Tr. 10,590 (H. Stiner); CASE Exhibit 919 at 6 (H. Stiner). He then stated that his concern had always been for excessive weave welding (Tr. 10,590 (H. Stiner)). However, we find that the earlier testimony is lacking in credibility, thereby seriously questioning the basis for CASE's allegations regarding weave welding.

⁴ During the hearing, the Board determined that the issue of weave welding included the impact of heat input during weave welding (Tr. 9947).

Mr. and Mrs. Stiner had violated procedures by welding in excess of weave width procedural requirements as they alleged, excessive heat input in the welds they made would not have had a significant adverse impact on plant safety.

a. Allegations of Weave Welding Do Not Reflect a Breakdown in the QA/QC Program

Henry and Darlene Stiner testified that excessive weave welding in violation of procedures was a widespread problem at CPSES (CASE Exhibit 919 at 6, 9, 14).

Mr. and Mrs. Stiner testified that under the direction of their supervisors they had welded and had observed others welding with weave widths in excess of procedural requirements. While they stated that such violations routinely occurred, they were only able to identify a few specific hangers where they believed unauthorized weave welding occurred. The two specific incidents identified⁵ involved A. Braumuller, one of Applicants' witnesses who had previously testified that he had never performed weave welding in violation of procedures. (Applicants' Exhibit 177 at 9; Tr. 11,675.) (The two specific incidents identified are addressed below.)

In response to these allegations of widespread weave welding in violation of procedural requirements (i.e., where the weave width was over 4 times the diameter of the weld rod used), Messrs. Fernandez,⁶ Pickett and Braumuller (welders still remaining at CPSES who were on Mr. Stiner's crews) testified that they had never welded or seen another person weld using a weaving pattern in excess of the bead width specified in welding procedures. Further, they testified that they had never heard a foreman or supervisor direct a welder to perform such illegal welds. (Applicants' Exhibit 177 at 9.) All welders (including the Stiners) apparently

⁵ Mr. Stiner also alleged that Fred Coleman directed him to beat the flux off a rod, insert it into a weld gap and weave weld over it (CASE Exhibit 919 at 9). However, he was not able to identify a specific hanger or weld which could be investigated. In any event, Mr. Coleman presented contradictory testimony (Tr. 11,538). Further, other welders who were under Mr. Coleman on the same crew as Mr. Stiner, stated that Mr. Coleman had not given them similar instructions and they had never heard of this being done at CPSES (Applicants' Exhibit 177 at 9).

⁶ Mr. Stiner testified that Mr. Fernandez was not on his crew and had never welded in the same area as Mr. Stiner (Tr. 10,589). Subsequently, when asked if Mr. Fernandez ever performed an illegal weld, Mr. Stiner stated that Fernandez had; Stiner knew because he was welding in the same area (Tr. 10,675-76). In any event, Messrs. Fernandez and Brown (Mr. Stiner's welding foremen) testified that Mr. Fernandez was on the same crew under Mr. Brown (Tr. 11,857, 11,673).

knew that intentional violation of procedures could result in termination (Tr. 11,729).⁷

In addition, Messrs. Brown, Coleman, Green and Hallford (supervisors on crews over Mr. Stiner and/or welders in areas where Mrs. Stiner welded) stated that they had never heard any supervisor direct a welder to perform illegal weave welding (Applicants' Exhibit 177 at 9-11). Significantly, Messrs. Brown and Coleman (welding foremen on H. Stiner's crews) testified that they monitored each welder on their crews (including Mr. Stiner) several times a day (Tr. 11,464, 11,534, 11,541) and if any welders were using excessive weave welding as a practice (as alleged by Mr. and Mrs. Stiner), they would have known about it (Applicants' Exhibit 177 at 10; Tr. 11,587).

Mr. Baker testified that he was unaware of any instances of excessive weave welding which had not been identified and appropriately dispositioned, and that if a welder was using excessive weave welding as a practice, Mr. Baker would have found out about it. Mr. Baker based his testimony on his personal observations of and discussions with welders coupled with the monitoring programs he administered in welding construction, e.g., welding technicians who all reported to him and the welder inspection program. Mr. Baker testified that welding technicians (assigned to each area of the plant where welding was taking place) continuously monitor the welders they are assigned. Mr. Baker stated that if any welder used excessive weave welding as a practice, it would have been detected by these technicians and reported to him. (Applicants' Exhibit 177 at 12-13.)

Further, Mr. Baker testified that welding engineering (apart from QA/QC) also conducted unannounced inspections of each active welder approximately every 14 days. (For example, Mr. Baker testified that during the short time Mr. Stiner was actively welding, he was inspected 15 times, and Mrs. Stiner was inspected at least 28 times during the period she welded.) During the inspection, numerous areas are checked, including the filler material, the acceptability of the welding, progression of travel (uphill or downhill), bead width, and weld rod control. Mr. Baker testified that to his knowledge, none of the inspections identified any concerns regarding excessive weave welding.

⁷ Mr. and Mrs. Stiner alleged that welders routinely violated procedures under the direction of their foreman even though they knew that they could be terminated if they were caught (Tr. 10,284, 10,287-88, 10,312-14). Mr. Stiner stated that the guidance he was given by his foreman was not to get caught (Tr. 10,680, 10,897). In addition, they stated that foremen and other welders kept a look out for QC to warn welders if QC was coming (Tr. 11,030-32, 11,103). This is in direct conflict with testimony of welders presented as witnesses by Applicants who, when asked by the Board, stated that, in essence, it did not make sense to intentionally violate procedures if you knew you could lose your job (Applicants' Exhibit 177 at 11; Tr. 11,729).

Further, Mr. Brandt testified that he was unaware of any instances of excessive weave welding which were not identified and dispositioned appropriately, and if a welder did excessive weave welding as a practice (as alleged by Darlene and Henry Stiner), QC would have found out about it and taken appropriate actions. Mr. Brandt's testimony was based on his observations of welders in the plant, and his discussions with numerous QC inspectors (who are monitoring the welders) regarding this issue. (*Ibid.*)

The NRC Staff investigated the allegations made by Mr. and Mrs. Stiner regarding weave welding (NRC Staff Exhibit 178 at 11-13). Based on the investigation, the Staff concluded that there was no evidence to support Mr. and Mrs. Stiner's allegations (NRC Staff Testimony at 11-12).

While testimony reflected that all welders were trained on the appropriate weave width that could be used (*see, e.g.*, Applicants' Exhibit 177 at 9, 13; Tr. 9991, 11,297), Mr. Stiner testified that he was never told that weave welding in any fashion (even less than 4 times the diameter of the weld material) was authorized (Tr. 4211 and 10,590). However, Mr. Stiner contradicted himself by stating that one of his training instructors (Kenneth Golden) told him that weave welding was acceptable and even at times preferable (CASE Exhibit 666 at 9). In addition, in March 1980 Mr. Stiner attended a training class on CPM-6.9 (*id.* at 8) which requires a maximum bead width of 4 times the weld rod diameter (NRC Staff Testimony at 6). In short, despite the contradictory testimony of Mr. Stiner, the Board finds that welders were properly trained on acceptable bead width.⁸

MR. STINER'S SPECIFIC ALLEGATION

On cross-examination, Mr. Stiner could recall only one instance where he had witnessed excessive weave welding. Tr. 10,592. According to Mr. Stiner, he noticed that the hanger on which a welder named Armand Braumuller was welding had turned blue approximately 4-5 inches from the weld joint. CASE Ex. 919 at 8. In Mr. Stiner's view, the blue discoloration was due to overheating of the base metal caused by excessive weave welding. Tr. 10,592.

The steel used at CPSES to construct hangers, A36 steel, has a carbon content of less than 0.3% and is considered "low-carbon" steel. Staff

⁸ Applicants testified that the bead width weld specified as acceptable in some welding procedures may have been confusing (Tr. 9991). Accordingly, these procedures are being changed to remove confusion (Tr. 9992). However, it appears that the confusion, if any, was not widespread. Further, any confusion would have resulted in welders conservatively using less of a weave pattern than they could have used.

Testimony at 6-8 (Taylor, Gilbert). Low-carbon steel, which changes color during oxidation (*id.* at 8, Tr. 10,020 (Baker)) "turns blue on the surface at 600°F." Tr. 10,020 (Baker). This surface discoloration is not an indication of embrittlement, or a loss of ductility or tensile strength. Tr. 10,020-24 (Baker, Muscente). Thus, the fact that Mr. Stiner may have observed a blue discoloration on the hanger at issue does not mean that the bead width of the weld made by Mr. Braumuller exceeded four core diameters.

It is noteworthy that Mr. Braumuller, a welder with 28 years' experience (Applicants' Ex. 177 at 4), denied that Mr. Stiner ever assisted him on a welding job and had no recollection of the incident described by Mr. Stiner. Tr. 11,694-95. Mr. Coleman, who was Mr. Stiner's foreman at the time, stated that Mr. Stiner was a welder "like all the rest," Tr. 11,539, and denied that Mr. Stiner was assigned the task of walking around correcting other welders' work. *Ibid.* Clifford Brown, who was a member of Mr. Stiner's welding crew, also controverted Mr. Stiner's statement that he and Mr. Stiner were roving repairmen, responsible for getting "bad welds" bought off by QC. *Compare* Tr. 11,467 (Brown) with Tr. 10,606; Tr. 10,622-23 (H. Stiner). Indeed, Mr. Stiner admitted on cross-examination that Mr. Coleman's and Mr. Brown's testimony on this point is correct. Tr. 10,974-75.

Mr. Stiner visited Comanche Peak with the Board Chairman to indicate the hanger that contained the improper weave weld made by Armand Braumuller. Tr. 11,118. Mr. Stiner identified hanger CT-1-017-005-Y35R as the offending hanger. Tr. 11,023. The weld package for hanger CT-1-017-005-Y35R, however, indicates that neither Mr. Stiner nor Mr. Braumuller ever welded on hanger CT-1-017-005-Y35R. Tr. 11,023.

The Staff inspected hanger CT-1-017-005-Y35R and the two adjacent hangers to determine whether any had excessive weave welds. Staff Testimony at 13 (Taylor). The welds did not appear to have been ground down and thus the longitudinal ridges and valleys of welds could be observed. *Ibid.*; Tr. 12,224 (Taylor). The ridges and valleys of these welds were "indicative of properly-made stringer beads well within the four rod diameter limitation." Staff Testimony at 14 (Taylor).

The Staff also reviewed the construction package for hanger CT-1-017-005-Y35R to determine whether it had been removed or replaced subsequent to the July-August 1980 time period that Mr. Stiner claims he and Mr. Braumuller welded on it. The construction package indicates that welding took place only in June 1979, January 1981, and October 1983, and nothing in the construction package or in the Staff's inspection of the hanger indicates that it has ever been removed or replaced. *Ibid.*

One of the adjacent hangers did have the weld symbols of both Mr. Braumuller and Mr. Stiner, suggesting the possibility that this was the hanger Mr. Stiner had described. However, the documentation for this additional hanger showed that Mr. Braumuller and Mr. Stiner had welded on that particular support several months apart. (Tr. 11,024; CASE Exhibit 968, received into evidence at Tr. 11,180.) So the documentation contradicts Mr. Stiner's testimony. Further, since the hangers pointed out by Mr. Stiner did not require Charpy impact testing (NRC Staff Testimony at 13), the existence of excessive weave welding on these supports would merely have indicated an isolated violation of a procedure without an adverse safety consequence. *See* Staff Testimony at 5, 7 (Collins, Smith); Tr. 9998 (Muscente).

We conclude that Mr. Stiner did not establish the existence of even one illegal weave weld. However, this incident does cast doubt on Mr. Stiner's credibility. When he was forced into pinpointing the location of a mysterious problem he stated positively that he knew existed, he failed to do so.

