NUCLEAR REGULATORY COMMISSION ISSUANCES

OPINIONS AND DECISIONS OF THE NUCLEAR REGULATORY COMMISSION WITH SELECTED ORDERS

July 1, 1978 — December 31, 1978

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Samuel W. Jensch

PREFACE

This is the eighth volume of issuances (1 - 776) 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 July 1, 1978 to December 31, 1978.

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.

This volume is made up of pages from the six monthly issues of the Nuclear Regulatory Commission publication *Nuclear Regulatory Commission Issuances (NRCI)* for this period, arranged in chronological order. 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, and Administrative Law Judge--ALJ.

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:

Victor Gilinsky, Acting Chairman
Richard T. Kennedy
Peter A. Bradford

In the Matter of **Docket Nos. 50-443**
50-444

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, et al.

(Seabrook Station, Units 1 and 2) **July 17, 1978**

The Commission denies applicants' motion to postpone the effectiveness of the order in CLI-78-14, 7 NRC 952, suspending the units' construction permits until 21 days after the EPA Administrator's cooling system decision is rendered.

RULES OF PRACTICE: MOTIONS

Postjudgment motions for relief are not favored by the regulations governing Commission review of Appeal Board decisions, 10 CFR §2.786(b)(7), and will not normally be granted absent a showing of "extraordinary circumstances."

MEMORANDUM AND ORDER

Public Service Company of New Hampshire (PSCO) has filed with us a "Motion for Modification of Order of Suspension in Light of Subsequent Events" asking us to delay the effectiveness of our June 30, 1978, order suspending the construction permits for the Seabrook projects as of 6 p.m., Friday, July 21, 1978. The subsequent events PSCO refers to are completion of hearings by the Environmental Protection Agency concerning the cooling system for the facility and the prospect that the Administrator of EPA may render his decision on the matter within a matter of days follow-

ing July 21. We are asked to postpone the effectiveness of our suspension order until 21 days after the Administrator's decision is rendered.[1]

We called for the views of the parties on the PSCO motion and we directed our Acting General Counsel to write to the EPA's General Counsel to determine the date she expected the Administrator to issue his decision on Seabrook. The EPA General Counsel responded, saying that " . . . we believe the Administrator will be able to issue a decision early in August, perhaps as early as the first week."[2] Intervenors NECNP and SAPL/Audubon have opposed PSCO's motion on various grounds. The NRC staff also opposed the motion, although staff's position (which was written before the EPA reply) was predicated primarily on the uncertainty as to the timing of EPA action.[3]

We have decided to deny PSCO's motion. Postjudgment motions for relief are not favored by our regulations. *Cf.* 10 CFR §2.786(b)(7). PSCO has not shown the "extraordinary circumstances" that we normally would require to modify our judgment once it has been rendered. *Cf.* Federal Rule of Civil Procedure 60(b)(6); *Ackermann* v. *United States,* 340 U.S. 193, 199 (1950). As we said in our June 30 decision "we can assume nothing about the outcome [of the EPA proceeding]," 7 NRC 952, 957. The Administrator may or may not approve once-through cooling for Seabrook. Were we to grant PSCO's motion, construction could continue at Seabrook through August. Should EPA disapprove open-cycle cooling, our ability to consider alternative sites as required by law would have been prejudiced. We do not believe that such prejudice is justified in the absence of any showing by PSCO of greater injury than we already took account of in our June 30 decision.

The allegation of changed circumstances on the timing of an EPA decision[4] works both for and against applicant's motion. An earlier EPA decision would reduce the amount of construction work performed on the proj-

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[1]PSCO also asks us to amend our order so that it would become void automatically if EPA should approve once-through cooling for Seabrook. Since we cannot know in advance exactly how the Administrator will rule, even assuming approval of once-through cooling, this request is denied.

[2]The letters are available for inspection at the NRC Public Document Room, 1717 H Street, N.W., Washington, D.C.

[3]A request for a limited appearance was filed with us by the New Hampshire State Building and Construction Trades Council, *et al.* We are treating that request as if it were an application to file as *amici* and grant it. New Hampshire has also filed with us a motion similar to PSCO's motion which we will treat as if it were an *amicus* filing. We are not, however, relying upon or accepting the affidavits filed by *amici.*

[4]The EPA estimate is not significantly different from the timing we considered possible on June 30, namely late August. Consequently, PSCO's claim of changed circumstance is not strong.

ect and thus the effect that work could have on our NEPA analysis. Nevertheless, an earlier EPA decision, if it favors once-through cooling, may also serve to lessen the harm to PSCO and to the workers by reducing the suspension time. PSCO counsel told us in oral argument that if his client knew a suspension would be relatively short, it could keep most of its work force in place and restart work relatively easily, while if construction were halted for a substantial period, the work force would scatter and restart would be delayed while workers were rehired and retrained.

If after an EPA decision is issued, PSCO files with us a motion for reinstatement of its construction permits, we will address that issue immediately.

For the reasons stated above, PSCO's motion to modify our June 30, 1978, decision is denied.

It is so ORDERED.

For the Commission

Samuel J. Chilk
Secretary of the Commission

Dated at Washington, D.C.,
this 17th day of July 1978.

[The attachments have been deleted from this publication but are available in the NRC Public Document Room, 1717 H Street, N.W., Washington, D.C.]

Commissioner Kennedy Dissenting:

The Commission's refusal to extend the period of time allowed for the shutdown of Seabrook is, in my view, both unfortunate and unnecessary. There can be no significant environmental impacts arising out of continued construction during the short period expected before the EPA Administrator's decision, estimated now to be about 3 weeks. I do not believe that a final decision on alternative sites could be swayed—or even influenced—by an additional 3 weeks of construction. Further, as the Commission has acknowledged, the effect on the labor force will be severe.

To better understand the position we find ourselves in, it is important to realize that the July 21 suspension date chosen by the Commission is not based on any firm evidence of the actual time needed for an orderly shut-

down. The Commission simply assumed that the full-scale construction underway in July would require a longer period to wind down than the relatively low level of activity underway during the previous suspension which followed the decision of the EPA Regional Administrator. A suggested effective date of July 21 would give 3 weeks for winding down construction, and that period was thought to be reasonable by the Commission. I do not mean to imply that the date was picked arbitrarily, merely that a longer, or even shorter, period might just as easily have been adopted. In any event, when the Commission picked July 21 as the suspension date, it believed that the EPA decision on the cooling system was at least 2 months away. Were construction to continue that long or longer, it was felt by my colleagues that the cost-benefit balance could be tipped irrevocably in favor of Seabrook, or at least that the increased investment would be impossible to ignore in later decisions. But had the Commission known that an EPA decision would be made, for example, on July 23, it seems most unlikely that July 21 would have been set as the suspension date—to have done so absent a compelling reason would have needlessly hurt the applicant and others. On the other hand, had we known for a fact that neither the EPA decision nor our own cooling tower inquiry would be available for a much longer period, 12 months for example, I myself would have agreed with the majority in ordering suspension.

Clearly, somewhere between these two examples lies a threshold. On one side of the threshold, we should stop construction to protect the integrity of the decisionmaking process. On the other side, stopping construction can only result in grave injury to our licensing process, the applicant, and others.

In this case, delaying the suspension date for some reasonable period is clearly appropriate in view of EPA's projection as to the date of its decision. That agency's announced determination to expedite its decision make it virtually certain that one of the two unresolved issues that led the Commission to suspend construction will be resolved much earlier than had been anticipated in June. Thus the threat that continued construction might result in a *fait accompli* is markedly lessened. If EPA approves once-through cooling, adherence to the July 21 date would inflict substantial costs on the applicant, its workers, and ultimately on its customers, virtually to no purpose. If the EPA decision disapproves once-through cooling, delay of the date for suspension will have permitted only a small increment of additional work—an amount that I cannot believe would be decisive in a comparison between Seabrook and another site. Thus, I believe the threshold for suspension has not been reached here.

It may be argued, of course, that delay of the suspension date puts an unfair burden on the Administrator of EPA, pushing him to make a hasty,

and therefore possibly inadequate, decision in order to avoid the inherent costs of a suspension. Indeed, SAPL/Audubon make this point clearly when they state " . . . the Administrator should not be faced with the realization that it will be up to him whether or not to stop work."[1] But this argument is more persuasive in the opposite direction. If the Commission stops construction before the Administrator's decision, he may feel under even greater pressure. Each day that publication of his decision is delayed will be another day of unemployment for 1,800 workers. The economic burden on consumers and taxpayers, though less readily calculable, will also have to be taken into account.[2] If the suspension order is modified, the Administrator will be given the time necessary to reach a sound decision.

The Commission's rigid adherence to its July 21 suspension date, even though it recognizes that that date was based upon a mistaken assumption, serves no valid purpose to offset the needless hardship it causes. I must, therefore, respectfully dissent.

[1]See, Memorandum Brief in Opposition to the Motion of the Applicants for Modification of Order of Suspension, July 12, 1978, page 3.

[2]See, Motion of the Applicants for Modification of Order of Suspension, July 10, 1978, at page 6; Motion of the State of New Hampshire . . . , July 13, 1978, pages 5-7; Statement on Behalf of New Hampshire State Building and Construction Trades Council, *et al.*, July 12, 1978, at pages 2-4.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSION:

Joseph M. Hendrie, Chairman
Victor Gilinsky
Richard T. Kennedy
Peter A. Bradford

FLORIDA POWER & LIGHT COMPANY

(St. Lucie Plant, Unit Nos. 1 and 2)	**Docket Nos. 50-335A 50-389A**
(Turkey Point Plant, Unit Nos. 3 and 4)	**Docket Nos. 50-250A 50-251A**

July 27, 1978

Upon consideration of the United States Court of Appeals decision in *Gainesville Utilities Department and City of Gainesville, Florida* v. *Florida Power & Light Company* (5th Cir., Civil No. 76-1542), which held that the NRC licensee involved in these proceedings had violated Section 1 of the Sherman Act, the Commission addresses a number of questions to the staff, the Department of Justice, the licensee, and other parties inquiring as to the courses of action which the Commission might take pursuant to §105a of the Atomic Energy Act, as amended.

ORDER

The Commission notes a recent decision of the Fifth Circuit, *Gainesville Utilities Department and City of Gainesville, Florida* v. *Florida Power & Light Company,* Civil No. 76-1542. The defendant in that action is an NRC licensee, holding operating licenses for its St. Lucie No. 1 and Turkey Point Nos. 3 and 4 plants and a construction permit for St. Lucie No. 2. In the *Gainesville* case, the court of appeals, reversing and remanding a decision of the district court, held that the evidence compelled a finding that FP&L conspired to divide the market for electric service, in violation of Section 1 of the Sherman Act. The court of appeals remanded the case to the district court for further findings, and to determine appropriate relief. The

Gainesville case was brought to the attention of the Commission by counsel for the Florida Cities.

Section 105a of the Atomic Energy Act, as amended, 42 U.S.C. 2135a, provides that

> In the event a licensee if found by a court of competent jurisdiction . . . in an original action in that court . . . to have violated any of the provisions of [certain antitrust laws] in the conduct of the licensed activity, the Commission may suspend, revoke, or take such action as it may deem necessary with respect to any license issued by the Commission under the provisions of this Act.

The Commission has not previously had occasion to conduct a 105a proceeding. We would like to obtain the views of the licensee, the Florida Cities, the Department of Justice, the staff, and other interested parties which address the following questions:

1. Should the Commission initiate a 105a proceeding at this time, or should it await the completion of the remanded aspects of the *Gainesville* case? Our interest in this question extends to the legal requirements, if any, the Commission may have under Section 105a and the administrative and practical aspects of a decision to either proceed toward or defer a 105a proceeding.

2. Should any 105a proceeding be consolidated with the current 105c antitrust hearing on the St. Lucie 2 plant, and are the possible efficiencies gained in consolidation reason to convene the 105a inquiry now?

3. If initiation of a 105a proceeding is not appropriate at this time, when should the Commission consider initiating such an inquiry? Would action be appropriate after completion of the district court proceedings? Should the Commission also await the results of related appeals, if any?

Submissions responding to these questions and addressing any other matters considered relevant to the Commission's disposition of this matter should be received by the Commission no later than August 25, 1978. Reply submissions will be considered if received by September 5, 1978.

It is so ORDERED.

For the Commission

Samuel J. Chilk
Secretary of the Commission

Dated at Washington, D.C.,
this 27th day of July 1978.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Dr. W. Reed Johnson
Jerome E. Sharfman

In the Matter of **Docket No. 50-320**

METROPOLITAN EDISON COMPANY, et al.

(Three Mile Island Nuclear Station, Unit No. 2) **July 19, 1978**

Upon appeal from LBP-77-70, 6 NRC 1185, which authorized the issuance of an operating license, the Appeal Board upholds the Licensing Board's decision on emergency planning but orders a further hearing (to be held before it) on the question of future aircraft crash probabilities. It declines to suspend the license pending such hearing. The Appeal Board also declines to reopen the record on emergency planning and defers its decision on radon-222 pending the outcome of procedures outlined in ALAB-480, 7 NRC 796.

EMERGENCY PLAN: CONTENT

Live tests and drills involving the general public are not essential to an adequate emergency plan. Drills for personnel assigned responsibilities under the plan are required.

EMERGENCY PLAN: CONTENT

The people responsible for implementing the emergency plan do not have to have expert knowledge of the effects of radioactivity in order for the emergency plan to be effective.

RULES OF PRACTICE: PETITION TO REOPEN THE RECORD

The proponent of a motion to reopen the record bears a heavy burden. Normally, the motion must be timely and addressed to a significant issue. *Kansas Gas & Electric Company* (Wolf Creek Generating Station, Unit No. 1), ALAB-462, 7 NRC 320, 339 (1978). If an initial decision has been rendered on the issue, it must appear that reopening the record might materially alter the result. Where a motion to reopen the record is untimely without good cause, the movant must demonstrate not only that the issue is significant but also that the public interest demands that the issue be further explored. *Vermont Yankee Nuclear Power Corp.* (Vermont Yankee Nuclear Power Station), ALAB-138, 6 AEC 520, 523 (1973); *id.*, ALAB-167, 6 AEC 1151-52 (1973).

RULES OF PRACTICE: PETITION TO REOPEN THE RECORD

Criteria for reopening the record govern each issue; the fortuitous circumstance that a proceeding has been or will be reopened on other issues is not significant. *Georgia Power Company* (Alvin W. Vogtle Nuclear Plant, Units 1 and 2), ALAB-291, 2 NRC 404, 413-414 (1975).

EMERGENCY PLAN: PROTECTION OF PERSONS OUTSIDE LPZ

Commission regulations do not require consideration in a licensing proceeding of the feasibility of devising an emergency plan for the protection (in the event of an accident) of persons outside of the low population zone. *New England Power Company* (NEP, Units 1 and 2), *et al.*, ALAB-390, 5 NRC 733, 747 (1977).

EMERGENCY PLAN: CONTENT

The type of accident that might occur at a particular plant is irrelevant to planning for emergency evacuation. The criteria for emergency planning are based on Part 100 which assumes radiation releases from a hypothetical major accident.

EMERGENCY PLAN: CONTENT

The vesting of certain emergency plan responsibilities (particularly those related to monitoring) in an applicant does not contravene the Price-Anderson Act, 42 U.S.C. 2210.

ATOMIC ENERGY ACT: SCOPE OF INFORMATION REQUIRED FOR LICENSING (AIRCRAFT CRASHES)

The concept of analyzing aircraft hazards in terms of probabilities has had longstanding acceptance within the Commission. *Long Island Lighting Company* (Shoreham Nuclear Power Station), ALAB-156, 6 AEC 831, 845-46 (1973).

RULES OF PRACTICE: APPELLATE PROCEDURE

A party may not raise issues on appeal which were not raised below. *Tennessee Valley Authority* (Hartsville Nuclear Plant, Units 1A, 2A, 1B, 2B), ALAB-463, 7 NRC 341, 351-52 (1978).

ATOMIC ENERGY ACT: SCOPE OF INFORMATION REQUIRED FOR LICENSING (AIRCRAFT CRASHES)

The consequences of a greater than design basis aircraft crash need not be explored, inasmuch as the probability of such a crash is so low that the plant need not be designed to withstand it, notwithstanding what its consequences might be.

OPERATING LICENSE: SUSPENSION

Nuclear facilities may be allowed short-term operation if it is determined on the record that a still unresolved safety question has no application to such operation.

TECHNICAL ISSUES DISCUSSED: emergency plans; aircraft crash risk.

Messrs. George F. Trowbridge and **Ernest L. Blake, Jr.**, Washington, D. C., for the applicants, Metropolitan Edison Company, Jersey Central Power and Light Company, and Pennsylvania Electric Company.

Mr. Chauncey R. Kepford, State College, Pennsylvania, for the intervenors, Citizens for a Safe Environment and York Committee for a Safe Environment.

Ms. Karin W. Carter, Assistant Attorney General of Pennsylvania, Harrisburg, Pennsylvania, filed a brief for the Commonwealth of Pennsylvania.

Mr. Stuart A. Treby (Messrs. Henry J. McGurren, Gregory H. Fess, and Lawrence J. Chandler on the brief) for the Nuclear Regulatory Commission staff.

DECISION

Unit No. 2 of the Three Mile Island Nuclear Station (TMI-2), located adjacent to a similar unit on an island in the Susquehanna River about 12 miles from Harrisburg, Pennsylvania, received a construction permit in November 1969, prior to enactment of the National Environmental Policy Act (NEPA). Therefore, no environmental review was performed in connection with the application for that permit. Subsequently, after the applicants (Metropolitan Edison Company, *et al.*) had sought an operating license, a Licensing Board undertook to consider both (1) those environmental and safety questions bearing upon the issuance of such a license; and (2) whether, as a result of a complete environmental review, the previously issued construction permit should be continued, modified, terminated, or appropriately conditioned to protect environmental values.[1]

On December 19, 1977, the Licensing Board issued an initial decision in which it concluded that the construction permit should remain in effect and authorized the Director of Nuclear Reactor Regulation to make findings requisite to issuance of a full-term operating license (subject to specified environmental conditions).[2] Exceptions to that decision were filed by Citizens for a Safe Environment and the York Committee for a Safe Environment, joint intervenors below.[3] Those intervenors also moved us to stay the effectiveness of the initial decision. In ALAB-456, 7 NRC 63 (January 27, 1978), we denied the motion.

The intervenors renewed their stay request before the Commission.[4] They stressed, as they had before us,[5] their disagreement with the Licensing Board's rejection of their claim that the environmental review of the nuclear fuel cycle had not correctly dealt with the effects of radon (Rn-222) releases generated by mill tailings produced in the course of the mining and milling of uranium. In ALAB-456, we had held that this claim was "barred as a

[1]See 10 CFR Part 50, Appendix D, Section C (1974 ed.).

[2]LBP-77-70, 6 NRC 1185. An operating license (DPR-73) was issued on February 8, 1978. See 43 Fed. Reg. 7073 (February 17, 1978).

[3]An appeal was also filed by a nonparty; we dismissed it for that reason. ALAB-454, 7 NRC 39 (January 23, 1978).

[4]On February 27, 1978, they also sought a judicial stay of the operating license authorization, but the court of appeals denied their request. *Kepford* v. *NRC*, No. 78-1160 (D.C. Cir., March 8, 1978).

[5]The issue was before us both through the intervenors' exceptions and as part of the stay request.

matter of law for the reason that it constitutes an impermissible attack upon a generic regulation of the Commission"—Table S-3 of 10 CFR 51.20(c).[6] The Commission, however, as was within its (but not our) authority, agreed with the intervenors that the radon release values in Table S-3 were incorrect and accordingly set aside that portion of the table. CLI-78-3, 7 NRC 307 (March 2, 1978). Although it denied the requested stay, the Commission directed us to review the issue "as though no Rn-222 release figure had been determined by regulation in Table S-3." *Id.* at 310. With that in mind, and following discussion of the matter with the parties at oral argument, we remanded the radon issue to the Licensing Board for further consideration. ALAB-465, 7 NRC 377 (March 27, 1978). But subsequently, in an order encompassing all the cases before us involving the radon matter, we determined that one particular proceeding pending before a licensing board[7] should be treated as the "lead case," with supplementary material to be received in other cases (including this one) where appropriate. *Philadelphia Electric Company* (Peach Bottom Atomic Power Station, Units 2 and 3), *et al.*, ALAB-480, 7 NRC 796 (May 30, 1978). As a result, we vacated the remand in ALAB-465. The radon issue remains before us pending the pursuit of the procedures outlined in ALAB-480.[8]

Now ripe for disposition are the remaining issues raised by the intervenors on appeal. Only two are sufficiently substantial to warrant discussion: the adequacy of the applicants' emergency plan and the probability of a crash of a heavy aircraft into the plant. With respect to the former question, the intervenors have moved to reopen the evidentary record. We have reviewed their claims and have found insufficient cause either to reopen the record on the emergency plan or to disturb the result reached by the Licensing Board on that question. As for aircraft crashes, our review has led to a different result. The record does enable us to find reasonable assurance of safety given present levels of aircraft traffic in the vicinity of the plant. But it contains sufficient inconsistencies and ambiguities relative to aircraft

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[6]7 NRC at 65. The Licensing Board had applied the Table S-3 values; the intervenors' position was that those values were erroneous. But that Board also admitted into evidence (and permitted cross-examination on) testimony proffered by the intervenors (and responsive testimony offered by the staff) on the health effects of radon releases and the effect of such releases on the comparative nuclear-coal cost-benefit balances. Without determining whether such testimony constituted an impermissible challenge to Table S-3, and granting *arguendo* the correctness of the intervenors' analysis, the Board determined the radon impact "to be of negligible materiality" and insufficient to alter the comparison between the nuclear and coal alternatives. 6 NRC at 1224.

[7]*Duke Power Company* (Perkins Nuclear Station, Units 1, 2, and 3), Docket Nos. STN 50-488, STN 50-489, STN 50-490.

[8]On July 14, 1978, the *Perkins* Licensing Board rendered its partial initial decision on the radon matter. LBP-78-25, 8 NRC 87.

crash probabilities over the life of the plant that we must order a further hearing on that question. There is, however, no need to suspend the operating license pending the outcome of that hearing.[9]

I. EMERGENCY PLANNING

A. The Final Safety Analysis Report (FSAR) for every operating license application must include "[p]lans for coping with emergencies." 10 CFR 50.34(b)(6)(v). While it need not include the "details of these plans and the details of their implementation," the FSAR must at least describe certain defined elements "to an extent sufficient to demonstrate that the plans provide *reasonable assurance* that appropriate measures can and will be taken in the event of an emergency to protect public health and safety and prevent damage to property." 10 CFR Part 50, Appendix E, Part III (emphasis supplied).[10]

The emergency plan for this reactor appears in Section 13.3 of the FSAR, as supplemented by Appendix 13A. Additional descriptive material relating to the plan was presented by a panel of the applicants' witnesses (Herbein, *et al.*, prepared testimony, fol. Tr. 757) and by two witnesses sponsored by the Commonwealth of Pennsylvania (fol. Tr. 801). The staff both reviewed the plan in its Safety Evaluation Report (SER, §13.3) and presented testimony on it (Van Niel, prepared testimony, fol. Tr. 1701).

In general, the plan anticipates that "the station will be self-sufficient in handling emergency conditions" but that "outside agencies will be called upon as needed" (FSAR, §13.3.1). The applicants are to be responsible for initially detecting the occurrence of an accident or event giving rise to an emergency situation; taking corrective action (where possible); assessing

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[9]This Board's *sua sponte* review of the remainder of the record has disclosed no other error warranting corrective action.

Insofar as intervenors' request for financial assistance is concerned, the Commission has held that no such assistance is to be granted in a proceeding of this type. *Nuclear Regulatory Commission* (Financial Assistance to Participants in Commission Proceedings), CLI-76-23, 4 NRC 494 (1976). We and the licensing boards are, of course, bound by that ruling. *Detroit Edison Company* (Greenwood Energy Center, Units 2 and 3), ALAB-376, 5 NRC 426, 428 (1977).

[10]The elements of an emergency plan which are identified in the regulations pertain to, *inter alia,* the organizational structure relied upon for coping with emergencies; communications systems to be used to keep various involved organizations informed of matters bearing upon their responsibilities, the means for determining the magnitude of radioactive releases; identification of first aid, decontamination, and treatment facilities; training of and drills for persons charged with emergency planning responsibilities; and criteria for determining the appropriateness of reentry into the facility and resumption of operations. 10 CFR Part 50, Appendix E, Part IV.

potential offsite and onsite effects; and timely notifying local, State, and Federal authorities (Herbein, *et al.*, pp. 1, 4). Among the authorities that might assist in responding to an emergency are the State and local (Dauphin County) civil defense organizations, the Pennsylvania Bureau of Radiological Health (BRH), the State Police, local fire departments, and the NRC Brookhaven Assistance Group (*id.*, pp. 3-4, 10). The record includes agreements between the applicants and various outside organizations spelling out the responsibilities the organizations would assume.

Stated in an extremely simplified way, the sequence of activities following an accident or incident, or other cause of radioactive release, would be as follows. The occurrence of the event would be detected, and its severity assessed, by means of instruments located onsite and monitored in the control room (and confirmed and augmented by portable equipment) (see Herbein, *et al.*, p. 5; also, LBP-77-70, 6 NRC at 1201-02). Thereupon, the applicants would notify first the State Council of Civil Defense duty officer (who is available at all times) and then (as necessary) the State Police, a nearby medical center, and NRC (Herbein, *et al.*, p. 10; Tr. 792). In the event of the most serious type of incident, the occurrence would become known in seconds, and the duty officer would be notified within 5 minutes (Tr. 1606). That officer in turn would notify the county civil defense organization (*ibid.*), which is also manned without interruption (Molloy, prepared testimony, fol. Tr. 801, p. 3), and the BRH duty officer. BRH would confirm the notification by recontacting the applicants (Tr. 1611, 1745, 1827A).

The information provided by the applicants to the State and local organizations would vary depending upon the nature of the event in question (Tr. 767-68); in all instances, however, it would include such data as might be available to assist in determining whether (and in what area) evacuation was called for. The applicants would also make a recommendation as to evacuation (Tr. 1606-07), but the State would make the final determination, based upon the advice of BRH (Herbein, *et al.*, pp. 3-4; Tr. 1363-64, 1481-82, 1625, 1654-57). The Dauphin County Civil Defense organization, acting through local fire and police departments and local civil defense personnel, would carry out the evacuation.

The Environmental Protection Agency has promulgated guidelines which would call for protective action to avoid doses to individuals in excess of 5 rem whole body of 25 rem to the thyroid.[11] The applicants' evidence indicated that, assuming the occurrence of the maximum hypothetical accident postulated under 10 CFR Part 100, nondispersive atmospheric conditions, and the transport of radioactive material in the direction of the

[11] Herbein, *et al.*, p. 9.

greatest number of people near the site (*i.e.*, north, toward Middletown, Pennsylvania), those dose levels would not be exceeded (1) within 45 minutes of the time of the event at a distance of 1 mile from the site; (2) within 3 hours at a distance of 2 miles from the site (on the fringe of the more densely populated areas of Middletown); (3) within 5 hours in the center of Middletown; and (4) at any time beyond 4.8 miles from the site (Herbein, *et al.*, pp. 8, 9). The Director of the Dauphin County civil defense organization (Kevin J. Molloy) testified that, in these circumstances, no more than 15,000-18,000 persons would have to be evacuated (Molloy, *supra*, p. 7; Tr. 1409, 1447-48, 1452). He concluded that "we could effect and complete an evacuation of this type within the period allotted us"—*i.e.* less than 1 hour for persons located closest to the island, less than 3 hours for those on the edge of the more densely populated areas of Middletown, less than 5 hours for those in the center of Middletown, and "a couple more hours" out to 5 miles (Molloy, pp. 10, 6; Tr. 1411). The staff determined that the organization and procedures proposed were adequate and that the applicants' plan satisfied applicable requirements (Van Niel, pp. 4-5). The Licensing Board agreed, finding the emergency and evacuation plans to be "both adequate and workable." 6 NRC at 1206.

B. With this background in mind, we turn to the particular criticisms leveled against the emergency plan by the intervenors. Both before the Licensing Board and on appeal, the intervenors have asserted that the plan is "inadequate and unworkable" for several discrete reasons—*viz*:

> The plans were based upon the unproven and questionable assumptions that all necessary officials will be available at all times, will know how to respond and will react promptly, and that members of the public will respond to a radiological emergency and allow themselves to be evacuated. . . .

Brief on appeal, p. 8. They additionally have advanced two legal claims: that the Board improperly limited the scope of their cross-examination, and that the plan is inconsistent with the Price-Anderson Act. We will treat these matters *seriatim*.

1. Central to the intervenors' challenge to the adequacy of the evacuation plan is their expressed belief that "live tests and drills" are essential. They reason that radiological emergencies are different from other emergencies and that the effectiveness of the plan can be ascertained only through tests involving the potential evacuees.

The evidence, however, is to the contrary. Witnesses for the Commonwealth expressly discounted the need for or desirability of live drills. The Director of Civil Defense for Dauphin County questioned whether such drills would be meaningful and whether most people would participate; in-

deed, he suggested that they might prove counterproductive inasmuch as a real emergency was not likely to conform to a test situation and an appropriate response to one might not be an appropriate response to the other (Molloy, p. 13; Tr. 1463). On the basis of a Stanford Research Institute study, substantiated by his personal knowledge of two events in Pennsylvania, the Deputy Director of the State Council on Civil Defense expressed a similar view (Williamson, prepared testimony, fol. Tr. 801, p. 10). He specifically pointed to (1) a planned extensive public evacuation exercise in Erie, Pennsylvania, in which actual public participation had been "minimal" and (2) the successful evacuation within approximately 4 hours of more than 100,000 people from Wilkes-Barre in the wake of Hurricane Agnes (*ibid.*). To the same effect, see also Tr. 1463, 1468-69 (Molloy); Tr. 1642-43 (applicants' witness); Tr. 1829-32, 1938-42 (staff witness); but *cf.* Tr. 1835 (recognizing "some diversity of opinion" in this area). Accordingly, the Licensing Board's rejection of the intervenors' thesis regarding live drills (6 NRC at 1206) is well-founded in the record.[12]

Closely tied to the intervenors' claim regarding the need for live drills is their assertion below that a predicate to a successful emergency plan is knowledge on the part of those who would be evacuated of the nature and consequences of radiological events.[13] As in the case of live drills, however, the record firmly establishes that such knowledge is not necessary. Indeed, a staff witness who had participated in the review of the emergency plan testified, on the basis of his more than 5 years' experience in emergency planning, that "the general population reacts more readily, fears more readily things which it knows nothing about" (Tr. 1852); and that, when confronted with such an event, a person "generally responds to people who tell him what to do to protect his health. . . . It is the fear of the unkown that makes [people] act" (*ibid.*).

2. Although discounting the need for live drills involving the public, the witnesses for the Commonwealth, the applicants, and the staff all acknowledged the desirability of drills for personnel assigned responsibilities under the emergency plan.[14] The plan provides for such drills by applicants'

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[12]We note that about a year ago the Commission denied a rulemaking request which sought a general requirement for licensees to conduct an "actual evacuation drill" as a precondition for obtaining a license. 42 Fed. Reg. 36326 (July 14, 1977).

[13]The assertion does not appear to have been directly advanced on the intervenors' appeal.

[14]An emergency plan must include, *inter alia*, "[p]rovisions for testing, by periodic drills, of radiation emergency plans to assure that employees of the licensee are familiar with their specific duties, and provisions for participation in the drills by other persons whose assistance may be needed in the event of a radiation emergency." 10 CFR Part 50, Appendix E, Part IV.I. Significantly, the appendix lacks any requirement or suggestion that live drills involving the public be included in an emergency plan.

personnel and others charged with responsibilities under the plan. See FSAR, App. 13A, §13A.10; Herbein, *et al.*, pp. 11-12; Molloy, p. 12, and Tr. 1457; Williamson, pp. 9-10; Van Niel, p. 4 and Tr. 1829-30.

The intervenors' only challenge to these provisions (aside from the failure to involve the general public, as discussed above) appears to rest on their assumption that the drills are announced in advance and hence are not "random." This assumption is not justified. It is founded wholly on the acknowledgement by an applicants' witness that *some* drills are scheduled and the participants so advised (Tr. 786-88, 793). But the same witness indicated that such notice is given for only one-third to one-half of the drills (Tr. 793) (see also Tr. 1079).

It bears noting that the provision for drills for Unit 2 parallels the requirement in effect under the emergency plan for Unit 1 (Tr. 1655). A staff witness testified, without contradiction, that he had observed two full-scale drills at Unit 1 and "in my opinion the drills [were] probably some of the best drills that I have seen conducted, wider in scope than I have seen in other areas, and the emergency planning as a whole has proven to me, or has been shown to me as being much more than adequate" (Tr. 1856).

3. The intervenors challenge the adequacy of the training program for persons who will carry out an emergency plan.[15] Specifically, they claim that the plan can be effective only if those persons have expert knowledge of the effects of radioactivity. But they point to no evidentiary foundation for that proposition.[16] Indeed, all the testimony on this subject contradicts the intervenors' conclusion. Mr. Molloy emphasized that he is able to fulfill his evacuation responsibilities effectively without specialized knowledge of radiation. He maintained that his evacuation personnel are adequately trained to carry out their responsibilities and, additionally, have expert assistance available to assist them—primarily from BRH and the applicants (Molloy, p. 5). Further, one of his staff members is a radiological defense officer (Tr. 1356-58, 1361) and several hundred persons in Dauphin County have been trained in radiological monitoring and are available to assist in an emergency, in most instances as volunteer firefighters (Tr. 1359-60). Approximately 50 percent of those who might aid in an evacuation have either

[15]An emergency plan must include "[p]rovisions for training of employees of the licensee who are assigned specific authority and responsibility in the event of an emergency and of other persons whose assistance may be needed in the event of a radiation emergency." 10 CFR Part 50, Appendix E, Part IV.H.

[16]In support of the proposition, they rely solely upon Mr. Molloy's admissions that his only special knowledge of radiation (or of the consequences of radiation) is derived from a week-long seminar on emergency planning for nuclear facilities (Tr. 1355-56, 813-14, 837; see also Tr. 1567). Plainly, that evidence provides no basis whatsoever for the point intervenors are attempting to make.

taken Pennsylvania's radiological monitoring course (as Mr. Molloy did)[17] or had other radiological training (Tr. 1449-50).

Even more important, Mr. Molloy insisted that those responsible for an evacuation would not need "detailed knowledge" of the event compelling that action (Molloy, p. 6). Rather, useful knowledge would be strictly limited and of a different genre:

> What we need to know is generally the nature of the problem, secondly what segment of the public will be or could be affected, and what action on our part is recommended. With this information, our organizational structure and communications capabilities allow us to respond very quickly, calling upon and coordinating whatever groups or agencies the situation dictates.

Ibid.; see also Tr. 1363. To the same effect, see Tr. 1686-87 (applicants' witness). Mr. Molloy expressed confidence that his organization had (or would have available to it) adequate knowledge of this sort (Molloy, pp. 5-6, 10-11; Tr. 1370-73, 1722-24).

On this score, the staff testimony went even further. It pointed to an Environmental Protection Agency study (EPA-520/6-74-002, June 1974) analyzing some 500 events—including floods, fires, hurricanes, explosions, and release of toxic substances—that had prompted evacuation. The study had found no statistically significant difference in the effectiveness of evaucation with an emergency plan and without such a plan. A staff witness opined that the study was relevant "because it talks about the movement of people. The reason for the movement, I think, is of secondary importance" (Tr. 1828). He added that the staff nonetheless believes it prudent that there be "proper training and planning on the part of the officials responsible for evacuation" (Tr. 1833). Another staff witness attributed the emergency plan requirement to the Commission's concept of "defense in depth" Tr. 1834).