MRS. STINER'S SPECIFIC ALLEGATION

Mrs. Stiner testified that she saw Mr. Braumuller and Mr. Stiner weave welding on an Auxiliary Building hanger, TWX-034-714-A35R (elevation 790) on March 24, 1981 and March 26, 1981 (Tr. 10,161, 4149; Case Exhibit 667 at 24). This issue is discussed in § II.B, above, as it relates to the credibility of Mrs. Stiner. While this discussion casts substantial doubt on her credibility as a witness as well as the accuracy of this specific allegation, documentation reflects that, in any event, Mr. Braumuller used a total of two rods on the hanger on March 24 and five rods on the hanger on March 25, 1981 (Tr. 11,790-91). (We find, based on the documentation, that Mr. Stiner did not weld on the hanger on March 26, 1981 as alleged (Tr. 11,791).)⁹ Significantly, Mrs. Stiner testified that seventeen to eighteen weld rods would not have completed even one weld on the hanger (Tr. 10,149). Accordingly, if Mr. Braumuller had weave welded on the hanger as Mrs. Stiner had alleged, he could

⁹ During cross-examination, CASE questioned Mr. Baker as to the adequacy of weld filler material documentation for this and other Class 5 hangers. Specifically, CASE was concerned that because weld filler material log sheets were not numbered for Class 5 hangers (as they are for Class 1, 2 and 3 hangers), there would be no way of telling if any sheets were missing (Tr. 11,942-43). Mr. Baker testified that this hanger package was taken from official company records and he had no reason to believe that it (as well as any other Class 5 hanger package) was not complete (Tr. 11,978-79). Further, he testified that there are no Code requirements regarding retention of such documentation for Class 5 hangers (Tr. 11,983). Further, Mr. Baker stated that after the filler material is used, the weld filler material log sheets for Class 5 hangers serve no safety function (Tr. 11,981-83). CASE presented no conflicting testimony.

not have weave welded for very long. In any event, the welds on the hanger did not require Charpy impact testing and would, therefore, have been constructed safely even if there had been weave welding.

We conclude that whether or not Mr. Braumuller may have weave-welded on this particular hanger, there is at most proof of one isolated instance of a violation of procedures. The violation, if it occurred would not have safety consequences. Consequently, Mrs. Stiner's testimony does not establish any serious shortcomings in welding practices with respect to weave welding.

Based on the evidence, the Board finds that CASE's allegations regarding weave welding do not reflect significant violations of procedural requirements, and thus, do not reflect even a minimum breakdown in the QA/QC program at CPSES. There also is no reason for concern about safety consequences of the alleged practices.

In making these findings, the Board notes that the testimony regarding this issue is in direct conflict. On the one hand Applicants' witnesses testified that they were not aware of any unreported weave welding in violation of procedures. These witnesses included welders who worked in the same areas as Mr. and Mrs. Stiner and who would have experienced the same working conditions that they did. Indeed, each of these welders has been at CPSES longer than either Mr. or Mrs. Stiner. In addition, Applicants' witnesses included two of Mr. Stiner's welding foremen and two of his other supervisors, all of whom would have monitored him and others on his crew. Finally, Applicants' witnesses included Messrs. Baker and Brandt who testified as to direct and substantial oversight of welding by the welding engineering department and QC personnel. Significantly, while each of Applicants' witnesses was sequestered and thus did not hear the testimony of the others before testifying, there were no inconsistencies of any moment in any of Applicants' witnesses' testimony.

b. Safety Implications of Allegations of Excessive Weave Welding

In the course of the foregoing discussion, we reached certain conclusions about the safety significance of Mr. and Mrs. Stiner's allegations, had we found them to have been true. In this portion of our opinion we discuss that conclusion in greater depth.

Mr. and Mrs. Stiner stated that their primary concern regarding weave welding was that it would result in excessive heat input into the parent metal resulting in damage (CASE Exhibit 919 at 5; Tr. 10,784).

With regard to CASE's concern, Messrs. Muscente and Baker testified that the type of steel Mr. and Mrs. Stiner were qualified to weld on was

low-carbon steel with a carbon content below 0.3% (Tr. 9997-98). Applicants testified that the vast majority of all carbon steel used at CPSES is low-carbon steel. Further, Applicants testified that this material is extremely ductile, not susceptible to cracking or embrittlement, and not susceptible to reduction in strength from excessive heat input. (Tr. 9998-99.)¹⁰ Applicants testified that heat input during welding on these materials is only a factor when welding on materials that require Charpy impact testing (Tr. 10,012). Applicants testified that excessive heat on such materials may alter the fine grain structure (Tr. 10,012). The NRC Staff testimony was consistent with Applicants' in this regard (NRC Staff Testimony at 7; Tr. 12,156, 12,178-82).

Applicants testified that the main steam and feedwater systems were the only two systems installed by Brown & Root in which there were any portions that required Charpy impact testing (Tr. 9996, 10,100). Mr. and Mrs. Stiner's qualifications would have restricted them to welding structural attachment welds on these systems (Tr. 9996). To determine whether Mr. or Mrs. Stiner welded on these systems, Applicants conducted a computer search of the welding documentation of the sections of the main steam and feedwater systems requiring Charpy impact considerations (Tr. 9996, 10,013). To verify that this documentation contained all pertinent attachments to the systems, Applicants also conducted a cross-check of all the drawings for the main steam and feedwater systems and identified all of the hangers attached to portions of those systems that required Charpy impact testing (Tr. 11,765). From these reviews, Applicants determined that neither Mr. nor Mrs. Stiner welded on materials requiring Charpy impact testing (Tr. 9996, 10,012). Another computer check by Applicants of all systems welded on by Mr. and Mrs. Stiner supported this conclusion (Tr. 9996). While Mr. Stiner stated that he was sure that he welded on systems requiring impact testing, he could not remember the hanger numbers or exact locations (CASE Exhibit 919 at 7-8). On the basis of this record the Board finds that neither Mr. nor Mrs. Stiner welded on material requiring Charpy impact testing.

To illustrate worst-case heat input conditions, Mr. Stiner testified that he observed hangers on which the weld was in excess of 4 times the diameter of the weld rod and the parent metal was heated so hot that 4 or 5 inches out from the weld it was "blue tempered" (*id.* at 8). Applicants testified that this coloration was a surface condition which occurred

¹⁰ Applicants testified that these characteristics were present in low-carbon steels, including A-36. Further, Applicants testified that due to the fabrication process for SA-500 tube steel (also a low-carbon, unalloyed steel), excessive heat input may cause some change in the mechanical properties and perhaps tensile strength. However, these characteristics would be essentially the same. (Tr. 11,926-27.)

at 600°F (Tr. 10,020). Applicants attempted to simulate this condition using the material Mr. Stiner alleged to have seen, 6-inch by 8-inch tube steel, ¼-inch thick (Tr. 10,021). (In that this material was tube steel, it was SA-500 low-carbon steel (Tr. 11,927).) Applicants welded on this material continuously for 37 minutes using excessive weave beads. During the test, there were interpass temperatures of over 650°F, which exceeds the 500°F specified by the procedure. The result was a blue ring on the surface 1¼ inches from the top of the weld. (Tr. 10,022.) Applicants testified that the excessive heat would not have had an impact on the characteristics of the base material (Tr. 10,021-25). Judge Bloch summarized Applicants' testimony in this regard as follows: "first, it is impossible to get that wide a blueness and second, if it did, it wouldn't matter anyway" (Tr. 10,025, *citing* Applicants' Exhibits 178, 179). NRC Staff testimony supported Applicants' position in this regard (NRC Staff Testimony at 8).

Applicants also performed a test on low-carbon SA-36 material where interpass temperatures of 750°F (250°F in excess of the maximum interpass temperature) were achieved (Tr. 10,015). Specimens were cut from the test plate and tested. These tests confirmed the acceptability of the material's important properties (Applicants' Exhibits 178, 179; Tr. 10,018).

From the testimony, the Board finds that, even if Mr. and Mrs. Stiner had made some weave welds in violation of procedures, as alleged, it would not have had an adverse impact on safe operation of the plant.

2. Downhill Welding

Downhill welding is an industry term with its expected common meaning. It refers to vertical welds made by progressing from the top of the weld toward the bottom of the weld.

Downhill welds are accepted for many applications. Neither the ASME nor AWS Codes exclude any particular direction of progression. Rather, both Codes would allow the contractor to specify direction of travel. While the Codes do not exclude uphill or downhill welding, the Codes do state that regardless of which direction of progression is selected the welder must be qualified to weld in that direction.

Brown & Root welding procedures do not authorize downhill welding. However, welding procedures of other contractors on site do authorize downhill welding. (Applicants' Exhibit 177 at 15-16.)

CASE's concerns regarding downhill welding were based on Mr. Stiner's allegations that (1) "once metal has been welded on and cut on with

a torch, it builds up a magnetic field which causes arc blow” and to correct arc blow “lots of times, people will run a downhill weld instead of doing it correctly, because then you’re going in the direction of the magnetic field” (Tr. 4246-47) and (2) because of limited access conditions welders were at times directed to make downhill welds instead of uphill welds (CASE Exhibit 191 at 15). Mr. Stiner contended that such downhill welds were contrary to procedures and could potentially result in trapped slag and lack of fusion (Tr. 4247).

As discussed more fully below, the record reveals that the allegations raised by CASE regarding downhill welding have not been substantiated. In any event, even if isolated instances of downhill welding occurred, as alleged, the likelihood that it would have an adverse impact on plant safety is remote.

a. CASE’s Allegations Regarding Downhill Welding Do Not Substantiate a Breakdown in the QA Program

Mr. Stiner alleges that downhill welds were routinely made to correct for arc blow¹¹ and, as directed by supervisors, in limited access conditions (CASE Exhibit 919 at 15). While Mr. Stiner stated that unauthorized downhill welding was common practice at CPSES, he was only able to identify two specific instances where he alleged downhill welding occurred (Tr. 10,607, 10,622).¹²

With regard to arc blow, Applicants testified that contrary to Mr. Stiner’s assertions, welding on metal or cutting it with a torch will not result in a magnetic field on the base material. In any event, arc blow is not caused by the base material being magnetized. Applicants testified that, if proper grounding is present, arc blow is a problem only at elevated amperage rates, usually above 250 amps. (Applicants’ Exhibit 177 at 14-15.) Applicants further stated that because of the method of grounding used at CPSES, and the small-diameter electrodes and low amperage ranges used in the field for vertical welding (90-120 amps), arc blow for vertical welding is not a problem at CPSES (*ibid.*; Tr. 10,085-86). However, Applicants testified that due to a separate grounding system in the

¹¹ Applicants testified that arc blow is a phenomenon sometimes encountered in D.C. arc welding where the arc is deflected due to the deformation of the magnetic field which is present in some form in all arc welding (Applicants’ Exhibit 177 at 15).

¹² In addition to the two specific instances, Mr. Stiner states generally that Messrs. Coleman, Brown and Green (and other unnamed foremen) directed him to perform, or themselves made, downhill welds in limited access conditions (CASE Exhibit 919 at 5; Tr. 10,607-20, 10,622, 10,624-26, 11,489). Messrs. Coleman, Brown and Green denied these allegations. (Tr. 11,488, 11,716; Applicants’ Exhibit 177 at 19.) Mr. Brown, however, testified that in restricted positions he had made welds that Mr. Stiner could not make, but such welds were not downhill (Tr. 11,488).

welding training facility, at one time arc blow was a problem in the training facility, but not in the plant (Tr. 10,085-88). Mr. Stiner did not take issue with this testimony.

With regard to Mr. Stiner's allegations that downhill welding was routinely performed in limited access situations under the direction of a supervisor, Messrs. Fernandez, Pickett and Braumuller (welders remaining at CPSES from Mr. Stiner's crews) testified that they had not welded or seen others weld downhill in violation of procedures. Further, they testified that welders knew downhill welding was unauthorized and there was no incentive to do it; if caught it could mean the loss of the welder's certification or perhaps termination. (Applicants' Exhibit 177 at 18.) In this regard, Applicants testified that the welders at CPSES are trained that downhill welding is not authorized. In addition, the weld technique sheets used by all welders specify an upward progression. (Tr. 10,130.)

Messrs. Brown and Coleman (welding foremen on Mr. Stiner's crews) testified that they had never welded or seen others weld downhill in violation of procedures. They testified that due to their close monitoring of welders on their crews (including Mr. Stiner), if a welder welded downhill as a practice, they would have known about it. (Applicants' Exhibit 177 at 19.)

Mr. Baker testified that based on his personal observations in combination with numerous interviews with welders, welding technicians (including the results of the periodic unannounced welder inspections), fitters, welding foremen, and construction supervision, he is unaware of any information which would indicate that unauthorized downhill welding on safety-related or Class 5 supports occurred at CPSES. Based on his personal observations of welders and his review of pertinent records as well as discussions with numerous welders, foremen, fitters and QC inspectors, Mr. Brandt also testified that he was unaware of information that would indicate that such unauthorized downhill welding occurred at CPSES. (*Id.* at 16-18.)