Finally, Mr. Molloy pointed to the wide variety of emergency situations in which his organization had successfully carried out evacuations (Molloy, p. 11). He specifically mentioned floods, a plane crash, a passenger bus accident, a train derailment (*ibid.*), and natural gas seepage (Tr. 1361-62). And he unequivocally stated that his actions did not depend on detailed knowledge of these matters (Tr. 1362).

Given this evidentiary record, the Licensing Board's conclusion that the effectiveness of State and local officials will not be hampered by a lack of technical training in radiological matters (6 NRC at 1206) is manifestly correct.

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[17]See n. 16, *supra*.

4. The intervenors' remaining factual challenge to the Licensing Board's evacuation determination is somewhat vague and diffuse; we understand it, however, to question the "availability at all times" of "officials" charged with evacuation responsibilities. Although their brief on appeal does not specifically identify the "officials" intervenors have in mind, it seems probable that the intended reference was either to State (or local) civil defense or to radiological health personnel.

a. No evidence of record casts doubt upon the testimony that the State civil defense duty officer is available continuously and that Dauphin County civil defense headquarters is likewise always staffed (Herbein, *et al.*, p. 10; Molloy, p. 3; Van Niel, p. 2). Moreover, in every test of the communications system, whether announced or random, the State or county official sought to be reached was available (Tr. 792-94).

b. Insofar as BRH personnel are concerned, we have seen that those individuals serve as radiological advisers to State and local civil defense personnel and, under the evacuation plan, would advise as to the appropriateness of evacuation in a given situation (see pp. 15, 18, *supra*). BRH also engages in offsite monitoring following an accident (Tr. 1075-76, 1668-69). Further, both Mr. Herbein (the applicants' witness) (Tr. 1607, 1625) and Mr. Molloy (Tr. 1363-64) indicated that the receipt of advice from a knowledgeable source (such as BRH) was perhaps the most significant element in determining whether evacuation should occur (as well as the area involved).

At the hearing below, the intervenors questioned whether budgetary curtailments would make BRH unavailable for or incapable of performing its assigned functions. Their inquiry was founded on a public announcement of the Pennsylvania Department of Environmental Resources (BRH's parent organization), dated May 13, 1977, to the effect that a budget cut for the 1977-78 fiscal year approved by the Pennsylvania Seante would result in a drastic curtailment of that department's services, including, *inter alia*, a reduction in the "radiologic health environmental monitoring program and emergency response capability" (Bd. Exh. 1, Tr. 1081-82).

But the record contains more than enough to support the conclusion that others could fulfill BRH's responsibilities under the emergency plan. The applicants indicated that, if necessary, they would notify NRC and make specific recommendations to achieve a substitution for BRH's capabilities (Tr. 1570-71). And there are clear indications that State and local civil defense officials are willing to rely upon advice provided by the applicants or NRC, either in conjunction with that of BRH or indepdent of it (Tr. 1363-64, 1368, 1499-1500, 1541, 1720-21, 2467, 2529-32). Beyond that, the staff stated that it would require resort to one or more of a number of available means to fill the "void in the overall emergency preparedness"

created by any inability of BRH to provide expected services (Tr. 1780-82; 1748-49).[18] Still further, the staff pointed out that it will keep track of the Commonwealth's continuing ability to fulfill its assigned responsibilities (Tr. 1078-79, 1087, 1746). Notwithstanding the intervenors' claim to the contrary, the record amply supports the conclusion that others could take over the functions assigned BRH in the emergency plan without the public safety being compromised.

c. In their appellate brief, the intervenors attempted to augment their position on BRH's potential lack of capability by referring to a statement made by the BRH Director at an EPA workshop (November 30-December 1, 1976). The statement analyzed the BRH experience in monitoring radioactive fallout from Chinese nuclear tests conducted in October 1976; and although indicating that BRH generally reacted satisfactorily to demands made upon it in the "fallout crisis," expressed serious doubt that it "would have been able to have responded as well" had there been a nuclear reactor accident.

That statement appeared in a draft EPA report which was not in the record before the Licensing Board. At oral argument, therefore, we advised the intervenors' representative that we could consider it only if he moved to reopen the record to include it. Somewhat belatedly, he did so.[19] In ALAB-474, 7 NRC 746, 748 (May 5, 1978), we decided to hold the motion in abeyance pending our review of the record on emergency planning and then to determine it on the merits (despite its tardiness) because it addressed an important safety question.

We recently have had occasion to reiterate the standards for reopening a record. *Kansas Gas & Electric Company* (Wolf Creek Generating Station, Unit No. 1), ALAB-462, 7 NRC 320, 339 (March 7, 1978). As we there stressed, the proponent of a motion to reopen bears a heavy burden. The motion normally must be timely presented and addressed to a significant issue. Moreover, if an initial decision has already been rendered on the issue, it must appear that reopening the proceeding might alter the result in some material respect. In the case of a motion which is untimely without good cause, the movant has an even greater burden; he must demonstrate not merely that the issue is significant but, as well, that the matter is of such gravity that the public interest demands its further exploration. See

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[18]These means include the expansion of the applicants' capabilities, replacement of BRH by another State agency, development of an "interagency cadre" to handle the BRH functions, or possible assumption of responsibility by the Federal Government (*ibid.*). *Cf.* Williamson, p. 5.

[19]At our request, the applicants, by letter dated March 24, 1978, supplied us with a copy of the draft report.

Vermont Yankee Nuclear Power Corp. (Vermont Yankee Nuclear Power Station), ALAB-138, 6 AEC 520, 523 (1973); *id.*, ALAB-167, 6 AEC 1151-52 (1973). These criteria govern each issue to be reopened; the fortuitous circumstance that a proceeding has been or will be reopened on other issues has no significance. See *Georgia Power Company* (Alvin W. Vogtle Nuclear Plant, Units 1 and 2), ALAB-291, 2 NRC 404, 413-14 (1975).

Plainly, intervenors' motion does not satisfy the above criteria for reopening.[20] Review of the statement and analysis of the issue demonstrate that the BRH Director raised only one matter relevant here: whether the bureau could fulfill its responsibilities for postaccident monitoring under the emergency plan. The statement does appear to question BRH's existing ability to conduct widespread environmental sampling and long-term laboratory analyses of such samples—activities incident to, but not directly involved with, emergency evacuation procedures. As we have seen, however, the question of BRH capability to respond to an emergency has already been fully litigated, in the context of the budgetary constraints which BRH might face. And we have also determined on this record that BRH participation is not essential to a successful emergency evacuation, since the applicants and NRC could fulfill the responsibilities assigned under the plan to BRH. That being so, reopening the record could not change the result previously reached and hence is not warranted.[21]

5. The intervenors claim that the Licensing Board improperly limited

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[20]There is some question whether the intervenors' failure to raise the issue suggested to them by the December 1976 statement earlier than January 1978, when they filed the brief which first mentioned it, should preclude them from raising it now. The draft report is undated and it is unclear precisely when it was issued. An affidavit of the BRH Director states that he received it "early in 1977" (Gerusky, affidavit dated April 26, 1978, par. 3). Interevenors claim they were not aware of it until January 1978. But that, even if true, does not settle the matter.

Pennsylvania was participating in this proceeding as an "interested State" (see 10 CFR 2.715 (c)). During the hearing below in April 1977, intervenors requested that a BRH witness appear and testify as to that organization's capabilities (Tr. 888). After the Commonwealth interposed an objection to that request, the intervenors withdrew it (Tr. 891). Even if the intervenors were not aware at that time of the December 1, 1976, statement of the BRH Director, had they persisted in their attempt to examine a BRH witness on BRH's capabilities and had their request to do so been granted, any present or projected weaknesses in those capabilities could have been brought to light by thorough questioning.

[21]There appears to be no evidentiary support whatsoever for other assertions made by the intervenors in their motion to reopen, to the effect that the Director of BRH had suggested in an otherwise unidentified public statement that he and members of his staff would not be on 24-hour call to respond to an emergency, and that the Director had stated in another unidentified statement that BRH had suffered a manpower loss "since the date of the EPA document." The Director by affidavit has explicitly denied making any such statements and has confirmed that BRH is in fact on 24-hour call. Gerusky, affidavit dated April 26, 1978, pars. 4, 5.

their cross-examination with respect to the size of the area to be considered for evacuation in the emergency plan. They insist that they should have been allowed to explore the feasibility of evacuation of areas beyond 5 miles from the reactor.

Intervenors' position is directly contrary to *New England Power Company* (NEP, Units 1 and 2), *et al.*, ALAB-390, 5 NRC 733 (1977). We there determined that existing Commission regulations do not require consideration in a licensing proceeding of "the feasibility of devising an emergency plan for the protection (in the event of an accident) of persons located outside of the low population zone." 5 NRC at 747. The LPZ for this facility extends 2 miles out from the reactor (SER, §2.1.3). It is true that, for reasons which need not be discussed here, the applicants and the staff nevertheless looked into the possible need for protective measures within a 5-mile radius of the reactor—and the intervenors were permitted to cross-examine on the evidence presented in this regard. It scarcely follows from this fact, however, that the question of emergency planning at still greater distances from the LPZ boundary had to be explored at the Intervenors' instance.

Intervenors further argue: "The prejudice to the public interest by this restriction of inquiry to evacuation of the areas in the immediate vicinity of TMI-2 is compounded because the record had already shown that a Class 9 accident at TMI-2 could occur by the crashing of a large aircraft into the TMI-2 plant." The likelihood of such a crash is discussed in Part II of this opinion and in Mr. Sharfman's dissent. It suffices for our purposes here to recall that the rquirements for evacuation planning are rooted in 10 CFR Part 100,[22] and that Part 100 assumes releases of radiation based upon a hypothetical major accident "that would result in potential hazards not exceeded by those from any accident considered credible."[23] Thus, what accidents might conceivably occur at the particular plant in question is irrelevant to planning for emergency evacuation; that is based solely on the Part 100 hypothetical accident and the assumed releases of radioactivity resulting therefrom.

6. Intervenors' claim that the emergency plan somehow runs afoul of the Price-Anderson Act[24] merits little discussion.[25] It appears to rest on the

[22]*NEP, supra.*

[23]Footnote 1 to 10 CFR 100.11(a).

[24]The provisions of the Price-Anderson Act are contained in Section 170 of the Atomic Energy Act, as amended, 42 U.S.C. 2210. Their constitutionality recently was upheld by the Supreme Court. *Duke Power Company* v. *Carolina Environmental Study Group,* _____ U.S._____, 46 U.S.L.W. 4845 (June 26, 1978).

[25]The applicants correctly point out that the Price-Anderson question was not explicitly encompassed by the intervenors' contentions. The staff goes on to assert that the question also

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thesis that the applicants will be the sole source of radiological information in the event of an accident; that, as a result of Section 190 of the Atomic Energy Act, as amended, 42 U.S.C. 2240, such information "cannot be used as evidence against the applicant in court"; and, hence, that the vesting of emergency plan responsibilities in the applicants (particularly those related to monitoring) "denies victims of a nuclear accident the opportunity to introduce in court the only evidence likely to establish a claim under the Price-Anderson Act." This line of reasoning is, however, defective in several respects.

In the first place, intervenors' factual premise that applicants are the sole source of radiological information is plainly incorrect. Postaccident monitoring is the responsibility not only of the applicants but also of State agencies (primarily BRH), the Department of Energy, the NRC, and others (Tr. 1093-94, 1578-81, 1613-14, 1668-70, 1678, 1742-43, 1767, 1805-06). Even if BRH should be unable to fulfill its monitoring responsibilities, other agencies (both Federal and State) would take up the slack. See p. 20-21, *supra*.

More important, the intervenors' legal premise is far wide of the mark. Section 190 of the Atomic Energy Act provides that

> No report by any licensee of any incident arising out of or in connection with a licensed activity made pursuant to any requirement of the Commission shall be admitted as evidence in any suit or action for damages growing out of any matter mentioned in such report.

The "action for damages" which intervenors have in mind is one arising under the provisions of Price-Anderson (*i.e.*, Section 170 of the Act (see fn. 24, *supra*.)) Under those provisions, the licensees waive, *inter alia*, "any issue or defense as to conduct of the claimant or fault of persons indemnified" (Section 170n. (1) (c) (i), 42 U.S.C. 2210 (n) (1) (c) (i); 10 CFR 140.2(c)). With limited exceptions not relevant here, a claimant would have to prove only causation and the severity of any injury in order to recover damages. The availability of the licensees' monitoring reports would be of little consequence because the Commission itself is required to make a public report on the incident (presumably to be based in part on information supplied by the licensees) (Section 170i, 42 U.S.C. 2210(i).

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"was not raised otherwise below" and asks that we dismiss the exception on this issue for that reason. In making this argument, which we reject, the staff has apparently overlooked the intervenors' unsuccessful attempt to include the Price-Anderson matter in their cross-examination on evacuation (Tr. 1782-83, 2505-12) and their filing of a proposed "finding" (par. 65) and "conclusion" (par. 94) on the subject (Intervenors' Proposed Findings of Fact and Conclusions of Law, dated August 15, 1977).

Further, the use limitations in Section 190 are strictly limited to particular reports submitted to the Commission and (as the applicants concede) would restrict neither (1) an individual's rights informally to request or formally to discover information and data possessed by the applicants (as licensees) concerning the offsite consequences of an accident; nor (2) his use of that information and data. In other words, while the use of the report itself may be circumscribed by Section 190, the use of the information and data undergirding the report is not.

II. AIRPLANE CRASHES

As a result of the facility's relative proximity to Harrisburg International Airport (formerly Olmstead Air Force Base), a significant issue throughout this licensing proceeding (as well as that for Unit 1) has been whether the public is adequately protected against the hazards of a crash of an airplane into the facility. The reactor's vital structures, power supplies, and cooling water sources ("safety structures") have been designed to withstand the aircraft impact and fire effects from the crash of a 200,000-pound plane traveling at 200 knots, the "design basis crash."[26] The crash of an airplane heavier than 200,000 pounds into TMI-2 has been calculated by the applicants and staff to have such a low probability that it does not present a hazard to the public, and therefore the plant need not be designed to withstand its effects. Because the probability of an airplane crash is proportional to the level of aircraft traffic, the determination that the crash probability for heavy aircraft is acceptably low reflected both the current level of heavy aircraft traffic at the airport and the projected magnitude of such traffic in the future.

The Licensing Board accepted this analysis (6 NRC at 1197-1200), despite the intervenors' challenges to the crash probability assessments of the applicants and the staff. The intervenors appeal from the Board's determination.

A. To give proper perspective to the claims of the parties on this matter, it is useful to look first at the Commission's methodology for determining whether there is reasonable assurance that the public will not be exposed to undue hazard as a result of an airplane crash into a nuclear facility. Most facilities are not required to be specially designed to withstand such crashes,

[26]SER, Three Mile Island, Unit 1, dated July 11, 1973, at pp. 3-4, 3-5; incorporated by reference into SER for Unit 2, at p. 2-8. "Design basis" is defined in 10 CFR 50.2(u) as "that information which identifies the specific functions to be performed by a structure, system, or component of a facility, and the specific values or ranges of values chosen for controlling parameters as reference bounds for design."

since as a general matter the likelihood of a plane crash which might affect a facility is exceedingly low.[27] However, as one gets closer to an airport, the probability of an airplane crash rises[28]—presumably because the density of air traffic increases and the likelihood of an accident is greater during takeoff and landing operations than when the plane is in flight.

Needless to say, Commission policy in the implementation of the Atomic Energy Act requires an assurance that, once built, a facility near an airport meets the same safety standards as one farther away. Under guidelines established to effectuate this policy, aircraft crash analyses must be performed whenever an airport lies within either 5 or 10 miles of a facility (depending upon the number of annual flights at the airport in question) for the purpose of determining whether a crash "should be used as [a] design basis [event] for plant design . . . ."[29] If an aircraft crash be so used, the plant must be designed to withstand it—*i.e.*, designed so that radiation doses resulting from releases caused by such a crash will not exceed the dose levels specified in 10 CFR Part 100. Finally, if the probability of a plane crash, or the crash of any particular class of planes (*e.g.*, those weighing in excess of 200,000 pounds), can be shown to be less than 1×10^{-7} (*i.e.*, less than one chance in 10 million) per year,[30] such events are deemed by the staff to be of sufficiently low likelihood that their effects may be ignored, even though the consequences of such a crash may exceed those specified in 10 CFR Part 100. Standard Review Plan (NUREG-75/087), §3.5.1.6.[31]

The applicants describe the Three Mile Island site as being 2.7 miles south of the southeastern end of the Harrisburg airport's only runway, which lies in a roughly northwest to southeast orientation, along compass bearing 310°/130°.[32] In accordance with Commission guidelines, therefore,

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[27]The Standard Review Plan (NUREG-75/087, §3.5.1.6, par. III.2) suggests an aircraft crash rate per mile for commercial aircraft using aviation corridors as 3×10^{-9} (three chances in a billion). Away from such corridors, the rate would be even less.

[28]Vallance, prepared testimony, fol. Tr. 511, fig. 2; see also Tr. 514.

[29]Regulatory Guide 1.70, Revision 2 (NUREG-75/094), §§2.2, 2.2.2.5; see also Standard Review Plan, §3.5.1.6, par. III.3.

[30]In this opinion, "10^{-7}" refers to "1×10^{-7} per year."

[31]In pertinent part, that section provides that "[t]he plant is considered adequately designed against aircraft hazards if the probability of aircraft accidents resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines is less than about 10^{-7} per year . . . " (par. II.1).

[32]The applicants go on to state that an extension of the runway in the southeasterly direction (*i.e.*, along bearing 130°) would pass no closer than 1.5 miles from the station, and a line from the runway end to the plant would form an angle of about 33° with the direction of the runway.

We have not been able to reconcile applicants' description of the TMI site *vis-a-vis* Har-

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aircraft crash analyses were required to be—and were—performed with respect to the Three Mile Island facility.

The crash for which the facility's safety structures are designed was chosen for two reasons: the great majority of aircraft which use the Harrisburg airport weigh less than 200,000 pounds,[33] and the 200-knot velocity represents an upper limit for aircraft involved in accidents in the vicinity of airports.[34] Beyond that, the applicants and staff each computed the probability that an aircraft weighing more than 200,000 pounds might crash into the plant's safety structures; each found it to be less than 10^{-7} per year.

To assure that these safety levels are maintained throughout the life of the plant, the staff devised (and the Licensing Board approved) a technical specification requiring the applicants to monitor the yearly number of movements of planes weighing more than 200,000 pounds. The applicants would be required to take further protective measures if the heavy aircraft traffic became excessive.[35] Although there is considerable doubt respecting the meaning of the terms used (see pp. 30-32, *infra*), the Licensing Board adopted the staff's figure of "2,400 operations per year at Harrisburg International Airport" as the point where such further measures would have to be taken. 6 NRC at 1198-99.

B. Although the intervenors advanced a number of claims below bearing on the matter of airplane crashes, the dispute on appeal is narrow. In the first place, intervenors make no serious claim that the facility will not withstand the "design basis crash" for which it is designed.[36] And our review of

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risburg airport with the apparent relative configurations of the site and airport as shown on the maps in the record. For instance, the orientation of the runway shown in Figure 2.1-2 of the TMI-2 FSAR does not seem to lie exactly along the bearing 310°/130°.

[33]Vallance, pp. 5-6.

[34]Tr. 688.

[35]Read, fol. Tr. 617, p. 2. The further protective measures could include (1) reassessment of the actual design capability of the facility's safety structures, to ascertain whether in fact they might withstand a crash of a plane weighing over 200,000 pounds (and, if so, to what extent); (2) agreement to restrict use of airspace in the site vicinity; (3) redesign of exterior plant structures; or (4) as a last resort, plant shutdown (Read, supplemental testimony, fol. Tr. 1297, pp. 2-3).

[36]Their brief on appeal states (without citation) that "[i]t is not *known* whether or not the safety-related structures can even withstand the crash of a design basis aircraft." The only support for that statement might be another statement in the brief (quoting the staff witness) that no test of a large aircraft against a rigid structure had been performed since immediately following World War II (citing Tr. 631). The staff had objected to questions on the structural aspects of facility design on the ground that its witness was not qualified to answer such questions, and it offered to produce a witness who could do so (Tr. 639). When it later became clear that the intervenors were interested only in the plant's ability to withstand a greater than design
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the record on this matter gives us no reason to believe that it will not do so.

Second, the intervenors do not disagree that the determination whether a plant need be designed to withstand the crash of a heavy aircraft may properly turn on the probability of occurrence of such a crash. That they do not is understandable, for the concept of analyzing aircraft hazards in terms of probabilities has had longstanding acceptance within the Commission. See, *e.g., Long Island Lighting Company* (Shoreham Nuclear Power Station), ALAB-156, 6 AEC 831, 845-46 (1973). *Cf. Consolidated Edison Company of New York* (Indian Point Unit No. 2), CLI-72-29, 5 AEC 20 (1972) (acceptance of probability approach to ascertain the need for additional safety measures with regard to pressure vessels). Nor do they contest the applicants' and staff's conclusion that a facility need not be designed to withstand a crash the probability of which is less than approximately 10^{-7}.[37] In these circumstances, and absent any indication that the criterion should be different, we accept that probability value for the purposes of this case. See *Public Service Electric and Gas Company* (Hope Creek Generating Station, Units 1 and 2), ALAB-429, 6 NRC 229, 234 (1977).[38]

In view of all of the foregoing, the issue before us boils down to whether it can be said on this record that the probability analyses for heavy airplane crashes were properly performed. The intervenors have advanced a two-pronged attack on these analyses. First, they challenge portions of the data bases for the probability models (especially the applicants'), noting in particular the absence of crash data for unscheduled aircraft or for military aircraft of the type (C-5A) which uses the airport. Second, they question whether the models themselves can yield meaningful predictions of crash probability, absent an assessment of the error that might be associated with such predictions.

We turn now to a consideration of the probability analyses.

C. Computation of the probability of a crash into this facility by an

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basis crash, the offer to produce a witness was withdrawn (Tr. 642-44, 647-48, 727-29, 748). Intervenors also have never advanced any particular challenge to the calculations used to demonstrate the ability of the plant to withstand a design basis crash. They thus never raised the issue below, and accordingly have no right to raise it here. See *Tennessee Valley Authority* (Hartsville Nuclear Plant, Units 1A, 2A, 1B, 2B), ALAB-463, 7 NRC 341, 351-52 (March 17, 1978).

[37]App. Tr. 46-48.

[38]This acceptance of the 10^{-7} probability standard disposes of one of the matters raised on appeal: the Licensing Board's denial of intervenors' request for a witness who could testify as to the consequences of a greater than design basis crash. If the probability of such a crash is less than 10^{-7}, the plant need not be designed to withstand it, notwithstanding what its consequences might be. That being so, the Board's denial of intervenors' request is consistent with the criteria by which the aircraft crash issue is being judged.

airplane heavier than 200,000 pounds necessitates consideration of several independent factors. These include the number of such aircraft that will fly into and out of the airport per year; the target area presented by the facility; and the likelihood that an airplane will crash at a specific location relative to the airport runway (areal crash probability). To ascertain the reliability of the crash probability calculations before us, we must determine whether each of these factors has an adequate foundation and was properly used.

As will be seen, the existing record presents problems with respect to (1) the values employed in the probability analyses for the number of operations and (2) the areal crash probability. The value for the plant target area has been determined to our satisfaction, as well as to that of the parties.

Normally, calculation of the heavy aircraft crash probability at TMI-2 for any time in the future would be performed under the assumption that the target area and areal crash probability remain constant during the life of the plant. The result of such a calculation thus hinges upon the level of air traffic at the Harrisburg airport. Hence, the acceptable upper level of traffic is that for which the crash probability is 10^{-7}. To repeat, the staff has asserted, and the Licensing Board has accepted, that the aircraft traffic is acceptably low if fewer than "2,400 operations" per year are flown by heavy aircraft at the Harrisburg airport;[39] and 2,400 operations per year is the traffic level at which the staff would require a reassessment of the aircraft crash hazard at TMI-2. We must consider whether this value has been properly determined and is reasonable.

Although the applicants and staff used several techniques to compute the probability that a heavy aircraft might crash into the TMI-2 plant, all of the analytical methods are variations on the following equation:[40]

$$P_A = NAC$$

For present purposes, the terms of the equation may be defined as follows:

P_A = the probability per year that a plane weighing more than 200,000 pounds ("heavy aircraft") will crash into the plant (the single TMI-2 unit); *crashes per year.*

N = the number of heavy aircraft operations (landings and takeoffs) per year at the airport that might affect the plant—*i.e.,* those occurring at the TMI end of the runway; *operations per year.*

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[39]See p. 27, *supra.*

[40]This equation for crash probability uses the same nomenclature and is exactly in the form given in NUREG-75/087 (at p. 3.5.1.6-3), simplified to consider a single type of aircraft (those heavier than 200,000 pounds), and a single flight path (that associated with Harrisburg runway 310°/130°). The equation is similar to that used by applicants (Vallance, pp. 3-4), except for being restricted to a single runway, and replacing applicants' two-term crash probability expression, "RD," with a single term, "C."

A = the effective area of the facility—*i.e.*, the area that the plant, as a target, presents to an oncoming aircraft; *square miles.*

C = the areal crash probability—*i.e.*, the probability that a heavy aircraft engaged in a landing or takeoff operation will crash at a designated position with respect to the runway; *crash per square mile per operation.*

We proceed to a discussion of each of the factors in the probability equation.

1. Operations per year, N. Because there is some ambiguity in this record respecting the terminology used in the discussion of aircraft traffic, we begin with an explanation of the terms we shall use. An aircraft *operation* is either a takeoff or a landing, and presumably each plane both lands and takes off. Thus, the total number of operations at an airport is twice the number of planes which use the airport—*i.e.*, twice the number of *flights.* It is reasonable to assume that the operations are distributed evenly between the two ends of a runway.[41] Therefore, the number of operations at one end of the runway of a one-runway airport can be taken to equal the number of planes that use the airport.

The number of heavy aircraft operations per year at the TMI end of the runway should be the least ambiguous of the three parameters in the crash probability equation. Because the Harrisburg airport keeps records of the yearly number of heavy aircraft operations for the airport as a whole, it is possible to obtain a reasonably accurate value of N for a given year.

In their prepared testimony, the applicants used 1976 data for the airport to determine the annual number of heavy aircraft operations at the TMI end of the runway. They obtained a value of 511 such *operations*[42]—which, under the assumption discussed above, means the airport also had about 511 heavy aircraft *flights* per year.

In the PSAR and FSAR for this facility, however, the applicants had postulated for Harrisburg airport a traffic level of 80,000 "movements" (operations) per year, of which 3%—2,400 movements, or 1,200

[41]Planes normally take off and land into the wind. For a most extreme case of wind direction maldistribution—the wind blowing constantly from the south—all takeoffs would be at the southern end of a north-south runway, and all landings at the northern end. Consequently, the number of operations at each end would be the same but would be unequally distributed between landings and takeoffs. For the typical, more uniform distribution of wind direction, one would expect the number of landings and takeoffs at a particular end of the runway to be approximately equal, and equivalent to one-half of the total number of operations. See Vallance, pp. 5, 6.

[42]Vallance, p. 6. The actual total number of heavy aircraft operations from both ends of the runway at Harrisburg was 1,025.

flights—were by aircraft heavier than 200,000 pounds.[43] The calculations of crash probabilities in those documents assumed that half of the movements occur at the TMI end of the runway.

As it bears upon aircraft traffic at the airport, the staff's direct testimony (fol. Tr. 617) is at best confusing. Its witness mentioned "2,400 *operations* per year at Harrisburg International Airport" as an acceptable maximum traffic level. He went on to note, however, that,

> at present, about 600 four-engine jets per year *use* the airport, which is considerably within our criterion of 2,400.

We must assume that the numbers 2,400 and 600 refer to the same entity, and that entity seems to be *flights,* although the previous reference was to 2,400 *operations.* Similarly, on direct examination, the witness appears to have acknowledged that the figure "2,400" refers to the number of flights:

> Q. Would you say the analysis that you have done which shows that the probability of an aircraft striking the Three Mile Island Nuclear Station is acceptably low if aircraft larger than the design basis frequent the airport less than 2,400 times a year, that that is a conservative analysis?
>
> A. Yes, I would.

Tr. 620.

At oral argument, staff counsel likened the staff's value of 600 to the applicants' value of 511 heavy aircraft operations per year at the TMI end of the runway. But applicants derived their figure from the total of 1,025 heavy aircraft operations, or about 511 flights (see fn. 42, *supra*). The Licensing Board also seems to have taken the values 600 and 2,400 to refer to flights per year, rather than operations (par. 49, 6 NRC at 1200).

On the other hand, the SER's for TMI-2 and TMI-1 (the former cites the latter) refer to a traffic level of 2,400 operations per year, noting applicants' use of that figure. In these documents, the 2,400 figure clearly refers to the sum of the landings and takeoffs for 1,200 annual flights of heavy aircraft at the Harrisburg airport.[44]

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[43]TMI-2, FSAR, pp. 2.2-7 and 2.2-8. This document uses the term *movement* synonomous with *operation*; thus 80,000 movements would correspond to 40,000 flights at the airport, and 3% of this number would be 1,200 flights per year. See also TMI-2 PSAR, pp. S4-A-3 and S4-A-5.

[44]The testimony prepared by the staff for the TMI-1 operating license hearings (which, as it turned out, were not held) used the value of 2,400 operations to calculate the probability of a crash at the site; but the staff noted that that computation entailed a conservatism factor of two because it assumed that all takeoffs and landings were at the TMI end of the runway. See fn. 46, at p. 32, *infra* (Bernero Testimony, p. 7).

Because of these discrepancies in its evidence, it is unclear at what traffic level the staff would require a reassessment of airplane crash probability. In our opinion, however, the only reasonable interpretation of its testimony is that the staff intends to require such reassessment if and when the annual heavy aircraft traffic at Harrisburg International Airport exceeds 2,400 flights—not 2,400 operations. But as will appear later (see pp. 41-42, *infra*), use of the 2,400-flight figure gives rise to an unacceptably high crash probability—that is, beyond the 10^{-7} guideline—under the staff's own calculational technique.

2. Effective Area—A. The second parameter in the probability equation, the effective area, establishes the target a crashing plane must hit in order to damage the facility. In the FSAR (at p. 2.2-6), the applicants described the method for determining an effective area for the two-unit station:

> The "target area" for arrival (landing) accidents was assumed to be approximately the horizontal area (on the ground) which would be covered by the station plus the shadow cast by the largest vertical cross-section of the station (excluding cooling towers) assuming light rays emanate from the plane as it approaches the plant along a line inclined 10° above the horizontal. This angle was chosen as being a typical descent line for airplanes crashing on landing. (If the angle were greater, the area would be less and the probability of a strike would be less.) The area of shadow so obtained was increased by 50 percent to account for airplanes which might crash in front of the station and slide into it. The resulting target area for arrival accidents (here called A_a) is about 0.0225 square miles.
>
> The "target area" for departure (takeoffs) accidents was similarly estimated using a 45° approach angle believed typical of departure crashes. This area (here called A_d) was estimated to be 0.0066 square miles.[45]

According to the applicants (Vallance, p. 7), these calculations yield an average effective area for the two-unit TMI station—considering all operations (landings and takeoffs)—of 0.018 square miles, rounded to 0.02. Mr. Vallance used an area of 0.01 square miles in his analysis for Unit 2. So, apparently, did the staff.[46] The intervenors do not suggest that this method of

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[45]The analysis in the FSAR computed crash probabilities for aircraft landing (approaching) and taking off (departing) separately, then summed them for a total probability.

[46]No indication of the area used is found in the staff's direct testimony, or in the TMI-2 SER. However, in direct testimony submitted in the TMI-1 operating license proceeding, the area 0.01 square miles per unit was used (letter of October 26, 1973, from D. V. Olson, AEC

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ascertaining the target area presented by TMI-2 is inadequate, and we find it reasonable.

3. Areal Crash Probability—C. The remaining factor in the probability analysis is the crash probability at the plant site per unit area per operation. The spatial distribution of the crashes in the data base (*i.e.*, distribution as to distance from the runway end and orientation with respect to the direction of the runway) is of critical importance in determining this value. As it turned out, two crash data bases were used and several different techniques employed to determine spatial distribution.

a. Basic Crash Data

i. All of the probability analyses before us,[47] except that in applicants' direct testimony (the Vallance testimony), are based on crash data for 1956 through 1965 (*56-65 Data*). That data base includes all *fatal* accidents of U.S. carrier aircraft within 5 miles of airports *in the continental United States.*[48] The record shows that, for 80 million aircraft operations during this period, 27 accidents involving a fatality occurred within 5 miles of airports. Figure 2.2-2 of the TMI-2 FSAR pinpoints each of these landing and takeoff accidents in relation to the runway where it occurred.

The data base for the analysis in the Vallance testimony covers the period from 1968 through 1975 (*68-75 Data*). It includes all *destruct* accidents of U. S. carrier aircraft within 5 miles of airports including accidents *in the United States and abroad.*[49]

Although the Vallance testimony does not specify the location of each

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staff, to Licensing Board, transmitting direct testimony of Robert M. Bernero, at p. 7). This testimony goes on to point out that 0.01 square miles is about 280,000 square feet. To put this target area into perspective, it was there noted that the side-view area of the TMI-2 reactor building is approximately 22,000 square feet.

[47]TMI-2 PSAR (March 10, 1969); TMI-1, applicants' testimony (October 25, 1973); TMI-1, staff testimony (October 26, 1973); TMI-1 SER (July 11, 1973); TMI-1 FSAR (April 5, 1977); TMI-2, staff prepared testimony fol. Tr. 617 and Tr. 652.

[48]TMI-2 FSAR at pp. 2.2-3 and 2.2-4, Tables 2.2-3, 2.2-4, 2.2-5, and Figure 2.2-2. The crash probability data appearing in the Standard Review Plan, §3.5.1.6, is identical to that appearing in the Bernero testimony (fn. 46, *supra*) at pp. 6-7. That data is there identified as being derived from the *56-65 Data.*

[49]In the text of the applicants' testimony, it is noted that the geometric pattern of air crashes "is derived from data at all airports in the contiguous U.S." Vallance, p. 4. This statement does not appear to agree with the notation on Table 1 that the data include accidents "abroad." In a letter to this Board, dated March 31, 1978, applicants restate the fact that the crash data includes accidents abroad involving U.S. carriers. That letter also states that the *68-75 Data* include crashes which took place on the runway and that the *56-65 Data* exclude such accidents.

accident, Figures 2 and 3 of that testimony show the cumulative probability distribution of crashes as a function of (1) distance from the runway end and (2) the angle formed between the runway direction and a line from the crash to the end of the runway. Table 1 of the Vallance testimony gives the yearly crash rate for 1968-1975. The *68-75 Data* show a total of 46 accidents for 82 million aircraft operations.

The two sets of data yield significantly different crash-per-operation probability values:

56-65 Data

$$\frac{27 \text{ crashes}}{80 \times 10^6 \text{ operations}} = 3.4 \times 10^{-7} \text{ crash per operation}$$

68-75 Data

$$\frac{46 \text{ crashes}}{82 \times 10^6 \text{ operations}} = 5.6 \times 10^{-7} \text{ crash per operation}$$

On the basis of these numbers—not completely comparable as they are derived from data selected using different criteria—the crash rate appears to have increased in recent years. However, the *68-75 Data* can also be analyzed for crash rate as a function of time, yielding:

1968-1971

$$\frac{31 \text{ crashes}}{42.3 \times 10^6 \text{ operations}} = 7.3 \times 10^{-7} \text{ crash per operation}$$

1972-1975

$$\frac{15 \text{ crashes}}{39.9 \times 10^6 \text{ operations}} = 3.8 \times 10^{-7} \text{ crash per operation}$$

These computations suggest a crash rate *decreasing* over time, in contrast to the trend indicated by the simple comparison of the two data bases.