Significantly, Applicants testified that there was no situation where it was easier to do a downhill weld than an uphill weld (Tr. 11,488-89, 11,854-57). NRC Staff testimony of Messrs. Gilbert and Taylor supports Applicants' testimony (NRC Staff Testimony at 22).

The Board now turns to the two specific incidents of alleged downhill welding raised by Mr. Stiner. The first involved another welder, Mr. Roy Combs, who allegedly welded stainless steel lugs to a pipe using a downhill weld (CASE Exhibit 919 at 15). Applicants testified that they performed a computer search of all stainless steel welds made by Mr. Combs (who is no longer working at CPSES) and performed a record search to assure that in all instances where he welded stainless steel lugs

to a pipe, proper QC inspections had been conducted. In addition, all welds that had not been ground down for nondestructive examination were again visually inspected to assure that there were no indications of downhill welds. (Tr. 10,036.) Based on this sample, which is the best available under the circumstances, we conclude that this alleged incident provides no support for Mr. Stiner's allegations.

In the second incident, Mr. Stiner testified that under the direction of Cliff Brown and Jimmy Green, he performed a downhill weld on a particular hanger in a limited access area (Tr. 10,613, 10,622).¹³ However, when Mr. Stiner was confronted with conflicting testimony regarding whether Mr. Brown could direct him to perform a weld, he reversed himself and testified that Mr. Brown did not direct him to make this downhill weld, but rather Mr. Brown made the weld himself (Tr. 10,967-75). An example of Mr. Stiner's inconsistency in this regard:

BY MR. REYNOLDS:

Q. Mr. Stiner, on page 10,622 you state that you were instructed to downhill weld by Jimmy Green and Cliff Brown?

A. What paragraph?

Q. This is lines 10 through 13.

A. That's correct.

Q. Yet, you say on lines 19 and 20 that you didn't even know Brown was a foreman? Is that correct?

A. I think when I said "instructed" I should have said "they told me to."

That'd probably have been the —

JUDGE BLOCH: As I understand the testimony, am I correct, Mr. Brown had a kind of a responsibility to get things fixed up so they could be bought-off. Is that correct? That's your testimony?

THE WITNESS: That is correct.

JUDGE BLOCH: And that you sometimes had that responsibility, too?

THE WITNESS: Yes, sir.

¹³ The Board notes that while Mr. Stiner relates this incident in vivid detail in his oral testimony (Tr. 10,612), in his earlier testimony (CASE Exhibit 666) Mr. Stiner did not mention this downhill weld. Since Mr. Stiner's earlier testimony discussed this hanger in detail (although not this downhill weld), the Board questions why Mr. Stiner failed to relate this incident earlier (*id.* at 35-36).

JUDGE BLOCH: Now, when you had that responsibility, you sometimes told other welders how to help you do that?

THE WITNESS: Yes, sir.

* * *

THE WITNESS: No, I never had the authorization to actually instruct a welder to go to another support and do something.

JUDGE BLOCH: Okay.

Did Mr. Brown ever have that authorization, to your knowledge?

THE WITNESS: Not at the time I worked there.

JUDGE BLOCH: So what was he doing telling you what to do?

THE WITNESS: Like I say, the reason why he came down there was because I couldn't crawl into the area; I couldn't crawl into the space due to the — my chest cavity being too big; and he was much thinner than I am; and they went to get him to come down there and do it.

And he tell me, he said, "Well you can do it, just run a downhill path."

And I said, "Well, I can't even get to it." So, you know, he went out and did it.

That's what I mean by he "instructed" me is when he told me, "Well, you can do it, you know" —

[Tr. 10,967, 10,975.]

In any event, Messrs. Brown and Green testified that they did not instruct Mr. Stiner to perform a downhill weld nor had they ever heard any foreman direct any welder to perform a downhill weld in violation of procedures (Tr. 10,037, 11,715-16, 11,753). In addition, pursuant to plant procedures, all such welds were required to receive a QC inspection. Furthermore, the NRC Staff inspected the hanger in question and testified that without cutting the hanger down and removing the paint it would be impossible to determine if a downhill weld was made. However, the Staff has testified that it will require the Applicants to evaluate the hanger and provide assurance that it is satisfactory for service. (NRC Staff Testimony at 22-23.) In short, due to the inconsistencies in Mr. Stiner's testimony this incident provides no support for CASE's position. The Board finds that the Staff action noted above is acceptable to provide reasonable assurance that even if this isolated incident did occur, there will be no compromise of public health and safety.

Based on the record, the Board finds that CASE's allegations regarding downhill welding are not substantiated. In addition, the Board finds either that the specific incidents of downhill welding alleged by Mr. Stiner did not occur or, in any event, that there is reasonable assurance that isolated violations that may have occurred would have no adverse impact on safe plant operation.

In making these findings, the Board is cognizant of the direct conflicts in testimony between Applicants' witnesses and Mr. Stiner. Based on the substantial inconsistencies in Mr. Stiner's testimony regarding this and other issues, as well as other factors set forth in § II.B, above, the Board finds Applicants' witnesses to be more credible.

b. Safety Implications of Downhill Welding

Mr. Stiner testified that his concern regarding downhill welding was that slag may be trapped and there may be a lack of fusion in the weld (Tr. 4247).

While Applicants testified that the likelihood of downhill welding in violation of procedures is extremely remote, they further testified that even if it occurred the probability that it would have an adverse impact on the plant is virtually zero. Applicants testified that if a welder experienced in downhill welding made the weld, it would in all likelihood be acceptable from a structural standpoint. (As previously noted, downhill welding itself is not contrary to any welding code.) However, if a welder was inexperienced, Applicants testified that his mistakes would in all likelihood result in obvious unacceptable visual indications which would be detected by either the welding technician/foreman (before QC inspection) or by the QC inspector during his inspection. (Applicants' Exhibit 177 at 18-20.) The NRC Staff supported this conclusion (NRC Staff Testimony at 20-21).¹⁴

Mr. Stiner attempted to refute this testimony by raising one instance where downhill welding may have adversely impacted the structural integrity of a weld, i.e., the weld which he alleged first that he performed and later that Mr. Brown performed, as discussed above. While Mr. Stiner's testimony on this weld is of questionable reliability in the first

¹⁴ In cross-examination of Applicants' and Staff's witnesses, CASE attempted to show that downhill welds could be made faster than uphill welds, and because of such speed there was a greater chance for lack of fusion and slag entrapment (e.g., Tr. 11,841-46). However, the Board notes that Mr. Stiner's allegations regarding downhill welding only related to instances where uphill welding could not be performed due to limited access or because of arc blow. In these instances, there would not be any accelerated welding speeds on downhill welds. Accordingly, such cross-examination is irrelevant to the issues before the Board.

instance, in any event, as previously noted, the Staff will satisfy itself that there is reasonable assurance that the hanger is acceptable.

Accordingly, from the record the Board finds that even if there were some downhill welds as alleged by Mr. Stiner, there is reasonable assurance that they would not adversely impact plant safety.

3. Weld Rod Control

CASE's concerns regarding weld rod control are based on allegations by Mr. and Mrs. Stiner. Mrs. Stiner alleged three specific instances of weld rod control violations:

- (1) she wrote an NCR on a welder whom she alleged had used two weld rods that had been checked out and not returned the day before (Tr. 4166);
- (2) she alleged that on one weld seventy-five rods were reported to have been used when it should have only taken three to four rods (Tr. 4164); and
- (3) she found two bundles of rods laying in the plant which she alleges were turned over to a QC supervisor who did not investigate the incident but simply threw the rods in the trash (Tr. 4164).

In addition, Mr. Stiner raised one specific instance of alleged inappropriate weld rod control, i.e., that he welded hangers with rods that were checked out to others in the crew (Tr. 4220-21). From these specific instances and other general observations, Mr. and Mrs. Stiner alleged that weld rod control violations were common practice at CPSES.¹⁵

At the start of each shift, the foreman signs and issues to each welder one or more weld filler material log ("WFML") sheet(s). (Prior to 1979, the form used was called a filler material requisition form; it contained essentially the same information as the WFML.) Each WFML specifies, among other things, (1) the specific item or joint to be welded on, (2) the weld rod material type and quantity requested to perform the work, (3) the welding procedure to be used, and (4) the identification symbol of the welder doing the work. The welder then takes the WFML to the appropriate issue station to draw the weld rod material for each specific work item. The distribution station attendant enters on the WFML the amount of material issued and the heat number of the material. The attendant also checks the welder's symbol against the welder qualification matrix to assure that the welder is qualified for the welding procedure listed and verifies that the material requested is the correct

¹⁵ The issue of unplugged weld rod containers was also raised. However, in the July 29, 1983 Partial Initial Decision, LBP-83-43, *supra*, 18 NRC at 142, the Board ruled that this issue would "not affect the safe operation of the plant."

type for use with the procedure. In a separate accountability log, the station attendant lists the welder's symbol and the container numbers that have been issued.

After obtaining the filler material, the welder goes to a work station to weld. It should be noted that before a welder uses a weld rod, he checks it to assure that it is not damaged. Damaged and used rod stubs are retained by the welder.

At the conclusion of each shift, each welder is required to return to the issue station to turn in any unused or damaged filler material and to turn in all remaining rod stubs. The amount of unused and undamaged filler material is entered on the WFML. Unused rods, rod stubs and damaged electrodes are counted and where this count does not equal the number of rods issued, this information is entered on a welder's log which is periodically tracked by the distribution station attendant and reviewed by welding engineering to assure that there is no trend of excessive rod stubs unaccounted for. If a welder does not turn in his filler material at the end of the shift, this can be a basis for firing the welder.

In short, regardless of what area the welder is welding in, at the beginning and end of each shift each welder must go to the issue station to disposition the material he is using. In this way, filler material used is accounted for at the beginning and end of each shift. If a welder fails to turn in his filler material at the end of his shift, an investigation is conducted to determine where it is. It should be noted that this weld rod control program exceeds all ASME or AWS Code requirements for control programs.

Finally, the Welding Engineering Department inspects the rod distribution stations for compliance with these procedures every 2 weeks.

As discussed more fully below, the record reveals that CASE's allegations regarding weld rod control violations are not reflective of a systematic or significant breakdown in the QA/QC program. In this regard, specific instances where violations were alleged to occur were either unsubstantiated or were previously detected by QC and corrected. In any event, the record reflects that even if violations had occurred as alleged, the likelihood of an adverse impact on safe plant operation is remote.

a. Allegations of Weld Rod Control Violations Do Not Substantiate a Breakdown in the QA/QC Program

Applicants presented testimony describing the weld rod control program which the Board adopts in these findings of fact, as follows (Applicants' Exhibit 177 at 21-23):

The Brown & Root weld rod control program at CPSES is governed by a construction procedure. The program is based on a daily system of accountability where each welder is accountable for all weld material he uses on each shift.

In response to Mr. and Mrs. Stiner's allegations that violations of the weld rod control program at CPSES are widespread, Applicants presented Messrs. Fernandez, Pickett and Braumuller (welders on Mr. Stiner's crews who also worked in areas inspected by Mrs. Stiner), who testified that they had not themselves violated or seen others violate the weld rod control procedures at CPSES. Further, they testified that welders who intentionally violated these procedures would be fired; thus, there was an incentive to adhere to these procedures (*id.* at 31-33; Tr. 11,534).

Mr. Brown (a QC inspector who was also welding foreman over one of Mr. Stiner's crews) presented similar testimony. Mr. Coleman (a QC inspector and a welding foreman over one of Mr. Stiner's crews and who also welded in the same areas as Mrs. Stiner) stated that except for one incident, he also had never observed violations of the weld rod control program. (Mr. Coleman's exception related to an instance where he had unintentionally failed to turn in a rod container; the rod shack attendant alerted his supervisor and the next morning Coleman was "chewed out" by his foreman.) (Applicants' Exhibit 177 at 31-33.) Messrs. Brown's and Coleman's testimony in this regard is significant in that they closely monitored the work of all welders on their respective crews and would have been in a position to notice violations if they occurred (*id.* at 10).