Neither the Licensing Board nor any party attempted to reconcile the different accident data bases. Both bases were used for the same computation (*i.e.*, determining the probability of a heavy plane crash at TMI-2), with no apparent appreciation of the different ground rules employed in selecting the data.

ii. Although not focusing on the differences in the data bases, the intervenors do criticize the data. Specifically, they complain that the data in-

clude all common carrier (*i.e.*, commercial) aircraft, scheduled and unscheduled, whereas the heavy aircraft that use Harrisburg International Airport are either unscheduled or military. They also claim that the data are biased.

It is quite true that the data lump together all common carrier flights even though, as established during cross-examination of applicants' witness Vallance (Tr. 556-57), most heavy plane flights into Harrisburg are unscheduled. But intervenors made no attempt below to demonstrate a difference in accident rates between scheduled and unscheduled flights, and nothing in the record suggests that such a difference exists.[50]

As for military aircraft, the record shows that C-5A's fly in and out of the airport an average of once a week—contributing about 10% of the heavy aircraft operations in question.[51] The intervenors requested the Board below to have the applicants produce crash rate data for C-5A's (Tr. 558-60). The Board deferred action on the matter (*ibid.*) and apparently never did rule on it. Although the intervenors did not pursue their request further, it is significant that the C-5A is an unusual aircraft that has no civilian counterpart and accounts for some—albeit a small—portion of the heavy aircraft operations near the plant. For these reasons, the Board should have attempted to obtain the C-5A data for the record and, accordingly, should have granted intervenors' request.[52]

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[50]The record does show that unscheduled flights constitute only a small amount of the information in the data bases (*i.e.*, most air carrier flights are scheduled) (Tr. 557). Given the rather low number of crashes in the vicinity of airports, it might be difficult to develop a statistically meaningful independent crash rate for unscheduled aircraft.

[51]FSAR, p. 2.2-3. As this page of the FSAR includes 1968 air carrier traffic data, we are not certain whether the reference to C-5A traffic likewise refers to 1968 or is more recent.

[52]On the matter of military crash rates, the Standard Review Plan which was referenced in the staff testimony includes the following table of total aircraft crash probabilities as a function of distance from airports (at page 3.5.1.6-4):

Probability (x 10^8) of a Fatal Crash per Square Mile for Aircraft Movements

Distance From End of Runway (Miles)	U.S. Air Carrier[a]	General Aviation	USN/USMC[a]	USAF[a]
0-1	16.7	84	8.3	5.7
1-2	4.0	15	1.1	2.3
2-3	0.96	6.2	0.33	1.1
3-4	0.68	3.8	0.31	0.42
4-5	0.27	1.2	0.20	0.40

[a]Reference 2 [D.G. Eisenhut, "Reactor Siting in the Vicinity of Airfields," paper presented at the American Nuclear Society Annual Meeting, June 1973].

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The intervenors' charge of bias in the applicants' crash data is rooted in a colloquy between intervenors' representative and applicants' witness Vallance. In the course of explaining that a statistically meaningful crash rate can be obtained only by averaging over crash data from all airports, the witness acknowledged that, if this technique introduces bias, then the data were indeed biased (Tr. 568).

In our view, averaging over crash data for all airports is the only reasonable approach to obtaining crash rate data. Of course, were a particular airport demonstrably more hazardous than the average, and hence presumably more susceptible to takeoff and landing accidents, the crash probability calculations for that airport should take into account that factor. No one has suggested, however, that Harrisburg International is such an airport.

iii. In sum, the development of basic crash rate data in the hearings below was infirm in certain respects. Although the averaging method of obtaining those data was reasonable, the same cannot be said for the introduction—without explanation—of two inconsistent sets of data which yielded markedly different crash rates.[53] Further, for completeness, the Licensing Board should have sought the inclusion in the record of unscheduled and C-5A crash data.

b. Spatial Distribution of Crashes

An important step in determining the crash probability at a particular plant site consists of establishing the spatial distribution of crashes in order to calculate the crash rate as a function of distance from and angular orientation to the runway.

In their early analyses (the PSAR and FSAR), the applicants used a rather simple technique to obtain the spatial distribution of crashes from the *56-65 Data.* First, they excluded landing accidents inside a 1-mile strip centered on a runway extension (eliminating 15 of 17 landing accidents) and

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This table shows that the near-airport crash rate of military (*i.e.*, USN/USMC and USAF) is generally less than, or equivalent to, that for U.S. air carrier traffic. Left unanswered, however, is the question whether the crash rate for the C-5A comports with that for the general run of military aircraft.

[53]This inconsistency is of particular importance as the staff data are incorporated into the Standard Review Plan which may be applied to other nuclear plants. That data would seem less appropriate than applicants' more recent data, which are quite different.

takeoff accidents within a radius of 1 mile of the runway end (eliminating five of ten takeoff accidents).[54] They then treated the accidents remaining in the data base (two on landing and five on takeoff) as being distributed at random (*i.e.*, with equal probability at each point) over the semicircular area extending 4 miles from the end of the runway, less that area in which the excluded accidents occurred. This procedure yields an areal crash rate for each of the two accident types, each rate having a constant value within 4 miles of the runway end. For a total of 2,400 heavy aircraft operations per year (1,200 at the TMI end of the runway), the use of this crash rate gives a combined yearly crash probability for landing and takeoff accidents of 2.6×10^{-8}.[55]

The staff's methodology for obtaining the spatial distribution of the crash rate, which is contained in the Standard Review Plan, is described in the direct testimony prepared for the TMI-1 operating license hearings. The staff excluded from the *56-65 Data* all crashes occurring outside an arc of $\pm 30°$ measured from the direction of the runway extension; this procedure apparently eliminated ten of the 27 crashes.[56] The staff grouped the remaining crashes according to their distance from the runway end and calculated the crash probability per square mile for each mile-wide annular section of the 60° arc off the end of the runway. The crash probability at each distance thus computed is shown in the first column of the table in fn. 52, *supra.*

The applicants' prepared testimony used the *68-75 Data* and a more sophisticated technique to obtain a spatially dependent crash probability.[57] Briefly, applicants first plotted the frequency of crashes for that period (see pp. 33-34, *supra*) according to distance from the runway end and to angular orientation relative to the runway extension. They then derived two independent probability density functions—one expressing the probability of a crash as a function of distance, r, from the runway end, and the other expressing it as a function of the angle, θ, with respect to the runway direction. The properly normalized[58] product of these two density functions for specific values of r and θ (*e.g.*, those of TMI-2) yields the relative probability that a crash will take place at a site denoted by the variables r and θ. This

[54]Applicants eliminated these accidents from consideration because the TMI facility is well beyond the strip and semicircle described.

[55]TMI-2 FSAR p. 2.2-9. This figure is summed over all quadrants and given without regard to the angle at which a structure is hit.

[56]See fn. 46, *supra* (Bernero testimony, p. 6). An exact recitation of which crashes were included is not presented there, but this information can be deduced from the spatial presentation of the *56-65 Data* (see TMI-2 FSAR, Figure 2.2-2).

[57]Vallance, pp. 7-9. The technique is described in detail there.

[58]"Normalization" as used here refers to the process of finding a constant multiplying factor for the probability density functions.

value, when multiplied by the total probability of a crash per year and per operation in the vicinity of an airport, gives the likelihood of a crash per year and per operation at the site defined by r and θ. This method produced a crash probability of 3×10^{-9} per year at TMI-2 for 511 operations per year (Vallance, p. 10).

Mr. Vallance also testified as to a calculation in which the applicants assumed equal crash probability for all angular orientations and considered variations in crash probability only as to distance from the runway end. (Applicants characterized this alternative technique as being similar to the staff's, but they used the *68-75 Data* whereas the staff used the *56-65 Data.*) With this technique, the applicants calculated an annual crash probability of 1×10^{-7} per 511 operations per year (Vallance, p. 10)—30 times greater than the result of its first method. According to Mr. Vallance, the first method provides the most realistic result because it embodies a more accurate representation of the crash distribution shown by the data.[59]

Our review of the two sets of data and the spatial distributions they display points up two striking features common to both: (1) a relatively large number of crashes occurred within one-half mile of the runway end, and (2) a large fraction of the remaining crashes took place within a narrow area along the path of a runway extension. The following table summarizes these observations for each set of data and for the two sets combined:[60]

Aircraft Crash Data Summary

Event Category	56-65 Data No.	56-65 Data Total	68-75 Data No.	68-75 Data Total	Sum, Both Data Sets No.	Sum, Both Data Sets Total
(1) Total Crashes 0-5 mi	27	100%	46	100%	73	100%
(2) Crashes, 0-0.5 mi	10	37%	26	56%	36	49%
(3) Crashes, 0.5-5 mi						
a. Within ± 15° of runway line	10	37%	20	44%	30	41%
b. Outside ± 15° of runway line	7[a]	26%	0	0	7	10%

[a]Of this number, five crashes—19% of the total—occurred outside of the ± 30° arc.

[59]Vallance, p. 10; Tr. 602, 603.

[60]Although the two sets of data were collected on different bases (see p. 33, *supra*), we feel

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For both data sets, the number of crashes beyond 0.5 miles and at angles greater than ± 15° to the runway direction (Category(3)b) is a small fraction of the total, and the more recent *68-75 Data* contain none in this category.

A rudimentary analysis of the combined data in the table indicates that most crashes occur either within a half mile of the end of the runway or within 15° of the approach to it. The remaining crashes are distributed more or less uniformly out to 4 miles from the runway end (one crash beyond this limit was at 4.1 miles). This tends to corroborate the method of spatial distribution analysis the applicants used in the FSAR—exclusion of crashes close to the end of the runway and in a narrow field along a runway extension, and random distribution of the remaining crashes over the rest of the semicircular arc extending to 4 miles from the end of the runway (see pp. 36-37, *supra*).

Applicants' most recent analysis, set forth in the Vallance testimony, employs probability density functions and is based on the *68-75 Data.* Only three of the crashes in that data set took place beyond a ± 10° arc (outside of 0.5 miles), and all were within ± 15°. As determined from these data, therefore, there is a very low accident probability for locations at large angles from an extension of the runway. An angular dependence correlation based on the *56-65 Data,* however, would have shown a greater propensity for such crashes, thus increasing the probability value calculated under applicants' method. In contrast, applicants' alternative technique adopted the staff's assumption that all crash angles are equally probable within a ± 30° arc and applied that postulation to the *68-75 Data.*

D. On the basis of this record, we must assess the crash probability assumptions accepted by the Board below. Given the criteria we are using, the question to be answered is whether the probability of a greater than design basis crash—particularly, a crash of a plane weighing more than 200,000 pounds—is greater than approximately 1×10^{-7}, considering both present traffic levels and possible increased levels.

As we have seen, both of the applicants' analyses assume 511 operations of heavy aircraft per year at the TMI end of the runway. Although this figure reflects the Harrisburg airport's 1976 traffic levels, the applicants testified in 1977 that they foresaw no significant increases in heavy aircraft traffic at the airport in the near future (Tr. 555-57).[61] There being no

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justified in summing them because all of the information was derived from statistics on severe aircrashes near airports.

[61]The witness explained that "Harrisburg is not a big city, it doesn't have a need for super large airplanes to handle passengers. There is an occasional need to bring freight in. . . . Small cities generally make use of smaller aircraft to serve the function of feeding passenger traffic into the larger cities." Tr. 556.

evidence to the contrary, we are satisfied that the 511 figure can be taken as a reasonable approximation of the Harrisburg airport's current traffic level of planes heavier than 200,000 pounds. For 511 operations and a plant effective area of 0.01 square miles, and employing the *68-75 Data,* the applicants' primary analysis gives a crash probability of 3×10^{-9} per year.

The applicants' alternative analysis yields a 1×10^{-7} per year crash probability, for the same area and traffic assumptions and crash data. However, the distribution shown by the *68-75 Data* suggests that the assumption of a uniform distribution of crashes over a $\pm 30°$ arc (which the alternative analysis utilizes) is an inaccurate and overly conservative portrayal of what actually happens.

Nor, in our opinion, is the uniform distribution assumption reasonable for the crash distribution shown by the *56-65 Data,* which the staff used. Depending upon the angular orientation of a plant with respect to the runway extension, the probability values which this assumption yields could be too high or too low. In the case of TMI-2, which lies near the outer boundary of (indeed, outside of) the $\pm$ 30° arc, the value would be too high. Our analysis indicates that the areal crash rate, beyond the 0.5-mile radius, is five to seven times lower outside of the $\pm$ 15° arc than within it.[62]

The spatial distribution functions employed by the applicants in their primary analysis appear upon preliminary scrutiny to provide a reasonable method for representing the distribution of crashes (assuming, of course, that the most accurate and appropriate data were used). Neither the Board nor any party, however, attempted to explore in any detail the spatial dependence of crash probability. This is significant because the two data bases display distinctly different spatial distribution of crashes. That being so, we are unable to accept fully the applicants' primary analysis without further inquiry.

The staff's analysis is even less satisfactory. Not only are the assumptions of the Standard Review Plan regarding spatial distribution unreasonable, but it is unclear from the record what probability analysis (if any) the staff actually performed. The staff's direct testimony does not set forth the explicit results of any analysis; it does no more than conclude that

> . . . with respect to the TMI-2 site, the risk from aircraft is acceptably low if fewer than 2,400 operations per year at Harrisburg International Airport are flown by aircraft larger than the design basis aircraft. The basis for this conclusion is that the expectation of aircraft larger than the Boeing 720 striking the plant would then be less than 10^{-7} per year.

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[62]Thus, for a plant situated within $\pm$ 15° of the runway extension, the staff's crash probability calculation might lead to a result that underestimated the actual value.

> At present, about 600 four-engine jets per year use the airport, which is considerably within our criterion of 2,400.

Read, pp. 1-2 (footnote omitted). Thus, the staff appears to believe that there exists a considerable margin for growth in the use of the Harrisburg airport by heavy aircraft before the crash probability becomes excessive.[63] The staff testimony went on to advise the Licensing Board that:

> [i]n order to assure that excessive traffic by large aircraft does not threaten the plant, we will require the applicant to continue periodic monitoring and reporting to us of airport usage, and we will reevaluate the adequacy of plant protection if heavy aircraft traffic is reliably projected to exceed 2,400 per year. This requirement is included in the technical specifications.

Id., p. 2.

The only explanation provided for the derivation of these conclusions is that they were "[e]stimated by the algorithm contained in Standard Review Plan Section 3.5.1.6 . . ." (*ibid.*). As we have discussed, the testimony appears to suggest that a crash probability of 10^{-7} per year would not be reached until there were 2,400 flights—*i.e.*, 4,800 total operations—per year of heavy aircraft at the airport.[64] But as we understand what its counsel said at oral argument, that is not the staff's thesis. Rather, we were told that, using the staff's analytical method, the 2,400-flight figure yields an annual crash probability of 2.4×10^{-8} (App. Tr., pp. 100-101). Further analysis, however, undermines the acceptability of either of those conclusions; for our own calculation of crash probability, using the formula in the Standard Review Plan, gives the following results:[65]

Number of Operations per Year at TMI End of Runway	TMI-2 Crash Probability Per Year
511	4.9×10^{-8}
600	5.8×10^{-8}
2,400	2.3×10^{-7}

[63]Indeed, at oral argument, staff counsel suggested that the 600 operations per year assumed by the staff may have been an overstatement of actual flights reached as a result of approximation or rounding off. He seemed to regard applicants' 511 figure as more accurate. App. Tr. 98-99.

[64]See p. 31, *supra*. As previously observed, the number of flights will equal the number of operations at the TMI end of the runway.

[65]For 2,400 operations per year at the TMI end of the runway, the equation P_A = NAC (see p. 29, *supra*) yields the following:

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The staff method seemingly, then, gives a crash probability *for 2,400 operations* per year at the TMI end of the runway which clearly exceeds the 10^{-7} limit, in apparent contradiction of the staff's direct testimony and statement of its counsel.[66] For the present level of heavy aircraft traffic (*i.e.*, 511 operations per year at the TMI end of the runway), however, the crash probability calculated by the staff's method, using the Standard Review Plan data, is within the 10^{-7} limit.

2. We have seen that the record contains two sets of basic data, collected for different time periods and with different selection criteria. These basic data have been treated in different ways to obtain spatially dependent crash rates. As a result, we are presented with a wide spectrum of values for the probability of a heavy aircraft crash at the TMI-2 facility. The applicants have presented two probabilities which differ by a factor of 30, and the results reached by our use of the Standard Review Plan model and the applicants' use of their primary model differ by a factor of 16. In each case, the crash probability for the current level of large aircraft traffic at Harrisburg airport is within the guideline value of 10^{-7} per year, but the amount of additional traffic that can be tolerated before this limit is reached varies greatly depending upon which data and which calculational model are used.

No attempt was made below by any of the parties or the Board to determine the best data base or the most reasonable methodology. As we have

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$$2.3 \times 10^{-7} = (2{,}400 \frac{\text{op}}{\text{yr.}})(0.01 \frac{\text{mi}^2}{\text{plant}})(0.96 \times 10^{-8} \frac{\text{crash}}{\text{mi}^2}).$$

This result is consistent with that presented in a paper cited as a reference in the Standard Review Plan (see fn. 52, *supra*). In that paper, a two-unit area of 0.02 square miles was used to compute a crash probability of 5×10^{-7} per year at Three Mile Island for a traffic level of 2,400 operations per year at the TMI end of the runway.

The probability value for 2,400 operations per year is also in agreement with the probability calculated and presented with the direct testimony of the staff in the TMI-1 operating license proceeding (see fn. 46, *supra*). This calculation appears to have been performed using the same formula and data as are presented in the Standard Review Plan.

[66]It is possible that the staff actually took the 2,400 value to refer to total operations—and thus a traffic level of 1,200 flights per year and 1,200 operations at the TMI end of the runway. This would give a probability value close to 10^{-7}, but would require a forced reading of the testimony inasmuch as the 600 and 2,400 figures would not then be comparable (contrary to the clear implication of the testimony).

It is also possible that the staff used crash data different from the data appearing in the Standard Review Plan. This would not have been improper. The plan merely includes data "currently being used" at the time this section of the plan was written. Standard Review Plan, p. 3.5.1.6-3. It does not preclude the use of more current or better data at a later time. However, if the staff did use different data, it should have disclosed that in its testimony.

seen, the intervenors did challenge the probability calculations because they failed to include an estimate of the uncertainty (or error) that should be associated with the calculated probabilities. The importance of such information in this type of probability assessment is unclear to us, but it might well be possible to estimate the error in the results of each model from the crash statistics used. It is unlikely, however, that any estimate of uncertainty would have given values sufficiently large to have encompassed the range of probability values calculated using the different models.

Obviously, a major reason for the divergent results is that variant sets of data were used. But the very magnitude of the differences in result makes it important to establish an adequate and consistent data base and to determine the best analytical method to take into account the spatial distribution of crashes. Significant questions remain as to whether certain trends in recent air crash data really do exist. Viewing both sets of data as a whole, it appears that the rate of crashes per operation has been increasing with time. However, the applicants assert that the accident rates for the two periods are not comparable because the types of accidents included in each data base are not the same.[67] Although they may be so, we have not been told why the differing selection criteria for accidents produced different crash rates. Similarly, the angular spread of the *68-75 Data* is much narrower than that for the *56-65 Data,* which would suggest to us a markedly diminished crash likelihood at an off-runway-line site such as TMI-2. But this may also result, at least in part, from the types of accidents included or excluded from the data base. Again, no adequate explanation of the differences in angular spread appears in the record.

To summarize, although all of the analyses in the record point to a crash probability value (assuming the current level of heavy aircraft traffic) within the 10^{-7} per year guideline, the record is sufficiently marred by inadequacies, inconsistencies, and ambiguities as to be unsatisfactory for ascertaining the increased level of traffic at which the 10^{-7} probability would be exceeded. This deficiency is particularly significant because future aircraft crash probabilities are important to the safety determinations required for a full-term operating license, and because the staff and Licensing Board have relied for that purpose upon a technical specification developed to account for those probabilities. We therefore have determined that the record must be reopened to receive additional evidence relative to the probability of crashes of over 200,000-pound aircraft at TMI-2. The parties will of course have an opportunity to test this new evidence at a further hearing.

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[67]Supplemental Answers by Applicants' Counsel to Appeal Board Questions, p. 3, transmitted to this Board by letter dated March 31, 1978.

Normally, where additional evidence is necessary, we call upon the Licensing Board to obtain it. But there are special considerations which in this instance induce us to conduct the further hearing ourselves. For one thing, it is obviously important to obtain a final resolution of the aircraft crash probability issue at as early a date as possible. For another, although arising here in the context of a particular nuclear facility and a particular airport, the issue has a decided generic flavor. Beyond that, we have formed definite views respecting the reach and ingredients of the required new analysis; in the circumstances, it appears desirable that we take charge of the development of a record which will give full effect to those views.

3. We will announce in a subsequent order, issued following consultation with the parties, the precise schedule for the further hearing. In the interest of expediting the commencement of that hearing, however, it is appropriate now to put the parties on notice respecting the scope of the inquiry so that they will be in a position to proceed *at once* with the task of preparing for it. Specifically, we will expect the additional evidence to encompass, *inter alia,* the matters set forth below. The responsibility for the development of the sought information rests with the applicants and the staff.[68] The other parties (including the Commonwealth) may, if they so desire, adduce their own evidence on one or more of these matters.

(1) There shall be provided a complete set of those data on aircraft crashes in the vicinity of airports in the United States which would be pertinent to the calculation of the probability of a crash of a heavy aircraft at the TMI-2 site. This compilation should cover the time period from the mid-1950's to the present. There should be an identification of the selection criteria used (*e.g.,* fatal *vs.* destructive crashes), together with a justification for the choices made. In furnishing this evidence, the parties shall observe the following directions:

(a) The data should include the spatial distribution of crashes in the vicinity of runways, either graphically, similar to Figure 2.2-2 of the TMI-2 FSAR, or by listing appropriate crash coordinates.

(b) The data should be grouped in appropriate time periods, so that any time-dependent trends in rate or spatial distribution will be identifiable.

(c) The basic data set would presumably be for United States common carrier aircraft. However, to the extent possible, any differentiations which can be made along the following lines should be provided:

[68]These parties may make individual presentations or a joint presentation. Each matter shall, however, be covered by the evidence of at least one of them.

(i) Aircraft greater than 200,000 pounds *vs.* aircraft less than 200,000 pounds.
(ii) Aircraft speed at time of impact.
(iii) Scheduled *vs.* nonscheduled flights.

(d) Separate crash data for military C-5A's near airports should be provided.

(2) If there are trends evident in the data obtained above (*e.g.*, crash rate different for heavy planes or in more recent years), these shall be addressed and, if possible, explained in the testimony.

(3) The data compilation shall be used to develop a model to compute the probability of a crash per operation and per unit area, at a site off the end of a runway. The model should reasonably reflect the spatial distribution of crashes displayed by the data and incorporate conservatively any trends for the future which these data portend. An attempt should be made to assess the precision that might be expected for probability values determined using the model.

(4) Since the compilation will be based on crash data obtained for many airports, the Harrisburg International Airport should be considered in terms of its particular degree of hazard relative to other airports in the selected data base. The testimony should address, among other things, such factors as topography, magnitude of traffic, meteorological conditions, and the availability of electronic guidance equipment at the airport.

(5) The testimony should identify, preferably on a large-scale map upon which the TMI site and the Harrisburg airport are accurately depicted, the routine takeoff and landing flight patterns that heavy aircraft would use. Typical airspeeds at various points in the patterns should be indicated.

(6) The testimony should address the extent to which the cooling towers at the TMI site might influence flight patterns at the Harrisburg airport. There should be an assessment of the effect that the towers might have on computed crash rate values.

(7) The testimony should disclose the number of aircraft of weight greater than 200,000 pounds which have used the Harrisburg airport during each of the last 8 years. This traffic should be broken down, if possible, by aircraft type, scheduled or nonscheduled, and military or commercial. If possible, a breakdown of the operations according to the end of the runway at which they took place should be provided.

(8) Projections of the future heavy aircraft traffic at the Harrisburg airport should be made on the basis of the information developed in connection with item (7) above, as well as any additional reliable information.

(9) Using the model developed in response to item (3) above and a range of levels of heavy aircraft traffic consistent with the projections developed in connection with item (8) above, the testimony should address the probability per year of a crash of an aircraft at TMI-2, including an estimate of the precision of the assessment.

(10) Finally, the testimony should consider how the generic probabilities thus arrived at might be affected by those unique features of the Harrisburg airport-TMI site relationship which might not be expressly reflected in the computational model (*e.g.*, the relative hazard of that airport, the effect of the cooling towers, *etc.*). This assessment should be cast in quantitative terms to the extent possible.

E. What remains to be decided is whether the TMI-2 operating license may be left in effect pending the outcome of our further consideration of the heavy aircraft crash probability issue. The standard which perforce governs this determination is an obvious one: will the continued operation of the plant over the period required to complete the additional proceedings be consistent with the requirement that there be reasonable assurance that the public health and safety not be endangered. See 10 CFR 2.104(c)(3); 10 CFR 50.57(a)(3). If not, the facility of course cannot be allowed to continue to operate at this time. If so, however, neither reason nor precedent dictates that the public be now denied the benefits of the power generated by it.[69]

Although the schedule for the additional proceedings is yet to be fixed, it may fairly be assumed that they will reach the terminal point within 6 months. Thus, the pivotal question is whether the identified deficiencies in the existing record preclude a present finding of reasonable assurance that the public health and safety will be adequately protected during that interval.

The answer to that question is clearly in the negative. As we have seen, the evidentiary deficiencies which have led us to order the reopening of the record relate essentially to the matter of *long-term* aircraft crash probability assessment. Specifically, what still is unclear—and must be explored anew at an evidentiary hearing—is by how much the current level of aircraft traffic would have to increase for the 10^{-7} guideline value to be exceeded. Insofar as the current traffic level is concerned, none of the appraisals of heavy aircraft crash probability produces a result which exceeds that value. Nor have we been given—either by a party or on our independent evaluation of the existing record—any cause to believe that, given the current traf-

[69]The Commission itself has recognized that nuclear facilities may be allowed short-term operation if it is determined on the record that a still unresolved safety question has no application to such operation. *Wisconsin Electric Power Company* (Point Beach Nuclear Plant, Unit 2), CLI-73-4, 6 AEC 6, 7 (1973).

fic level, there is a greater than 10^{-7} probability that a heavy airplane will crash into TMI-2.[70]

These conclusions are not affected by the fact that the crash data in the record do not segregate the data for either unscheduled or C-5A aircraft. We have not been provided with any substantial reason why those data might be different from the data for commercial aircraft which form the bases for the analyses in the record.[71] The unscheduled flights into and out of the Harrisburg airport involve the same types of planes as fly on schedules.[72] Moreover, we are unprepared to assume that unscheduled aircraft are subject to materially less stringent safety standards than scheduled aircraft. And while the C-5A is both a military aircraft and of unique design, the crash rate for military aircraft generally appears to be comparable to that for commercial aircraft (see fn. 52, *supra*). In this connection, because the C-5A represents only a relatively small portion (about 10%) of the heavy airplane traffic at Harrisburg, the crash rate of C-5A's would have to be substantially greater than other military planes for it to have any material effect on the aircraft crash probability under consideration here.

Beyond these considerations, there are numerous conservative assumptions factored into the analyses made by the applicants and staff which serve to offset any uncertainties engendered by the lack of segregation of unscheduled and C-5A crash data. What is at issue is whether there is a probability of greater than 10^{-7} that an aircraft will strike a safety-related feature of the facility and damage it to such an extent that there are releases of radioactive materials resulting in dose levels in excess of those specified in 10 CFR Part 100. In applying this guideline, the applicants assumed that any heavy aircraft crash involving the facility *necessarily* would occasion such a result (Vallance, p. 2). But this plainly is not so. For one thing, the strike might well miss entirely the safety structures (*id.* at 3). Secondly, the aircraft might strike the safety-related feature at a glancing angle to the surface (*ibid.*); if this were the case, the impact likely would not cause serious

[70]As we have noted earlier, the most recent crash data, used in the applicants' primary probability assessment, strongly suggests that the likelihood of a crash at an off-runway-line site such as TMI-2 would be far less than 10^{-7} per year (see p. 40, *supra*). Using the probability model of the staff, as presented in NUREG-75/087, the 10^{-7} limit would not be reached unless the traffic of heavy planes were to double.

[71]*Cf. Commonwealth Edison Company* (Zion Station, Units 1 and 2), ALAB-185, 7 AEC 240 (1974)(operation permitted during remand resulting from defects in Licensing Board's disposal of safety issue, where no information suggested the existence of an actual safety problem).

[72]Those over 200,000 pounds using the Harrisburg airport are primarily Douglas DC-8's and Boeing 707's (Tr. 586).

harm given the fact that the safety structures are designed to withstand a direct hit by a 200,000-pound plane. Finally, the applicants' assumption disregarded the shielding effect upon safety structures of nonvital structures such as cooling towers (*id.*, pp. 2, 3). The staff proceeded on the basis of the same conservative premise, and additionally employed the unrealistic spatial distribution assumptions previously discussed.

Although in their totality the foregoing factors are themselves dispositive on the license suspension question, it is worthy of note that the concern here is with an event which, though safety-related, has an extremely small possibility of occurrence. Even where the crash probability values derived by the use of current aircraft traffic levels turn out to be materially understated—which to repeat seems most unlikely—any incremental risk that might accrue through the period of the additional hearing reasonably can be expected to be insignificant.

In sum, because the probability of a crash of a heavy airplane which would affect public health and safety appears to be acceptably low at present levels of air traffic, suspension of operations during our further inquiry is not warranted, and the operating license will be permitted to remain in effect. The technical specification calling for heavy aircraft monitoring will likewise remain effective. If, before the proceeding is finally concluded, the data collected pursuant to that specification should suggest a significant change in the frequency or type of heavy air traffic in the vicinity of the Harrisburg International Airport, the applicants are to advise both the staff and us (with copies to the other parties).[73]

In light of the foregoing:

1. A further evidentiary hearing will be held on the aircraft crash question. A scheduling order respecting that hearing will issue at a later date. In the meantime, the parties should commence preparation for the hear-

[73]We see no need to extend this already prolix opinion with a point-by-point refutation of Mr. Sharfman's differing views. To the contrary, we are satisfied that what has already been said provides a sufficient answer to all that remains in the dissenting opinion once the heavy overlay of rhetoric has been stripped from it.

We are constrained, however, explicitly to disassociate ourselves from Mr. Sharfman's observations in Part III of his opinion and, more particularly, the invitation there extended to the parties to brief at some later time the multiple reactor question which he has raised on his own initiative. The Commission's regulation dealing with the determination of the exclusion area, low population zone, and population center distance—all elements of the evaluation of the acceptability of a site from the standpoint of public health and safety—expressly provides (10 CFR 100.11(b)):

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ing—particularly the development of evidence on the matters discussed at pp. 44-46, *supra.*

2. Decision on the radon question will be held in abeyance pending the outcome of the procedures outlined in ALAB-480, p. 13, *supra.*

3. In all other respects, the December 19, 1977, decision of the Licensing Board is *affirmed.*

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

Opinion of Mr. Sharfman, concurring in part and dissenting in part:

I join fully in Part I of this Board's opinion dealing with the subject of

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For sites for multiple reactor facilities consideration should be given to the following:

(1) If the reactors are independent to the extent that an accident in one reactor would not initiate an accident in another, the size of the exclusion area, low population zone, and population center distance shall be fulfilled with respect to each reactor individually. The envelopes of the plan overlay of the areas so calculated shall then be taken as their respective boundaries.

(2) If the reactors are interconnected to the extent that an accident in one reactor could affect the safety of operation of any other, the size of the exclusion area, low population zone, and population center distance shall be based upon the assumption that all interconnected reactors emit their postulated fission product releases simultaneously. This requirement may be reduced in relation to the degree of coupling between reactors, the probability of concomitant accidents and the probability that an individual would not be exposed to the radiation effects from simultaneous releases. . . .

We perceive no reason why this dichotomy might be any less applicable to other safety matters such as the aircraft crash probability question presented here. And, indeed, to our knowledge it has been consistently so applied right up to this time; insofar as we are aware, in the absence of the interconnection to which Section 100.11(b)(2) refers all probability and other safety-related analyses have been performed on precisely the same basis as were the aircraft crash probability analyses for TMI-2. In the final analysis, then, Mr. Sharfman's quarrel appears to be with established Commission policy. But neither we nor the parties are free to change that policy. Accordingly, no useful purpose would be served by calling upon the parties to explicate their agreement or disagreement with it. Nor is there cause for us to develop the foundation for our own judgment that the policy is a sound one.

emergency planning. I am also in substantial agreement with most of the Board's analysis of the deficiencies of the record with respect to the probability of heavy aircraft crashes into the plant. I further agree that additional evidence must be taken on this issue and that we should take it. However, I disagree that the record supports the conclusion that safety from heavy aircraft crashes at present levels of traffic is assured and I would therefore suspend the operating license pending our decision on remand. I also dissent from the majority's determination that we may only consider the probability of a heavy plane crash into one unit of the two-unit Three Mile Island complex. My views, insofar as they diverge from those of my colleagues, follow.

I

I preface my remarks by saying that I think it makes little sense to have an issue such as the likelihood of a plane crash into the plant adjudicated after the plant has been built. This is because, if the issue is litigated before construction and it is decided that the risk is too great, the plant can either be built somewhere else or possibly designed to withstand the hazard.[1] However, once the plant is built, to abandon it and build another elsewhere entails an enormous waste of resources, a terrible financial loss for the utilities involved, which may ultimately have to be borne by the ratepayers, and the deprivation of a major source of power which has been found necessary to meet projected demand and has been relied upon by the utilities to do so. Nevertheless, so far as I can determine, there is nothing in the law or regulations which prevents the issue from being raised for the first time at the operating license stage.[2]

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[1]I am not familiar with the state of the art on designing nuclear plants to withstand plane crashes. It may be that, with respect to very heavy aircraft such as we are concerned with here, it is not possible to make the containment structure strong enough to withstand a head-on collision.

[2]The Commission has held that "an operating license proceeding should not be utilized to rehash issues already ventilated and resolved at the construction permit stage," absent "any supported assertion of changed circumstances or the possible existence of some special public interest factors in the particular case . . . ." *Alabama Power Company* (Joseph M. Farley Nuclear Plant, Units 1 and 2), CLI-74-12, 7 AEC 203 (1974). But the Commission was talking about application of the doctrines of *res judicata* and collateral estoppel. Its remarks therefore have no application to a case such as the one at bar, where the issue was uncontested in the construction permit proceeding or where, though contested there, it was contested by a different party. This problem is dealt with, however, in the proposed §189a(2)(C) of the Atomic Energy Act contained in §103 of the Administration's proposed Nuclear Siting and Licensing Act of 1978, S. 2775, which states:

Any hearing on an application subject to this paragraph or any hearing on the com-

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I make this point for two reasons: (1) to show that we are dealing with this issue at this time not because we are intrinsically irrational people but because we are legally required to and (2) to emphasize the caution we must take to prevent our judgment from being improperly influenced against taking necessary remedial measures by the fact that the timing of the litigation will cause such measures to impact the applicants more harshly than would have been the case had the issue been resolved before construction. This issue after all is one affecting public safety, and no matter when the law requires us to deal with it, we must deal with it cautiously and carefully, mindful of the severity of the consequences which might ensue were we to be too lax.

II

The majority's analysis recognizes at the outset[3] that there does not exist a Commission regulation on the question of when a nuclear power plant must be designed to withstand an airplane crash. Our only source of a standard is Section 3.5.1.6 of the Standard Review Plan (NUREG-75/087). The Standard Review Plan describes the process by which the staff reviews license applications. It is written for the guidance of the staff reviewers and to tell the industry and the public what the review process consists of. The plan contains regulatory standards that have been developed by the staff over the course of time.[4] To the extent that the plan includes safety criteria, it carries the same force as the staff's regulatory guides which

> merely set forth methods acceptable *to the regulatory staff* of implementing specific parts of Commission regulations. While they are entitled to considerable *prima facie* weight because of the important

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mencement of operation of any facility shall be limited to issues as to which there was no prior opportunity for hearing in a prior proceeding before the Commission or a State, unless the person requesting the hearing on the issue makes a prima facie showing in accordance with procedures established by the Commission that significant new information relevant to the issue has been discovered since the prior proceeding and that as a result thereof it is likely that the site or facility design will not comply with this Act or the Commission's regulations for protection of the public health and safety, the common defense and security, or the environment.

I cite this provision not because I intend to endorse it but merely to illustrate that this matter of timing is of concern to others besides myself. Indeed, the Commission itself has recently launched a study designed, in part, to achieve earlier resolution of all licensing issues and especially those involving siting. See *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-78-1, 7 NRC 1, 6-7 (1978).

[3] *Supra*, pp. 26 and 28.

[4] See the Introduction to the Standard Review Plan.

day-to-day responsibilities of the Regulatory Staff in effectuating Commission policy, these guides do not themselves have the force of regulations.

Vermont Yankee Nuclear Power Corp. (Vermont Yankee Nuclear Power Station), CLI-74-40, 8 AEC 809, 811 (1974). Because none of the parties has chosen to challenge Section 3.5.1.6 in this case and because it does not contain any manifest flaws, I agree with my colleagues[5] that we should accept it as controlling for purposes of this case.

As the plant is concededly designed to withstand crashes of aircraft weighing up to 200,000 pounds, the only question before us under the Standard Review Plan is whether the probability of a crash of a heavy aircraft into the plant "is less than about 10^{-7} per year."[6] If it is, the decision below must be affirmed. If it is not, then the decision below must be reversed and the operating license must be suspended.

The intervenors presented no analysis of this probability. As the majority opinion amply demonstrates, the staff similarly presented no such analysis—only some vague, conclusionary testimony that the standard would be met at a level of 2,400 operations per year, with its use of the term "operations" possibly mistaken and, at the very least, hopelessly ambiguous. My brethren, however, took the plane crash data contained in the Standard Review Plan, made an assumption as to what the staff meant by "2,400 operations,"[7] and made their own calculation by means of the formula contained in the Standard Review Plan.[8] They then treated the probability thus obtained, which was less than 1×10^{-7}, as one of the bases for their statement that all of the analyses in the record indicate that the 10^{-7} criterion is met for present traffic levels.[9]

In my view, this is not proper. If the staff would like its probability analysis to be considered, it should present one. Moreover, data contained in the Standard Review Plan may not be treated as evidence on a contested issue, absent the testimony of a witness to sponsor it. Even if that were not so, however, the air crash data in the Standard Review Plan is too old to constitute, in and of itself, a sufficient data base for determining crash probability in a current licensing proceeding. Aviation technology, both in the plane and at the airport, has changed too rapidly to permit us to feel secure in basing decisions on data of that vintage. As the majority opinion

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[5]*Supra,* pp. 26 and 28.

[6]Standard Review Plan, p. 3.5.1.6-1.

[7]*Supra,* pp. 30-32.

[8]*Supra,* pp. 41-42.

[9]See pp. 42, 43, and 46, *supra.* It is assumed that the 1976 traffic level is the same as the present one.

itself shows,[10] the 1968-75 data puts the validity for current purposes of the 1956-65 data used in the Standard Review Plan into serious question.

The basic underpinning of the majority's decision is its finding that all four of the analyses either present in or deducible from the existing record produce a crash probability that meets the 1×10^{-7} standard for the present level of heavy aircraft traffic.[11] I have already shown why the majority's construction of what the staff's analysis should have been, had it done one, may not be relied upon. The other three probability determinations alluded to by my brethren are the applicants' analysis in the FSAR and the applicants' two alternative analyses presented by their witness Vallance in his written testimony following Tr. 511. The analysis in the FSAR is unsatisfactory because it uses the 1956-65 data base contained in the Standard Review Plan.[12] In addition, my colleagues ignore the fact that the applicants themselves abandoned it because of the availability of what they deemed to be a better data base and better analytic models.[13] It would be strange if we were to give it more credence than the applicants themselves did. Indeed, intervenors had every right to believe that they did not have to refute it because the applicants were no longer espousing it. The majority rejects Mr. Vallance's fallback alternative analysis.[14] It therefore can hardly rely on it.[15] As far as the primary probability determination presented by Mr. Vallance is concerned, it should suffice to say that even my colleagues (and, here, I agree with them) are sufficiently disturbed by problems with selection of the data base, the failure to analyze trends in aircraft crashes, and the failure "to explore in any detail the spatial dependence of crash probability" as to find themselves "unable to accept [it] fully . . . without further inquiry."[16]

Thus, what the majority relies on for the crucial safety finding as to present traffic are four inadequate probability analyses. It forgets that four times zero is still zero. Until the record contains one adequate analysis or the evidence upon which we can make such an analysis, a finding that the 10^{-7} standard is met cannot validly be made. At bottom, my colleagues ap-

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[10]*Supra,* pp. 42-43.

[11]*Supra,* pp. 42 and 46.

[12]See p. 36, *supra.*

[13]Vallance written testimony, p. 2.

[14]*Supra,* p. 40.

[15]While my brethren do characterize it as "overly conservative" in one of its assumptions (spatial distribution) (*ibid.*), that does not mean that it was conservative overall. For example, its use of the 1968-75 data to determine crash rate may err on the side of liberality. We all agree that it is too early for us to decide whether the crash rate should be taken from this data base alone.

[16]*Supra,* pp. 33-36, p. 40, and pp. 42-43. The quotation is on p. 40.

pear to rely on their belief that, when all the evidence is in, they will in all likelihood be able to determine definitively that the criterion is met. But our decisions must be based on evidence in the record, not intuition.

As the majority opinion explains,[17] the probability of the accident at issue is the product of three factors, which it refers to as N, A, and C. That opinion also explains at great length why the record is not adequate to permit us to make a judgment as to factor C.[18] Plainly, it is impossible to determine the product when one of the factors is unknown.

The dichotomy created by my colleagues between the crash probability at present traffic levels and that at possibily higher future levels is thus a false one. All of the matters which we have unanimously agreed to seek more evidence on with the exception of one[19]—crash data ranging from the mid-1950's to the present, the identification of and justification for the selection criteria used, information on the spatial distribution of crashes in the vicinity of runways, crash data for C-5A's[20] and nonscheduled flights, trends in the crash data, the development of a probability model for factor C of the equation, the peculiar hazards of the Harrisburg airport, the flight patterns of heavy aircraft at the Harrisburg airport, the effect of the cooling towers on crash rate values, the amount and nature of heavy aircraft traffic in the last 8 years, the calculation of a probability per year for the crash of a heavy plane into TMI-2 and the effect of unique features of the airport upon that probability—bear just as much on the probability of a heavy plane crash into the plant at the present level of traffic as they do on the probability of such an accident at higher levels. To say that the evidence we have now leaves us uncertain as to the future but permits us to be satisfied as to the present or even the next 6 months is simply not accurate.

The basic and controlling fact is that we have concluded that the record is not adequate to support the findings of the Board below on air crash probability. Though the majority thinks that the findings are probably supportable as to the present level of traffic, it needs more evidence in order to make a reasoned judgment. I think my colleagues would not disagree that the plant presents a far greater hazard if struck by a heavy aircraft when operating than when it is shut down. In my view, it follows ineluctably that

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[17]*Supra*, pp. 29-30.

[18]*Supra*, pp. 33-38. I agree that it is not adequate.

[19]That one is the projection of future heavy aircraft traffic at the Harrisburg airport.

[20]The majority opinion states (at p. 36) that the C-5A data should have been sought "for completeness," implying that it was not really necessary for reaching a judgment. The short answer to that is that, if it were not necessary, we would have found the Licensing Board's failure to order its production harmless error and we would not have ourselves requested that evidence. We indeed worship at many altars but that of "completeness" is not one of them.

we must suspend the operating license pending our decision following the further hearing.

The most obvious question raised by the majority opinion is why it should have been necessary to write a whole section (pp. 46-48, *supra*) to justify the decision not to suspend. If the evidence were indeed sufficient with respect to present levels of traffic, it would be obvious that there is no need to suspend pending the further hearing. The answer, not apparent at first reading, is that the majority opinion nowhere finds that, even at present traffic levels, the probability of a heavy aircraft crashing into the plant is less than 1×10^{-7}. To be sure, it states that "all of the analyses in the record point to a crash probability value (assuming the current level of heavy aircraft traffic) within the 10^{-7} guideline . . . ."[21] It says: "The record does enable us to find reasonable assurance of safety given present levels of aircraft traffic in the vicinity of the plant."[22] Finally, it concludes that "the probability of a crash of a heavy airplane which would affect public health and safety appears to be acceptably low at present levels of air traffic . . . ."[23] But it never goes so far as to state that that probability is less than 10^{-7}. Why not? Because it cannot make that finding on the evidence of record. What the majority is really saying is that we have sufficient assurance of safety and that the probability of a crash "appears to be acceptably low,"[24] despite the fact that we cannot at this point be sure that it is less than 1×10^{-7}, because (1) it has not been demonstrated to be greater than that, (2) the lack of crash data for C-5A's and unscheduled flights is insignificant, and (3) three conservative assumptions made in the applicants' probability analysis give us a substantial margin of safety.[25] I will deal with these arguments *seriatim*.

After adverting to the fact that the analyses in the record all produce a probability for current traffic which meets the 10^{-7} standard (a point with which I have already dealt), the majority opinion states:[26]

> Nor have we been given—either by a party or on our independent evaluation of the existing record—any cause to believe that, given the current traffic level, there is a greater than 10^{-7} probability that a heavy airplane will crash into TMI-2.

In other words, says that majority, no one has been able to prove that the

[21] *Supra*, p. 43. To the same effect, see p. 42, *supra*. I have already discussed my colleagues' attempts to hide behind the skirts of inadequate analyses.

[22] *Supra*, p. 13.

[23] *Supra*, p. 48.

[24] *Ibid.*

[25] *Supra*, pp. 46–48.

[26] *Supra*, pp. 46-47.

probability is greater than 1 x 10^{-7}. But the burden of proof in licensing proceedings before this Commission is always on the applicant (see 10 CFR 2.732), unless a party is seeking to stay a presumptively valid Licensing Board decision in the applicant's favor, in which case the burden shifts. *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-395, 5 NRC 772, 785 (1977); see *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-338, 4 NRC 10, 14-15 (1976); *Florida Power & Light Company* (St. Lucie Nuclear Power Plant, Unit No. 2), ALAB-415, 5 NRC 1435, 1437 (1977). In the case at bar, we have unanimously held that the evidence in the record is not sufficient to support the decision of the Licensing Board on the aircraft issue.[27] The defects having been adjudicated by our decision to reopen, there is no longer any presumptive validity to the decision below on this question. Not only has the burden of proof on suspension reverted to the applicants[28] but it has become "doubly heavy." *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-458, 7 NRC 155, 160 (1978). As the quotation from the majority opinion at the beginning of this paragraph implicitly concedes, that burden has not been met.

The majority argues that C-5A's representing 10% of the heavy plane traffic would have to have a substantially higher crash rate than other military planes to have any material effect on the probability in question here.[29] But it admits "that the C-5A is an unusual aircraft that has no civilian counterpart."[30] To decide that its crash rate is not substantially higher than civilian aircraft without knowing the facts is to make an impermissible *a priori* judgment. Yet, such a judgment is necessarily implicit in the majority's opinion at p. 47, *supra.* Moreover, the majority's statement (*supra,* p. 47) that the only problem with respect to C-5A crash data is that it is not segregated from more general data is false. The 1968-75 data used by the applicants does not include military data at all (Tr. 557-58). While the 1956-65 data does include military crashes, the record does not indicate whether or to what extent the C-5A was flying during that period.

The majority opinion acknowledges that "most heavy plane flights into Harrisburg are unscheduled . . . ."[31] Although the majority states that no-

[27]Although my colleagues, in the ordering paragrahs at the end of their opinion, have chosen not to reverse any aspect of the decision below (for that would make the suspension issue more difficult for them), they have also not affirmed any aspect of the decision on plane crash probability. Be that as it may, matters of form should never control issues of substance.

[28]It was on the intervenors when they moved to stay the decision below. See ALAB-456, 7 NRC 63 (January 27, 1978); CLI-78-3, 7 NRC 307 (March 2, 1978).

[29]*Supra,* p. 47.

[30]*Supra,* p. 35.

[31]*Supra,* p. 35.

thing in the record suggests a difference in accident rates between scheduled and unscheduled flights,[32] the fact is that we have no evidence at all in the present record on the accident rate for unscheduled flights, as opposed to scheduled ones. My brethren say that they "are unprepared to assume that unscheduled aircraft are subject to materially less stringent safety standards than scheduled aircraft."[33] But there may be a difference between the safety standards such flights are subject to and the actual level of safety which they achieve. Moreover, no one is asking them to make any such assumption. It is they who are assuming that the crash data for unscheduled flights will make no significant difference in the probability arrived at. I would make no assumptions at all until the facts are in.

What is more significant, however, is the reason my colleagues focus on these two things, which are not the major grounds for reversing and reopening on the air crash issue. That is because it is much easier for them to say that crash data for C-5A's and unscheduled flights will not make much difference in the probability than it is for them to say that a better general data base and a better methodology for predicting the spatial distribution of air crashes will not do so. Indeed, the whole suspension section of their opinion is written as if the lack of C-5A and unscheduled flight data were the only (or at least the primary) reasons for disturbing the decision reached below. Yet, the truth is that, without a good general data base and without a good model for predicting spatial distribution, a probability determination of this kind is not worth very much at all.

What are the conservatisms in the applicants' probability analysis which, in my colleagues' judgment, offset any uncertainties as to the probability of a heavy airplane crash into the plant? Applicants assumed that any heavy aircraft crash into the facility would release radioactive materials resulting in dose levels in excess of those specified in Part 100. However, the plane might (1) hit a nonsafety-related structure, (2) strike only a glancing blow at a safety-related structure, thus not causing serious harm, or (3) strike a cooling tower which would shield the safety-related structures.[34]

My colleagues' invocation of these alleged conservatisms underscores the unfairness and unsoundness of their decision.

First, we must remember that we are dealing here with a mathematical safety criterion.[35] Had the evidence of record conclusively shown that the 10^{-7} standard were met, we would say to the intervenors: "You lose." As the

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[32] *Ibid.*

[33] *Supra*, p. 47.

[34] *Supra*, pp. 47-48.

[35] I fully realize that any probability determination must make certain assumptions and contain a margin of error within it. My point here simply is that, once made, it gives you a mathematical answer which can be easily matched against a mathematical standard.

evidence in this case does not show that, the majority says to the intervenors: "You lose anyway because there are conservatisms in the applicants' analysis." But there are always conservatisms in the analyses of applicants. In this case, the majority states that "the staff proceeded on the basis of the same conservative premise" which, since the staff did not do an analysis, must mean that it has been the practice of the staff, in estimating the probability of air crashes into plants, to assume that any hit would give rise to a release in excess of the Part 100 limits and not to give the applicant credit for having cooling towers on the premises. If these assumptions are conservative, they should be, for we are dealing with a technology that carries a terribly dangerous potential for damage in the event that something goes wrong. The fact that safety analyses made under our regulations and staff regulatory guides are conservative should never serve to excuse a failure to meet a safety standard.

Second, on April 15, 1977, the intervenors moved the Licensing Board to compel the applicants to produce witnesses who could testify as to the "consequences, if any, to the nuclear safety-related structures from the impact of a large, fully loaded aircraft, such as a Lockheed C-5A or a Boeing 747, at Three Mile Island, Unit 2." The Board issued an order on August 8, 1977, denying that motion on the grounds that the aircraft crash section of the Standard Review Plan does not require an analysis of the consequences of such an occurrence, that the 10^{-7} criterion had been met and that, "under the Commission's scheme of regulation, applicants for licenses are not required to be concerned with the consequences of extremely improbably accident events such as this (proposed annex to 10 CFR Part 50, Appendix D, 36 Fed. Reg. 22851)." The majority affirms this ruling.[36] My question is simply this: If it was correct for the Licensing Board to have refused intervenors' motion for the production of a witness on the consequences of a heavy aircraft collision, on the ground that such consequences are not relevant, how can the majority of this Board rely on testimony of applicants' witness Vallance on the very same subject as a basis for its decision not to suspend?[37] Apparently, what was not suitable as sauce for the gander is suitable as sauce for cooking the intervenors' goose.

Third, the testimony establishing these conservatisms is that of applicants' witness Vallance. Mr. Vallance's testimony that many heavy aircraft strikes into the plant would not "result in significant release of radioactivity

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[36]*Supra*, p. 28, n. 38.

[37]It can hardly be argued that the question of whether a crash into a nonsafety-related structure or into a cooling tower or even a glancing crash into a safety-related structure will produce releases in excess of Part 100 levels does not go the consequences of a crash into the plant.

or in disabling more than one of the redundant and spatially separated systems needed for safe shutdown"[38] is totally unsupported by any studies or analyses. This is not surprising, for applicants' attorney stated, soon after Mr. Vallance left the witness stand:[39]

> [W]hile the applicant has done an analysis of the impact of the 200,000-pound plane, the applicant has not done an analysis of the impacts of comparable larger planes.
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> This means that none of the extremely detailed engineering work involved in postulating various sizes of aircraft, various ways in which they come apart, various angles of approach or any of the hit aftermath has been done and Applicant, if [it] produced the witness [on consequences], would be able to do no more than verify that statement.[40]

Moreover, Mr. Vallance's testimony on consequences of a crash into the plant was not supported by any references to published scholarly articles. As for Mr. Vallance's qualifications on the subject, he is a chemical engineer,[41] hardly the kind of expert you would want to rely on to forecast the consequences of the crash of a more than 200,000-pound airplane into a nuclear plant.[42] Thus, even if it were proper to consider the very meager testimony which was permitted on the subject of consequences, my colleagues showed very poor judgment in swallowing Mr. Vallance's conclusionary statements on such an important safety issue hook, line, and sinker.

At the outset of their discussion of the plane crash issue, my brethren recognize that "the issue before us boils down to whether it can be said on this record that the probability analyses of heavy airplane crashes were properly performed," *i.e.*, whether they show that the 1×10^{-7} standard has been met.[43] At the end, however, they say that "the pivotal question is whether the identified deficiencies in the existing record preclude a present finding of reasonable assurance that the public health and safety will be adequately protected during" the 6 months which they estimate it will take

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[38]Vallance written testimony following Tr. 511, at p. 3.

[39]Tr. 615.

[40]This statement shows that, if applicants had produced a witness on consequences, it would not have been Mr. Vallance.

[41]See his qualifications, following his written testimony.

[42]The fact that he has done air crash probability analyses for other nuclear plant licensing proceedings does not qualify him on this subject, either. Those analyses are nothing more than statistical exercises.

[43]*Supra*, p. 28.

to conclude the additional proceedings mandated by today's decision.[44] They then proceed to vindicate the old adage that, if you ask the wrong question, you are very likely to get the wrong answer.

The root problem with my colleagues' approach lies in the tremendous respect which they have for an operating license which was improperly issued. The Commission is currently considering whether it should change its rule (10 CFR 2.764) giving immediate effectiveness to a licensing board's grant of a license, despite the fact that appeals may be taken and the decision reversed. See *Seabrook, supra*, CLI-78-1, 7 NRC 1, 6-7. This is not the proper occasion for the expression of views on that subject. However, I do think that the influence of the immediate effectiveness rule becomes intolerable if appeal boards take the attitude that, once a license has been issued, it becomes so sacrosanct that an appellate reversal may not result in its suspension or revocation in the absence of some overwhelming, impending danger which would be incurred were it left undisturbed. Clearly, the rule does not compel such an attitude; nor should it. The Licensing Board could not have authorized the issuance of an operating licensing had it not found that "there is reasonable assurance . . . that the activities authorized by the operating license can be conducted without endangering the health and safety of the public" and that "the issuance of the license will not be inimical . . . to the health and safety of the public." 50 CFR 50.57(a) (3) and (6). Those findings, in part, were based on the determination that the likelihood of a heavy plane crash into the plant was not greater than 1×10^{-7}. Having decided that the record does not support this determination, we have no legally permissible choice but to suspend the license.

This is not like the case in which we find error on a safety issue in the grant of a construction permit and we remand for further hearings. In a case of that nature, there is usually not any threat to the public health and safety from continued construction and it is often possible to remedy safety problems at a later stage. See, *e.g.*, *Public Service Electric and Gas Company* (Hope Creek Generating Station, Units 1 and 2), ALAB-429, 6 NRC 229, 246-47 (1977). This is also unlike the case in which we or a reviewing court find error with respect to an environmental issue in a decision to grant a construction permit. There, suspension has usually been decided on the basis of a "balancing of equities" and "consideration of any likely prejudice to further decisions that might be called for by the remand." *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-77-8, 5 NRC 503, 521 (1977); *accord*, *Midland*, *supra*, ALAB-458, 7 NRC 155, 160. *But see Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-78-14, 7 NRC 952, 957-960 (June 30,

[44]*Supra*, p. 46.

1978). That is because the National Environmental Policy Act (specifically, 42 U.S.C. §4332(2)(C)) is itself a balancing statute, requiring an agency to balance the environmental costs and benefits of the proposed action and weigh it against reasonable alternatives.

We are dealing here with the issuance of an operating license. And the making of the safety findings in 10 CFR 50.57(a) is a *sine qua non* for such a license.[45] Indeed, the statute is even clearer than the regulations on this point. Section 103 of the Atomic Energy Act (42 U.S.C. §2133), which governs the issuance of licenses for commercial nuclear power plants, states, in subsection d: "In any event, no license may be issued to any person within the United States if, in the opinion of the Commission, the issuance of a license to such person would be inimical to . . . the health and safety of the public." Reasonably construed, this must mean that, if the health and safety findings required by the Commission's regulations cannot be made, the license may not issue.[46] And it will not do for the majority to say that, *in their opinion*, the public health and safety will not be threatened by a failure to suspend despite the failure to meet a Commission safety standard. Their opinion must perforce be based on the application of the standard to the evidence of record. To say otherwise is to say that Congress intended to delegate to this Commission the power to disregard a failure to meet the Commission's own safety standards. That is patently ridiculous.[47]

If we were the Licensing Board, it would be clear enough that we could not authorize issuance of the license, given our appraisal of the evidence. Why, then, should we be allowed to continue it in effect when we are reviewing a Licensing Board decision which we have found to be erroneous? It is surely not the statutory purpose that safety errors made below be perpetuated *pendente lite.*

These principles stem not only from the Atomic Energy Act itself but also from the Supreme Court's construction of the Act in *Power Reactor*

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[45]Thus, the majority was wrong (at p. 46, *supra*) in weighing the denial to the public of the benefits of the power generated by the plant in deciding whether or not to suspend. The assurance of an adequate electric supply for the American people is indeed an important function but it is not one which Congress has assigned to us. We march to "the sound of a different drummer"—protection of the public health and safety.

[46]Although Congress once authorized the issuance of temporary operating licenses before completion of the environmental review, for a limited period of time and in limited circumstances (see §192 of the Atomic Energy Act, 42 U.S.C. §2242), it has never authorized the issuance of a temporary operating license prior to completion of the safety review.

[47]I recognize, of course, that the Commission or even the staff may change the standard at any time and that even we have the power to find it unreasonable and refuse to apply it. In the absence of those things, however, failure to comply with the standard may not be disregarded. *Cf. United States ex rel. Accardi* v. *Shaughnessy*, 347 U.S. 260 (1954).

Development Company v. *International Union of Electrical, Radio, and Machine Workers*, 367 U.S. 396 (1961). In that case, the Atomic Energy Commission granted a provisional construction permit authorizing the construction of "a fast-neutron breeder reactor for the generation of electric power."[48] The Commission found "reasonable assurance in the record, for the purposes of this provisional construction permit, that a utilization facility of the general type proposed in the PRDC application and amendments thereto can be constructed and operated at the location without undue risk to the health and safety of the public."[49] "A more severe safety test would have to be passed when the reactor was completed, the [Commission's] opinion said, since '[t]he degree of "reasonable assurance" . . . that satisfies us . . . for purposes of the *provisional* construction permit would not be the same as we would require in considering the issuance of the *operating* license.' "[50] The issue before the court was whether the more severe finding had to be made at the construction permit stage as well.

The court, after quoting from §182a of the Atomic Energy Act, 42 U.S.C. §2232(a), stated:[51]

> *It is clear from this provision that before licensing the operation of PRDC's reactor, the AEC will have to make a positive finding that operation of the facility will "provide adequate protection to the health and safety of the public."* What is not clear, and what is at the center of the controversy in this case, is whether the Commission must also have made such a finding when it issued PRDC's construction permit. [Emphasis added.]

The court held that the definitive safety finding does not have to be made at

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[48]367 U.S. at 398. Before April 30, 1970, the Commission called its construction permits "provisional." Whatever differences (if any) that appellation might have connoted from the construction permits issued after that date, it made no difference at all with respect to the issue in *Power Reactor*. As the Commission stated when it announced that construction permits would no longer be characterized as provisional, "The findings required for issuance of a construction permit would be the same as those which have been required for a 'provisional' construction permit." 35 Fed. Reg. 5317 (March 31, 1970).

[49]367 U.S. at 403.

[50]*Id.* at 402-03 (ellipsis and emphasis in the original). As the dissenting opinion put it (*id.* at 417), the Commission found

> that "it has not been positively established" that a facility of this character "can be *operated* without a credible possibility of releasing significant quantities of fission products to the environment." The Commission added that there was "reasonable assurance" before the date when the facility went into operation that research and investigation would definitely establish "whether or not the reactor proposed by applicant can be so operated." [Emphasis in the original.]

[51]*Id.* at 406.

the construction permit stage but emphasized that one of the reasons for this is that the finding must be made before the issuance of the operating license. It said:[52]

> We deem it appropriate to add a few words concerning the fears of nuclear disaster which respondents so urgently place before us. The respondents' argument is tantamount to an insistence that the Commission cannot be counted on, when the time comes to make a definitive safety finding, wholly to exclude the consideration that PRDC will have made an enormous investment. The petitioners concede that the Commission is absolutely denied any authority to consider this investment when acting upon an application for a license for operation. PRDC has been on notice long since that it proceeds with construction at its own risk, and that all its funds may go for naught. With its eyes open, PRDC has willingly accepted that risk, however great. *No license to operate may be issued to PRDC* until a full hazards report has been filed, until the AEC's Advisory Committee on Reactor Safeguards makes a full investigation and public report on safety to the Commission, *until the Commission itself, after notice and hearings at which respondents, if they desire, may be heard, has made the safety-of-operation findings required by §182a and Reg. 50.35, and until the other requirements of §185 have been met.* . . . We hold that the actions of the Commission up to now have been within the Congressional authorization. We cannot assume that the Commission will exceed its powers, or that these many safeguards to protect the public interest will not be fully effective. [Emphasis added.]

The majority cites two cases as authority for its decision not to suspend: *Wisconsin Electric Power Company* (Point Beach Nuclear Plant, Unit 2), CLI-73-4, 6 AEC 6 (1973), and *Commonwealth Edison Company* (Zion Station, Units 1 and 2), ALAB-185, 7 AEC 240 (1974). I will discuss each in turn.

In *Point Beach*, the Licensing Board had authorized the grant of a full-power operating license. An issue had been raised in the proceeding over a discovery that fuel rods of the type used in the plant had collapsed after some 2 years of operation at another plant known as the Ginna plant. The Appeal Board initially ruled that the Ginna fuel issue was a contested one, that "there was no record basis for authorization of operation at any level above 20% [of full power]," and that the Licensing Board's failure to reopen the proceeding had deprived the intervenors of a forum in which to

[52] *Id.* at 414-16.

participate in the resolution of that issue.[53] The Appeal Board therefore limited operation to 20% of full power pending completion of the proceeding on remand.[54] Subsequently, however, the Appeal Board authorized operation at 75% of full power for a 3-month period. It based its decision on the following factors: a staff report said that fuel rod collapse would not occur until beyond the first fuel cycle; staff counsel stated that the plant could be operated at 70% to 80% of full power for 3 months without any risk to public health and safety; intervenors' counsel was unable to say that there would be a risk from short-term operation; and the short remand period originally envisioned had been considerably expanded. In reversing the Appeal Board's decision to authorize operation at 75% of full power, the Commission stated:[55]

> But however reasonable or logical that result may have appeared to the Appeal Board, it does not adequately take into account the demands of the Atomic Energy Act and the Administrative Procedure Act. Those statutes provide that whenever an agency is required to conduct an adjudicatory hearing on an operating license application, all parties have the right to an opportunity to participate in the resolution of properly contested issues. Such procedural flexibility as inheres in the system does not go so far as to authorize elimination of that opportunity.
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> Accordingly, we direct that the Appeal Board's action authorizing operation of the Point Beach Nuclear Plant, Unit 2, beyond 20% full power be stayed pending completion of the remand proceeding now underway and review of the augmented record by the Appeal Board.

The *Point Beach* decision is different from the case at bar in two significant respects. First, it involved a hazard resulting from deterioration of something in the plant, which can only take place after a period of time—in that case, over 2 years. In our case, the hazard of a heavy aircraft collision into the plant is just as great right now as it will be 2 years from now, provided that the level of traffic does not increase. Second, the Appeal Board, in its initial reversal of the Licensing Board, had found that there was basis in the record for authorization of operation at 20% of full power.[56] The Commission's decision to permit operation at 20%, there-

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[53] 6 AEC at 6.

[54] *Ibid.*

[55] *Id.* at 7.

[56] This was implicit in its finding that there was no record basis for the Licensing Board to have authorized operation at any level in excess of 20%. ALAB-86, 5 AEC 376 (1972).

fore, is not startling. Safety at 20% of power was established by the evidence of record. In our case, however, as we have shown above, even the majority is not able to find that the evidence of record establishes that the 10^{-7} safety standard is met at present traffic levels. That is why it does not affirm the Licensing Board's finding as to current levels of traffic. Operating at current traffic levels here is therefore equivalent to operating at 75% of full power in *Point Beach*. Although my colleagues think that interim operation does not present an undue hazard, the evidence of record does not establish that. Thus, *Point Beach* is powerful authority for the proposition that the majority's decision not to suspend pending the further hearing is unlawful.

In *Zion*, though it found that the Licensing Board had erred in refusing to give the intervenors access to certain information bearing on a safety issue and remanded for further proceedings, the Appeal Board did not suspend or modify the operating license in any way. One of the reasons assigned was that "the intervenors have not urged that anything in the evidentiary record in its present state casts doubt upon the correctness of those calculations."[57] In the case at bar, intervenors contended on appeal that the data base used by the applicants was defective because it did not contain crash data for military planes and because it included only a relatively small amount of unsegregated data for unscheduled flights, whereas all of the heavy aircraft flights at Harrisburg Airport are unscheduled.[58] And they asserted that the numbers used to determine probability were of "unknown accuracy."[59] Hence, it cannot be said here that intervenors have not urged that anything in the record casts doubt on the correctness of the calculations.

However, I do not rest on the point that *Zion* is distinguishable. It seems clear to me that *Zion* was also wrongly decided because it is inconsistent with both the Supreme Court's decision in *Power Reactor* and the Commission's decision in *Point Beach*. As we are bound to follow the higher authorities, it would be wrong to follow *Zion*.

It may be argued that there are more rational ways for society to decide whether, how, and where nuclear power plants should be built than by trial-type hearings. However, if that is to be the means used, it is essential that the integrity of the quasi-judicial process be maintained. That requires that

[57] 7 AEC at 242.
[58] Brief, pp. 2 and 6.
[59] App. Tr. 48.

we apply our regulations, our staff safety standards and relevant legal principles and precedents in a consistent and evenhanded manner—no matter what result that may lead to.[60] I believe that the majority has not done that in this case and that its failure to do so has prejudiced the result. It is for this reason that I dissent.

III

One of three factors which determine the probability of the heavy aircraft accident was identified in the majority opinion as the effective area or A. This is "the target a crashing plane must hit in order to damage the facility."[61] Applicants' witness Vallance determined this factor by calculating the effective area for the two-unit station, rounding it off and dividing by two.[62] In effect, this means that only the probability of a crash into one of the two units was considered.[63] The majority finds this approach "reasonable."[64] Even though the intervenors have not appealed on this issue, I question whether we should not consider both units when calculating the probability of a crash.

My reasons are these. While it is true that we are only licensing the second unit (the first is already licensed), the licensing of the second unit will expose the population in the surrounding area, as well as those who work at and use the airport, to twice the risk of a heavy plane crashing into a nuclear plant than they had before. If this risk is unacceptably high, then something should be done to reduce it. I fail to see how we can close our eyes to the fact that it is the same people who are subject to the risk of a heavy plane crash into each of the two units.

Implicit in the position that we must only consider the risk arising from the presence of the unit we are licensing is the notion that Unit 1 has nothing to do with Unit 2. The fallacy of this thesis may be shown by a *reductio ad absurdum*. Suppose that the applicants decide to completely encircle the Harrisburg airport with a network of 250 nuclear power plants. Suppose further that each one is licensed in a separate proceeding. Could it be seriously argued in that case that we should not consider the risk of a heavy aircraft collision into any one of the 250 reactors? I think not.

My colleagues argue that 10 CFR 100.11(b) precludes consideration of

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[60]It is significant that the artist who conceived of the idea of portraying justice as a lady put a blindfold over her eyes.

[61]*Supra*, p. 32.

[62]*Supra*, p. 32.

[63]Mr. Vallance testified that the probability of a crash into the entire two-unit station would be twice as great. Tr. 577-79.

[64]*Supra*, pp. 32-33.

the area of all units in a multiple unit nuclear generating station in determining what the probability of a plane crash into the plant site is.[65] As they recognize, however, that regulation tells one how to determine the exclusion area, low population zone, and population center distance for a plant. It does not purport to deal at all with the question of determination of aircraft crash probability.[66] While I grant that the principle used in this regulation could be extended to that queston, I do not see why we should conclusively presume that the Commission would do so. This is because, in the case of an aircraft crash hazard, we are looking at probability of occurrence; and I think it is relevant to ask whether a crash into any of the reactors, because it will adversely affect the same people, is the occurrence whose probability we should be concerned with. In the case of deciding whether population density is sufficiently low at various distances from the station, however, we are concerned with how many people will be how close to each reactor in the event of an accident. If this analysis is undertaken separately with respect to each unit, the population density problem will have been satisfactorily analyzed with respect to an accident at each unit unless, as the regulation indicates, an accident at one unit will make operation of another unit unsafe. To the extent that the same people may be impacted by an accident at any one of the units, this is taken into account by the fact that the exclusion areas, low population zones, and population center distances of the individual units will overlap with each other. In sum, the problem dealt with by this regulation is inherently different from a probability determination of an aircraft crash. In the latter case, it makes sense to add up the sum of the probabilities for each unit, which is the same as saying that the area of all the units should be multiplied in the basic equation.

Even if my colleagues were right, however, in assuming that both units should be considered only in the circumstances described in Section 100.11 (b) (2), they fail to explain the basis for their implicit conclusion that the crash of an aircraft larger than 200,000 pounds into one of the Three Mile Island units will not affect the other. This gets into the subject of the consequences of a crash again, a subject that was foreclosed from inquiry by the Licensing Board's order of August 8, 1977, which they have affirmed.

My colleagues also complain that my views on this question conflict with the staff's established practice with respect to "all probability and other safety-related analyses."[67] That may indeed be true. But it is one of our functions to question the staff's practice in those cases where we think it is wrong. Moreover, as I have shown in the case of population density

[65] *Supra*, pp. 48-49, n. 73.

[66] It should be remembered that it is a regulation we are expounding, not a constitution.

[67] *Supra*, p. 49, n. 73.

analysis for purposes of siting, not every safety problem merits the same type of analysis. Thus, if the existence of multiple reactor units has not been considered in connection with other safety questions, that does not necessarily mean that it should not be considered for the purpose of assessing the aircraft crash hazard.