Messrs. Green and Hallford (foreman and general foreman over one of Mr. Stiner's crews) testified that they had not observed any violations of the weld rod control program, but they were aware of one where QC noted a violation and the welder was fired immediately. (This incident is one raised by Mrs. Stiner and discussed below.)

Messrs. Baker and Brandt testified that based on personal observations of welders in the plant, as well as discussions with numerous welders, fitters, foremen, QC inspectors, welding foremen and welding technicians, the weld rod control procedures at CPSES are, with very few exceptions, strictly adhered to. In this regard Applicants testified that in addition to the inherent checks built into the rod control program (e.g., the counting of returned rods and rod stubs to determine if any are missing), other mechanisms that provide assurance that violations are detected include the periodic inspections of each active welder every 14 days (previously addressed), routine monitoring of welders by welding technicians/foremen and other supervisors, and QC inspections (during which weld rod traceability is checked) and surveillance. (*Id.* at 33-34.)

The NRC Staff presented supporting testimony regarding Applicants' weld rod control program. Further, the Staff testified that over the

period of construction at CPSES, NRC inspectors have routinely examined the Applicants' welding activities, including weld rod control. With respect to weld rod control, the inspectors emphasized "whether the documented weld rod was being used in a given weld under observation, and whether the weld rod was appropriate and properly traceable." (NRC Staff Testimony at 36.) The Staff testified that there were no identified findings indicating problems in these areas. In this regard, the Staff noted that what may appear to be a situation where a weld rod has been abandoned, in reality may be where a welder has temporarily left his immediate work station for personal or other needs. As part of the NRC's routine inspections, the inspector has observed apparently unattended weld rods in cans, buckets, or pouches and after remaining near these "unattended" rods found that welders did return to the work station in a matter of minutes. (NRC Staff Testimony at 36-37.)

The NRC Staff also testified that Brown & Root Project Welding Engineering is required by the ASME-approved Brown & Root QA manual to maintain periodic surveillance of the rod issue stations and of welders to whom rods have been issued. This requires surveillance of the rod issue stations every 14 days, and of the welder at least once every 10 working days. A sample of the records of these surveillances has been reviewed by the Staff. The Staff found that the records were complete, the required surveillances were done, and no pattern of discrepancies or potential problems with either weld rod control or welder activities was identified. In addition, the Staff testified that the Brown & Root QA Corporate Office conducted periodic audits of the welder and weld rod issue station surveillances. The Staff reviewed one of these audit reports, and it did not disclose any significant problems. (NRC Staff Testimony at 34-35.)

Mr. Stiner testified that he received no training or indoctrination regarding weld rod control (Tr. 11,140). However, he later contradicted himself by stating that his first foreman, Mr. Coleman, gave him indoctrination regarding weld rod control (Tr. 11,146). In addition, Applicants testified that after successful completion of qualification testing and prior to being released for production welding, each new welder at CPSES (including Mr. Stiner) was given an orientation by welding engineering as to the requirements of the weld rod control procedure. Applicants testified that at this orientation the importance of filler material control at the facility was explained to the welder and the welder was informed that any willful violation of the procedure would result in immediate firing. This orientation was documented and the welder signed a form indicating his understanding. (Applicants' Exhibit 177 at 27-28.)

With regard to the threat of termination for weld rod control violations, Mr. Stiner testified as follows (Tr. 10,853-54):

BY MR. REYNOLDS:

Q. What would happen if you were caught doing that [committing weld rod control violations] Mr. Stiner?

A. Immediate termination.

Q. What is the incentive for doing it?

A. The incentive for doing it is, as I said before, the convenience to the welder.

Q. You would risk your job to avoid having to walk back to the rod shack for rods?

A. Well, as I have stated before, the quality control program at Comanche Peak is, you know, less than adequate in the fact that they can't catch these types of problems. So they can literally do it all over the place and the quality control inspector has no way of knowing that it is being done.

JUDGE BLOCH: But before, Mr. Stiner, you said that the quality control people would wander around the plant and you would have to worry about them and cover for your welds. Why wasn't the same thing true for additional weld materials as it was for your repair welds?

THE WITNESS: That is why I say they always had somebody watching when they do this.

JUDGE BLOCH: But why do you always have to have someone watching when you are doing a repair weld but you don't worry at all about QC finding extra weld rod materials?

THE WITNESS: Well, you do worry about it. Like I said, it is reason for termination, you see.

Mr. Stiner also testified that workers violated weld rod control procedures regarding retention of rods, even under threat of termination, because "they are under so much pressure to get the work done and get the hangers up that they try to do anything they can do to speed up work" (CASE Exhibit 919 at 19). However, in response to an inquiry that appeared to bring into question the logic of such a position, Mr. Stiner reversed himself and testified that he did not hold out rods because he was under time pressure (Tr. 11,126-28). The Board finds Mr. Stiner's testimony on this issue to be inconsistent and unreliable.

Mr. and Mrs. Stiner also testified that the accountability process specified in the weld rod control program was ineffective. Specifically, they al-

leged that rod stubs were not counted or recorded by rod shack attendants (Tr. 10,638, 10,978-83).¹⁶ However, Mr. Stiner testified later that early in his employment he was told by his first welding foreman, Mr. Coleman, that he had to "keep account of everything . . . don't lose none of your stubs . . . because they may count them on you when you go back and if you don't have any they will write you up, you know." (Tr. 11,146).

Applicants testified that rod stubs are counted (Applicants' Exhibit 177 at 21-23; Tr. 11,419-20, 11,422, 11,592, 11,670) and introduced an example of the checksheets maintained by the rod shacks reflecting shortages resulting from such counts (Applicants' Exhibit 185, introduced into evidence at Tr. 11,975).

Mr. Baker testified that the rod counts are monitored on a daily basis by the rod shack attendant and reports are sent monthly to the piping general superintendent who reviews them for trending purposes (Tr. 11,892-93). Mr. Coleman testified that normally the attendants in the rod shack would take the rod stubs and pour them out of the stub can, count them and then throw them into a barrel (Tr. 11,594). However, Messrs. Coleman, Pickett and Braumuller testified that at busy times the attendants would take the stub cans and write the welders' symbols on them and place them off to the side; when the rush was over they would count the stubs (Tr. 11,594-95, 11,637-41, 11,684-85). Further, Mr. Brown testified that if a welder did not return his unused weld rods and stubs, the weld technicians would conduct an investigation (Tr. 11,501-02).

Mr. and Mrs. Stiner raised four specific incidents of weld rod control violations. In the first incident, Mrs. Stiner testified that she wrote an NCR on a welder who had used two weld rods that had been checked out and not returned the day before (Tr. 4166). Applicants' witness Baker testified that Applicants' investigation of Mrs. Stiner's NCR (#M82-0034) revealed that while the facts were substantially as Mrs. Stiner had stated, she did not discuss the resolution. In this case, Applicants testified that the welder had completed the weld the day before and intended to alert QC that an inspection was needed the next day. The next morning the welder was assigned another task, drew his weld rods for the other task, and went back to the weld he had worked on the preceding day to get a QC inspection. For some reason he did some more welding on the weld (perhaps he saw something he had missed) using two additional rods (either from his rods checked out for other

¹⁶ Mr. Brandt testified that the practice of issuing a precise number of weld rods and counting returned stubs was not widely used at other nuclear construction sites. Other nuclear construction projects which are in compliance with Code requirements merely issue rods by weight. (Tr. 11,422.)

tasks that day, or as Mrs. Stiner alleges, from two rods he kept from the previous day). In any event, the incident was uncovered in the QC inspection and an NCR was written. The resolution of the NCR was that the welder was *terminated immediately* and the weld was ground out and replaced. (Applicants' Exhibit 177 at 28-29.) The Board finds that this incident provides no support for CASE's position. If anything, it reflects that the QA program functioned properly and that violations of the weld rod control procedure at CPSES are taken seriously.

In the second incident, Mrs. Stiner alleged that seventy-five weld rods were used on hanger SI-0135032.S35R (Tr. 4164). She alleged that that particular hanger should not have required more than three to four rods (Case Exhibit 919 at 20; Tr. 4165). Applicants testified that the Applicants' investigation revealed that only fifty weld rods (not the approximately seventy-five that Mrs. Stiner reported) were issued. Further, the weld rod accountability log did not reflect that any rods were missing (i.e., the total number of unused rods, rod stubs and damaged rods turned in was fifty). As to the specifics of the incident, records reflect that at 7:10 a.m. on April 9, 1980, the date in question, the welder checked out fifty rods for the hanger. At 1:48 p.m. that same day he returned the rod can, plus unused and damaged rods and rod stubs. (Records indicate that there were no missing rods.) The welder then checked out additional rods for another job using a separate WFML. At the end of the day he turned in the remaining unused rods, stubs or damaged rods. The welder could not remember the incident. (Applicants' Exhibit 177 at 29-30.) The Board finds that this incident does not raise a safety concern or provide support for Mrs. Stiner's allegations.

In the third incident, Mrs. Stiner testified that she found bundles of unburned rods wrapped in a rubber band (Case Exhibit 919 at 20). Mrs. Stiner alleged that after she gave the rods to her supervisor, he threw them into the trash (Tr. 4165, 10,206-07, 10,293-97, 10,470-74). Mrs. Stiner stated, however, that she did not know if he later removed them from the trash (Tr. 10,296). Applicants testified that the two bundles of weld rod material were not immediately discarded without an investigation, as Mrs. Stiner had indicated. Rather, the weld rod material was given to Mr. Brandt who subsequently turned it over to construction to assure that an investigation was conducted. (Applicants' Exhibit 177 at 30; Tr. 11,459-60.) Based on the investigation, Applicants were able to trace the rods to the organization which used them (not Brown & Root) and training was conducted to correct the situation (Tr. 11,454-55).¹⁷

¹⁷ Mr. Brandt testified that other QC inspectors have at times also discovered loose rods and reported them to their supervisors (Tr. 11,426-27) who assured that the incidents were investigated (Tr. 11,440).

The Board finds that this incident also reflects that the QA program was effective and appropriate corrective action taken. However, there is a gap in the record for the Staff to fill through investigation. If Applicants found bundles of unburned rods left uncontrolled by Grinnell Fire Protection Company, an organization doing construction on site, it is not at all clear that instruction alone would cure the problem with respect to work that had been already done. We trust that the Staff will inquire into whether this nonconforming condition was properly resolved with respect to prior work of Grinnell Fire Protection Company.

In the final incident, Mr. Stiner testified that his supervisor was under a great deal of pressure to complete a particular assignment which Mr. Stiner described in detail. He stated that to accomplish this the welders on the crew used rods checked out to other welders to complete work. (Tr. 4220-21.) Mr. Baker testified that the Applicants investigated the allegation and determined that welders from Henry Stiner's first crew remaining at Comanche Peak (Messrs. Pickett and Braumuller) stated that no such incident occurred. Further, the welding foreman (Mr. Coleman) on Stiner's crew at that time also stated that no such incident occurred. In any event, even if the incident did occur, Applicants testified that all the welders on Stiner's crew would have been welding on the same material with the same type weld rod. Thus, while such action would have been a violation of procedure, Applicants concluded it would not have had an adverse impact on plant safety. (Tr. 4220, 10,648-50.) The Board finds that substantial and credible testimony from Applicants' witnesses reflect that the incident never occurred.

From the testimony, the Board finds that CASE's allegations regarding weld rod control do not reflect systematic or significant violations of procedures indicative of a breakdown in the QA/QC program. In addition, the Board finds that there is reasonable assurance that the specific incidents of weld rod control violations raised by Mr. and Mrs. Stiner do not raise a significant safety concern.¹⁸

b. Safety Implications of Weld Rod Control Violations

Mr. and Mrs. Stiner raised as their concerns regarding weld rod control violations, the possibility that weld rods left out may absorb moisture and result in defective welds due to excessive porosity (CASE Exhibit 919 at 18; Tr. 10,648). Also, they were concerned over the impact of

¹⁸ During direct examination of Mrs. Stiner, CASE attempted to raise in connection with weld rod control, the new issue of placement of welders' symbols adjacent to welds (Tr. 10,477-94). Upon a representation by Applicants' counsel that such symbols would not be relied on to support the adequacy of the weld rod control program, the Board ruled that such testimony was not admissible (Tr. 10,494).

welders exchanging weld rods (Tr. 10,640-41, 10,650); however, in later testimony, Mr. Stiner stated that this was not a safety concern (Tr. 11,150).