My colleagues further assert that the views I have expressed are in conflict with "established Commission policy."[68] But, to my mind, established Commission policy is that which is expressed by the Commissioners in regulations, policy statements, and rulemaking or adjudicatory decisions. I do not find any Commission policy on the air crash probability issue.

Since the plane crash question is being reopened, however, it is not necessary for us to make up our minds definitively on this issue at the present juncture. It would be especially inappropriate to do so because, as I have considered it on my own motion, the parties have not had an opportunity to express their views with respect to it. I would therefore invite them to do so at such time as they submit their briefs following the further hearing before us.

[68]*Supra*, p. 49, n. 73.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Jerome E. Sharfman, Chairman
Dr. John H. Buck
Dr. Lawrence R. Quarles

In the Matter of	**Docket No. 50-247**
	OL No. DPR-26
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.	**(Determination of Preferred Alternative Closed-Cycle Cooling System)**
(Indian Point Station, Unit No. 2)	**July 25, 1978**

Upon *sua sponte* review of the Licensing Board order (LBP-78-21, 7 NRC 1048) granting an intervenor's motion to modify the operating license, the Appeal Board affirms.

DECISION

On June 14, 1978, the Licensing Board issued an order granting the motion of Hudson River Fishermen's Association ("HRFA") to modify the operating license to provide "that all governmental approvals required to proceed with construction of the closed-cycle cooling system have been received." As no exceptions were filed to this order, we have reviewed it on our own motion. We find no error warranting correction. Accordingly, the order is *affirmed.*

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Marshall E. Miller, Esq., Chairman
Dr. Emmeth A. Luebke
Dr. Paul W. Purdom

In the Matter of

WISCONSIN ELECTRIC POWER COMPANY

(Point Beach Nuclear Plant, Units 1 and 2)

Docket Nos. 50-266
50-301

Amendment to License Nos. DPR-24 and DPR-27 (Increased Spent Fuel Storage Capacity)
July 6, 1978

The Licensing Board denies the staff's motion to reconsider the scheduling of a prehearing conference but clarifies its earlier order to indicate more clearly the matters to be considered at that conference.

LICENSING BOARD: DELEGATED AUTHORITY

In NRC proceedings in which a hearing is not mandatory but depends upon the filing of a successful intervention petition, an "intervention" licensing board has authority only to pass upon intervention petitions.

RULES OF PRACTICE: HEARING REQUIREMENT

Where a licensing board in a proceeding where a hearing is not mandatory grants an intervention petition and thus gives rise to the necessity for a full hearing, a second licensing board, which may or may not be composed of the same members as the first board, is established to conduct the hearing.

RULES OF PRACTICE: INTERVENTION PETITION

Under 10 CFR §2.714, effective May 26, 1978, it is no longer necessary for petitioners for intervention to advance at least one viable contention at the petition stage. The petition may later be supplemented to include contentions.

RULES OF PRACTICE: CONTENTION REQUIREMENT FOR INTERVENTION

There is no single date when a petitioner for intervention must supplement its petition to list contentions and their bases with reasonable specificity. Pursuant to 10 CFR §2.714(b), the supplement may be submitted 15 days prior to the special prehearing conference or, if none is held, the first prehearing conference.

RULES OF PRACTICE: PREHEARING CONFERENCE

There are many types of special prehearing conferences authorized by 10 CFR §2.751a.

ORDER

By its Notice of Special Prehearing Conference entered June 28, 1978, the Atomic Safety and Licensing Board established to rule on petitions and/or requests for leave to intervene in this proceeding ordered a special prehearing conference to be held at Manitowoc, Wisconsin, on July 19, 1978. The Staff filed a motion for reconsideration of this order dated July 3, received by the Board on July 5, 1978. The grounds for the motion are that the established date for the special prehearing conference does not allow time for the petitioner for intervention to perfect contentions as provided by the recent amendments to 10 CFR §2.714, or provide time for negotiation of contentions as encouraged by the Commission.[1]

The Staff's motion to reconsider the July 19, 1978, date for a special prehearing conference and to reschedule such conference for September 1978 is denied. However, because of a failure to distinguish between the functions of an "intervention" board and a "hearing" board, the notice and order of June 28, 1978, requires some clarification which is provided *infra.*

The Appeal Board described the differences between the two types of licensing boards in *Stanislaus* as follows:

> In any event, the Board below correctly held that it lacked jurisdiction to pass upon the motion [for summary disposition]. The role assigned to the Board at the time of its establishment by the Chairman of the Licens-

[1]The Staff in footnote 1 of its motion correctly sets forth the telephonic communications between the Chairman and Staff counsel on June 29, 1978. The Chairman informed the Staff that he did not wish to engage in *ex parte* discussions nor in a telephone conference call relating to the request for reconsideration, and advised the Staff to file an appropriate motion, which has been done by the instant motion.

ing Board Panel was a narrow one: "to rule on petitions and/or requests for leave to intervene in [this] proceeding." 41 Fed. Reg. 26081 (June 24, 1976). The Board was not given the additional authority to proceed beyond that assignment and to entertain filings going to the merits of the controversy between the petitioners and the applicant. In thus confining the area of responsibility of the Board, the Licensing Board Panel Chairman was adhering to firmly rooted Commission practice. In virtually all NRC proceedings in which a hearing is not mandatory but rather is dependent upon a successful intervention petition being filed in response to the published notice of *opportunity* [emphasis in original] for hearing, an "intervention" licensing board is especially established for the sole purpose of passing upon such petitions as may have been filed . . . . Should, however, at least one petition be granted in whole or in part, thus giving rise to the necessity for adjudication of the merits of the issues presented therein, a discrete licensing board is then established to perform that function. [Citations omitted.] The second or "hearing" board may or may not have the same composition as the "intervention" board which preceded it . . . . In the totality of circumstances, we think the settled division of jurisdiction between "intervention" and "hearing" boards to be as sensible as it is venerable and therefore reject out-of-hand the applicant's claim to the contrary.[2]

The language of the order establishing the intervention board in this proceeding is identical with that used in *Stanislaus,* and the extent of its jurisdiction is the same. The FEDERAL REGISTER notice of Proposed Issuance of Amendments to Facility Operating Licenses in this case (43 Fed. Reg. 20064, May 10, 1978) followed the same practice, stating that "Timely petitions will be considered to determine whether a hearing should be noticed or another appropriate order issued regarding the disposition of the petitions."

Pursuant to that notice of opportunity for hearing, an intervention petition was filed by Lakeshore Citizens for Safe Energy (Lakeshore) on June 5, 1978. The Petitioner sought not only leave to intervene and a hearing, but further asked for other relief including a stay of the license amendment request.[3] The Staff responded to this petition on June 26, 1978, supporting the request for leave to intervene but opposing the request for a stay and for

[2]*Pacific Gas and Electric Company* (Stanislaus Nuclear Project, Unit No. 1), ALAB-400, 5 NRC 1175, 1177-78 (1977).

[3]The Petitioner also requested that the Atomic Safety and Licensing Intervention Board appointed for this case (1) stay consideration of the Applicant's license amendment request pending final approval of the Final Generic Impact Statement on Handling and Storage of Spent

(Continued on next page.)

various other relief. The Staff further stated that since the amendments to 10 CFR §2.714 had gone into effect on May 26, 1978, it is no longer necessary that petitioners advance at this stage at least one viable contention, and that it would defer stating its position on the several pleaded contentions. A similar position was taken by the Licensee in its response filed June 20, 1978.[4]

The Staff argues that:

The order scheduling the prehearing conference for July 19, 1978, is unreasonable in that it adversely affects the orderliness of the proceeding, and constitutes an infringement of the procedural rights of the parties. 10 CFR §2.714(b) of the Commission's new Rules of Practice [fn. 3, 43 Fed. Reg. 17798 (April 26, 1978), effective May 26, 1978] provides:

> Not later than fifteen (15) days prior to the holding of the special prehearing conference . . . the petitioner shall file a supplement to his petition to intervene which must include a list of the contentions which petitioner seeks to have litigated in the matter, and the bases for each contention set forth with reasonable specificity. A petitioner who fails to file such a supplement which satisfies the requirements of this paragraph with respect to at least one contention will not be permitted to participate as a party.

(NRC Staff Motion for Reconsideration, pp. 2-3.)

However, the portions of the quotation omitted by the Staff are necessary for *its* interpretation in this case. The omitted language reads "pursuant to §2.751a, or where no special prehearing conference is held, fifteen (15) days prior to the holding of the first prehearing conference." Read as a whole, it thus appears that there is no single date when a petitioner must supplement his petition to list contentions and the bases for each with reasonable specificity. Rather, the timing of such supplement under §2.714(b) is tied either to the special prehearing conference under §2.751a, or where none is held, to the first prehearing conference. In addi-

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(Continued from previous page.)

Light Water Power Reactor Fuel; (2) order the establishment of assorted trust funds to cover the costs of shipping radioactive wastes and spent fuel from the plant and/or the costs of perpetually caring for radioactive wastes and spent fuel, and to cover the costs of decommissioning the Point Beach facility; (3) order the monitoring of radioactivity to be done by a neutral party; (4) grant "compaction" on a limited basis so as to give the Applicant the capacity to offload the entire Point Beach core, if needed; (5) grant the Applicant license renewals on a 5-year basis contingent on Point Beach passing monitoring and safety inspections; and (6) order a hearing on the Applicant's license amendment request.

[4]The State of Wisconsin has also requested leave to participate in the proceedings as an interested State under §2.715(c), and neither the Staff nor the Licensee has objected to such participation.

tion, the rule may be read to refer to more than one special prehearing conference.

The first type of special prehearing conference in an operating license proceeding was considered by the Appeal Board in the *Zimmer* proceeding,[6] where it stated:

> Finally, without giving any reasons for doing so, the Board omitted the special prehearing conference called for in Section 2.751a of the Commission's Rules of Practice, although those Rules specify that "this conference may be omitted in proceedings *other than contested proceedings.*" [Emphasis supplied.] We need not decide whether such a conference must always be held before intervention petitions are ruled upon to agree with the staff that one should have been held here. . . . In sum, our admonition in *River Bend* [ALAB-183, 7 AEC 222, 226] bears repeating here. "In an operating license proceeding, unlike a construction permit proceeding, a hearing is not mandatory . . . . There is, accordingly, especially strong reason in an operating license proceeding why, before granting an intervention petition and thus triggering a hearing, a licensing board should take the utmost care to satisfy itself fully that there is at least one contention advanced in the proceeding which, on its face, raises an issue clearly open to adjudication in the proceeding."

A special prehearing conference before an "intervention board" may also be important where there could be a question of discretionary intervention, as opposed to intervention as a matter of right under judicial tests of standing.[7] The board would be able to observe for itself whether the petitioner's participation "would likely produce a valuable contribution to the decisionmaking process."[8]

A second type of special prehearing conference could flow from the division of responsibility between "intervention" boards and "hearing" boards. It has been held that a petitions board to fulfill its responsibilities need find the requisite interest or standing under Section 2.714, and at least one viable contention in order to grant intervention.[9] Thereafter the hearing board will pass upon the admissibility of all contentions, permitting such refinement, amendment, or rewording of contentions as is necessary to

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[6]*Cincinnati Gas and Electric Company* (William H. Zimmer Nuclear Power Station), ALAB-305, 3 NRC 8, 12 (1976).

[7]*Portland General Electric Company* (Pebble Springs Nuclear Plant, Units 1 and 2), CLI-76-27, 4 NRC 610 (1976); *Tennessee Valley Authority* (Watts Bar Nuclear Plant, Units 1 and 2), ALAB-413, 5 NRC 1418 (1977).

[8]*Watts Bar, supra,* 5 NRC at 1422.

[9]*Northern States Power Company* (Prairie Island Nuclear Generating Station, Units 1 and 2), ALAB-107, 6 AEC 180, 194 (1973); *Zimmer, supra,* 3 NRC at 10.

frame appropriate issues for discovery and evidentiary hearings. A special prehearing conference is usually called by a hearing board under Section 2.751a for this purpose.[10] A third type of special prehearing conference would be one held where no separate "intervention" board has been established, as in proceedings for a construction permit, and the licensing board could call such a conference under Section 2.751a to consider intervention petitions filed pursuant to notice of hearing.

It thus appears that there are several types of special prehearing conferences which serve different purposes. The instant conference is one called by an intervention board, established to determine whether an intervention petition, filed in response to a published notice of opportunity for hearing, should be allowed and a hearing should be noticed. The jurisdiction of this intervention board is limited in accordance with the principles laid down by the Appeal Board in *Stanislaus, supra.*

The Petitioner filed a detailed petition for leave to intervene and a request for hearing on June 5, 1978. The petition alleged interest or standing, and set forth with specificity 32 contentions with numerous subsections. The Licensee's answer stated that the "petition is timely, adequately states the interests of Lakeshore Citizens and contains at least one allowable contention" (Applicant's Answer, p. 1). The Staff stated that "Lakeshore has met the interest and statement of specific aspects criteria required at this time . . . with respect to intervention in NRC proceedings," but opposed its request for a stay and other relief, and deferred stating its position on the contentions (NRC Staff's Response, pp. 1 and 4). Of course, the Board must exercise its own independent judgment as to the adequacy of the intervention petition to show a cognizable interest and at least one viable contention.

If the Staff construes the FEDERAL REGISTER notice of May 10, 1978, to be a published "notice of hearing" sufficient to trigger the application of Section 2.751a, then the special prehearing conference should be called within 90 days, or August 8, 1978. In expanding the time for a special prehearing conference from 60 to 90 days by the recent amendment to Section 2.751a, the Commission set out in the Statement of Considerations accompanying the amended Rules of Practice (43 Fed. Reg. at 17798):

> The Commission takes this opportunity to set forth more reasonable time limits for certain portions of the review and hearing process, but wishes to indicate that it expects that these new time limits will be more closely adhered to, and that there will be less reason for extensions of time in such proceedings.

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[10] *Northern States Power Company* (Prairie Island Nuclear Generating Plant, Units 1 and 2), CLI-73-12, 6 AEC 241, 242 (1973).

It is scarcely expeditious procedure to suggest that a discussion by the parties of contentions filed on June 5 requires a special prehearing conference called by an intervention board to be deferred to September 1978 (Staff), or even to August 15 (Applicant). No good reason is shown why the Staff and the Applicant could not have held such discussions with the Petitioner well before the present date. No action is required by the Board to enable the parties to confer; usually a telephone call is sufficient to set up a prompt conference.

The Petitioner has apparently not felt a compelling need for such a conference, as it has not filed any responses to that effect. The Applicant filed a reply to the motion on July 5, 1978, objecting to postponing the conference as late as September, and indicating that it would be available to meet with the other parties prior to the scheduled conference on July 19. The Applicant also took issue with the Staff's assertion that it would not need the increased capacity in the spent fuel pool until 1980, pointing out that it intended to complete Stage 1 of the storage capacity expansion by September 1979. To accomplish this it will be necessary to release the Stage 1 racks for manufacture by November or possibly December 1978. Applicant therefore wishes to have a decision on its application before committing the funds involved, so that the financial risk would at least not be deliberately built into licensing schedules.

The parties are entitled to a prompt consideration and resolution of the issues involved in this proceeding. The suggestions as to timing by the Staff are entirely too leisurely, and are unnecessary under the facts in this case. The special prehearing conference will proceed as scheduled on July 19, 1978. However, the matters to be considered will be viewed in the context of the limited jurisdiction of an intervention board, and to this extent our notice of hearing and order of June 28 is modified and clarified.

IT IS SO ORDERED.

THE ATOMIC SAFETY AND LICENSING BOARD DESIGNATED TO RULE ON PETITIONS FOR INTERVENTION

Marshall E. Miller, Chairman

Dated at Bethesda, Maryland,
this 6th day of July 1978.

Cite as 8 NRC 78 (1978) LBP-78-24

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Robert M. Lazo, Chairman
Oscar H. Paris
Glenn O. Bright

In the Matter of	Docket No. 50-305
	Amendment to License
WISCONSIN PUBLIC SERVICE	No. DPR-43
CORPORATION, et al.	(Increase Spent Fuel
	Storage Capacity
(Kewaunee Nuclear Power Plant)	July 12, 1978

The Licensing Board grants an untimely petition for leave to intervene in a proceeding to authorize modification of the facility's spent fuel storage pool.

RULES OF PRACTICE: INTERVENTION

A *pro se* petitioner for intervention should not be held to the same standards of clarity and precision to which a lawyer might reasonably be expected to adhere. *Public Service Electric and Gas Company* (Salem Nuclear Generating Station, Units 1 and 2), ALAB-136, 6 AEC 487, 489 (1973).

RULES OF PRACTICE: NONTIMELY INTERVENTION PETITION

Confusing and misleading letters from the staff to a prospective *pro se* petitioner for intervention, and failure of the staff to respond in a timely fashion to certain communications from such a petitioner, constitute a strong showing of good cause for an untimely petition.

RULES OF PRACTICE: NONTIMELY INTERVENTION PETITION

A satisfactory explanation for failure to file on time does not automatically warrant the acceptance of a late filed intervention petition. The four factors specified under 10 CFR §2.714(a) must also be considered.

RULES OF PRACTICE: NONTIMELY INTERVENTION PETITION

Where a late filing of an intervention petition has been satisfactorily explained, a much smaller demonstration with regard to the four factors of 10 CFR §2.714(a) is necessary than would otherwise be the case.

MEMORANDUM AND ORDER

On December 30, 1977, the Nuclear Regulatory Commission (the Commission) published a notice of the "Proposed Issuance of Amendment to Facility Operating License" with respect to Wisconsin Public Service Corporation, *et al.'s,* (licensees') Kewaunee Nuclear Power Plant (the facility) (42 Fed. Reg. 65335). The proposed amendment to Operating License No. DPR-43 would authorize modification of the spent fuel storage pool to increase its capacity. The notice provided that any person whose interest may be affected may file a request for a hearing in the form of a petition for leave to intervene in accordance with the provisions of Section 2.714 of 10 CFR Part 2 of the Commission's regulations.

On April 24, 1978, an untimely petition for leave to intervene signed by Ms. Mary Lou Jacobi was filed on behalf of Lakeshore Citizens for Safe Energy (Lakeshore) and Safe Haven, Limited (Safe Haven). Following the filing of answers by Licensees and the NRC Staff, the Atomic Safety and Licensing Board designated to rule on petitions for leave to intervene issued a memorandum and order dated May 12, 1978, (Order) which found that petitioners Lakeshore and Safe Haven had failed to make adequate showings of their interest in the proceeding and justification for the untimely filing of the petition. The Board granted petitioners 14 days to file an amended petition.

On May 19, 1978, petitioners filed an Amendment to Petition to Intervene (Amendment). In their answer, Licensees argue that petitioners have failed to cure the defects in their petition and urge that we deny the request to intervene. On the other hand, Staff believes that the petitioners have made a strong showing of good cause for the tardiness of the petition and an adequate showing of interest and urges that the petition be granted.

In our Order we noted that circumstances surrounding correspondence between Mrs. Wend Schaefer (Jame Schaefer) and the Commission may provide basis for a showing of good cause for the untimely filing by Lakeshore and Safe Haven. Copies of letters filed with petitioners' original petition and with their amendment, plus copies of letters submitted to us by Staff, provide us with record of this correspondence.

On October 13, 1977, Mrs. Schaefer wrote to the Chairman of the

Commission, requesting that Safe Haven be informed of any request to expand the spent fuel storage capacity at Kewaunee or any other nuclear plant in Wisconsin. On October 26, 1977, she wrote another letter which indicated that she was then aware of Licensees' fuel pool modification plans, and she requested a copy of Licensees' application. Mrs. Schaefer also asked for a ". . . delineation of the procedure the NRC will follow in reviewing this petition." The Commission responded to Mrs. Schaefer's October 13 letter by a letter from Mr. Edson G. Case dated November 3, 1977, telling Mrs. Schaefer that Licensees had not yet submitted their application to the NRC but that the utility had indicated its intention to do so in a letter sent to the Commission in July 1977. Although Mr. Case's letter alluded to the public document room in Kewaunee and to the publication in the FEDERAL REGISTER of notices of proposals to modify spent fuel pools, the letter made no reference to public hearings.

On November 17, 1977, Mr. Case responded to Mrs. Schaefer's October 26 letter, briefly telling her how the NRC would proceed in reviewing the anticipated application for amendment. In this regard the letter stated as follows:

> The first step in our procedure will be to publish in the FEDERAL REGISTER a Notice of Consideration of the proposed action.[1] We will also perform a comprehensive review of the safety and the environmental impact aspects of the proposed action.

The letter again pointed out that copies of correspondence related to the Kewaunee plant were available in the public document room at Kewaunee. The letter did not, however, indicate that the procedures for requesting a public hearing would be set forth in the Notice of Consideration to be published in the FEDERAL REGISTER; in fact, again there was no mention of public hearings.

On January 11, 1978, the Commission sent Mrs. Schaefer a copy of Licensees' application for a license amendment under a covering letter by Mr. Victor Stello, Jr. Other than indicating that the DES would be issued in February 1978, the letter did not refer to the proceedings.

On January 16, 1978, Mrs. Schaefer again wrote to Mr. Case and specifically asked when hearings would be held regarding the proposed spent fuel pool modification at Kewaunee.[1] This January 16 letter went unanswered by the Commission until March 27, 1978. Meanwhile, on March 2, 1978, Mrs. Schaefer responded to Mr. Stello's January 16 letter. She advised Mr. Stello she had learned at a public meeting, sponsored by the

[1]Mrs. Schaefer's January 16 letter and Mr. Stello's January 11 letter appear to have crossed in the mail.

Public Service Commission of Wisconsin, that the deadline for filing a request for an NRC hearing on the proposed Kewaunee license amendment had passed. She went on to say, "If the deadline for requesting hearings on Kewaunee . . . has indeed passed, you certainly should be amenable to extending that date because of an oversight you made in not notifying me as I requested." Mr. Stello answered Mrs. Schaefer's January 16 and March 2 letters on March 27, 1978. In that letter Mr. Stello suggested that Mrs. Shaefer might file an untimely petition, citing as good cause for the late filing the Staff's failure to provide a timely response to her January 16 letter (see Order at 5).

The petitioners argue that ". . . Ms. Schaefer acted in good faith and was expecting the NRC to inform her of any hearing date regarding Docket 50-305." They point out that the NRC correspondence gave no indication of a hearing deadline, nor did it indicate when such information would be published. They point out, further, that the Commission, in its correspondence with Mrs. Schaefer, never explicitly stated that information concerning the procedure for requesting a hearing was contained in the notice published in the FEDERAL REGISTER. Licensees, in their response, argue that Mrs. Schaefer's ". . . expectation that the Staff explain all possible options to her is unrealistic and does not justify her failure to act on her own behalf to protect her interests." In addition, Licensees contend the fact that Mrs. Schaefer was sent a copy of the application and was advised of the local document room placed the responsibility for becoming aware of the governing procedures on her.[2] Staff, on the other hand, says that the more detailed description of the correspondence between Mrs. Schaefer and the Commission ". . . furnish[es] good cause for the untimely filing."

Clearly the failure of Staff to provide Mrs. Schaefer with a timely response to her January 16 letter, in which she asked when a hearing would be held, was a significant lapsus. Moreover, after Mrs. Schaefer had asked for ". . . a delineation of the procedure the NRC will follow . . ." in her October 26 letter, it would have been reasonable to expect the Staff to advise her that the procedure for requesting a hearing would be described in the notice to be published in the FEDERAL REGISTER. We believe that the record of correspondence shows that Mrs. Schaefer was, indeed, acting in good faith and that inadvertently the Commission was remiss in not advis-

[2]The Licensees also point to the lapse of more than 2 months between the WPSC meeting, when petitioners learned that the NRC deadline for requesting a hearing had passed, and the filing of the petition in April. We note, however, that Mrs. Schaefer apparently learned of the *procedure for filing an untimely petition* from Mr. Stello's March 27 letter. The original petition was filed less than 30 days following the writing of that letter. It appears to us that petitioners acted in a timely manner once they became aware of the procedure to be followed.

ing her, in its correspondence, how to request a hearing or, at least, where to obtain such information. Were we dealing with a party represented by counsel, we would agree with Licensees that the responsibility for becoming aware of procedures was the party's, and need not be shared by Staff. But we are dealing with a party who comes before us *pro se*, and ". . . we do not think that a *pro se* petitioner should be held to those standards of clarity and precision to which a lawyer might reasonably be expected to adhere." *Public Service Electric and Gas Company* (Salem Nuclear Generating Station, Units 1 and 2), ALAB-136, 6 AEC 487, 489 (1973). In view of the above, we conclude that Mrs. Schaefer has made a strong showing of good cause for her untimely petition.

In our Order we said that the basis for a good cause showing, if made by Mrs. Schaefer, could be extended to the petitioners, Lakeshore and Safe Haven, if it could also be shown that Mrs. Schaefer, Ms. Mary Lou Jacobi, and Ms. Sandra A. Bast were each authorized to represent both Lakeshore and Safe Haven. Accompanying the amendment submitted by the petitioners was the affidavit of Mrs. Schaefer indicating that she had been authorized by the Board of Directors of Safe Haven, Limited, to correspond with and petition the Nuclear Regulatory Commission jointly with Lakeshore Citizens for Safe Energy. The affidavit also indicated that Ms. Jacobi and Ms. Bast had been authorized to submit the petition to intervene on behalf of Safe Haven and to represent Safe Haven before the Commission. Also accompanying the amendment was the affidavit of Ms. Bast, Chairperson of Lakeshore, on behalf of Lakeshore, indicating that Ms. Jacobi, Mrs. Schaefer, and Ms. Bast were authorized to submit the petition to the Commission.

In their answer to the amendment, Licensees assert that the affidavits fail to show that Mrs. Schaefer was authorized to represent Lakeshore in January and that Staff was not informed in January that Lakeshore was relying on Mrs. Schaefer to protect its interests. Staff, however, believes that the affidavits make an adequate showing that Mrs. Shaefer, Ms. Jacobi, and Ms. Bast were authorized to represent both groups. Staff also states that a telephone conversation with Ms. Bast causes it to believe that at least one, if not all, of the aforementioned representatives hold dual membership in the two organizations.

We recognize the technical deficiencies which Licensees have identified in the affidavits. We believe, however, that we must view them in light of the accepted practice of the Commission which recognizes that we should not require the same precision in the filings of laymen that is demanded of lawyers. Consequently, we are led to agree with Staff. We conclude that the strong showing of good cause for failure to file on time can be extended to joint petitioners.

A satisfactory explanation for failure to file on time does not automatically warrant the acceptance of a late filed intervention petition. We must also consider the four factors specified under 10 CFR §2.714(a) (see our Order dated May 12, 1978, at 2). But where the lateness has been satisfactorily explained, a much smaller demonstration of these factors is necessary.

The first factor is the availability of other means whereby the petitioners' interest will be protected. In their attempt to meet this test, petitioners state in their amendment that neither the Licensees nor any agency has considered certain problems raised in their petition. They relate the adequacy of other means to protect their interest to the problems of perpetual care of spent fuel and of decommissioning; however, neither is an admissible contention in this proceeding. But they also indicate that consideration will not be given to certain contentions contained in their original petition, absent their participation as intervenors. Indeed, as Staff points out in its response to their amendment, if their petition is denied no hearing will be held.[3] Licensees, in their response to the amendment, argue that the petitioners' interest will be adequately protected by the Staff. Clearly Staff does not agree. Inasmuch as the petitioners have formulated a number of cognizable contentions, which would not be ventilated absent a hearing, we conclude that the first factor weighs in favor of the petitioners.

The second factor is the extent to which participation by the petitioners may reasonably be expected to assist in developing a sound record. This factor is not addressed directly in either the original petition or the amendment. Staff contends that ". . . there is no reason to draw a negative inference on this factor since petitioners have made a particularly strong good cause showing and have stated contentions related to the proposed modification of the spent fuel storage facility." Licensees, on the other hand, said, "Petitioners possess no special background or expertness which would make their participation especially useful in the development of the record. They have proffered no special evidence or data that they plan to present which would aid evaluation of the pending applications." We agree with Licensees that petitioners have shown no expertise or access to evidence not available to Licensees or Staff. On the other hand, they have formulated several technical contentions which suggest that they may have expert assistance available to them. Had petitioners filed on time, they might have qualified for admission as a matter of right, and thus would not

[3]The State of Wisconsin has filed for leave to participate as an interested State pursuant to 10 CFR §2.715(c), without contentions. Should participation by the petitioners be denied, a hearing might nevertheless be held if the State were granted an opportunity to formulate contentions and did so, and those contentions were admitted by the Board. We cannot, of course, assume that such events will transpire.

have had to stand the test of expertness which the rules require us to apply in judging untimely petitions. This consideration and the fact that they have shown their late filing was not out of all reason lead us to be more lenient in judging the second factor than we might otherwise have been. We lack the evidence to find that the second factor weighs in favor of the petitioners; but, for the foregoing reasons, we do not find it weighs against them.

The third factor is the extent to which petitioners' interest will be represented by existing parties. If Lakeshore and Safe Haven are denied leave to intervene, the only parties to the proceeding will be Licensees and Staff. Licensees state that the petitioners have produced no factual basis to support the conclusion that their interests are not adequately represented by Staff. But Staff argues that neither it nor the Licensees ". . . would seem to have a 'sufficient identity' of interests with the petitioners to assume the petitioners' concerns will be represented." We note that the petitioners contend that certain health and safety matters have not been dealt with adequately. Staff is aware of these contentions and still says we should not assume that it will represent the petitioners' concerns. We conclude, therefore, that the third factor weighs in favor of the petitioners.

The fourth factor, the extent to which the petition will broaden issues or delay the proceeding, is a particularly significant one. Licensees claim that initiating a hearing at this late date would severely prejudice prompt processing of its application. Staff indicates that it expects to issue the SER in mid or late July and says that a prolonged hearing would probably delay the start of the proposed modification on September 1, 1978. Staff believes, however, that the narrow scope of cognizable issues noted by the Board in its Order dated May 12, 1978 (see p. 7, n. 2), should serve to avoid undue delay or unnecessary broadening of issues. We agree that granting petitioners leave to intervene at this time will probably result in some delay in the proceeding. But the significance of such a delay has been described only in the vaguest terms. Absent any information about the nature and extent of injury that the Licensees might suffer as a result of such a delay, we are disinclined to assign it great importance. We conclude, therefore, that the issues will be broadened to a limited extent and some delay in the proceeding can reasonably be expected if the petition is granted, but we have no reason to believe that the delay would cause the Licensees great harm. We find, therefore, that the fourth factor weighs neither in favor of nor against the petitioners.

In summary, the petitioners have made a strong showing of good cause for the late filing, and we have found that two of the four factors weigh in their favor and two have no significant weight. We conclude that Lakeshore and Safe Haven have satisfactorily passed the test for untimely petitions set forth in Section 2.714(a).

There remains for us to determine whether the petitioners have also passed the test of interest, also set forth in 10 CFR §2.714(a). In our Order dated May 12, 1978, we said that they might be able to make an adequate showing of interest by identifying members who live or work near the plant and showing how their interests would be affected. In the Amendment, they identified several members of either Safe Haven or Lakeshore Citizens, or both, who live within 2-1/2 to 50 miles of the Kewaunee plant, and they identified health and safety interests of these members that would be affected by the proposed modification. Staff believes that this showing fully complies with our Order. Licensees complain that petitioners have failed to make a showing that these members wish to have their interests represented by the petitioning groups and cites *Barnwell* for precedence (*Allied-General Nuclear Services* (Barnwell Fuel Receiving and Storage Station), ALAB-328, 3 NRC 420, 423 (1976)). In that case the Appeal Board found that a single affidavit which merely attested to the truth of the petition was inadequate. We view that situation as different from the instant case. Here we have affidavits which attest that Mrs. Schaefer, Ms. Jacobi, and Ms. Bast are authorized to represent both organizations before the Commission. In our view, this authorizes them to represent all members of the organizations, collectively and individually. Accordingly, we agree with Staff. We find the petitioners have made an adequate showing of interest in this proceeding.

In addition to passing the test for their untimely filing and demonstrating the requisite interest in this proceeding, the petitioners must also state at least one contention which meets the requirement of particularity set forth in 10 CFR §2.714(a). Petitioners have identified several cognizable contentions, including B-1&2 and B-5 which were cited in our Order dated May 12, 1978. One of these which meets the requirements of Section 2.714(a) is B-1&2, which contends that a loss-of-cooling accident in the spent fuel pool has not been adequately evaluated because the rate at which temperature would rise in the pool has not been demonstrated. We conclude that petitioners have satisfied the requirement of setting forth at least one contention which meets the requirements of 10 CFR §2.714.

On the basis of the foregoing findings, we conclude that the petitioners have met all of the requirements for intervention and should be admitted as a party to this proceeding. By admitting them as a party, we do not necessarily approve any of their other contentions. A hearing board will determine the specific contentions which warrant consideration in the hearing. The hearing board must also be satisfied that a genuine issue actually exists with regard to Contention B-1&2. If the Board is not so satisfied, it may summarily dispose of the contention on the basis of the pleadings pursuant to 10 CFR §2.749.

The petition for leave to intervene by Lakeshore Citizens for Safe Energy and Safe Haven, Limited, is *granted.*

The unopposed petition of the State of Wisconsin for leave to participate in this proceeding as an interested State pursuant to 10 CFR §2.715(c) is hereby *granted.*

Pursuant to the provisions of 10 CFR §2.714(a), this order may be appealed to the Atomic Safety and Licensing Appeal Panel within ten (10) days after service of the order. The appeal shall be asserted by the filing of a notice of appeal and accompanying supporting brief. Any other party may file a brief in support or in opposition to the appeal within ten (10) days after service of the appeal.

A notice of hearing implementing this decision is appended to this Memorandum and Order as Attachment A.

It is so ORDERED.

THE ATOMIC SAFETY AND
LICENSING BOARD
DESIGNATED TO RULE ON
PETITIONS FOR LEAVE
TO INTERVENE

Glenn O. Bright, Member

Oscar H. Paris, Member

Robert M. Lazo, Chairman

Dated at Bethesda, Maryland,
this 12th day of July 1978.

[Attachment A has been omitted from this publication but is available at the NRC Public Document Room, 1717 H Street, N.W., Washington, D.C.]

Cite as 8 NRC 87 (1978) LBP-78-25

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Frederic J. Coufal, Chairman
Dr. Walter H. Jordan
Dr. Donald P. deSylva

In the Matter of **Docket Nos. STN 50-488**
STN 50-489
DUKE POWER COMPANY **STN 50-490**

(Perkins Nuclear Station,
Units 1, 2, and 3) **July 14, 1978**

In accordance with the Commission's directives in its statement of consideration concerning the revision of Table S-3 of 10 CFR Part 51, 43 Fed. Reg. 15613 (1978), the Licensing Board reopens the record on the environmental effect of radon emissions and concludes that the health effects associated with increasing the value for releases of radon-222 during the uranium fuel cycle are insignificant in striking the cost-benefit balance for the subject units.

PARTIAL INITIAL DECISION

ENVIRONMENTAL CONSEQUENCES OF THE URANIUM FUEL CYCLE

Appearances

J. Michael McGarry, Esq., Debevoise & Liberman, 806 15th Street, N.W., Washington, DC 20005 and **William L. Porter, Esq.,** Legal Department, P. O. Box 2178, Charlotte, NC 28242, for the Applicant, Duke Power Company

William G. Pfefferkorn, Esq., 2124 Wachovia Building, Winston-Salem, NC 27101 and **Thomas S. Erwin,** P. O. Box 928, Raleigh, NC 27602, for the Intervenors

Bernard M. Bordenick, Esq., Charles A. Barth, Esq., and **Joseph F. Scinto, Esq.,** Office of the Executive Legal Director, Nuclear Regulatory Commission, Washington, DC 20555, for the NRC Regulatory Staff

Background

1. The environmental consequences of the uranium fuel cycle associated with the operation of the Perkins Nuclear Station were considered in the FES (dated October 1975) by including Table S-3[1] and by factoring those consequences into a cost-benefit balance. On March 7, 1977, the Commission promulgated its final interim rule as to environmental impact values for the uranium fuel cycle which amended Table S-3. At the hearing, the Staff provided testimony that the new figures contained in the revised Table S-3 were so little different from those in the original Table S-3 that the cost-benefit balance would not be disturbed (see Affidavit of Robert A. Gilbert at 6, following Tr. 1778; see also 1779-1782).

2. In addition to presenting the revised Table S-3, the Staff presented an analysis comparing the health effects associated with the coal and nuclear fuel cycles. In making this evaluation, Dr. R.L. Gotchy considered the entire fuel cycle associated with each alternative. The coal fuel cycle consists of mining, processing, transportation, power generation, and waste disposal. The nuclear fuel cycle includes mining, milling, uranium enrichment, fuel preparation, fuel transportation, power generation, irradiated fuel transport, reprocessing (if permitted), and waste disposal (see Supplemental Testimony, R.L. Gotchy, following Tr. 1740). The Applicant also presented testimony concerning the health effects associated with the coal fuel cycle (see Testimony of Lionel Lewis, following Tr. 1776).

3. After the close of the evidentiary record in this proceeding, one of the members of this Board prepared a memorandum which was transmitted to the Commission. The chief thrust of this memorandum was to bring into question the Table S-3 value for the amount of radon (Rn-222) emitted from tailing piles associated with uranium mills.

4. On April 11, 1978, the Commission amended Table S-3 by removing the value contained in the table for radon releases from the uranium fuel

[1]Table S-3 is part of 10 CFR Part 51.

cycle.[2] The Commission directed that in proceedings pending before licensing boards, the record be reopened for the limited purpose of receiving new evidence on radon releases and on health effects resulting from radon releases.

5. In response to the Commission's directive, a public hearing was convened on May 16 and 17, 1978, in Bethesda, Maryland, to receive evidence on the amount of radon that might be released into the environment resulting from the mining and milling of an amount of uranium sufficient to supply the Perkins Nuclear Station for 40 years of operation. The subsequent health effects were also considered.

6. In connection with the hearing, the Staff filed with this Board a series of five affidavits (following Tr. 2369) which included, as more fully discussed below, the Staff's most recent estimates of radon-222 releases from mining and milling operations and an evaluation of the health effects resulting from such releases. The Applicant also filed testimony and presented evidence through a panel of witnesses (Lewis, Goldman, Hamilton, following Tr. 2266).

7. Intervenors provided the testimony of Dr. Chauncey Kepford, a former assistant professor of chemistry, who had participated in questions concerning radon-222 emissions in the *Three Mile Island* proceeding. Dr. Kepford's testimony was supplied by a deposition taken on June 8, 1978, in Bethesda, Maryland. At the deposition, Dr. Kepford's prefiled direct testimony was offered (Tr. 2715).[3] Dr. Kepford also offered a document entitled, "Resource Consumption" (Tr. 2713) and some 11 other documents, or parts of documents (Tr. 2716-2724) which had not been prefiled.

8. Two of the Staff's affidavits explained how the incorrect value of 74.5 Ci for Rn-222 from milling came to be incorporated into Table S-3. Mr. Rothfleisch pointed out that during the preparation of WASH-1248 (from which Table S-3 was taken) he estimated the amount of radon emitted from the full tailings pile during the period of time required to mill one annual fuel requirement (AFR).[4] Miss Black (who sponsored testimony originally written by Mr. Lowenberg) said that this is nearly equivalent to the amount of radon that is emitted per single AFR during the typical 10-year period of active mill operation. It was assumed that the tailings pile would remain wet, a condition which retards the emission of radon. This value was incorporated into Table S-3. The fact that the value did not include the total amount of radon that would be emitted from the pile during

[2] 43 Fed. Reg. 15613.

[3] The Board, in an order dated June 29, 1978, received the deposition and certain exhibits and ruled on objections and motions made at the time the deposition was taken.

[4] About 57 days are required to mill the 2.7×10^5 tons of 0.1% uranium ore required to fuel a 1,000 MWe plant operating at 80% capacity for 1 year.

the thousands of years following the cessation of milling operations was overlooked.

Radon Source Terms

A. Radon From Mining

9. Radon-222 is one of the natural products of the decay of uranium-238 which has a half-life of 4.5 billion years. The precursors of radon are all solids, two of them of long half-life, thorium-230 with 80,000 years and radium-226 with 1,600 years. Radon is a gas having a half-life of 3.8 days and readily diffuses through the soil or ore body; the amount reaching the atmosphere depends on the length of the path (and hence the lapse of time) between the origin of the radon (the ore body) and the air interface. Typically 2 feet of soil will hold up the radon long enough to permit about 25% of the radon to decay, allowing 75% to escape. If a body of uranium ore is exposed to the air, radon gas will escape into the air. The process will continue so long as the ore body is exposed, up to billions of years.

10. Staff's witness R.M. Wilde explained how he arrived at an estimated quantity of 4,060 Ci of Rn-222/AFR associated with mining. It was calculated from an estimate of the concentration of radon in the ventilating air from an underground mine during the time required to extract 2.71×10^5 metric tons of ore (1 AFR) from the mine. Since mine ventilation ceases when the mine is closed down, the mine does not constitute a continuing source of radon. The estimate of 4,060 Ci/AFR was accepted as reasonable by Applicant's witness (Lewis Testimony, paragraph 2, following Tr. 2266) and was not challenged by Intervenors. This value was used by Gotchy in his estimates of health effects from mining. We adopt it as a reasonable estimate.

11. The Board was concerned that abandoned underground mines could continue to be a source of radon release to the atmosphere and questioned Mr. Wilde concerning this. Mr. Wilde indicated that it was industry practice to seal ventilation and hoisting shafts of mines no longer producing uranium. Moreover, even if the shafts were not sealed, when the ventilation fans are shut down, radon release would essentially go to zero (Tr. 2541-2542).

12. Mr. Wilde testified that there was insufficient data to predict with certainty the potential rate of radon emission from open-pit mining operations (Wilde, p. 7, following Tr. 2369). Open-pit mining constitutes about half of the present uranium mining activity (Tr. 2543). Though this may be anticipated to become a decreasing portion in the future (Tr. 2550), the Board was concerned by the absence of any estimates of potential radon

released from open-pit mining (Tr. 2543-2558). Failure to include any such estimates (and the associated health effects) appeared to be a major omission that was questioned at length. We insisted that at least an upper bound be placed in the record. Mr. Wilde made a number of conservative assumptions and calculated a value for radon release from open-pit mines of approximately 100 Ci per year per AFR (Tr. 2609-2613). Applicant's witness Goldman indicated that he made a similar calculation and estimated bounding values of 100 to 200 Ci/yr.

13. We have assumed that the amount of radon released from mining could be as high as 200 Ci/yr/AFR and that half of the uranium for the Perkins plant will be from open-pit mines. Thus we arrive at a figure of 100 Ci/yr/AFR from unreclaimed open-pit mines. This figure was adopted by Intervenors' witness Kepford for purposes of calculations which he subsequently performed in connection with testimony that he gave at his deposition (Kepford p. 2).

14. The total amount of radon attributable to open-pit mining depends upon the period of time that the walls and floor of the pit remain open to the atmosphere as well as the concentration of uranium in the soil of the mined-out pit. In arriving at the figures in column 4 of Table 1 of his testimony, Dr. Kepford assumed that the pits remain open forever. Since U-238 has a very long half-life, he calculates the amount of radon from the open-pit mines required to fuel the Perkins plant (110 AFR's) at 6×10^{13} Ci emitted in the following 10^{10} years. We find no error in his mathematics but do have problems with the assumption.

15. If one assumes that an open-pit mine produces enough ore to supply one nuclear plant and that the pit is refilled (or otherwise stabilized) at the end of 20 years of operation, then some 4,000 Ci of radon would be released per AFR, nearly the same as that estimated for underground mining so it would not matter whether the uranium came from underground or open-pit mines.

16. NRC has no regulatory power over uranium mines; it is entirely a State matter. Therefore we inquired concerning the present practices of the State regulatory agencies. Mr. Wilde stated that nearly every State has rather stringent reclamation laws governing open-pit mines. Wyoming requires that the land be returned to a condition such that it can be used for an equal or higher purpose after mining than it was used for prior to mining (Tr. 2556). Dr. Goldman stated that of the five States in which significant amounts of uranium are mined, only Arizona has no reclamation requirements.

17. Since the amount of radon expected from the mining operations is determined by the amount of reclamation to be applied to open-pit mines, we necessarily must speculate as to what might occur. We are doubtful that

all mines will be reclaimed immediately on the cessation of operations. Neither do we believe that society will permit such open sores on our landscape for all future time. It is our judgment that reclamation will likely occur within 100 years after mining has ceased. This would result in an upper limit of 10,000 Ci/AFR—2-1/2 times that considered by the Staff but very small compared to that proposed by the Intervenors. What if we are wrong? Would radon from this source impose a serious burden on future generations? We think not, as we shall explain when we consider health effects.

B. Radon From Milling

18. After the mining operation, uranium ore is delivered to a mill where it undergoes the various chemical processes which result in the separation of U_3O_8 from the other materials contained in the ore (Tr. 2502-2505). At the mill there a number of potential points of radon release. One point is the stockpile where the ore awaits processing (Tr. 2502). There will be some generation of radon during this storage period. Staff witness Magno testified that this was considered in developing his estimates but proved to be only a very minor contribution and was not included in the overall estimates (Tr. 2559-2560). During the course of milling, there will be the release of some radon as a result of crushing and grinding and various chemical processing steps. Staff witness Magno estimated that this release would amount to some 30 curies per AFR (Magno, pp. 2-3, following Tr. 2369, Tr. 2560). Thereafter, the tailings or residual material remaining after the uranium has been extracted (which contain substantial amounts of thorium and radium) go to a tailings pile (Tr. 2505-2506). Mr. Magno provided separate estimates for radon releases from the tailings piles during different periods during and following active milling.

19. Since most of the thorium and radium remain in the ore after the uranium has been removed, radon will continue to be released from the ore and diffuse to the surface of the tailings piles. The rate of emission will be determined primarily by the diffusion constants and will be essentially constant for thousands of years, being chiefly determined by the half-life of the parent Th-230, 80,000 years. Since only 90% of the uranium is recovered in the milling operation, the tailings piles contain about one-tenth as much uranium as the ore. Hence even after most of the Th-230 has decayed it will be regenerated from the U-238 and will continue to emit radon at about ten percent of the original level for billions of years.

20. Mr. Magno's testimony provides an estimate of approximately 750 curies of radon per AFR released from the tailings during the period of active mill operation, which he took to be 26 years. During this period of

time, a portion of the tailings pond is composed of wet pond area, wet sandy beach areas, and some dry beach areas. Radon is released principally from the dry beach areas (Magno, pp. 3-4, following Tr. 2369 and Tr. 2561-2562). Mr. Magno estimated that during the following period of approximately 5 years during which the tailing piles dry out and are stabilized, approximately 350 curies per AFR would be generated (Magno, p. 6, following Tr. 2369).

21. Mr. Magno's values of 750 and 350 curies of radon per AFR emitted from the piles prior to stabilization was accepted by the parties and the Board.

22. Mr. Magno estimated that at the end of the 5-year dry-out period, the tailings piles would be emitting radon at a rate of about 100 Ci/yr/AFR.[5] This value was not challenged; indeed it was used by Dr. Kepford in his calculations (Kepford Testimony, bottom of p. 2).

23. The total amount of radon emitted per AFR depends entirely on the assumptions that are made concerning the stabilization of the tailings piles after they dry out. If the piles remain uncovered, or are protected only by a foot or two of soil, as has been the practice in the past, the radon will continue to be emitted at a rate of 100 Ci/yr/AFR for tens of thousands of years. The total to infinite time would be about 11 million curies per AFR or nearly 1.3 billion curies for the 110 AFR's required to fuel the Perkins Nuclear Station for 30 years. This is shown in column 7 of Table 1 of the Kepford testimony.

24. The Board agrees with the Intervenors that the amount of radon that would be emitted from unstabilized tailings piles when integrated far into the future will be very large.

25. Staff witness Gotchy assumed that the tailings piles would emit radon at a rate of 1 Ci/yr/AFR for the first 100 years, 10 Ci/yr/AFR for the next 400 years, and 100 Ci/yr/AFR for periods beyond 500 years (Gotchy p. 4). Thus at the end of 10,000 years, he estimated 912,000 Ci/AFR (Gotchy Table 6, p. 15) which would amount to 1×10^8 Ci due to the 110 AFR's required for Perkins. This agrees with the Kepford figure of 1.06×10^8 Ci (see Kepford Table 1, column 7 at 10^4 years).

26. We question both the Kepford and Gotchy assumptions on stabilization. Dr. Kepford assumed no stabilization. Mr. Magno testified that the Staff has recently developed performance objectives for tailings piles management that will require that the tailings piles be buried so deep that the radon emission rate will be no more than double the release rate from natural soils in the surrounding environs (Magno p. 6). This will require

[5]This value is consistent with that derived in NUREG-0002 which was relied upon by Board member Jordan in questioning the 74.5 Ci that appeared in Table S-3.

some 6 to 20 feet of soil over the piles and will reduce the rate to less than 1 Ci/yr/AFR, about 1% of the rate from unstabilized piles.

27. In response to Board questions, the Staff produced a witness, Hubert Miller, who described the Staff's Branch Technical Position which requires all Applicants for a license to operate a uranium mill to commit themselves to a plan of reclamation (Tr. 2394, *et seq.*). The fundamental thesis of the Branch Technical Position is that the tailings be reclaimed in such a manner that no ongoing active care would be required to maintain stabilization (Tr. 2395). The Branch Technical Position is applied to new and existing applicants (Tr. 2401, 2542). By way of example, Mr. Miller stated that the two most recent applicants have committed themselves to dispose of tailings below grade (Tr. 2396).

28. Since a number of mills may be located in Agreement States and thus are not subject to NRC licensing, the Board questioned the assumption that all tailings piles would be subject to stabilization requirements such as those described by Mr. Miller as NRC branch positions for NRC licensing purposes. The Staff presented in response to the Board's inquiry Mr. Kerr, Assistant Director for State Agreements in NRC's Office of State Programs. Mr. Kerr testified that the NRC had been in contact with the States in which uranium milling activities are carried out and each of the responsible States has provided the NRC with commitments to impose stabilization requirements equivalent to those described by the Staff (Tr. 2477-2480, 2483-2485).

29. There are, of course, some abandoned mills and associated tailings piles from previous milling activities. These abandoned facilities are no longer under license and may not therefore be subject to stabilization requirements as a part of licensing activities, although there is some indication that some effort in this regard may develop in the future (Tr. 2453-2544, 2480-2481). Nevertheless, since these are abandoned facilities, any radon emission from such tailings piles cannot be attributed to the operation of the Perkins facility.

30. The Board is of the opinion that the situation with respect to tailings piles has changed greatly within the past year. We are no longer faced with abandoned and unstabilized piles. The new requirements will assure that they will no longer be a major source of radioactivity. The NRC Staff has recognized the problem and has moved to handle it. Tailings piles stabilized to NRC criteria will emit only 1 Ci/yr/AFR so that the amount of radon from tailings piles associated with the fueling of the Perkins plant will be about 110 Ci/yr. This is negligibly small compared to the natural emission of radon from the soil of the U.S. (some 10^8 Ci/yr—see Gotchy, p. 14).

31. Neither the Intervenors nor the Staff have argued that stabilized piles are a menace. The Intervenors argue that we cannot guarantee that

they will be stabilized for all future times. Gotchy conservatively assumed that after 100 years the soil coverings will be eroded to the point that the radon release rate will be 10 Ci/AFR and that after 500 years it will be 100 Ci/AFR. He also assumes that the population of the U.S. will remain stable at 300 million.

32. It appears to us that Dr. Gotchy is being excessively conservative. It is not apparent that piles that meet present NRC standards will be eroded in a matter of a few hundred or a few thousand years. Furthermore if there are people around to breathe the radon, those people can readily repair any damage to the piles. We see no reason for piling uncertainty on top of uncertainty. There may be another period of glaciation within the next 10,000 years, but we do not have to assume it to project radon emissions into the future. If all the stabilization is destroyed by some catastrophic event, then radon will be a minor problem.

33. The Intervenors argue that even if stabilization could be assured for the next few thousand years, it surely could not be guaranteed for millions of years. Most of the impact that they project occurs after the first thousand or 10 thousand years. That impact is cancer deaths to future generations. Before addressing the impact on people to be born tens of thousands of years in the future, we will first explore the relation between radon and cancer.

Radon and Cancer

34. There is good evidence that miners who in the past breathed air containing a large concentration of radon gas (over 100 pCi/liter) for extended periods were much more likely to die of cancer than were members of the public who breathed air containing only the normal background concentration of radon (about 0.1 pCi/liter). Today uranium miners are protected by regulation which limits radon exposure to 3 WLM/yr;[6] this results in a maximum dose to the bronchial epithelium of about 15 rem per year (Tr. 2573).

35. Miners are exposed to air containing a considerable concentration of radon, but no one escapes breathing some radon. Radon seeps from the soil (because the soil contains uranium) and mixes with the air we breath. The amount varies from place to place. It has been estimated that the average concentration of radon in the air over continental U.S. is about 0.1 pCi/liter which in itself produces a dose to the bronchial epithelium of about 50

[6]WLM stands for working level months. One working level (WL) is the exposure to a miner that breathes air with a radon concentration of about 100 pCi/liter. A miner exposed to such a concentration for 8 hours per day for a month (177 hrs) would receive an exposure of 1 WLM.

mrem/yr.[7] But that isn't all. Modern man lives in houses with concrete floors, stone fireplaces, or brick walls. He works in buildings made of concrete. The radon concentration inside such homes and buildings is much larger than it is out of doors. Consequently the average dose to an individual in the U.S. is estimated to be between 210 and 23,000 millirem per year with an average of about 1,650 mrem/yr (Hamilton, Tr. 2276).

36. The question arises as to whether this exposure to background radon produces lung cancer in some people? In other words, do small doses of radiation to large numbers of people produce as many cancer deaths as large doses to fewer people. This is equivalent to asking whether the relation between health effects and dose is a linear one. Science does not provide an unequivocal answer. Many radiation biologists are of the opinion that since body cells have a demonstrated capacity for repair there may well be a threshold dose below which the damage is much below linear, possibly zero (Hamilton Tr. 2270, 71). Applicant's witness Lewis stated ". . . it is important to note that the linear extrapolation used to calculate health effects at low levels as an estimate of actual health effects may considerably overestimate the actual number of health effects. Various radiation protection standards-setting bodies say, in fact, that the real effects are likely very much lower and may, in act, even be zero" (Lewis, pp. 3 and 4, following Tr. 2266). He cited a number of government publications as authority for his statement.

37. Since there is no certain evidence for a radiation effects threshold, it is generally agreed that the conservative approach is to assume linearity. Dr. Gotchy's estimates of deaths were based on the linear assumption using risk estimators from WASH-1400 and GESMO (Gotchy p. 7). Although Dr. Kepford made reference to some published papers which argue that the linear assumption is not conservative, Intervenors presented no such evidence. Indeed Dr. Kepford used the risk estimators of Dr. Gotchy in his calculations (Kepford p. 3). We are of the opinion that the linear hypothesis

[7]The figures for the concentration of radon in air due to natural background and the lung dose therefrom are subject to a considerable uncertainty. Gotchy, on p. 45 of his written testimony (quoting from NCRP-45), gives the average Rn-222 concentration in the U.S. as 150 pCi/m^3 which is equivalent to 0.15 pCi/liter. That concentration results in a dose of 450 mrem/yr to the bronchial epithelium. In response to a question, Dr. Hamilton relied on a United Nations Scientific Committee Report to arrive at an average dose of 1,650 mrem/yr to the bronchial epithelium from natural radon background. That dose was from breathing radon inside buildings; the figure for radon out of doors was an average of 50 mrem/yr (Tr. 2275-76). We recognize that the concentration of radon in the atmosphere varies from place to place and is subject to considerable uncertainty. Differences by a factor of five are not important for our purposes of comparing natural background to the amount that might be due to Perkins.

provides a conservative estimate of potential deaths due to small doses of radiation to large populations.

38. Dr. Gotchy adopted a simple wedge model for calculating the dispersion of the radon plume from a mine or tailings piles as it moves across the U.S. He used present population density figures increased by a factor to bring the total U.S. population to 300 million. He relied on the RABGAD computer code developed for NUREG-0002 to calculate the total population doses per curie of radon emitted. Then, using the risk estimators of WASH-1400 and NUREG-0002, he estimated the potential deaths per curie of radon from a source in western U.S. His figure (derived from Table 4 of his testimony) is about 2×10^{-5} potential cancer deaths per curie. As he stated on p. 7 of his testimony, this figure is smaller than that used by EPA by about a factor of 2 which is well within the factor of 10 error band of his estimates.

39. Using the foregoing risk conversion factor and his estimates of radon release from mining and milling, Dr. Gotchy calculates the total deaths during the 1,000-year period following the mining of 1 AFR to be 1.2 additional deaths (Gotchy p. 8). This number should be multiplied by 110 AFR's to get the total impact of the Perkins plant or approximately 130 deaths in 1,000 years.

40. Dr. Gotchy's testimony discusses at length the reasons for his conclusion that he cannot predict specific health effects into the future beyond 1,000 years (Gotchy pp. 11-13, following Tr. 2369; Tr. 2418-20). Dr. Gotchy further shows that on another basis one can conclude that the radon release from the nuclear fuel cycle does not have a significant adverse impact. He compared radon releases resulting from the mining and milling of uranium with radon naturally occurring on the earth, and provided calculations out to 10,000 years of the comparative population exposure resulting from radon emanation from the nuclear fuel cycle compared to the naturally occurring exposures. These calculations show that exposures due to radon releases from mining and milling are insignificant compared to natural background radiation exposures (Gotchy pp. 13-16, following Tr. 2369).

41. Out to 1,000 years, Dr. Kepford's calculations are somewhat higher than those resulting from the use of Dr. Gotchy's estimates. For 1,000 years, Dr. Kepford estimates a total of 489 deaths due to the radon resulting from approximately 110 AFR's required to fuel the three Perkins facilities for a 30-year operating lifetime (Kepford, Table 4, Tr. 2790, 2791). For the same number of annual fuel requirements, Dr. Gotchy's estimates to 1,000 years predict approximately 132 deaths. It should be noted that Dr. Kepford's calculations contain certain radon source estimates greater than those contained in Dr. Gotchy's estimates. These include a source of 100 curies per year per AFR, to account for residual releases from open-pit mines

(Kepford, p.2). Dr. Kepford assumes no stabilization of mill tailings piles and thus assumes a release of approximately 100 curies per year per AFR for the entire period (Kepford p. 2, Tr. 2791). As noted above, Dr. Gotchy's estimates for 1,000 years are based upon a release from the tailings piles for the first 500 years of approximately 10 curies per AFR and 100 curies per AFR for the 500 years that follow.

42. In contrast to Dr. Gotchy, Dr. Kepford continues his computations of health effects on the same basis for periods to millions and billions of years. On that basis, of course, although the annual increment is small, the total period of time is so enormous that the total number of deaths summed over this period of time, as computed by Dr. Kepford, is very large, *e.g.*, the impact accumulated for 10,000 years is 4,800 computed deaths, for a billion years it is 230 million computed deaths (Kepford, Table 4). It is this impact that Dr. Kepford urges us to debit nuclear power when assessing nuclear power vs. an impact associated with coal (Kepford p. 6).

43. On the other hand, a third and different point of view was expressed by Applicant's witness Dr. Hamilton who, although agreeing that Dr. Gotchy's estimates were reasonable and conservative based upon the data he used (Hamilton Testimony page 1, following Tr. 2266, and Tr. 2270), felt that calculating health effects based upon such extremely low-level exposure was not truly meaningful as repair mechanisms were not taken into account (Tr. 2271). Dr. Hamilton also decried extrapolations of health effects into the distant future as being misleading (Tr. 2275).

44. Rather, Dr. Hamilton expressed the view that the problem should be addressed in terms of increase in radon-222 that a person is going to get from the nuclear fuel cycle in terms of the fractional increase in natural background radiation from radon-222 to which every living person is exposed (Tr. 2275). Dr. Hamilton concluded that the average annual dose to the bronchial epithelium from radon-222 from natural sources is 165 millirad per year (Tr. 2276). He calculated that 1 year's operation of a 1,000 MWe nuclear power plant for 1 year at a capacity factor of 0.65 would increase natural background radon by about 1.5 parts in 10 million; the dose to the bronchial epithelium would be increased by less than one-thousandth of a millirem (2.5×10^{-7} rem) per year. Dr. Hamilton considered that increases in radon-222 of this magnitude "make an additional negligible contribution to annual natural background radiation and consequently, a similarly negligible impact on the health effects associated with the fuel cycle" (Hamilton Testimony pp. 2 and 3, following Tr. 2266).

45. In response to Board questioning, Dr. Hamilton testified that variations in normal living style, traveling about the country, and going indoors or outdoors results in doses that are many orders of magnitude greater than the increase in dose resulting from radon-222 emanating from tailings and

mining (Tr. 2322 and 2333). Dr. Hamilton concluded that these low levels of exposure are "completely insignificant and without any reality" (Tr. 2323).

46. Applicant's witness Goldman calculated the amount of radon that would seep from the ash pile of a coal-fired station that burns coal from various regions of the U.S. Since the amount of uranium in the coal varies from region to region as well as the heat content of the coal, his comparison was on the basis of Ci of radon per year per annual coal requirement (Goldman Testimony, Table 2, following Tr. 2266). He calculates that the amount of radon from a 20-foot-deep ash pit would vary from 2 to 15 Ci/yr/AFR. This is more than that expected from uranium mill tailings piles stabilized to NRC criteria. The radon also persists for very long times into the future.

47. Dr. Kepford accepted the Goldman estimates of 2 Ci/yr/AFR as a basis for his calculations of deaths from radon from a coal plant (Kepford Testimony p. 4 and Table 4). However he reduced the Gotchy risk estimate of deaths per curie of radon by combined factors of 0.05 and 0.17 because of the reduced number of people between a coal plant at the Perkins site and the seacoast and also because of reduced plume residence time.[8] These reduction factors were strongly questioned at the deposition (Tr. 2756-2782). Dr. Kepford is certainly correct that a triangle with its apex at Mocksville, North Carolina, will include many fewer people than a similar triangle with its apex in Utah. On the other hand he did not take into account such factors as the decay of radon in the plume as it moves across the U.S. and the increase in population density near the east coast. The problem is complicated, and it appears that Dr. Kepford's model was oversimplified.

48. It appears to us that if the open uranium mine pits are filled and the milling piles stabilized then the health effects from the radon from the uranium fuel cycle would not be much larger than the health effects from the radon from coal ash piles. In either case the effects are small; the 110 Ci year from stabilized piles caused by Perkins (110 AFR's) would produce only 0.002 deaths per year in the entire U.S. Dr. Kepford's coal figures are smaller but are suspect for the reason stated in paragraph 47. We don't think the difference is important.

49. The Board has weighed carefully the views of the Staff, Applicant, and Intervenors. They do not differ greatly on factual evidence, but they do differ on the proper treatment of projections of potential effects into a distant future. We believe that we have an obligation to assess the effects of today's actions on future generations. We certainly must consider any

[8]Radon from a coal-fired plant is released at the point of use of the coal and the location of ash piles; uranium is mined and milled in western United States.

known effects on our immediate successors as of importance comparable to effects on those now living. When it comes to balancing adverse impacts to those descendants who may follow a million years from now against the benefits to the present generation, we would weight benefits to the present population. The benefits are certain—the impacts hypothetical. The action presently proposed is not one that presents a serious risk to any future generation. Even if Dr. Kepford's projections were to come about, Perkins would result in, at most, 500 deaths per millennium at any time in the future. We believe those estimates are inflated. A possible half-a-death per year in a population of 300 million people is a minimal impact. Under the NRC stabilization procedures and reasonable regulations on open-pit reclamation, the impact will be 100 times less.

50. The impact on future generations of a coal-fired Perkins plant is also considerable. A 3-unit coal station would consume 400 million tons of coal in 40 years—coal that will be sorely needed in the future. A billion tons of CO_2 that it would put into the atmosphere could have a significant effect on future climate. We believe that future generations will be better off if Perkins is nuclear.

51. Based on the record available to this Board, we find that the best mechanism available to characterize the significance of the radon releases associated with the mining and milling of the nuclear fuel for the Perkins facility is to compare such releases with those associated with natural background. The increase in background associated with Perkins is so small compared with background and so small in comparison with the fluctuations in background, as to be completely undetectable. Under such a circumstance, the impact cannot be significant.

CONCLUSION

52. In response to the Commission's directives contained in the statement of consideration issued in connection with the amendment to Table S-3 of 10 CFR Part 51, published in the FEDERAL REGISTER on April 14, 1978 (43 Fed. Reg. 15613), this Board has carefully considered available information concerning the releases of radon-222 associated with the uranium fuel cycle and health effects that can reasonably be deemed associated therewith, and concludes that such releases and impacts are insignificant in striking the cost-benefit balance for the Perkins Nuclear Power Station.

IT IS SO ORDERED.

THE ATOMIC SAFETY AND
LICENSING BOARD

Dr. Walter H. Jordan, Member

Dr. Donald P. deSylva, Member

Frederic J. Coufal, Chairman

Dated at Bethesda, Maryland,
this 14th day of July 1978.

Cite as 8 NRC 102 (1978) LBP-78-26

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Sheldon J. Wolfe, Esq., Chairman
Dr. Paul W. Purdom
Frederick J. Shon

In the Matter of

Docket Nos. STN 50-556
STN 50-557

PUBLIC SERVICE COMPANY
OF OKLAHOMA
ASSOCIATED ELECTRIC
COOPERATIVE, INC.
WESTERN FARMERS ELECTRIC
COOPERATIVE, INC.

(Black Fox Station, Units 1 and 2)

July 24, 1978

Upon consideration of relevant environmental and site suitability issues, the Licensing Board authorizes the Director of Nuclear Reactor Regulation to issue a limited work authorization for the subject units, subject to certain conditions.

LIMITED WORK AUTHORIZATION: REQUIRED DETERMINATIONS

Applicants are not required to have every permit in hand before a Limited Work Authorization is authorized.

ATOMIC ENERGY ACT: APPENDIX I

Compliance with Appendix I is *not* tantamount to full consideration of the genetic and somatic effects of radioactive discharges from the plant. Despite such compliance, a licensing board may review such effects.

NEPA: RULE OF REASON

The National Environmental Policy Act requires that a Federal agency make a "good faith" effort to predict reasonably foreseeable environmental impacts (*Scientists' Institute For Public Information, Inc.* v. *AEC,* 481 F.2d 1079, 1092 (D.C. Cir. 1973)), and that the agency apply a "rule of

reason" after taking a "hard look" at potential environmental impacts (*Sierra Club* v. *Morton,* 458 F.2d 827, 834, 838 (D.C. Cir. 1972)). But an agency need not have complete information on all issues before proceeding (*Alaska* v. *Andrus,* 11 ERC 1321, 1327 (D.C. Cir. 1978)).

NEPA: CONSIDERATION OF ALTERNATIVES

Unless a proposed nuclear unit has environmental disadvantages when compared to alternatives, differences in financial cost are of little concern. *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-458, 7 NRC 155 (1978).

TECHNICAL ISSUES DISCUSSED: Site suitability; seismic design criteria; probability of postulated barge explosion in river; transportation of nuclear material; capacity factor and plant lifetime; construction effects; condenser cooling system effects; effects of spoils from dredging on river during flood conditions; air quality; radon-222; release of radioactive materials in effluents to unrestricted areas; population health surveys; radiological and bioaccumulation monitoring; occupational radiation exposures; need for power; alternatives; efficiency of utilization of uranium fuel; uranium availability and fuel costs.

PARTIAL INITIAL DECISION AUTHORIZING LIMITED WORK AUTHORIZATION*

Appearances

Michael I. Miller, Esq., and **Paul M. Murphy, Esq.,** of Isham, Lincoln & Beale, One First National Plaza, Suite 4200, Chicago, Illinois 60603 and **Charles Crane, Esq.,** Public Services Company of Oklahoma, for the Applicants, Public Service Company of Oklahoma, Associated Electric Cooperative, Inc., and Western Farmers Electric Cooperative, Inc.

Andrew T. Dalton, Jr., Esq., 1437 South Main Street, Tulsa, Oklahoma 74119 for the Intervenors, Ilene Younghein, Lawrence Burrell, and Citizens' Action for Safe Energy

L. Dow Davis, Esq., and **William Paton, Esq.,** Office of the Executive Legal Director, U. S. Nuclear Regulatory Commission, Washington, D.C. 20555

*Portions of this Initial Decision were the subject of an "Order Granting Applicants' Motion for Reconsideration and Clarification" of August 24, 1978, LBP-78-28, 8 NRC_____.

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I. PRELIMINARY STATEMENT OF UNCONTESTED FACTS

On January 23, 1976, the Nuclear Regulatory Commission (NRC) issued a Notice of Hearing on Application for Construction Permits which was published on that date in the FEDERAL REGISTER (41 Fed. Reg. 3515) concerning the application filed by Public Service Company of Oklahoma

(PSO), acting upon its own behalf and upon that of Associated Electric Cooperative, Inc. (Associated). The application, filed on December 11, 1975, applied for permits to construct two boiling water nuclear reactors designated as the Black Fox Station, Units 1 and 2 (Appls'. Ex.1). Each of these two General Electric reactors is designed for a rated core power of 3,579 megawatts thermal and a net electrical output of approximately 1,150 megawatts electrical (MWe). Dissipation of waste heat will be accomplished by six circular mechanical-draft cooling towers. The Verdigris River or Kerr-McClellan navigation channel will be the sole source of cooling water. The proposed facility will be located on a 2,206-acre site in Rogers County on the east bank of the Verdigris River, approximately 13 miles east of the Tulsa city limits.

Subsequently, the application was amended to include Western Farmers Electric Cooperative, Inc., (Western) as an additional co-owner of the proposed Black Fox Station. An "Amended Notice of Hearing" was published on October 26, 1976 (41 Fed. Reg. 46918). The amended notice referenced the original notice, announced the change in ownership,[1] and afforded any person whose interest might be affected by the addition of Western as co-owner the opportunity to participate in the proceeding. On January 6, 1977, Applicants applied for a Limited Work Authorization pursuant to 10 CFR §50.10(e)(1).

Ultimately three petitioners to intervene were admitted as parties herein.[2] They are Ilene Younghein, Citizens' Action for Safe Energy (CASE), and Lawrence Burrell. Said parties were represented by counsel and were consolidated for hearing purposes. In our Order of July 20, 1977 (6 NRC 167), we granted in part and denied in part Applicants' and Staff's motions for summary disposition of several contentions and set forth questions to be addressed by the parties in their evidentiary presentations. Evidentiary hearings were held on August 23, 1977,[3] through September 9, 1977, and October 17, 1977, through October 21, 1977. As hereinafter indicated, the hearing was reopened and evidence was presented on June 5 and 6, 1978, on radon releases and resulting health effects. The exhibits admitted into evidence are listed in Appendix A hereto.

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[1]Pursuant to an agreement dated May 14 and 15, 1976, PSO will own 60.87% of the facility and remain the principal owner with responsibility for licensing, constructing, and maintaining the facility. Associated will have a 21.74% interest, and Western will have a 17.39% interest in the facility.

[2]A petitioner for leave to intervene, Mr. Tom Beam, on behalf of the Green County (Tulsa) Chapter of the Isaak Walton League of America, withdrew from the proceeding. His contentions, however, remained as issues in controversy (Tr. 88, 89).

[3]Numerous individuals presented limited appearance statements on August 22-23, 1977, and the Board visited the site of the proposed facility on August 23, 1977.