With regard to the first concern, Mr. and Mrs. Stiner testified that when weld rods are kept out and not controlled they can absorb moisture (Case Exhibit 919 at 19, 21; Tr. 10,283, 10,648, 10,858, 11,124). They stated that E-7018-type electrodes should not be exposed to an unheated atmosphere for more than 4 hours (Case Exhibit 919 at 20; Tr. 10,646).

The NRC Staff testified that if weld rods had been exposed to ambient air at CPSES for 2 to 3 days (such as alleged here) the "worst-case effect" would be porosity in the weld (which is due to arc instability and off-gassing of water vapor) which should be detected during the normal visual inspection by the welder and QC (NRC Staff Testimony at 33, 35).

Applicants conducted tests of E-7018 electrodes (the electrodes used by Mr. and Mrs. Stiner) which had been stored for 7 months in an open container in an uncontrolled atmosphere. Using this electrode, test specimens were welded utilizing a full penetration butt weld. Nondestructive and destructive examinations conducted on the resulting specimen showed no rejectable defects; failure of the base material (not the weld material) occurred at a reading in excess of 70 kilograms per square inch (ksi), the maximum requirements for any affected steels (most steels have a much lower requirement). In short, even if weld material was left out for 2-3 days (as alleged by Mr. and Mrs. Stiner), the Board finds that there is little likelihood that this could have an adverse impact on the safety of the plant. (Applicants' Exhibit 177 at 27.)

With regard to the second concern, Mr. and Mrs. Stiner alleged that welders deliberately saved weld rods to lend to other welders so that these welders would not have to get rods issued from the distribution stations (Case Exhibit 919 at 19; Tr. 10,209-10, 10,223, 10,648-50). However, Mr. Stiner stated that this was not a safety concern (Tr. 11,150). Applicants presented testimony that all welding on safety-related low-carbon and mild steels at CPSES which is of concern here (the welding to which Mr. and Mrs. Stiner referred in their testimony) uses the same electrode (weld rod), E-7018. Thus, Applicants testified that the possibility of a welder borrowing an electrode from another on his crew and getting the wrong electrode for the job was virtually nonexistent. Applicants further testified that, in any event, welders are trained to know that they can only use the specific electrodes designated for that job. (Applicants' Exhibit 177 at 26.) The Board finds that even if some weld rod control violations such as alleged by Mr. and Mrs. Stiner oc-

curred, there is reasonable assurance that they would not have a significant adverse impact on plant safety.

4. *Welding of Misdrilled Holes*

Mr. and Mrs. Stiner alleged that under the direction of supervisors, welding of misdrilled holes without appropriate welding engineering authorization or proper QC inspection was common practice at CPSES (CASE Exhibit 919 at 22-23).

The numerous inconsistencies in Mr. and Mrs. Stiner's testimony called into question their credibility on all issues (*see* § II.B, *supra*). On this issue we do not believe that Mr. Stiner's testimony can be relied upon and accordingly, the Board gives it no weight. The one overriding factor regarding the Board's decision involves Mr. Stiner's incredible statement that a 1¼-inch hole in 2-inch-thick material (on which he allegedly welded many times (Tr. 10,683-84)) could be easily welded in about 2 minutes (excluding the blending of the weld with surface material (Tr. 10,698-99)), *and* it would only require two weld rods to complete (Tr. 11,158).

NRC Staff witnesses stated that it was impossible for such a hole to be welded in 2 minutes or with the two weld rods as noted by Mr. Stiner. The Staff testified that a simple volumetric calculation reflected that it would require twenty-five weld rods to fill the hole. (Staff Testimony at 26; Tr. 12,250-51.) Further, the Staff testified that it takes approximately 1 minute to burn one weld rod (Tr. 12,250). Accordingly, even assuming that only twenty rods were required to fill the volume of the hole, it would take 20 minutes to simply burn the rods, not including the time required to change rods or turn the specimen over (Tr. 12,251-52). Based on independent testing, Applicants testified that such a hole would require approximately twenty weld rods to complete (Tr. 11,768).

Mr. Stiner's sworn testimony on this point is not accurate and reliable. The Board believes that any welder who had ever weld-repaired a misdrilled hole of this large size or smaller would have been able to at least provide a response that was in the ballpark. In that Mr. Stiner was not able to do so, the Board questions whether Mr. Stiner has ever performed a weld repair on a misdrilled hole. This, in combination with other inconsistencies noted in § II.B, above, leads the Board to conclude that on this issue Mr. Stiner's testimony will be given no weight.

In any event, Mr. Stiner's principal concerns are that misdrilled holes were "repaired" without proper authorization or QC inspections, and

may contain slag so as to call their structural integrity into question.¹⁹ These concerns are addressed below in conjunction with the Board's discussion of Mrs. Stiner's allegations.

With regard to allegations concerning widespread repair of misdrilled holes without proper engineering authorization or QC inspection, Messrs. Fernandez, Braumuller and Brown, who each were welders or foremen in the same areas as Mr. and Mrs. Stiner for an extended period of time, testified that they had never welded a misdrilled hole (Applicants' Exhibit 177 at 38; Tr. 11,479, 11,690). Mr. Coleman testified that he had welded some misdrilled holes on cable tray supports in the cable spreading room, but that these had all been properly inspected (Tr. 11,542-53). Mr. Pickett also stated that he had welded a few misdrilled holes on cable tray supports in the cable spreading room which had also been properly inspected by QC (Tr. 11,625). Indeed, both Messrs. Coleman and Pickett testified that QC personnel were in the cable spreading rooms when the repairs were being made (Tr. 11,543, 11,625).

The testimony of both Messrs. Coleman and Brown that they had not observed any unauthorized welding of misdrilled holes is significant in that they routinely monitored the work of the welders under them, including Mr. Stiner, and would have been aware of any problem which existed in this regard (Applicants' Exhibit 177 at 10; Tr. 11,480, 11,534). Messrs. Green and Hallford, who have also had welders under their supervision for an extended period of time at CPSES, provided similar testimony (Applicants' Exhibit 177 at 41).

Applicants further testified that there was little motivation to violate procedures by performing unauthorized welding on misdrilled holes, to do this could result in termination (*ibid.*).

Both Mr. Pickett and Mr. Coleman stated that they were not sure what design documentation authorized their repair of the misdrilled holes in cable tray supports (Tr. 11,544-45, 11,647).²⁰ Applicants testified that these repairs were made in accordance with a Design Change Authorization ("DCA") issued by the design engineer for the welding

¹⁹ It should be noted that individuals that Mr. Stiner implicated as having performed such welds or having directed him to perform these welds have denied the allegation, *viz.*, Messrs. Coleman (Tr. 11,540), Brown (Tr. 11,479), Pickett (Tr. 11,622), Fernandez (Tr. 11,690) and Braumuller (Tr. 11,690).

²⁰ Mr. Coleman stated that he had no paperwork when repairing the holes (Tr. 11,545). He stated that his foreman may have had the paperwork (Tr. 11,545, 11,787). In any event, the Board requested that Applicants provide it a report on this issue (Tr. 11,786-87). By letter of April 27, 1984, Applicants provided to the Board and all parties a report which explained why separate authorization at that time was not needed to weld-repair misdrilled holes on cable tray supports in the cable spreading room. The Board is satisfied with the report.

of these and other holes on cable tray supports (Tr. 10,039).²¹ Since these repairs were non-ASME repairs, only the DCA was needed, not an RPS (NRC Staff Testimony at 24; Tr. 10,137). The Staff further testified that Inspection Report 81-12 (Staff Exhibit 178) determined that "plug welds" were being utilized by welders in accordance with Brown & Root welding procedures (NRC Staff Testimony at 26, 30).

With regard to the welding procedure used to make the repairs, Applicants testified that if the welds were authorized by engineering, Welding Procedures 10046 and 11032 could be used to repair AWS and ASME welds, respectively (Tr. 11,393). As previously noted, a DCA had been authorized to repair misdrilled holes on cable tray supports. Repair of pipe supports was not authorized by this DCA. (Tr. 10,040.) In response to cross-examination on this issue, Mr. Pickett verified this by testifying that baseplates for pipe supports which had misdrilled holes were discarded (Tr. 11,632-33).

To determine if the QC inspections were being routinely performed on weld repair of misdrilled holes, Applicants conducted a preliminary search of documentation for cable tray hangers in the cable spreading room and reported that QC inspection reports of over 450 misdrilled holes were located (Tr. 10,038). Applicants concluded that this reflected that misdrilled holes were being properly inspected by QC (Tr. 10,039, 11,401-07).

Mrs. Stiner testified that she weld-repaired misdrilled holes under orders many times (Case Exhibit 919 at 23). However, she stated that she could only remember doing them on the "fab tables" in the turbine building (Tr. 10,555). She stated that while a couple of other welders who worked on the fab tables also made such welds (she doesn't remember the names), she did not know what other welders in the field did (Tr. 10,553-54). She stated that she made such welds under the orders of James Stembridge (her foreman), and though she was less sure, Clay Andrews (another foreman). (Tr. 10,286-88, 10,541.) She stated that she thought it was improper because she was told to watch for QC (Tr. 10,529). The record reflects that Mr. Andrews was Mrs. Stiner's first foreman while she was a welder; Mr. Stembridge replaced Mr. Andrews and was her foreman for a fairly short period of time. (Tr. 4130, 11,782.)

Applicants investigated Mrs. Stiner's allegation by interviewing Mr. Stembridge (Mr. Andrews no longer works at CPSES) and others associated with the incident (Tr. 11,781-86). Mr. Stembridge stated that he

²¹ DCA 5347 provided direction on which misdrilled holes needed to be repaired and authorized their repair (Tr. 11,407). It should be noted that based on this DCA, Mrs. Stiner's testimony that *all* misdrilled holes needed to be welded (Tr. 10,506) is in error.

had directed Mrs. Stiner to make unauthorized repairs on three hangers that had misdrilled holes in them (Tr. 11,781). Applicants testified that Mr. Stembridge had been a foreman in the small-bore hanger fabrications area for about 4 months when the incident occurred. Applicants testified that one day, seven hangers were sent from the fab shop to Mr. Stembridge to install, but three of them were wrong. Applicants testified that Mr. Stembridge stated that as a new foreman he tried to shortcut the system. (Tr. 11,782.) However, another foreman saw the activity and informed a QC inspector, Mr. Wilkerson. Mr. Wilkerson stated that he investigated and caught Mrs. Stiner making unauthorized repairs. (NRC Staff Testimony at 28; Tr. 11,782.) The hangers were subsequently scrapped and Mr. Stembridge was demoted to and remains in a nonsupervisory position (NRC Staff Testimony at 28-30; Tr. 11,786). Staff testimony supported the results of Applicants' investigation (NRC Staff Testimony at 27-30).

Mrs. Stiner stated that her concern with repairing misdrilled holes is slag entrapment²² (Case Exhibit 919 at 22). She further stated that if slag were left in the weld it would be an improper weld (Tr. 10,497). While she attempted to clean out as much slag as possible with a chipping hammer, she testified that there was still some left inside the weld²³ (Tr. 10,229, 10,235, 10,236, 10,284).

Applicants testified that welding of a misdrilled hole is a relatively simple procedure (Applicants' Exhibit 177 at 42; Tr. 11,623). Further, Applicants stated that it was very difficult to leave significant slag deposits using low-hydrogen electrodes, like those used at CPSES, because the normal welding technique provides assurance that slag remains fluid, floats to the top of the weld and is removed (Applicants' Exhibit 177 at 36). The Staff testified that if there were large amounts of slag entrapped, when the arc was struck much of this slag would become granulated from the force of the arc and would float to the top with succeeding passes (Tr. 12,240). Applicants testified that it was very difficult to weld over unacceptable slag deposits using normal welding techniques (Applicants' Exhibit 177 at 36, 37). Further, if the weld was not relatively free of slag, there would in all likelihood be unacceptable surface indi-

²² Mrs. Stiner also stated that repair welds could not be traced because welders did not put their symbols on them (Tr. 10,504, 10,528-29, 10,670-71). Applicants' witness Coleman stated that he repaired misdrilled holes in accordance with procedures and that included placing his welding symbol by the welds (Tr. 11,545-46). Applicants' witness Pickett also placed his symbol on the "plug welds" he did in the cable spreading room (Tr. 11,629). In any event, the allegation does not raise a safety concern.