Although the aforementioned notice of hearing set forth all the issues which must be considered and decided by this Board to determine whether construction permits should be issued to Applicants, this Partial Initial Decision addresses only the environmental issues specified by 10 CFR Part 51 and the site suitability issues specified by 10 CFR §50.10(e)(2), as well as those contested issues within the scope of those sections. A partial decision dealing with the remaining radiological health and safety issues, together with our ultimate decision on the issuance of the construction permits, will be issued after the conclusion of later public hearings on the remaining radiological health and safety aspects of the application. Further, in making the following findings and conclusions, we reviewed and considered the entire record in this case and all of the parties' proposed findings of fact and conclusions of law. Those proposed findings of fact and conclusions of law submitted by the parties which are not incorporated directly or inferentially in this Partial Initial Decision are rejected as being unsupported in law or fact or as being unnecessary to the rendering of this decision.

II. FINDINGS OF FACT—CONTESTED ISSUES

A. Site Suitability

1. Geology and Seismology

Contention 4:

Intervenors contend that the Applicants have not adequately demonstrated compliance with 10 CFR Part 50, Appendix A, Criterion 2, and Part 100, Appendix A, with respect to the Black Fox 1 and 2 site, in that the G-value selected for the safe shutdown earthquake is too low.

1. Prior to the hearing, on April 1, 1977, Applicants moved for summary disposition on this contention offering an affidavit and exhibits by Dr. M. John Robinson. Intervenors opposed, but did not submit affidavits. In its reply to the motion dated April 19, 1977, the Staff indicated that there was disagreement among its technical personnel as to the details of the seismic analysis for the site. One member of the NRC Staff, Dr. Leon Reiter, was of the opinion that an assumption of local intensity of MM VII-VIII should be used as a basis for determining the safe shutdown earthquake. Both the Staff and the Applicants have used a local intensity of MM VII as the appropriate basis for establishing the seismic design of the facility. Both the Staff and the Applicants have also concluded, based on their use of this local intensity, that Regulatory Guide 1.60 response spectra scaled

to a reference acceleration of 0.12g conservatively described the maximum ground motion which could reasonably be expected to occur at the site. Dr. Reiter felt that a reference acceleration of 0.18g was more appropriate.

2. It should be noted here that the contention did not cast doubt upon the suitability of the site within the meaning of 10 CFR §50.10(e). The site suitability report introduced by the Staff (Staff Ex. 2, fol. Tr. 917) concluded that the Black Fox site was a suitable location for two power reactors of the general size and type proposed. That conclusion itself was not at issue (Tr. 1411-12). The difference of opinion simply centered about the exact value of the reference acceleration to which such plants should be designed. We could, perhaps, have left these considerations for the later health and safety phase of the hearings, accepting the notion that either value was clearly within the capacity of the state of the art in reactor design, and that the decision for a limited work authorization need not consider this design detail. Since, however, the question seemed to turn upon matters which were related to the fundamental seismological nature of the site, we decided to hear evidence from all parties, in order to test whether the range of potential earthquake severity might be greater than the bounds set by the differing Staff opinions. Accordingly, in our July 20, 1977, "Order Ruling on Motions for Summary Disposition and Listing Board's Questions," 6 NRC 167 (1977), we denied Applicants' motion and stated our intent to hear evidence on this contention.

3. All parties presented witnesses. Applicants presented Mr. Paul Zaman (written testimony, pp. 1-6, fol. Tr. 1260) and Mr. Howard Waldron (Tr. 1264, *et seq.*). The Staff called Dr. Carl Stepp and Ms. Sandra L. Wastler (written testimony, pp. 1-8, fol. Tr. 1388), who supported the Staff's position as expressed in Staff Ex. 2. The Board called Dr. Leon Reiter who expressed a dissenting view (Tr. 1402, *et seq.*). Intervenors' witness was Mr. Jay Mason Gregg (written testimony, pp. 1-2, fol. Tr. 1304).

4. Criterion 2 of Appendix A to 10 CFR Part 50 requires that nuclear power plant structures, systems, and components important to safety be designed to withstand the effects of natural phenomena including, *inter alia,* earthquakes. To that end the geologic, seismic, and engineering characteristics of a site and its environs must be investigated in sufficient scope and detail to describe the maximum vibratory ground motion produced by the "safe shutdown earthquake" (SSE). This SSE is defined in paragraph III(c) of Appendix A to 10 CFR Part 100. (The SSE is also commonly called the "design basis earthquake.") The intensity of this earthquake, a term quantified by a number on the Modified Mercalli Scale, is a measure of the effects of the earthquake on the earth's surface and on structures erected thereon. It is derived through investigation of all capable faults and other tectonic structures within 200 miles of the proposed plant

site, or from a knowledge of the tectonic province in which the site is located.[4]

5. Applicants' witness, Mr. Zaman, stated that no capable faults have been identified within 200 miles of the site. He also stated that faults within 200 miles of the site can be associated with geologic structure features which are very old and that there is no conflicting evidence respecting capability (Zaman, p. 3). Since no capable faults exist in the vicinity of the site, no local structures are relevant to the determination of the safe shutdown earthquake (Zaman, pp. 5, 6). Mr. Zaman indicated that the maximum earthquake associated with structure is on the Nemaha Uplift and is estimated to have potential intensity of VII to VIII. An acceleration at the Black Fox site from an earthquake of this intensity situated at the point on the structure closest to the site is .06g (Zaman, p. 4). This witness further testified that the site is located in the Ozark Uplift Tectonic Province. The largest historically reported earthquake in the Ozark Uplift Province, the epicenter of which cannot be reasonably related to tectonic structure, is the intensity VI Eastern Missouri earthquake of October 20, 1965. This earthquake intensity, when assumed to occur at the Black Fox site, would produce a reference acceleration of 0.06g (Zaman, p. 4). In this witness's opinion, the appropriate acceleration value for the SSE should be determined by the technique of 10 CFR Part 100, Appendix A, Section V(a)(1)(iii), *viz.*, by assuming that the largest historically reported earthquake (not associated with structure) in an adjoining province could occur at the point on the province boundary closest to the site. This was the intensity VII earthquake of October 30, 1956, near Catosa, Oklahoma, in the Cherokee Basin Province. This earthquake would produce an acceleration at the site of 0.12g (Zaman, pp. 4, 5).

6. Intervenors' witness Mr. Gregg testified that certain geologic features on the Black Fox site were in fact faults which had not been recognized by either Applicants or Staff (Gregg, pp. 1-2). Actually, both Applicants and Staff were aware of these features (Zaman, p. 5; Wastler, Tr. at 1391). They had, after reviewing results of the extensive onsite investigations, concluded that these faults were not capable faults (Zaman, pp. 5, 6; Wastler/Stepp, Tr. at pp. 1391-1393). Mr. Gregg, on the other hand, admitted that he has no opinion as to whether these faults were capable faults within the meaning of 10 CFR Part 100, Appendix A, and that he was not qualified to form such opinions (Tr. 1350-1351). The Board is convinced that the faults which

[4]Definitions of the terms "tectonic structure," "fault," and "capable fault" are set forth in 10 CFR Part 100, Appendix A, Section III. Investigations required at the site are set forth in that same appendix at Section IV. Assumptions for evaluating intensities and maximum ground accelerations are set forth in Section V of that appendix.

Mr. Gregg mentioned are not capable faults and do not need to be considered in evaluating the SSE.

7. We turn now to the matter which persuaded us to hear evidence on this contention rather than granting summary disposition: *viz.* the disagreement as to the appropriate acceleration value to use as a design basis for the plant.

8. Dr. Reiter explained the factors which led him to disagree with the position officially adopted by the Staff (Tr. 1404, *et seq.*). These factors are:

a. The historic record in the area is only 100 years long. In other areas with longer records, the last 100 years have not always included the most severe earthquake.

b. The intensity VII-VIII earthquake which occurred at Anna, Ohio, in 1937 cannot be definitely associated with tectonic structure, and it occurred within the same tectonic province, the Central Stable Region. (Thus, according to 10 CFR Part 100, Appendix A, Section V(a)(1)(ii), it should be assumed to occur at the site.)

c. The correlation of earthquakes with structure in Oklahoma is a matter about which there is some disagreement among experts.

d. The historical record does not suggest that the area around the Black Fox site is less active seismically than other similar sized areas within the tectonic province comprised by the Central Stable Region.

9. The Staff's witness, Dr. Stepp, discussed these matters. With respect to the first of Dr. Reiter's four factors, Dr. Stepp stated that although records in the immediate vicinity were only 100 years old, within the Central Stable Region in general, records of earthquake activity date back well over 200 years and are sufficiently long to establish the spatial pattern of earthquake occurrence with a high degree of confidence (Tr. 1396).

10. With respect to Dr. Reiter's second factor, Dr. Stepp pointed out that the Central Stable Region was a very large region, that there is a significant amount of data that supports the idea that earthquake activity within the Central Stable Region is not uniform, and therefore, the Staff does not consider that region to be a single tectonic province for the purpose of selecting a SSE (Tr. 1398). Indeed, the Staff felt the Anna, Ohio, earthquake of 1937 was associated with a historically noted "cluster" of earthquakes, near Anna (Stepp/Wastler, p. 5), and was not the controlling event for the Black Fox site. Dr. Reiter's third concern, that there is a lack of agreement among experts as to the correlation of earthquakes with structure within Oklahoma, does not seem to the Board to be a major safety problem. First, despite the alleged lack of agreement among experts on correlation of earthquakes with structure, Dr. Reiter himself is one person who has made such a correlation (Tr. 1404). In the Staff's view, the major historical earthquakes within the region have been associated with the Nemaha Uplift

Structure (Stepp, Tr. at 1398, 1396; Stepp/Wastler testimony at p. 5). There is no reason to believe that similar structures exist nearer than the Nemaha Uplift, and the Staff and Applicants correctly assumed correlation with that structure.

11. With respect to Dr. Reiter's fourth concern, that the historic record of earthquake occurrence in the region of Black Fox does not indicate that it is an area of low seismicity, Dr. Stepp noted his own high degree of confidence that the spatial pattern of earthquake occurrence in the area is known (Tr. 1396-7), and he stated that worldwide experience shows earthquake spatial patterns are well established by a few tens of years of historic record. He testified that the Staff thought the low rate of seismicity within 50 miles of the site assured a low earthquake potential there (Tr. 1395-1400).

12. The difference of opinion between Dr. Reiter and Dr. Stepp is a difference in interpretation, by qualified experts, of data known to both of them. Dr. Reiter did not have access to any information that was not also available to his colleagues on the Staff (Tr. 1413). Dr. Reiter himself concedes that the Staff position is "very, very safe" and that the public would not be exposed to any undue risk if the acceleration value 0.12g is used for the plant's design (Tr. 1425).

13. The Board concludes that a SSE characterized by an acceleration of 0.12g is appropriate for the Black Fox site. We also conclude that there is no evidence to suggest that any faults in the area are capable faults, and we agree with the Staff that, as far as seismicity is concerned, the site is a suitable one for location of reactors of this general size and type.

2. Compliance With 10 CFR §100.11

14. Intervenors had contended (Contention 17) that the site selected for Black Fox Station would not comply with the requirements of 10 CFR §100.11. Both Applicants and Staff moved for summary disposition on this contention, supporting the motions with affidavits. After reviewing the affidavits we concluded that the requirements of 10 CFR §100.11(a) had been met, and since the contention clearly addressed itself only to that subsection, we granted summary disposition. In the course of doing so, however, we asked that evidence be presented regarding the following questions (6 NRC 167, 171 (1977)):

a. What consideration has been given to the requirements in Section 100.11(b)?

b. If the SER reflects that the radiological consequences of a postulated hypothetical fission product release from the site will be less

than the dosage guideline limits given in 10 CFR Section 100.11, how was this dosage evaluation determined?

15. Dr. M. John Robinson testified on behalf of Applicants (written testimony, pp. 1-17, fol. Tr. 588); Mr. Falk Kantor submitted an affidavit on behalf of the Staff (Kantor affidavit, fol. Tr. 1022). Dr. Robinson testified that all safety-related systems for the two Black Fox units are designed with sufficient independence, redundancy, and physical separation such that a postulated accident in one reactor would not cause an accident in the other reactor, nor would it impair the ability to shut down the second reactor (Robinson, p. 5). The only shared system necessary for safe shutdown of the reactors is the ultimate heat sink (Kantor affidavit, p. 1; Robinson, p. 5). The ultimate heat sink is designed to provide adequate cooling water for a design basis accident in one unit and for the simultaneous shutdown of the other (Robinson, p. 5; Kantor affidavit, p. 1). Therefore, the size of the exclusion area, low population zone, and population center distance are based on the fission product release resulting from a design basis loss of coolant accident in either reactor individually as permitted by 10 CFR §100.11(b)(1) (Kantor affidavit, p. 1; Robinson, p. 5). The Board finds that Black Fox Station, Units 1 and 2, meet the requirements of 10 CFR §100.11(b).

16. Applicants' evaluation of the design basis accident and the resultant doses is presented in the PSAR, Chapter 15 (Appls'. Ex. 2). This dose was calculated according to Regulatory Guide 1.3 (Robinson, p. 5).

17. Mr. Kantor testified that the NRC Staff's evaluation of a hypothetical fission product release was based on a hypothetical loss of coolant accident that would result in potential hazards not exceeded by any accident considered credible (Kantor affidavit, p. 2). A detailed list of the assumptions used by the NRC Staff in their dose calculations was presented (Tables 1 and 2 attached to Kantor affidavit). The NRC Staff calculated a maximum 2-hour dose of 115 rem to the thyroid and a 7.8 rem whole body at the exclusion area boundary and a maximum 30-day dose of 146 rem to the thyroid and 7.3 rem whole body at the boundary of the low population zone (Kantor affidavit, p. 2). The Board finds that suitably conservative assumptions were used in the dose calculation and that the calculated doses are well within the requirements of 10 CFR §100.11(a).

3. Exploding Barge

Contention 14:

Intervenors contend that the Applicants have not adequately analyzed potential consequences on the Black Fox 1 and 2 facility resulting from a

possible explosion of a barge carrying potentially explosive fertilizers on the Verdigris River.

18. Applicants' witness was Dr. M. John Robinson (written testimony, pp. 1-17, fol. Tr. 588). The Staff presented Mr. Falk Kantor (written testimony, pp. 1-2, fol. Tr. 1022).

19. There is no merit to this contention. The United States Coast Guard, which is responsible for classifying and regulating the shipment of hazardous materials on inland waterways, does not consider any commercial fertilizer to be an explosive hazard. While in the past, ammonium nitrate explosive accidents have occurred, the product involved differed from the ammonium nitrate fertilizer now in use, and the basic safety practices, which are now standard, had been violated. Accordingly, the probability of an explosion on the Verdigris River of a bargeload of commercial fertilizers, including ammonium nitrate fertilizers, is extremely remote[5] (Kantor, p. 2). Further, even assuming that an explosion of a bargeload of commercial fertilizer occurred adjacent to the site of the facility, only nonsafety-related structures (*i.e.*, non-Category I structures) such as the water intake structure, the turbine building, and the cooling towers might be damaged. Such a postulated explosion of that magnitude would not adversely affect the ability to safely shutdown Units 1 and 2 because (a) the plant facilities necessary for safe shutdown have been designed for the peak overpressure caused by the design basis tornado, which would be greater than that caused by a fertilizer barge explosion, and (b) operating personnel in the control room, which is a Category I structure, would not be incapacitated (Robinson, pp. 3-4; Tr. 616-622, 698-99; Kantor, Tr. 1057-1060). Parenthetically, we note and disregard certain of the Intervenors' proposed findings which stray beyond the issue in controversy—for example, they assert that no analysis was made concerning coincident events such as an explosion and a tornado.

4. Transportation of Nuclear Material

Contention 29(a):

Intervenors contend that the Applicants and the Regulatory Staff did not adequately analyze the proposed sites for Black Fox 1 and 2 because the feasibility of receiving and shipping radioactive material was not adequately considered.

[5]Applicants' witness Dr. Robinson estimated an overall probability of a fertilizer barge explosion on the river-mile adjacent to the Black Fox Station site of 8.8×10^{-8} incidents per year (p. 3).

20. Applicants' witness was Dr. M. John Robinson (written testimony, pp. 1-3, fol. Tr. 595).

21. The record evidences and we find that adequate consideration has been given to the feasibility of receiving and shipping radioactive material[6] in the site selection process wherein approximately 50 site areas were considered initially. Applicants' Environmental Report, Chapter 9, after observing that transportation facilities must be evaluated in order to assess the suitability of particular sites, concluded that the feasibility of transporting new and spent fuel would not vary significantly from site to site in that the Oklahoma State highway system is adequate for meeting such transportation requirements (Appls'. Ex. 3, pp. 9.2-37, 9.2-29). Moreover, the BFS site is near two other major transportation systems—the Missouri-Pacific railroad and the Kerr-McClellan navigation channel (Robinson, p. 2). Further, the environmental impacts associated with the shipment of radioactive materials are set forth in Table S-4, 10 CFR Part 51. These impacts are not such as to make unfeasible the receipt and shipping of radioactive materials. Finally, the economic costs of transporting radioactive materials obviously may vary, depending on whether trucks, railcars, or barges are selected (Robinson, p. 2).

22. The Intervenors neither presented direct evidence nor cross-examined Applicants' witness upon the instant contention, and thus failed to meet their burden of going forward with some affirmative showing with respect thereto. Moreover, contrary to 10 CFR §2.754(c), their proposed findings consist of arguments rather than setting forth material facts cited to the record. Accordingly, we give no weight to this argumentation.

B. Capacity Factor and Plant Lifetime

Contention 46:

Intervenors contend that the Regulatory Staff and Applicants' cost-benefit analysis have overstated the amount of electricity which Black

[6]New and spent fuel shipments to or from BFS, by weight and bulk, will be the largest shipments of radioactive material (Robinson, p. 2). The balance of the radioactive materials, such as solidified radioactive waste materials, will also be shipped offsite. It both can and will be presumed that there will be spent fuel repositories available when needed (*Northern States Power Company* (Prairie Island Nuclear Generating Plant, Units 1 and 2), *Vermont Yankee Nuclear Power Corporation* (Vermont Yankee Nuclear Power Station), ALAB-455, 7 NRC 41, 51 (1978)); clearly the Congress, to date, shares the NRC's confidence that the wastes can and will in due course be disposed of safely (*Natural Resources Defense Council, Inc.* v. *NRC*, No. 77-4157, slip op. at 21, n. 13 (2d. Cir. July 5, 1978)), and such shipments of radioactive material must be performed in accordance with Department of Transporation regulations (Robinson, p. 1).

Fox 1 and 2 will generate by utilizing an incorrect capacity factor and overestimating the plant life.

23. Applicants presented testimony by Dr. John Zink (written testimony, pp. 1-6, fol. Tr. 3216) and by Mr. Frank Meyer and Dr. M. John Robinson (written testimony, pp. 1-34, fol. Tr. 3413). The Staff presented Dr. Robert Easterling (written testimony, pp. 1-4, fol. Tr. 3367). Intervenors presented Dr. Charles Komanoff (supplementary testimony, pp. 1-19, fol. Tr. 2561) and Mr. Mike Males (written testimony on Contention 46, pp. 1-12, fol. Tr. 2848).

24. The capacity factor of a power plant is the fraction of the amount of electricity it is designed to produce which it actually does produce. Slight differences in definition exist—for example, the denominator in the fraction so expressed can be the "design electrical rating" (DER) or the "maximum dependable rating" (MDR). Intervenors favor the former definition (Intervenors' Proposed Findings at p. 93; Komanoff supplementary testimony). Applicants favor the latter (Zink testimony). In the case of BFS, the definitions are identical since MDR and DER are equivalent (Easterling, Tr. 3394, 3405).

25. Although Applicants had used a value of 80% for capacity factor in the ER (Appls'. Ex. 3, Table 8.1-9), witnesses, Mr. Meyer and Dr. Robinson, reestimated this parameter for purposes of preparing testimony on this contention and used a value of 67% (p. 14). This figure was derived by estimating forced and planned outages through the plants' projected history (pp. 14-15). The value was reviewed by Applicants' witness, Dr. Zink (pp. 1-4), who compared the value with those for various nuclear plants from 1975 to 1977 (p. 3 and Ex. JCZ-4). He concluded that 67% was a reasonable figure.

26. Staff witness Dr. Easterling estimated the expected capacity factor by averaging those for selected existing plants over certain years, using BWR's of 500 megawatts or larger and averaging from year of startup to 1976 (p. 1). He found no statistically significant variation with age of plant or industry. He obtained a value of 58% ± 21% (p. 2).

27. Intervenor's witness had analyzed the performance of nuclear power plants with respect to capacity factor and had concluded that this factor decreases as plant size rises (Komanoff supplementary testimony at p. 6). He claimed to have established a relationship between capacity factor and size for nuclear power plants, a relationship which showed that capacity factor decreased as size increased. He presented two different equations, one derived with the Brown's Ferry plants' experience included in the data, and one with Brown's Ferry excluded (Komanoff supplementary testimony at p. 6).

28. However as measured by "adjusted R^2" his equations leave from 80.5% to 96.5% of the capacity factor variation unexplained, the former figure being the unexplained variation in the equation that includes Brown's Ferry data, the latter the figure with that data excluded (Komanoff supplemental testimony at p. 8). The two mathematical expressions, when used to extrapolate to plants the size of BFS, give capacity factors of 38% (Brown's Ferry included) and 50% (Brown's Ferry excluded). In Dr. Komanoff's own opinion, 55% is "a good estimate," although he does not say exactly why (Komanoff supplementary testimony at pp. 3, 10), attributing this estimate to "judgment."

29. The Board notes that, in the FES, the Staff calculated power costs for a range of capacity factors (Staff Ex. 1, Table 9.1 at p. 9-4). We note further that the values obtained, using 3% escalation and 9% interest rate, were:

Capacity Factor	Mills/kWh
50%	46.43
60%	40.16
70%	35.72

This range brackets the values suggested by Applicants (67%), Staff (58%), and Intervenors (55%). Further we note that a rough interpolation suggests that use of any of these figures would result in a power cost of 40 $\pm$ 3 mills/kWh. The Board does not view an uncertainty of $\pm$ 3 mills/kWh in this range as an important weight in the cost-benefit balance. We find that any possible error in estimating capacity factor is unlikely to tip that balance against construction.

30. Applicants' witnesses note that a lifetime of 30 years is "customarily utilized" as an operating life for a nuclear plant. They also note that technical obsolescence rather than physical breakdown is expected to be limiting (Meyer/Robinson, p. 16). Staff calculations in the FES are based on a 30-year lifetime, a figure which the Staff justifies by noting the standards to which a nuclear plant is built, by noting that much of the plant's equipment is similar to that of a coal-fired plant, and by noting that coal-fired plants can be expected to last 30 years (Staff Ex. 1, p. 11-27).

31. Intervenors' witness, Mr. Males, stated that coal-fired plants may last 40 years but "whether this lifetime can be casually applied to nuclear units is unclear." However, he gave no actual estimate (Males testimony on Contention 46, p. 10).

32. Considering the testimony in sum, the Board finds no reason to assume that a 30-year lifetime will be substantially in error.

C. Construction Effects

Contention 34:

Intervenors contend that the Applicants and Regulatory Staff have not adequately analyzed the environmental impacts at Black Fox 1 and 2 of the following construction activities:

(a) the clearing, excavation, dredging, and dewatering will result in long-term ecological damage;

(b) the acreage from which vegetation will be removed is underestimated; and

(c) the acreage disturbed is underestimated because it does not include land necessary for the wastewater canal, railroad spur, and access roads.

33. Applicants' witnesses were John G. Aronson (written testimony, pp. 1-14, supplementary testimony, pp. 1-3, and affidavit of January 25, 1977, pp. 1-3, fol. Tr. 1600) and David F. Guyot (written testimony, pp. 1-31, fol. Tr. 1498, and written testimony, pp. 1-7, fol. Tr. 1916), who testified regarding ecological damage and the acreage disturbed from construction activities. Vaughan L. Conrad testified for the Applicants on site restoration (written testimony, pp. 1-2, fol. Tr. 1907). Intervenors did not present any witnesses on this contention. Charles R. LaFrance (written testimony, pp. 1-9, fol. Tr. 1707) was a Staff witness.

34. Intervenors contend that habitats and vegetation will be affected by construction and will not recover for a long time. They further contend that a more adequate analysis is required in order to avoid or mitigate impacts. Intervenors failed to cite any portion of the record to support their arguments.

35. Applicants' witness (Aronson, p. 14) testified that there would be no long-term impacts from dewatering and dredging. This was supported by Staff's witness (LaFrance, p. 6).

36. Applicants and Staff agreed that there would be some unavoidable long-term disturbance of soil and vegetation by excavation and construction activities at the site, from clearing of transmission line rights-of-way, from building railroad spurs and access roads, and by creation of a spoils area to receive dredged material. Onsite construction will affect 704.7 acres of which 674 are now in vegetation (Guyot, Tr. 1495, 1498). Most of this area (516.3 acres) will be revegetated. Offsite, 78 acres will be disturbed and 65.5 acres revegetated (Guyot, p. 25). These estimates are greater than those stated in the ER and FES. Staff does not believe the increase affects the cost-benefit balance to a major extent (LaFrance, Tr. 1711-12). The Staff

had proposed that a qualified biologist inspect four sections of transmission rights-of-way (FES, p. 4-7), but has now withdrawn this requirement because two sections will be built irrespective of Black Fox and there is no evidence the other two sections in question have unique habitats requiring such inspection (LaFrance, Tr. 1712-14).

37. The Board concludes that the long-term ecological effects have been adequately considered. The Applicants' mitigating measures are satisfactory. The Board also notes the revised estimates of areas disturbed and finds these acceptable in the cost-benefit analysis.

D. Water Use and Quality

1. Availability

Contention 39:

Intervenors contend that the Applicants and the Regulatory Staff have not adequately demonstrated that there will be a sufficient supply of water for operation of Black Fox 1 and 2.

Contention 40:

Intervenors contend that the Applicants and the Regulatory Staff have not adequately assessed the cost to other water users of the consumptive use of water at Black Fox 1 and 2.

38. Applicants' witnesses were Jack O. Cornett (written testimony, pp. 1-9, fol. Tr. 3509) and J. E. Daley (written testimony, pp. 1-5, fol. Tr. 3776). Mr. James Dwen, Assistant District Counsel for Tulsa District, Corps of Engineers, was also called as a witness by the Applicants (Tr. 3723-3738). Staff witness was Nicholas J. Beskid (written testimony, pp. 1-3, fol. Tr. 2122). Intervenors did not present witnesses on these contentions.

39. Intervenors question the adequacy of the water supply for Black Fox, the accessibility of Applicants to a water supply, and the impacts connected with supplying water to the Applicants. Intervenors contend the Applicants do not have access to water because their source, Tulsa, Oklahoma, has no present right to water storage in Oologah Reservoir, and the Applicants have no assured right to an allocation of water by Oklahoma Water Resources Board (OWRB). They state that the alternative of using sewage effluent is insufficient to supply Black Fox and that the Applicants do not have an allocation to withdraw such water from the Verdigris River. In-

tervenors are also concerned about Tulsa terminating or interrupting its contract with PSO at will and the fact that the contract does not include Associated or Western Farmers. Intervenors claim that Tulsa must obtain voter approval before obtaining water storage from the Corps of Engineers. Intervenors further contend that no other water supply is available because no contract exists with the Grand River Dam Authority, and because water rights of Applicants in other reservoirs are for future planning or do not include the other participants in Black Fox. Intervenors also claim that the consumptive use of water and its affect on other users has not been adequately considered.

40. The Black Fox Station will take water from the Verdigris River at a maximum rate of about 40 Mgal/d, or 62 ft^3/s (FES 3-8), and will discharge about 4 Mgal/d (6 ft^3/s). Water is used for cooling and other purposes. Cooling is a consumptive use of water. Applicants do not have a direct allocation of water rights from OWRB, but plan to meet water supply needs by purchasing water from the city of Tulsa, Oklahoma (Daley, p. 2). The city of Tulsa has an allocation of 141 Mgal/d to be released from storage in Oologah Reservoir (Dwen, Tr. 3726). Storage required to yield this amount of release of water is 313,500 acre-ft (Dwen, Tr. 3726). Tulsa had a contract with the Corps of Engineers for 38,000 acre-ft of storage and is in the process of negotiating a new contract for the higher figure (Dwen, Tr. 3727).

41. The city of Tulsa has signed a contract with PSO to sell a maximum of 20,000 acre-ft per year (about 18 Mgal/d) for use at the Northeastern Power Station (coal-fired) and a maximum of 50,000 acre-ft per year (about 44 Mgal/d) for use at Black Fox (Daley, p. 3 and Ex. JED-2, pp. 3 and 4). The water for Black Fox may be supplied from raw water stored in Oologah Reservoir or from sewage treatment plant effluents discharged by Tulsa into Bird Creek (Daley, pp. 3-4, Tr. 3782).

42. If Tulsa elects to supply sewage effluents, it was estimated that this would amount to about 35 Mgal/d, which is less than total needs of Black Fox—about 5/6 of total needs (Cornett, Tr. 3636). The degree of treatment provided for the sewage will be determined by EPA and OWRB, but this treatment requirement is not influenced by its use by Black Fox (Cornett, Tr. 3563, 3632-4). However, should its use be considered for recycling as drinking water, much more extensive treatment using advanced waste treatment methods would be necessary (Cornett, Tr. 3643-4).

43. The Board is aware that the U. S. District Court in Tulsa has ruled that there is no contract in effect between the city of Tulsa and the Corps of Engineers for water storage in Oologah Reservoir. However, Mr. Dwen (Tr. 3726, 3728-29) stated that the Corps fully intends to consummate a contract with Tulsa.

44. The Intervenors in their proposed findings allege that Tulsa will be

without water by 1983 (p. 69) or 1985 (p. 70) and cite the Holloway Report for corroboration (Intervenors' Ex. 6). This is not an exact representation of that report. The report does project a demand exceeding yield by 1983 to 1985 (p. 11), but it proposes improvements in the present system and the development of additional supplies to meet the anticipated demands (pp. 15-43). None of the increase in water supply proposed for Tulsa by Holloway includes the use of Oologah Reservoir water. In fact, the Holloway Report recommends that Oologah Reservoir water be used only for industrial purposes because of taste and odor problems (p. 12-14). We note also that Tulsa had this report in hand at the time it executed the contract to supply water to PSO (date of Holloway Report, April 1976; date of Tulsa-PSO contract, October 1977).

45. The Board finds that the contract between the city of Tulsa and PSO provides reasonable assurance of adequate water supply for BFS. The Board sees no evidence to indicate that the interruptability clause is a serious impediment. Tulsa does not need the water being sold, the water being sold is of questionable quality for a public water supply, the city of Tulsa is proceeding in good faith, and most of the needs of Black Fox may be met by using sewage effluents. While the Corps must proceed in accordance with applicable laws and court rulings, the Corps' counsel indicated that the Corps had every intention to proceed to consummate a contract with Tulsa. The Board notes that the Corps has reported to the district court that it has determined that an EIS is not required. We, of course, do not know what the court's attitude will be toward this report, but there appears to be no obstacle to the Corps' ultimately executing a contract with Tulsa.

46. The Applicants plan to take delivery of water purchased from Tulsa by means of natural water courses—Bird Creek and/or Verdigris River—to Black Fox Station where it will be withdrawn for use in the plant. The Intervenors argue that the Applicants cannot under Oklahoma law withdraw water at that point without a permit from OWRB. The Applicants cite another provision of the Oklahoma law (Applicants' Brief, December 23, 1977, pp. 11-12) that states a party is entitled to reclaim water turned into a water course. Nevertheless, Applicants have filed an application for a permit to withdraw with OWRB, which is pending. There was no evidence that such a permit would not be granted, and the Intervenors did not cite any. The Board finds that Tulsa has water rights which have been conveyed to PSO. Since PSO is the lead company, it makes no difference that the conveyance did not include all Applicants. Further, while details of the means of delivery of water have to be worked out, there is ample time to do this before water is needed for operation of Black Fox. The Applicants are not required to have every permit in hand before an LWA is authorized. See

Cleveland Electric Illuminating Company, et al. (Perry Nuclear Power Plant, Units 1 and 2), ALAB-443, 6 NRC 741, 748 (1977).

47. Intervenors question the consumptive use of water for Black Fox in view of the water supply needs of other communities, particularly Broken Arrow, and possibly other more beneficial uses. The Board has already noted above that the best use for Oologah water is for industrial purposes, such as that planned at Black Fox. Broken Arrow has an allocation now of 15 Mgal/d and uses about 4-5 Mgal/d. By year 2000, the allocation will not be sufficient to meet its demands (Cornett, Tr. 3518-19). Mr. Cornett, whose firm has consulted with Broken Arrow on its water supply problems, testified (Tr. 3527) that his firm was studying a number of future possibilities to meet this demand, although an alternate source was not in hand at present. Oologah Reservoir water, as mentioned above, is not a good source for public water supplies because of taste and odor problems.

2. Status of 401 Certification and Compliance With FWPCA Amendments

Contention 38:

Intervenors contend that the Applicants have not demonstrated that Black Fox 1 and 2 will comply with all applicable Federal, State, and local water quality requirements.

Contention 42:

Intervenors contend that the Applicants and Regulatory Staff have not adequately assessed the effects of the blowdown discharged into the Verdigris River by Black Fox 1 and 2 because the low flow value of 379 ft^3/s upon which these effects have been based cannot be justified by either historical values or the Corps of Engineers' projections.

48. Applicants presented Allan F. McGilbra (written testimony, pp. 1-6, fol. Tr. 1790) and in rebuttal, Vaughn L. Conrad (Tr. 2299-2307). Intervenors presented Umesh Mathur (written testimony, pp. 1-19, fol. Tr. 1933). Staff's witnesses were Dr. Fred Vaslow (written testimony, pp. 1-2, fol. Tr. 2199) and Nicholas Beskid, (written testimony, pp. 1-3, Tr. 2122). The Staff also called as rebuttal witnesses Dr. Vaslow, Mr. William Vinikour, and Mr. Beskid (written testimony, pp. 1-4, fol. Tr. 2128). G. A. Shirazi and Jim Long of the Oklahoma Water Resources Board were called as Board witnesses (Tr. 2034-78).

49. Intervenors in addressing these contentions also included Contention 32, which had been dismissed by the Board on summary disposition (6 NRC

167). Intervenors also discussed programs for radiological monitoring of water, which the Board considers with respect to Contention 37, *infra.*

50. Intervenors contend that the 2-year, 7-day low flow (on which Oklahoma bases calculated discharges to maintain in-stream water quality standards) should be 70 ft^3/s. They also contend that cooling tower blowdown discharges from Black Fox Station will cause water quality standards to be violated for sulfates, total dissolved solids (TDS), and toxic metals. Intervenors are also concerned about chlorine residuals and antiscalant compounds. Intervenors further allege that 401 certification has been denied the applicants by OWRB and that the proposed treatment of sanitary wastes from the plant will not meet standards.

51. The Board will first consider the matter of the "401 certification." Section 401(a)(1) of the FWPCA (33 U.S.C. §1341) provides, *inter alia,* that:

> Any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable waters at the point where the discharges originate or will originate, that any such discharge will comply with the applicable provisions of Sections 301, 302, 306, and 307 of this Act.

A licensing board must determine compliance with this provision before issuance of an LWA or CP. *Washington Public Power Supply System* (Hanford No. 2), ALAB-113, 6 AEC 251 (1973). Nevertheless, the FWPCA further provides:

> If the State, interstate agency, or administrator, as the case may be, fails or refuses to act on a request for certification, within a reasonable period of time (which shall not exceed 1 year) after receipt of such a request, the certification requirements of this subsection shall be waived with respect to such Federal application. 33 U.S.C. §1341(a)(1).