²³ Mrs. Stiner testified that a pencil grinder was needed to clean slag completely out of a misdrilled hole, but there were none available (Tr. 10,285-86, 10,499). Other welders and foremen (Pickett, Braumuller, Fernandez, Coleman, Brown and even Mr. Stiner) testified that they had pencil grinders in the areas in which they worked (Tr. 11,469, 11,547, 11,621-22, 11,643, 11,666).

cations remaining on the face of the weld. Test techniques corroborated this. (*Id.* at 37, 39.)

To determine the possible impact of slag deposits on repairs of misdrilled holes, Applicants conducted a test of the effects of slag inclusions in a misdrilled hole on the strength of the material. Two test specimens of SA36 plate material with a minimum tensile strength requirement of 58 ksi were prepared. The specimens were approximately 8 inches in length and 3/8-inch thick,²⁴ and, in the area of concern, approximately 1.5 inches in width. A 3/4-inch-diameter hole (which was to be welded) was drilled in the area of concern of each specimen. This hole, therefore, comprised one-half of the cross-sectional area of the test specimen. Applicants testified that in view of gauge tolerance requirements under which a hole cannot be placed nearer than 1 hole-diameter to the edge of the material (here being 3/4 inch), this configuration was extremely conservative.) (Applicants' Exhibit 177 at 43-44. However, it is difficult to generalize about the probable location of welds made in violation of procedures because there was no authorizing weld repair paper.)

The hole in one of the specimens was properly welded and radiographed to assure that it was perfect. Applicants testified that after numerous attempts and using abnormal welding techniques, the hole in the second specimen was welded with significant slag deposits remaining. (As previously noted, it is very difficult to weld over slag in a hole.) The second specimen was radiographed showing major slag inclusions throughout the weld, including one which was about 1/4 inch at its widest point, 1/2 inch in length and about 1/8-inch thick. Tensile tests were performed on each specimen. The first specimen (with the good weld) failed at a tensile strength of 71,639 psi. Significantly, the failure occurred in the specimen material and not the weld material (i.e., the weld material was stronger than the base material). The second specimen (with major slag inclusions) failed at a tensile strength of 69,918 psi, still significantly above the 58,000 psi required of the material. (*Ibid.*)

In sum, Applicants testified that even when skilled craftsmen attempted to weld a worst-case weld such that major slag inclusions were present in the material, the strength of the resultant weld was not significantly lower than the strength of the base material, and still well above the required strength. Applicants thus stated that even if some degree of slag was present in a weld of a misdrilled hole, as alleged by Mrs. Stiner, it

²⁴ Mr. Stiner stated that this test was flawed because the specimens should have been 2 inches thick (Tr. 10,683). Applicants testified that the thickness was immaterial in that the relevant parameter of concern (pounds per square inch (psi)) was dependent and correlated with the cross-sectional area (Tr. 11,905-06).

would not have had a significant adverse impact on the strength of the material.

Ordinarily, we would not accept any test of a single sample to be dispositive of any safety issue, particularly where the relevant variable — the amount of slag inclusion — is not fully detailed and where it is not possible to tell whether the test caused stress concentration within the welded area. In addition, the only thing that was tested was a newly made weld, which may or may not be representative of the extent to which inclusions may progressively weaken the weld material over time.

However, the NRC Staff supported Applicants' conclusions and testified that the Brown & Root Welding Procedures 11032 and 10046 specified the use of E-7018 weld rod, a low-hydrogen rod which produces a weld with a tensile strength of approximately 70,000 psi, or about 10,000 psi better than the tensile strength of the base material. If the "plug weld" was made well enough not to be readily discernible after surface grinding, which was the case for both Mr. and Mrs. Stiner, the Staff testified that the weld and the surrounding base material would be at least as strong as the original base material before it was drilled. (Staff Testimony at 26.) Although the Staff did not testify about the continued strength of the weld over time, the technical point is fairly obvious and we expect that the Staff considered it. If the Staff did not, we would expect it to correct the record on this point.

From the foregoing, the Board finds that Mrs. Stiner was directed to perform unauthorized weld repairs of misdrilled holes on at least three hangers on the turbine building fab tables.

In any event, in view of the testimony of Applicants and Staff, the Board finds that most, if not all, hangers repaired by Mrs. Stiner on the fab tables were subsequently cut down and replaced. In addition, based on (1) Applicants' testing which suggests that even large amounts of slag in the repair weld would not affect the weld integrity of a newly made weld and (2) Staff testimony that as long as the surface of the weld repair of a misdrilled hole was acceptable (as both Mr. and Mrs. Stiner stated) the weld would provide acceptable structural strength, the Board finds that even if some weld repairs of misdrilled holes were not properly inspected and contained defects as alleged by Mr. and Mrs. Stiner, it is unlikely to have an adverse impact on the safety of the plant.

Conclusion About Improperly Documented Repairs

We are far less sanguine about Applicants' failure to comply with their procedures than we are with the possible safety implications of their having failed to do so. Violations of procedures are important in their

own right because they contribute to the workers' understanding of the extent to which procedures are to be taken seriously and followed scrupulously. The record in this instance convinces us that there was a practice of indeterminate extent at Comanche Peak with respect to welding unauthorized repair welds. Since Applicants did not make the required contemporaneous investigation of this practice, we find that the practice was of substantial extent and that this violation of procedures was a significant violation of Appendix B to 10 C.F.R. Part 50.

First, we note that until January 1983, Welding Procedure WES-29 required that the welding engineering department issue a Repair Process Sheet (RPS) specifying the methods and techniques to be used for any base metal repairs, the qualified welding procedure to be used in making the repair (for Class 4 and 5 hangers the repair procedure is CDM 6.9 (Tr. 11,969 (Baker))), and the type of nondestructive examination to be made of the repair. The RPS also provided for a final inspection by quality control. Tr. 11,766 (Baker).

Second, we note that when Applicants detected Mrs. Stiner making an improper repair at the direction of her supervisor, they failed to create any deficiency paper and made no contemporaneous investigation of the extent of this improper practice. Tr. 11,783-84. This was a clear violation of Appendix B requirements for the prompt identification of deficiencies and for trending of deficiencies that may be significant. (At that time, Applicants had not done studies of the effects of improper repairs and they cannot take credit for their subsequent studies as an excuse for not trending this earlier deficiency.)

Third, we note that Applicants repeatedly testified that individuals are "terminated" when they violate procedures. However, Mr. Stembridge was merely reduced in rank. We infer from other testimony and from the failure to investigate the extent of the practice at that time that Mr. Stembridge's directions to his welders about repair welds may not have been an isolated incident. Fred Coleman, who was a welder at the plant, testified that there were many misdrilled holes repaired in the Unit 1 cable spread room. Tr. 11,542. Additionally, Mr. Coleman was not even aware that any form of paper, such as a Repair Process Sheet, was needed for him to repair such a hole. Tr. 11,544-45. Nor have Applicants even attempted to explain this testimony of Mr. Coleman.

The welding of misdrilled holes without authorization is further substantiated by a Staff inspection of fifty-six supports in the north cable spreading room. Staff found two plug welds in each of three supports, but none of these welds was properly documented. Addendum to Page 27 of Staff Testimony at 1 (Gilbert).

We note that the Staff has requested and is evaluating an explanation of these undocumented repairs from the Applicants. NRC Staff Proposed Findings of Fact on Weld Fabrication at 57. We will consider the Staff's analysis of the Applicants' response in this proceeding. We are particularly concerned about the extent to which welding procedures and, possibly, QC procedures may have been ignored. The possibility of QC procedures being ignored is supported by the testimony of Mr. Fred Coleman, who stated that QC inspectors were present in the cable spreading room during the time he was welding misdrilled holes. Tr. 11,542.

We find that there was a significant violation of Appendix B in that there was a practice in which misdrilled holes were not properly documented.

5. Preheat Requirements

Preheat requirements are specified temperatures above which the parent metal surrounding a weld joint must be heated prior to beginning to weld (Tr. 10,026). Brown & Root welding procedures, however, require all weld joints to be preheated to at least 70°F (Tr. 11,836-37).

Mr. Stiner alleged that most of the hangers he worked on at Comanche Peak "were not preheated." Case Exhibit 919 at 9. He later testified that "all" hangers he worked on were not preheated (Tr. 10,824). Subsequently, he testified that he did preheat one hanger and that there were many he did not have to preheat (Tr. 10,826-28). Mr. Stiner testified that he was directed by his supervisor not to preheat in order to speed up production (CASE Exhibit 919 at 9). He testified that failure to preheat was a common practice at Comanche Peak (Tr. 10,800, 10,826). He further stated that on many occasions he had welded without preheat when the temperature was below freezing (CASE Exhibit 919 at 9; Tr. 11,084-85).

As discussed more fully below, the record reveals that Mr. Stiner's allegations regarding preheat are not reflective of systematic or significant violations of procedural requirements. Further, even if isolated events of violation of preheat requirements have occurred, the likelihood of an adverse impact on plant safety is remote.

a. Preheat

Mr. Stiner alleged that he welded on Class 3 hangers that were not preheated on days when the temperature was below 32°F. He stated that he was ordered to do this in order to speed up production. CASE Ex. 919 at

9 (H. Stiner). Although the Board discussed striking this portion of Mr. Stiner's testimony, it decided not to do so after Applicants withdrew their motion rather than have this matter referred to the Staff. Tr. 9947-49.

During Mr. Stiner's first term of employment at Comanche Peak, the environmental temperature dropped below 32°F only on March 3, 1980, when the recorded temperature rose from 28°F at 6 a.m. to a high of 60°F. (Tr. 10,035 (Baker).) The Board took official notice that during Mr. Stiner's second term of employment, from June 1981 to July 1981, the temperature at Comanche Peak (in central Texas) did not drop below 32°F. Tr. 10,035.

Welding when the temperature is below 32°F is not necessarily a violation of the applicable procedure. Paragraph 4.2 of § IV of the ASME Code prohibits welding only "where the ambient temperature is below 0° Fahrenheit." Tr. 10,031 (Baker). "Ambient temperature" does not refer to the atmospheric or environmental temperature, but rather the temperature in the immediate vicinity of the weld joint. *Ibid.* Thus, even if it were 0°F outside, welding operations could continue so long as the area adjacent to the weld joint were maintained at 0°F or higher. *Ibid.*

"Preheat temperature" is the temperature of the material immediately prior to welding. Tr. 10,026 (Baker). Weld Procedure 11032 specifies a minimum preheat temperature of 60°F for material up to 1¼ inches thick and 200°F for materials of greater thickness. *Ibid.* Joint Affidavit at 9 (Gilbert, Taylor). Procedure 10046 (non-ASME) specifies a preheat temperature of 70°F for steel up to 1½ inches thick. For steel from 1½ to 2 inches thick, preheat is specified as 150°F, and for steel over 2 inches thick, the specified preheat is 225°F. Joint Affidavit at 9-10 (Gilbert, Taylor).

During the colder months, the temperature in the areas where welding takes place is likely to be somewhat higher than the environmental temperature because welding usually takes place inside heated enclosed structures. Tr. 10,034 (Baker). Moreover, the ambient temperature is even higher than room temperature due to supplemental heat sources such as space heaters, and lighting. *Ibid.*; Tr. 11,618 (Pickett). It is not necessary to preheat material when the room temperature has been greater than the required preheat temperature for a period of time. When it is necessary to preheat, however, a propane torch is used. *See* Tr. 11,537 (Coleman).

Mr. Stiner also testified that the welders at Comanche Peak, himself included, did not preheat metal before welding. CASE Ex. 919 at 11. The weight of the evidence is to the contrary. Mr. Pickett, for example, testified that Mr. Stiner did preheat. Tr. 11,643 (Pickett). Mr. Pickett

was certain of this because he remembered lending his propane torch ("rosebud" or "preheat bottle") to Mr. Stiner. *Ibid.* The other welders who worked on Mr. Stiner's crew or in the same general area as Mr. Stiner each testified that they complied with preheating requirements. E.g., Tr. 11,665 (Fernandez); Tr. 11,665 (Braummuller); Tr. 11,615 (Pickett).

Although Applicants' witnesses testified that welders preheated material prior to welding, this testimony does not address precisely the allegation made by Mr. and Mrs. Stiner: that welders do not check to make certain that the temperature prior to welding is at least 60°F for materials less than 1¼ inches in thickness. Applicants' witnesses testified only that they used preheating bottles. There is no evidence, however, that suggests that welders utilized any kind of temperature measuring device to verify that the temperature of the metal after being preheated was at least 60°F or 200°F, whichever the case may be. In fact, Mr. Muscente implied that it is sufficient for a welder "to take his torch and play it over this material until he gets it up to what we refer to as hand warm." Tr. 10,028 (Muscente). Accordingly, the Staff has required Applicants to assess the significance of permitting welders to make subjective determinations as to whether the preheat requirement of Procedure 11032 is met. Staff's assessment of Applicants' response will be considered in this proceeding.

b. Safety Implications of Violation of Preheat Requirements

Mr. Stiner's apparent concern regarding failure to preheat is that porosity (Tr. 10,799) or "under bead" cracking could occur (Tr. 10,802-03). In this regard, Mr. Stiner relates an incident where he failed to adequately preheat and the result was a visible crack down the middle of the weld. Mr. Stiner testifies that he ground out the weld and repaired it. (Tr. 10,801-04.)

With regard to Mr. Stiner's concerns, Applicants testified that in view of Applicants' use of low-hydrogen electrodes, failure to preheat would not have had a significant adverse impact on the low carbon steels welded on by Mr. Stiner or resulted in a hydrogen-embrittlement-related defect in the weld joint itself. However, given extreme conditions, restraint of the weld joint, and thick materials, failure to preheat may result in shrinkage stresses that could impact the weldment and possibly the heat-affected zone of the weld. While the likelihood of a problem even under these conditions is remote, Applicants testified that if such a weld was not adequately preheated to retard the cooling rate, excessive stresses could develop in the joint resulting in a wide-open, centerline

crack of the weld. (Tr. 11,820-38.) This was apparently the type of crack that allegedly occurred when Mr. Stiner failed to preheat the one weld joint he described in his testimony (Tr. 10,802-03). Significantly, this type of failure is clearly visible and would result in detection by the welder (with appropriate action such as that allegedly taken by Mr. Stiner) or the QC inspector during his final visual inspection of the weld. In either case, the resulting defect would be detected and corrected.

With regard to Mr. Stiner's concerns regarding possible porosity in a weld resulting from lack of preheat, if such a condition should occur Applicants have previously testified that it would also be detected by the welder and corrected or by QC during their final visual inspection (Tr. 11,897). In this regard, Applicants have testified that the AWS and ASME Codes state that some porosity in a weld is acceptable. For example, for Class 3 welds, such as alleged to have been welded without preheat by Mr. Stiner, the ASME Code does not even address porosity as a visual accept/reject criterion, and it is rejectable under ASME subsection NF construction only if a pore of porosity exceeds 1/16 of an inch (Tr. 11,215). In addition, pursuant to the AWS Code, porosity is rejectable only to the extent that the sum of the diameters of the porosity exceeds 3/8 of an inch in any linear inch of weld, or 3/4 of an inch in any linear 12 inches of weld. (Tr. 11,215). There has been no testimony that even implies porosity of this magnitude.

In sum, the Board finds that even if Mr. Stiner had failed to preheat some weld joints as alleged, there is reasonable assurance that this would not have resulted in an adverse impact on plant safety. The principle impact in this proceeding would be on the Board's opinion of whether Applicants have conscientiously applied their procedures.

III. OTHER MATTERS CONSIDERED

We have addressed in this decision each of the remaining allegations by Mr. and Mrs. Stiner regarding the welding issues at Comanche Peak which we perceive could have affected our determination as to the adequacy of the QA program or the safe operation of the plant. To the extent CASE may have raised other questions, we have considered those also, and found they were without merit, were improperly raised or were insignificant and could not affect our determination here.

IV. CONCLUSION

The Board concludes that the allegations raised by Mr. and Mrs. Stiner and addressed here (i.e., weave welding, welding of misdrilled holes, downhill welding, weld rod control and preheat) are without merit except to the extent that the Board has specifically indicated in this opinion, primarily with respect to implementation of repair weld procedures and the use of temperature measuring instruments to verify preheat. We await further Staff filings before determining the extent of the breakdown indicated by these situations. The Board further concludes, however, that there is reasonable assurance that these allegations are not reflective of any condition that could adversely impact the safe operation of the plant. (We expect Applicants or Staff to correct the record, however, if they know that slag inclusions may cause a long-term safety problem because of the effect of the inclusions on weld integrity over time.)

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is, this 18th day of December 1984,

ORDERED

1. Staff analyses of Texas Utilities Electric Company, *et al.*, (Applicants) responses concerning preheat and repair welding will be considered in this proceeding.

2. Applicants appear to have had the practice of verifying preheat by subjective determination of whether materials were "hand warm."

3. Applicants had a practice, of indeterminate extent, of making repair welds without proper documentation.

4. Applicants demoted a welding supervisor for directing improper welding in violation of procedures, but they violated Appendix B by: (a) failing to document this personnel problem in deficiency paper and (b) by failing to conduct an adequate contemporaneous investigation of the extent of the practice or the effect of the practice on plant safety.

5. In all other respects, the welding allegations discussed in this opinion are found to be without merit.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

**Walter H. Jordan (by PBB)
ADMINISTRATIVE JUDGE**

**Kenneth A. McCollom (by PBB)
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

**Peter B. Bloch, Chairman
Dr. Kenneth A. McCollom
Dr. Walter H. Jordan**

In the Matter of

**Docket Nos. 50-445-OL
50-446-OL
(ASLBP No. 79-430-06-OL)**

**TEXAS UTILITIES ELECTRIC
COMPANY, *et al.*
(Comanche Peak Steam Electric
Station, Units 1 and 2)**

December 18, 1984

Because a false statement made by Applicants' witnesses and other inconsistencies in Applicants' filings, the Licensing Board permits Intervenor and Staff to file additional discovery requests relating to the credibility of Applicants' witnesses.

RULES OF PRACTICE: DISCOVERY

Discovery may be reopened against Applicants as a remedy for a misrepresentation and for inconsistencies in testimony.

MEMORANDUM

(Reopening Discovery; Misleading Statement)

Citizens Association for Sound Energy (CASE) and the Staff of the Nuclear Regulatory Commission (Staff) agree that Texas Utilities Electric Company, *et al.* (Applicants) have made a false statement in this proceeding and that a proper remedy is to reopen discovery.¹ Applicants disagree.²

Although we will await the Staff investigation before determining whether this is a material false statement,³ we find Applicants' testimony to be misleading, to reflect adversely on the credibility of Applicants' expert witnesses and to be cause for reopening discovery.

Applicants' U-Bolt Summary Disposition Motion, June 29, 1984, relied in part on a testing program. Applicants state, at page 5:⁴

[T]o assure that the tests and analyses accurately represent plant conditions, Applicants conducted a survey of the torque on a representative sample of cinched down U-bolts

It now appears, however, that there is no sense in which the sample was representative or random.

First, the "sample" was collected with no written procedures.⁵ Second, there was no method of drawing a random or representative sample; the sample included "U-bolts that could be found . . . that were unpainted."⁶ Third, the sample was restricted to Unit 2, because "Unit 1 had already been painted," thereby allegedly making it impossible to obtain a relevant sample from Unit 1;⁷ however, this sampling restriction was not disclosed and therefore not subject to challenge until after the Board requested the raw data from Applicants.

Fourth, Applicants stated that they "inspected the torque of a randomly selected representative sample of cinched down U-Bolt supports" and presented the results of the sampling in Table 2, which provides the

¹ CASE's Motions and CASE's Answer to Applicants' Response to Board Request for Information Regarding Cinched Down U-Bolts, November 5, 1984 (CASE's Motion), and NRC Staff Response to CASE's Motions . . . , December 7, 1984 (Staff Response).

² Applicants' Reply to CASE's Motion Concerning Information Regarding Cinching Down U-Bolts, November 19, 1984.

³ Staff has requested the advice of the Office of Inspection and Enforcement concerning whether this is a material false statement. Staff Response at 6.

⁴ Page 5 cites page 10 of the accompanying affidavit, which also states that the sample was "randomly selected."

⁵ Applicants' Response to Board Request for Raw Data Regarding Cinching Down U-Bolts, November 9, 1984, at 2.

⁶ *Id.* at 3.

⁷ *Ibid.*

"Torque Range (ft-lbs.)."⁸ However, Applicants failed to mention that Table 2 was constructed using the *average* torque on the two bolts on each U-bolt. They also failed to mention that the torques were not always the same — a condition that may or may not be material but that differed from the test that was conducted, suggesting that the test may not have been representative of field conditions because torques used in the test were equal.⁹

Fifth, although Applicants claim that the torquing practices in both units were the same, their own filing discloses that the procedures changed; Applicants state:

[T]he construction practice for torquing Unit 1, common and Unit 2 U-bolts was the same. In this regard, Applicants note that the procedure referenced by CASE [a torquing procedure adopted by Applicants on October 8, 1982] was written at the suggestion of the NRC resident inspector at that time (Robert Taylor) to document the construction practice which had been and was currently being used to torque U-bolts. *Finneran Affidavit at 2.*¹⁰

It is apparent from Applicants' representation that prior to October 8, 1982, Unit 1 was constructed without any written procedure governing the torquing of U-bolts. Under the circumstances, it will require empirical information to determine that torques applied in Unit 2 are representative of those applied in Unit 1. Even were the same procedure in effect in both units, the turnover in relevant personnel during a period of years could affect *practice*, requiring evidence concerning whether the torque on Unit 2 bolts is representative of the torque on Unit 1 bolts.

Our concern about the reliability of Applicants' testimony goes beyond that of CASE and the Staff in the instant motion. In Applicants' Motion for Summary Disposition of CASE's Allegations, at 5 n.3, we find the following statement, which we believe to be a reiteration of earlier testimony before this Board:

Even though the Board refers to SA-307 [steel] material, the designation of the U-bolt material is SA-36. Applicants recognize that *the material is the same* [emphasis added] in any case, with A-307 being the designation employed for headed bolts.

Then, in Applicants' Response to Board Memorandum (Information on Composition of A36 and A307 Steel), we learn that the materials are not the same. Applicants' witnesses state, at page 2 of their affidavit,

⁸ Applicants' Motion for Summary Disposition at 10.

⁹ Applicants' Response to Board Request for Raw Data at 2.

¹⁰ Applicants' Reply to CASE's Motion at 7.

that "there is a major difference in the specified mechanical requirements for SA36 and SA307 steels."

Furthermore, Applicants' Response to Board Memorandum (Information on Composition of A36 and A307 Steel) seems to be an intentional effort to avoid displaying, in clear language or tables, the information the Board sought in its October 25, 1984 Memorandum and Order (LBP-84-44, 20 NRC 1340). We requested information on the extent to which the items tested by Applicants have been representative of the steels actually employed at the plant. We did this because Dr. Robert Iotti had described A307 steel to the Staff as "garbage steel," which is highly variable in content. We inferred that A36 steel, previously considered in testimony to be identical to A307, also was a "garbage steel," a logical inference that has not been directly contradicted by responsive testimony.

Applicants did not address the variability of A36 steel composition at all. Nor did they state directly how the test samples compared to steels in use at the plant. From Figure 1 of their filing it would appear that some fraction of the steels at the plant have a yield strength of less than *any* of the samples used in the Westinghouse tests and there are no data in our record concerning the extent to which the Westinghouse samples are representative of materials in use in the plant; nor is their data on the statistical error of the sample. From Figure 2, as well, there would appear to be a substantial portion of the steels in the plant with a tensile strength less than that subject to test, and we have no way of quantifying the significance of that. Furthermore, Applicants' tests related to friction, stiffness, relaxation and creep, characteristics of steel that are not readily ascertained from data on yield and tensile strength.

We note that Applicants also failed to respond fully to our question on the extent to which the U-bolt configurations in the plant are the same as those tested.¹¹ Obviously, differences in those configurations would limit the extent to which the test results may be applied to actual configurations found in the plant. We suspect that this omission was intentional.

We have had other changes in position that are hard to understand. At Tr. 9881, Applicants' attorney insists on cross-examining Mr. Jack Doyle, who had been examining CYGNA's witness. Despite the lack of orthodoxy in this suggestion, the Board granted the request. The purpose

¹¹ Our Memorandum of October 25, 1984, LBP-84-44, *supra*, 20 NRC at 1341 n.2, stated that "there . . . is no mention of the extent of their representativeness [sic] of the dimensions of U-Bolts used at the plant. *See also*" Yet, Applicants treated the "*See also*" citation and the discussion of that citation as if it restricted the meaning of the clear words of the preceding sentence. We do not understand or sympathize with this lack of attention to our language.

of the examination was to attack Mr. Doyle's knowledge concerning whether the use of cinched up U-bolts was industry practice. Yet, it now appears to be clear (based on the transcript of a recent conference between Applicants and Staff) that the use of cinched-up U-bolts at Comanche Peak is unique. Applicants should have known that at the earlier date and should have refrained from taking a position contrary to the facts.

Prior to our December 27, 1983 decision (LBP-83-81, 18 NRC 1410), witness Reedy testified about an alleged industry practice. Yet, on cross-examination by Mr. Mark Walsh, it was discovered that the sole basis for his generalization was his knowledge of Comanche Peak. Tr. 6905-31, especially 6921-22 [MPSI should be read as NPSI], 6930-31 (Mr. Reedy evades Judge Bloch's question about industry practice by responding that he is a "registered professional engineer.").

After we had ruled that several sections of the AWS Code appear to be applicable to Comanche Peak, we were assured that all welds are qualified under ASME and not subject to any AWS provisions. Tr. 6264/13-25, 6265/1-2 (Reedy). We ruled against that position. Later, we learned from Applicants that they agree that a few of the AWS Code provisions pointed out by CASE are applicable to weld design at Comanche Peak.

There also have been instances of calculational errors and of mislabeling of tables in testimony filed before this Board. LBP-83-81, 18 NRC 1410, 1440-41 (1983).¹²

With respect to the role of an independent expert in this proceeding, pursuant to Applicant's plan, we have had conflicting representations. At Tr. 13,033-34, in the midst of a discussion concerning CYGNA's responsibility to review in detail the results of tests on U-bolts, Applicants' attorney objected that the Board was misconstruing CYGNA's role because

[T]hey are not an independent reviewer of our plant. The professor who we are going to retain will perform that function.

However, Applicants' Report Regarding Academic Expert, November 9, 1984, at 3, stated that Applicants' expert in theoretical and applied mechanics reviewed "the basic engineering principles employed in the

¹² See also the August transcripts of meetings between Applicants and Staff and Case's Proposed Findings of Fact and Conclusions of Law (Walsh/Doyle Allegations), August 22, 1983, especially ch. XXVII. Although we have determined that some of the allegations in ch. XXVII cannot be substantiated, we have not reviewed each allegation thoroughly enough to ascertain whether any constitute significant inconsistencies or material misrepresentations.

review and analyses set forth in Applicants' motions for summary disposition." If we understand this correctly, he did *not* review the details of Applicants' analysis of pipe supports affected by Walsh-Doyle issues.¹³ Hence, his role appears to have been limited in a way that precluded a meaningful independent review.

Similarly, despite the Board's conclusions rejecting the SIT's findings and Applicants' assurances that CYGNA would review pipe supports in order to resolve matters in controversy,¹⁴ CYGNA has adopted certain SIT findings and not gone into them, apparently at Applicants' request.¹⁵ Applicants appear to have ignored the advice given by the Board at Tr. 9283-85, 9287 (CYGNA's checklist should include the Walsh/Doyle concerns; there should be a measure of observer reliability; filings under the plan should be clear and fully documented; findings will not rely on unanalyzed portions of Applicants' studies; use of tables, charts and matrixes; assistance in evaluating the meaning of recurrent noncosting errors). As a consequence, there is no independent review of Dr. Iotti's and Dr. Finneran's findings. *Compare* the Board's strong suggestion at LBP-83-81, *supra*, 18 NRC at 1454-55.

Under these circumstances, and in light of Applicants' failure to file current information about the completion of construction, CASE and the Staff may undertake additional discovery concerning samples, testing or any other aspect of testimony whose credibility they now decide to investigate within the time limits imposed in the accompanying Order. We also invite Applicants to review their own testimony and to disclose all their errors in the course of this proceeding (or the related docket) in a single filing, together with explanations.

ORDER

For all the foregoing reasons and based on consideration of the entire record in this matter, it is, this 18th day of December 1984,

ORDERED

¹³ If we are correct in this, it is directly contrary to Applicants' representation at Tr. 9267/8-12.

¹⁴ Tr. 9268/12-18, 9274/18-24, 9277/20-25, 9278/10-14. ("What we tried to do was assess the issues in controversy and then pick those systems where most, if not all, of the configurations would be found."). (Note that Judge Bloch is often referred to in this transcript as Judge Broch.)

¹⁵ See Tr. 13,033-34 where the Board made it clear that CYGNA should examine in detail tests Applicants planned to conduct in order to substantiate the acceptability of the SIT acceptance of cinched-up U-bolts as a cure for stability problems. *Compare* CYGNA, Independent Assessment Program, Final Report — Phase 3, vol. 2, App. J, General Notes 7 and 8; see also Tr. 12,805, 12,810, 12,826/7 to 12,827/7, 12,830/14-25, 12,847/15 to 12,848/9, 13,038/8 to 13,039/2 and 13,114/8 to 13,115/10. (These sections indicate some lack of clarity in the way in which Applicants and CYGNA were defining CYGNA's role.)

Citizens Association for Sound Energy and the Staff of the Nuclear Regulatory Commission may conduct discovery until February 21, 1985, on questions relating to samples, tests or the credibility of testimony or representations of Texas Utilities Electric Co., *et al.*, in this proceeding. Delays in response to interrogatories will be considered should there be a request for an extension of this time period.

**FOR THE ATOMIC SAFETY AND
LICENSING BOARD**

**Peter B. Bloch, Chairman
ADMINISTRATIVE JUDGE**

**Walter H. Jordan (by PBB)
ADMINISTRATIVE JUDGE**

**Kenneth A. McCollom (by PBB)
ADMINISTRATIVE JUDGE**

Bethesda, Maryland

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION

Harold R. Denton, Director

In the Matter of

Docket No. 50-155
(10 C.F.R. § 2.206)

CONSUMERS POWER COMPANY
(Big Rock Point Plant)

December 3, 1984

The Director, Office of Nuclear Reactor Regulation, denies a Petition filed by Mr. John O'Neill, II, requesting that the Commission issue a show-cause order requiring Consumers Power Company to demonstrate that it is financially qualified to operate an expanded spent fuel pool.

DIRECTOR'S DECISION UNDER 10 C.F.R. § 2.206

By a petition sent in the form of a "Motion for Show-Cause Order Regarding the Financial Qualifications of Consumers Power" dated August 15, 1984, to the Director of Nuclear Reactor Regulation, Mr. John O'Neill, II, requested that the NRC issue a show-cause order requiring Consumers Power Company (the Licensee) to demonstrate why a proposed amendment to its license to permit compacted storage of spent fuel should not be suspended because the Licensee is financially unqualified to safely operate an expanded spent fuel storage pool. Mr. O'Neill was informed by letter dated September 7, 1984, that his petition would be considered under 10 C.F.R. § 2.206 of the Commission's regulations. A notice was published in the *Federal Register* September 28, 1984 (49 Fed. Reg. 38,426) that Mr. O'Neill's petition was being treated pursuant to 10 C.F.R. § 2.206.

As a basis for his request, Mr. O'Neill asserts that the Licensee has not been required to demonstrate that it is financially qualified to operate an expanded spent fuel pool before the Licensing Board which has considered the proposed amendment and that the NRC Staff has never reviewed the Company to determine its financial health. Mr. O'Neill asserts that under the decision by the D.C. Court of Appeals in *New England Coalition on Nuclear Pollution v. NRC*, 727 F.2d 1127 (D.C. Cir. 1984), such financial review is required by law. In addition, Mr. O'Neill asserts that the cancellation by the Licensee of its Midland Nuclear Power Plant on July 15, 1984, because of financial constraints makes the Company's continued solvency speculative. He contends the financial difficulties surrounding the Midland cancellation raise sufficient doubt as to whether Consumers Power Company can safely modify and maintain the modified spent fuel pool.

I have considered the concerns of the petitioner and other relevant information bearing on the issue addressed in the petition. For the reasons set forth below, the petitioner's request for a show-cause order is denied.

Consumers Power Company's amendment application was in hearing before an Atomic Safety and Licensing Board for some time. The Board issued its Initial Decisions on the application authorizing issuance of the amendment in August and September 1984. LBP-84-32, 20 NRC 601 (1984), supplemented on September 25, 1984, LBP-84-38, 20 NRC 1019. On October 11, 1984, the NRC Staff issued Amendment No. 70 to the Big Rock Point license authorizing the Licensee to expand the storage capacity of the spent fuel pool from 193 to 441 assemblies.

No specific financial qualifications review was necessary for issuance of that amendment. In response to the Court's decision in *NECNP v. NRC*, *supra*, the Commission initiated a new financial qualifications rulemaking to clarify its position on financial qualifications reviews, 49 Fed. Reg. 13,044 (April 12, 1984). In addition, the Commission issued a policy statement on June 7, 1984, 49 Fed. Reg. 24,111 (June 12, 1984) which indicated that it had reasonably interpreted the Court's opinion as not vacating the rule so as to require adjudication of financial qualifications issues for operating license applications pending completion of the rulemaking. A final rule was published on September 12, 1984, 49 Fed. Reg. 35,747, reinstating financial qualifications review for construction permit applicants, and continuing in effect the provision that no finding of financial qualification is necessary for an electric utility applicant for an operating license, 10 C.F.R. § 50.33(f) and 10 C.F.R. § 50.57(a)(4). The Commission concluded that case-by-case review of financial qualifications for all electric utilities at the operating license stage is unnecessary due to the ability of such utilities to recover, to a

sufficient degree, all or a portion of the costs of safe operation through the ratemaking process.

The Commission's regulations governing amendment of an operating license, 10 C.F.R. §§ 50.90-50.92 do not provide for any financial qualifications review. Section 50.90 directs an applicant to follow as far as applicable the form prescribed for original applications. Although amendments to operating licenses are not explicitly addressed in 10 C.F.R. § 50.33(f), given the basis for elimination of financial review for an operating license, it is reasonable to include any amendments to such a license within that exclusion. Thus, no financial review was necessary for issuance of the recent amendment to Consumers Power Company's license.

The NRC Staff is aware, of course, that the circumstances surrounding the cancellation of the Midland project have created a potentially uncertain situation and consequently is monitoring the financial health of Consumers Power Company. Currently, there is no indication that the payment of nuclear operating expenses is in jeopardy for Big Rock Point or Palisades, the two nuclear power reactors operated by Consumers Power Company. Also, in response to the petition, the resident inspector at Big Rock Point performed a special review of operational safety over a time period of several months following the cancellation of Midland. This review found no apparent decrease in operational safety at Big Rock Point. In addition, recent personnel reassignments made by Consumers Power have actually increased the number of employees working at Big Rock Point and Palisades and appear to favorably impact future operational safety at Big Rock Point.

The NRC's resident inspectors and region-based inspectors will continue to observe the operational safety of Big Rock Point and Palisades. If these observations begin to indicate that operational safety is being adversely affected due to financial constraints (or for any other reason), the NRC will take all necessary actions required to ensure the safety of these plants.

In addition, the NRC project managers who are responsible for licensing actions on the Palisades and Big Rock Point plants have been and will continue to watch for signs that financial constraints are unduly affecting Consumers Power Company's programs for ensuring plant safety.

In conclusion, as discussed above, the NRC Staff is monitoring the financial health and nuclear power plant operations of Consumers Power Company. Based on the NRC Staff's findings to date, I have determined that no adequate basis exists for issuance of a show-cause order to Consumers Power Company regarding its financial capability to safely operate the Big Rock Point Plant. Therefore, the petitioner's request is

denied. A copy of this decision will be filed with the Secretary for the Commission's review in accordance with 10 C.F.R. § 2.206(c).

Harold R. Denton, Director
Office of Nuclear Reactor
Regulation

Dated at Bethesda, Maryland,
this 3rd day of December 1984.

It was decided to publish CLI-84-13A out of sequence in order that it follow CLI-84-13 for the record. Therefore, CLI-84-13A may be found at 20 NRC 283.

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