52. PSO applied to the Oklahoma Water Resources Board (OWRB) for certification under Section 401 in a letter dated October 21, 1975 (Conrad, Tr. 2306, and Shirazi, Tr. 2087). The ER was made available to State agencies sometime in February 1976 and the DES in July or August 1976 (Conrad, Tr. 2312). Two meetings were held between PSO and OWRB on October 7, 1975, and August 31, 1976. The FES was obtained by OWRB at the hearing on August 22, 1977 (Shirazi, Tr. 2038). As of September 7, 1977, OWRB had not issued a certification or requested more information

of PSO (Conrad, Tr. 2306). Both Applicants and Staff urge the Board to find that this inaction constitutes a waiver.

53. OWRB contends that it is acting on the matter by reviewing the request while awaiting all documents, including the FES (Shirazi, Tr. 2089). OWRB intends to issue a 401 certification if, and only if, all legal requirements are satisfied (Shirazi, Tr. 2090).

54. The Board notes that the Intervenors aver (in Proposed Findings, January 3, 1978, p. 64) that the State has denied certification and cite letters from OWRB. The Board has reviewed these letters, one from OWRB to the parties dated November 10, 1977, and one to the Board dated November 29, 1977, and the Board finds that these letters are not accurately characterized by the Intervenors. The OWRB did not deny certification in these letters. OWRB does reassert its belief that a waiver does not exist and states that its delay was required to complete low flow calculations.[7] However, OWRB states in its November 10 letter that " . . . if the company complies with the storage and release requirements as stipulated in Part III J of the proposed NPDES permit, Oklahoma standards will not be violated, and conditional certification would appear appropriate."

55. With respect to the proposed action to authorize an LWA and CP, this Board finds that OWRB failed to act on the request by PSO for 401 certification in a timely fashion because in the 1-year period stipulated in the FWPCA, OWRB did not issue a certification, deny a certification, or notify PSO that additional information from or action by PSO was required before action could be taken. While the Board finds the 401 certification requirement to be waived, the Applicants are not relieved of their responsibility to comply with all applicable State and Federal water quality standards. The waiver provision merely allows us, acting as a Board, to authorize the issuance of an LWA without the 401 certification in hand. We do, in fact, expect that the Applicants will take any steps necessary to comply with all applicable legal standards. The Applicants have indicated an intention to do so, but this Board is precluded from prescribing the precise means whereby compliance with other laws shall be obtained.

56. The Board has considered the matter of wastewater disposal, its impact, and the costs of alleviating any problems, if necessary. Key to such an analysis is the question of low flow in the Verdigris River at Black Fox Station.

57. OWRB uses the stream concentration of pollutants as a measure of water quality and bases its decisions for issuing waste discharge permits on meeting State standards for the values after mixing (Shirzai, Tr. 2048). Thus

[7]Applicants' witness stated that even as late as August 15, 1977, OWRB had not established procedures for processing 401 certifications (Conrad, Tr. 2305-06).

in computing effects of discharges and estimating the in-stream water quality after mixing, the anticipated low flow must be established. OWRB uses the anticipated 7-day, 2-year low flow for design purposes with respect to calculating the in-stream values (Shirazi, Tr. 2054).

58. The flow of water in the Verdigris River since the completion of the Oologah Reservoir in 1970 has been partly natural flow and partly controlled releases from the reservoir. OWRB, using historical data from 1969 to 1975, concludes 143 ft^3/s is the 7-day, 2-year low flow (Shirazi, Tr. p. 2053). The FES used a figure of 379 ft^3/s, which is a 30-day minimum flow for a 50-year drought (McGilbra, p. 5; Shirazi, Tr. 2053). This value was based on full use of the navigation system and cannot be guaranteed. Revised figures based on USGS work show 70 ft^3/s for the 7-day, 2-year low flow (McGilbra, p. 5). Seven years of records at the Newt-Graham Lock and Dam provide an observed minimum flow of 40 ft^3/s (Beskid, pp. 1-3). Staff estimates flow would have to be maintained at a minimum of 36 ft^3/s to serve downstream users (Beskid, Tr. 2148) and that about 140 ft^3/s is the value for 7-day, 2-year low flow. Intervenors used the USGS figures of 70 ft^3/s as anticipated low flow (Mathur, p. 1).[8]

59. There are two issues involved in the low flow. One is anticipated compliance with OWRB in-stream standards. The Board finds that interpretation of OWRB requirements is a matter to be resolved between the parties and OWRB. The Board notes that OWRB may choose to use its (OWRB's) 7-day, 2-year low flow of 143 ft^3/s.

60. The other issue is what figure will be used by the Board in its appraisal. Considering all the evidence, the Board believes that a 7-day, 2-year low flow of 70 ft^3/s is the appropriate value to use in estimating anticipated environmental effects.

61. In addition to meeting OWRB in-stream standards, the Applicants must obtain a National Pollution Discharge Elimination System (NPDES) permit from the U. S. Environmental Protection Agency (Shirazi, Tr. 2047). Such a permit may be issued after a State 401 certification, or in the event of a waiver, upon application under Section 402 of FWPCA. In either event, the discharge will have to meet EPA's standards.

62. Liquid waste to be discharged from construction and operation of BFS will consist of storm-water runoff, sanitary wastes, and cooling tower blowdown. Construction area runoff will pass through a holding pond where some suspended solids will be removed (McGilbra, p. 2). The pond has the capacity to hold a 10-year, 24-hour rainfall. The proposed method for handling storm-water runoff was not questioned.

63. Sanitary waste will be treated by an "extended aeration" plant and

[8]Intervenors also made calculations based on 40 ft^3/s.

Applicants believe the discharge will meet all applicable standards (McGilbra, p. 1). Intervenors argue that the treatment system is not acceptable as the best available technology (Intervenors' Proposed Findings, p. 45). OWRB indicated that performance with respect to biochemical oxygen demand (BOD) and solids would be the critical factor (Shirazi, Tr. 2069). The technology to be employed is a matter to be decided by OWRB. The Board is satisfied that if the proposed system meets standards of OWRB, there will be no adverse impact and that there is no serious environmental impact or significant cost involved in meeting OWRB requirements for sanitary waste treatment in the event a more effective BOD and solids removal system is necessary.

64. The cooling tower blowdown will contain sulfate concentration multiplied over that in intake water through evaporation and possible addition of chemicals in the plant to control scaling. The intake concentration will be near the OWRB permissible limit so that an increase in concentration through the plant may cause OWRB in-stream standards to be exceeded (McGilbra, p. 4, and Staff rebuttal, Tr. 2128, and Mathur, pp. 1-5). Metallic compounds will be added from corrosion of metallic components of the water circulating system (McGilbra, Tr. 1794), and any compounds in river water will be concentrated through evaporation (McGilbra, Tr. 1795). Chlorides and total dissolved solids (TDS) may also be a problem according to Intervenors (Mathur, pp. 5 and 6), but Staff calculations refute the chloride contention (Staff rebuttal, p. 3, fol. Tr. 2128).

65. The Board finds that liquid discharges from BFS as currently designed may result in violation of OWRB or EPA standards. The Board notes, however, that in their Proposed Findings (p. 74), Applicants do not propose to violate applicable standards and they propose to install necessary equipment to meet limitations in discharge permits from OWRB or EPA. In fact, Applicants propose a condition on the permit (p. 212, Proposed Findings) which the Board adopts with modification (see the Board's License Conditions, *infra*).

66. The cost would range from 4 to 5 million dollars for lime softening to 40 to 50 million for ion exchange treatment systems (McGilbra, Tr. 1902; Mathur, Tr. 2253). In the cost-benefit analysis, the Board finds that this added cost would not upset the cost-benefit of BFS even if the highest cost were incurred.

67. Intervenors claim that preoperational water monitoring programs by USGS and OWRB at Newt-Graham Lock and Dam are inadequate to assess impacts of BFS because toxic metals of concern are not included (Mathur, pp. 10-11). They also claim that the two samples of Applicants do not provide an adequate statistical base (Mathur, p. 9). The Staff rebuttal, p. 6, tends to refute this testimony by citing quarterly sampling at Newt-

Graham Lock and Dam for trace elements by USGS and the Oklahoma State Water Quality Laboratory. The Board finds that existing information is sufficient for the evaluation to be made at this time.

3. Effects on Aquatic Biota

Contention 26:

Intervenors contend that the Applicants' program to monitor fish impingement on the intake plate will not be able to detect fish concentrations in the vicinity of the intake structure so as to minimize fish loss (see 6.2.6.3 and page 5.1-6).

Contention 27:

Intervenors contend that the construction of Black Fox 1 and 2 would cause silting on the eggs of the fish inhabiting the Verdigris River, which would result in false spawning and migratory cycles.

Contention 28:

Intervenors contend that the discharge of heated effluent from Black Fox 1 and 2 would cause false spawning and false migratory cycles of fish which inhabit the Verdigris River.

68. John Aronson (written testimony, pp. 1-14 and affidavit of July 25, 1977, pp. 1-3, fol. Tr. 1600) testified for the Applicants. Intervenors presented Mr. Jimmy Pigg (Tr. 3130-3148). The Staff presented William Vinikour (written testimony, 1 page and 2 corrected sheets, fol. Tr. 1593), and Staff written rebuttal testimony of Messrs. William Vinikour, Nicholas Beskid, and Dr. Fred Vaslow (pp. 1-14, fol. Tr. 2128).

69. Intervenors do not cite the record for supporting evidence. They do argue that there is no evidence that the intake structure will comply with EPA requirements, but they do not state what those requirements are and what, if any, deficiencies exist. Intervenors also claim that the fish-sampling program of the Applicants was inadequate.

70. With respect to Contention 26, Applicants moved prior to the hearing for summary disposition. Staff supported the motion. The Board denied the motion because of a statement in the FES that ". . . The Staff will require a fish impingement monitoring program." Staff amended the FES at the hearing (Vinikour, Tr. 1589-93, and fol. 1593) because the statements previously made were based on reference to an incorrect design of intake

structure. Upon review of the correct design, the Staff no longer thought such monitoring necessary. In view of the correction, the Board granted the Applicants' renewed motion for summary disposition of Contention 26 (Tr. 1585-95).

71. Contention 27 dealing with siltation had been previously dismissed by summary disposition. The question was reopened because the affidavit of Applicants in support of the motion was based on an assumed low flow of 379 ft^3/s (Aronson, Tr. 1597). Applicants reexamined the issue based on an assumed low flow of 70 ft^3/s and concluded that this would not alter the previous findings with respect to ecological impacts of construction of BFS (Mr. Aronson's affidavit, p. 3). Mr. Aronson had previously testified that most fish prefer spawning sites in backwater areas rather than in the main channel of the Verdigris which has been altered by channelization and that virtually no spawning occurs in the vicinity of the proposed barge slip, intake structure, or outfall structure (p. 3). Various techniques will be used—berme and holding pond—to prevent silt discharges, and Mr. Aronson predicted Black Fox's contribution of suspended solids to the Verdigris will be inconsequential (p. 4). Mr. Aronson stated that disruption of potential fish-spawning patterns will be avoided by prohibiting construction in the river or removal of riverbank plugs during the period April 15 to June 15. Mr. Pigg (Tr. 3145-47 and 3192-93) expressed concern about the affect of siltation on the spawning of fish. He stated the spawning season for darters was January or February and for most species, April through June (Tr. 3192).

72. However, the Staff has advised the Board in a letter dated March 22, 1978, that the issue has been conciliated and that:

> . . . The parties have agreed that no riverside construction (except that work needed to control construction erosion as set forth in Section 4.5 of the FES) should take place during the period from March 1 to June 1 in order to avoid the possibility of any damage to fish spawning in the Verdigris River. The primary concern of the parties is to minimize the possibility of harm to Verdigris River biota which might be caused by construction dredging for the cooling water intake structure and the barge slip.
>
> While the Applicants have previously agreed that no river construction should take place during the period from April 15 to June 15, the parties decided to exclude from the ban construction of the wastewater outfall which is an integral part of the construction runoff and erosion control program which the NRC Staff had recommended should be accomplished early in the construction schedule.

The Board accepts this agreement of the parties.

73. Contention 28, like Contention 27, had been previously dismissed by summary disposition, but was reopened for similar reasons. With respect to the thermal effluents, all parties appear to agree that the thermal plume will be small and no impediment to fish and other organisms (Mr. Aronson's affidavit, p. 3; Mr. Pigg, Tr. 3145, 3179; rebuttal testimony of Mr. Vinikour, *et al.*, pp. 6-8). It was brought out that under certain conditions the natural temperature of water in the Verdigris River exceeds the maximum temperature (90°F) permitted in a discharge by OWRB (FES p. 7-6). OWRB, However, did not feel that a discharge from BFS that resulted in a temperature after mixing lower than or equal to the natural river temperature before mixing would be considered a violation even though the temperature after mixing might exceed the maximum allowable temperature (Mr. Shirazi, Tr. 2072, 2085-6). The Board finds that the thermal discharge will cause no detectable effects on the river ecosystem and will meet applicable standards.

74. The Applicants' fish sampling included electro fishing, seining, and netting in backwater and channel areas. They also sampled for other organisms and fish eggs (FES, Section 6). Staff concluded and we agree that the Applicants' preoperational monitoring program was adequate (Staff rebuttal testimony of Mr. Vinikour, *et al.*, p. 11).

75. The Board finds the estimated impact on aquatic biology from silting or heated effluent to be minimal. Consequently, we believe there is no need for further preoperational monitoring. Nevertheless, the Board finds that the Applicants should conduct a comprehensive postoperational monitoring program, as suggested by Staff (Mr. Vinikour, *et al.*, Staff rebuttal, pp. 6 and 12-13), for 2 or 3 years to assess the effects, if any, from Black Fox.

4. Effects of Spoils From Dredging on River During Flood Conditions

Contention 35:

Intervenors contend that in order to minimize environmental damage the Applicants and Regulatory Staff should have used a "100-year flood" rather than a 50-year "standard project flood" in determining where to place the spoils which will result from Black Fox 1 and 2.

76. Applicants presented David F. Guyot (written testimony, pp. 1-7, fol. Tr. 1916) and Staff, Charles LaFrance (written testimony, pp. 1-9, fol. Tr. 1707). Intervenors did not present witnesses.

77. Applicants and Staff earlier had moved for summary disposition of this contention. The Board was inclined to grant the motion; however, we

noted some apparent discrepancies between Applicants' and Staff's documents which we asked to be clarified by addressing these questions:

a. The Guyot affidavit repeatedly states that the spoils will present no problem if stored "*at* or *below* 550 ft MSL." The LaFrance affidavit assures us that the site is proper because the spoils are stationed *above* the calculated level for the flood. Is the limit properly a minimum level or a maximum level? Are both analyses directed at protection against the same contingency and, if so, exactly what is the contingency?

b. The LaFrance affidavit states that the *50*-year return period flood elevation is 536.8 MSL and that the 100-year return period flood elevation is 0.14 ft higher. The FES, however, at p. 3-9, in a note in Figure 3.5 lists a 50-year flood at 554 ft and a 100-year flood at 556 ft at the intake structure. Since the intake structure is located quite near the spoils area, it seems unlikely that the predicted floods would differ so greatly. Are these the same floods? Would the possibility of a flood reaching 556 ft MSL alter Dr. LaFrance's conclusion that "the 100-year return period is . . . still . . . below the proposed spoils disposal area?" How would such a flood level alter the environmental impact of the stored spoils?

The Board asked for evidence only to the extent necessary to answer these questions (6 NRC at 182, 183 (1977)).

78. With respect to the first question, the Applicants and Staff were addressing different issues. Mr. Guyot (pp. 3-4) was pointing out that the spoils deposits would not impede the flood of the river because material would be placed behind a protective berme the same height as normal terrain upstream (550 MSL). Dr. LaFrance (p. 7) was concerned about resuspension of spoil material in the event a flood overtopped the protective berme. Dr. LaFrance concluded this would not occur unless a flood exceeded 556 ft MSL, which would have a predicted recurrence interval of 10,000 years. While Intervenors argue that the Board's questions were not covered, the Board feels that its concerns have been satisfied.

79. Intervenors also are concerned that the Corps of Engineers' permit has not been issued. Applicants have applied for the permit and its issuance is not required at this stage of the proceedings. There was no evidence that the permit would not be issued.

80. The Board concludes that the spoil disposal site is adequately protected from floods of a reasonable recurrence interval.

E. Air Quality

Contention 24:

Intervenors contend that the Applicants and Regulatory Staff have not demonstrated that Black Fox 1 and 2 will comply with all applicable Federal, State, and local clean air requirements.

Contention 25:

Intervenors contend that the Applicants have not demonstrated that it will minimize the impact of dust and particulates which will occur during construction of Black Fox 1 and 2.

Contention 30(f):

Intervenors contend that the Applicants and Regulatory Staff have inadequately considered the effect of the plume of Black Fox 1 and 2 cooling towers in the following areas:

f. Emissions of asbestos which is used in the cementfiller board.

81. On behalf of the Applicants the following witnesses testified: David F. Guyot (written testimony, pp. 1-4, fol. Tr. 1493) re: dust and particulates suppression measures; Allan F. McGilbra (written testimony, pp. 1-4, fol. Tr. 1552), re: air quality standards; and George E. McVehil (written testimony, pp. 1-6, fol. Tr. 930, plus a 2-page affidavit), re: asbestos emissions. The following Staff witnesses testified: Charles R. LaFrance (written testimony, pp. 1-9 fol. Tr. 1707), re: fugitive dust; Fred Vaslow (written testimony, pp. 1-4, fol. Tr. 1707), re: diesel and cooling tower emissions and ozone from transmission lines; and Barbara-Ann Gamboa Lewis (written testimony, pp. 1-10, fol. Tr. 950), re: asbestos emissions. The Intervenors did not present witnesses on these subjects.

82. The Intervenors contend that open burning is generally prohibited by Oklahoma Air Pollution regulations, that exemptions permitted do not apply to construction activities, and that open burning will degrade air quality. It is also contended that construction activities will generate fugitive dust, causing Oklahoma secondary standards for particulates to be exceeded.[9] The Intervenors further contend that emissions of asbestos have not been adequately analyzed.

[9]Secondary standards are to protect public welfare, while stricter primary standards protect public health (LaFrance, p. 2).

83. The secondary standards for air quality, not to be exceeded, are 150 mg/m^3, 24-hour maximum and 60 mg/m^3 annual geometric mean (Ex. 2 to McGilbra testimony). Current background levels of suspended particulates at Black Fox Station are already at, or approach, the annual standard (LaFrance, p. 2). Consequently, we find that any construction activity that creates dust may cause these standards to be exceeded.

84. While some dust will be generated by construction activities of the magnitude of Black Fox regardless of precautions taken (LaFrance, p. 2), Applicants have outlined measures that will be employed in this project to prevent and minimize dust generation (Guyot, pp. 1-4). These measures include sprinkling, cover-crop planting, bituminous and/or crushed rock surfacing (major access roads and parking areas will receive bituminous surfacing), as well as restriction of areas to be disturbed and selective removal of vegetation to retain some ground cover and roots, and other measures (Guyot, p. 2). We note that Dr. LaFrance (p. 3) believes natural biota in this area have adapted to a dusty environment and any impact of construction dust will be negligible.

85. Applicants are planning to burn cleared vegetation material, and possibly some combustible construction materials as necessary, in the open or in an open-pit incinerator (Guyot, p. 3; Tr. 1509-1522) even though it is feasible to use alternate disposal methods (Guyot, Tr. 1519). Admittedly, the proposed methods of burning could produce smoke (Guyot, Tr. 1519 and 1522). Since particulate levels in this area are already at the secondary standards and any increment may cause these standards to be violated, the Board finds that reasonable alternative methods are available which should be used to avoid additional particulate generation by open burning or by open-pit incineration.

86. Unrefuted testimony indicates that exhaust from emergency diesel engines, ozone generated by transmission lines, and cooling tower particulate emissions do not present any significant air quality problems (Vaslow, pp. 1-4).

87. The question of emissions of asbestos fibers from erosion of filler material in the cooling towers was examined in detail. Unrefuted testimony indicates that about 14 grams per day of asbestos would be emitted from six cooling towers at Black Fox Station. Calculations show resulting ambient concentrations would be below a proposed national standard of 30 nanograms per cubic meter. This is about 1/1,000 of the OSHA standard for working environments (Lewis pp. 2-4).[10]

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[10]Although asbestos in cooling tower blowdown as it affects water quality in the Verdigris was not a matter in contention, there was testimony on the subject (Lewis, p. 4). Calculations indicate that concentrations of 10^6 to 10^{10} fibers per liter could occur in the Verdigris after

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88. The Board finds that the area in the vicinity of Black Fox site is already at the secondary standards for particulate matter. Consequently, we feel that every reasonable measure should be employed to mitigate the generation of dust and smoke. The Board finds the proposed plans to prevent or minimize dust generation by construction activities are adequate; however, because this area is already burdened with dust, we find that dust generation should be monitored to evaluate, guide, and if necessary to modify, the supervision methods during construction. The impact of construction-generated dust we find to be negligible and acceptable. The Board fails to see the necessity for the Applicants to burn vegetation and combustible construction materials in the open or in an open-pit incinerator with resulting particulate generation. Such air pollution in some isolated areas might create no special problems, but in this area any additional pollution may cause standards to be violated. Hence activities that add to the pollution burden should be avoided. The Board, therefore, directs that alternate methods of solid waste disposal be used. The Board finds that other sources of emission, such as diesel exhaust and asbestos from cooling towers, will comply with existing and anticipated regulations and standards, and are no problem.

F. Combined Effects of Black Fox Station With Proposed Northeast Coal Units 3 and 4

Contention 54:

Intervenors contend that the Applicants and Regulatory Staff have not adequately considered the combined effects of Black Fox 1 and 2 and PSO's proposed Northeast 3 and 4 coal-fired units on water supply, water quality, air quality, and demand on local facilities.

89. Steven Day testified for Applicants (written testimony, pp. 1-6, fol. Tr. 1525). Intervenors presented one witness, Edward Malecki (written testimony, pp. 1-6, fol. Tr. 993), who addressed only socioeconomic issues. Staff provided a number of witnesses—Nicholas Beskid (written testimony, pp. 1-3, fol. Tr. 2122) testified concerning low flows; William Vinikour (written testimony, pp. 1-4, fol. Tr. 2125) testified concerning thermal effects; Fred Vaslow (written testimony, pp. 1 and 2, fol. Tr. 2119) testified

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mixing. No standards have been set for asbestos fibers in water; however, if standards are promulgated at some future time because asbestos in water proves to be hazardous, alternate fill might be used in the cooling tower or the wastewater treated to remove fibers before discharge to the Verdigris.

concerning sulfates and chemicals; Gary Marmer (written testimony, pp. 1-5, fol. Tr. 2124) testified concerning thermal effects, and James Carson (written testimony, pp. 1-3, fol. Tr. 1707) testified concerning mixing of atmospheric plumes. There was also Staff rebuttal testimony (written testimony of Vinikour, Beskid, and Vaslow, pp. 1-14, fol. Tr. 2128), and Staff witness Susan Hong (written testimony, pp. 1-4, fol. Tr. 1707) testified on socioeconomic effects.

90. Intervenors contend that the combined water demand will adversely affect other use, that Northeast will add sulfates and total dissolved solids (TDS) to the Verdigris River to the extent that Black Fox Station will violate water quality standards, and that plumes from NE stacks and Black Fox Station will intermix to produce adverse effects. They further contend that Rogers County will receive socioeconomic impacts from labor-intensive construction that will require a mitigation program.

91. The Board fully considered the question of water availability for Black Fox Station and NE in dealing with Contention 39, *supra*.

92. The Board considered water quality issues in connection with BFS alone in dealing with Contention 38, *supra*. Some aspects of the interaction between BFS and NE are noted here. Calculations show the effect of NE on chemical aspects of water quality at BFS would be about 0.2% of the changes caused by BFS and less than natural fluctuations (Vaslow, p. 2) at normal flows. At flows of 100 ft^3/s at BFS (equal to 40 ft^3/s below BFS), effects could be significant and OWRB in-stream water quality standards exceeded. NE alone, however, has received a negative declaration from EPA indicating it will have no significant environmental impact (Day, Ex. 2).

93. Staff calculates the thermal rise from NE to be 0.7°F. This is expected to dissipate by the time the water reaches BFS in that there will no measurable thermal effects (Marmer, p. 5). The effects of BFS alone on air quality are considered in dealing with Contentions 24, 25, and 30(f), *supra*. BFS and NE are 22 miles distant from each other and the stack discharges are at different heights (60 versus 600 ft). It is estimated that the wind would permit mixing of the two plumes only 7.5% of the time; however, there would be considerable dilution between the plants reducing any interaction. The propensity of the water vapor and sulfur oxides to join in producing an acid mist is minimal and would be masked by natural variations in atmospheric humidity. Staff witness Carson does not believe the sulfur cycle at NE will be changed (pp. 2-3).

94. Applicants point out that the peak construction period for NE is 1978-79 and for BFS 1980-82 and thus there is no overlap (Day, pp. 5-6). Staff's witnesses (Hong, pp. 1-4) concur that no significant stress will be created for schools, housing, and other facilities in Rogers, Wagoner, and Mayes Counties for a variety of reasons. Nevertheless, the Staff feels that

the Applicants should work with local planning and other governmental bodies to anticipate the work schedules and minimize any impacts that could result from an inflow of workers.

95. The Board finds that there will be no significant effects from the mixing of plumes from BFS and NE, nor any effects from thermal discharges at NE on BFS operations or significant changes in river temperature due to combined discharges. The NE plant adds some chemicals to the river that in periods of very low flow could accentuate problems at BFS. Nevertheless, the Board finds that these factors have been adequately considered as discussed in Contention 38. The Board finds no serious socioeconomic impact due to interaction of NE and BFS; however, the suggestion of the Staff will alleviate any impacts that may arise.

G. Radiological Matters

1. Uranium Fuel Cycle—Table S-3

96. On November 1, 1977, the record in this case was formally closed. However, pursuant to the Commission's amendment to Table S-3 of 10 CFR Part 51 and the directions therein (42 Fed. Reg. 15613, April 14, 1978), on May 8, 1978, we reopened the record on National Environmental Policy Act issues for the limited purpose of receiving new evidence on radon releases and on health effects resulting from radon releases. The reopened evidentiary hearing was held on June 5 and 6, 1978.

97. The Staff's witnesses were Ralph Wilde (written testimony, pp. 1-7, fol. Tr. 3803), Dr. Reginald Gotchy (written testimony, pp. 1-19, fol. Tr. 3805), and Paul Magno (written testimony, pp. 1-13, fol. Tr. 3898). Staff also called Hubert Miller to respond to questions posed during cross-examination (Tr. 3906-18, 3924-35, 3945-52, 3971-2, 3997-8, 4003-05, 4012-13). Intervenors' witnesses were Dr. Stanley Ferguson (written testimony, pp. 1-5, fol. Tr. 4019), and Dr. Robert Pohl (written testimony, pp. 1-15, fol. Tr. 4041). (It should be noted that the Board granted Applicants' motion to strike Part 2 of Dr. Pohl's written testimony—see Tr. 4038-41, 4088-92.) The Applicants presented as rebuttal witnesses Dr. Hoyt Whipple (Tr. 4121-29), Dr. John Zink (Tr. 4143-46), and Dr. Doyle Edwards (Tr. 4148-51).

98. Mr. Wilde testified that 4,060 curies of Rn-222 are released in producing enough uranium from deep mines to provide one annual fuel requirement (AFR)[11] (Wilde, pp. 2-5). This estimate was made from data

[11]One AFR is essentially the same as one reference reactor year (RRY). It is the fuel requirement for operation of a 1-gigawatt (electric) power station for 1 year at 80% capacity

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supplied in January and February 1975 in telephone conversations with Mr. James Cleveland of the New Mexico Environmental Improvement Agency and with Mr. Edward Kaufman of the Kerr-McGee Nuclear Corporation. Mr. Wilde considered both of these individuals to be knowledgeable and reliable (Wilde, p. 2, Tr. 3817). We do not agree with the Intervenors' argument that Mr. Wilde's calculation does not meet the requirements of the National Environmental Policy Act of 1969, 42 U.S.C. §4321 *ff*, in that the data upon which it was based were hearsay, were outdated, and consisted only of "estimates" since "no actual measurements were taken" (Intervenors' Proposed Findings of Fact and Order Concerning Radon Releases and Impacts Therefrom at pp. 3-4). Intervenors' argument is not well-taken because, in the first place, Mr. Wilde asserted that these estimates were based upon measurements (Tr. 3843), that they checked well with a later independent evaluation made in October 1976 by Mr. W. J. Shelley, Director, Regulation and Control, Kerr-McGee Nuclear Corporation, and that Mr. Shelley's evaluation, submitted in writing to Mr. Wilde under date of December 9, 1976, was also based upon actual measurements (Wilde, pp. 5-6; Tr. 3843). Second, we conclude that Mr. Wilde's calculation is reliable.[12] The record indicates that it has been questioned only once. Mr. Wilde's calculation based upon the figures from Messrs. Cleveland and Kaufman, was published in an early version of the Generic Environmental Statement on Mixed Oxide Fuel (GESMO) but contained a typographical error of a factor of one hundred. Thereafter, representatives of the uranium mining industry questioned the validity of the source term for radon release from mining, and Kerr-McGee undertook the independent investigation that led to the checking adverted to, *supra* (Wilde, p. 5). We can only conclude that, were the release rate grossly in error, interested individuals, who review the literature, could have and would have noted the error. The Intervenors presented no evidence showing that the Wilde calculation was in error. Finally, as to the hearsay argument, we have already ruled that such testimony is admissible since it is common practice for experts to rely upon the research of other experts (Tr. 3826).

99. The Board accepts Mr. Wilde's value as the proper release per AFR for underground mines. As to the applicability of this value for open-pit

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factor. The terms are used interchangeably at various points in the testimony. The Intervenors' witness, Dr. Pohl, preferred the term gigawatt-year, but conversion is simple 0.8 gigawatt(e)-year = 1 AFR = RRY (Pohl testimony at p. 2). We shall use the AFR notation, always bearing in mind that the matter at issue here is the *total* fuel requirement for two approximately 1-gigawatt(e) generators for 30 to 40 years (Tr. p. 4006), something between 60 and 80 AFR.

[12]Mr. Wilde testified that his figure was accurate within a factor of two (Tr. 3843).

mines as well, we will accept it as an estimate for that purpose (Tr. 3808) in view of Mr. Wilde's expressed expert opinion that:

> In both cases the source of the radon is the same. It is the uranium ore itself.
>
> We make the basic assumption that in the mining of a ton of ore the release rate would be approximately the same from either operation (Tr. 3810).

100. The value represents the release associated with the actual extraction of the ore required for one AFR from an active mine. Once an underground mine is closed, it no longer is assumed to emit radon, because the shafts to such mines are generally closed. When their ventilation shafts no longer function the release of radon becomes "essentially zero" (Wilde, Tr. 3831, 3837-3838).

101. The emissions of an open-pit mine, however, do not necessarily cease when the mine stops operating. Whether or not significant releases occur after the mine is abandoned depends on the extent to which the disturbed area is reclaimed or restored to its original state. Mr. Wilde made an estimate of the continuing release from an unreclaimed open-pit mine, and arrived at a value of 100 Ci/yr (Tr. 3809). He made this estimate by assuming the parameters of a typical open-pit mine as described in the Generic Environmental Statement on Mixed Oxide Fuel (NUREG-0002) and using emanation rate data from a Massachusetts Institute of Technology report (MIT 952-5) on radon release rates from soil (Tr. 3848-3849). For a properly reclaimed mine, Mr. Wilde estimates that there would be no more release than there was before operation began (Tr. 3840-3841).

102. Mr. Wilde's estimate of 100 Ci/yr from an abandoned open-pit mine was not challenged by other witnesses, although Dr. Gotchy pointed out that it was probably high (Tr. 3888). The estimate assumed no reclamations whatever, and even the reentry of ground water into an abandoned open-pit mine would reduce the emanation (Tr. 3887-3888). Moreover, many States have mine land reclamation laws, which would require that the mines be left in a condition in which the emanation would be greatly reduced (Tr. 3888).

103. Something less than one-half, probably nearer one-third, of the total fuel requirement for a typical reactor can be expected to come from open-pit mines (Tr. 3842). This value can be used to establish a weighted average for emissions from fuel originating in deep and open-pit mines. The Board accepts the estimate that each AFR will release, during its actual mining, about 4,060 Ci, and that for an extended time in the future, each AFR will, on the average, result in releases from open-pit mines of something less than 50 Ci/yr.

104. Radon is also released in the process of milling uranium, that is,

in the process of extracting it from ore, and it is released from the tailings (the residual materials left after uranium is extracted) which result from this process. Staff witness Magno estimated that 30 Ci/AFR would be released during storage of ore at the mill and processing of the ore through the mill (Magno, pp. 2-3). The estimate was based upon assumption of secular equilibrium of U-238 and its decay products in the ore, and upon an emanating power (fraction of radon released) double that for natural soil, the latter assumption being an attempt to account for the effect of the various steps in the milling process (Magno, p. 2). While the emanating power used in this calculation was only estimated, we note that even were one to assign that parameter its maximum possible value (*viz.* unity), the total emission listed below would rise by only 40 Ci/AFR (Magno, Tr. 3939).

105. Mr. Magno also made an estimate of the rate of radon release tailings resulting from one AFR. This estimate is complicated by the fact that tailings are discharged wet, allowed to dry, and ultimately are required to be stabilized, *i.e.*, covered by earth to reduce radon emissions (Magno, pp. 6-9). His estimate was that 350 Ci/AFR would be released between the time the tailings were discharged and the time they were stabilized, and that thereafter implementation of recent NRC criteria for management of tailings areas would require overburden sufficient to limit releases to less than one Ci/yr-AFR (Magno, pp. 2-4). Thus the total released would be:

Milling operation	30 Ci
Tailings during milling	750 Ci
Tailings until stabilization	350 Ci
	1,130 Ci[13]

106. After stabilization, the tailings piles will continue to emit some radon. The exact rate of emission will depend upon the nature of the overburden and whether or not it is subsequently disturbed. Mr. Magno assumed that the piles would be stabilized with sufficient overburden to attain compliance with a recently published NRC Staff document listing performance objectives for tailings pile management (Magno, pp. 6-8). He calculated that a pile which met the performance objectives would emit 0.93 Ci/year per AFR (Magno, p. 8), and he therefore assumed, as a pessimistic estimate, that such a pile would emit from 1 to 10 curies per year per AFR (Magno, pp. 2, 8). He also estimated that, if all cover material were to be removed from such a pile, the rate of emission would rise to about 110

[13]Intervenors, in their Proposed Findings of Fact and Order Concerning Radon Releases and Impacts Therefrom (p. 7), misconstrue this number as 1,130 Ci *per yr* per AFR. It is a one-time release per AFR.

Ci/year per AFR (Magno, p. 10). While the general approach used by Mr. Magno in his calculation was not challenged, Intervenors' witness, Dr. Pohl, believed that one of the parameters involved, the depth of the model tailings pile, was incorrect (Pohl, p. 3). Changing the value for pile depth to that preferred by Dr. Pohl (16 feet) would increase tailings pile emissions by a factor of 2.4 (Pohl, p. 3). Mr. Magno testified that the 16-foot depth may have been used in the past, but that present and future practices would be better represented by the 38-foot value he had used (Tr. at 3936-3937, 3940-3941). The Board will adopt Mr. Magno's value (as, indeed, did Dr. Pohl ultimately in his calculations, *cf.* Tr. at 4078).

107. The Board finds that a reasonable estimate for the radon released in the course of milling one AFR is 1,130 Ci, and that the tailings produced in this process will emit an estimated 1-10 Ci/yr if stabilized and about 110 Ci/yr if the overburden covering them is removed.

108. Using the estimates by Messrs. Magno and Wilde for the radon releases in deep mining, milling, and storage of tailings, Dr. Gotchy calculated the health effects which would result from one AFR (Dr. Gotchy, p. 2). The calculation employed a computer code, RABGAD, developed for the Generic Environmental Statement on Mixed Oxide Fuel (GESMO, NUREG-0002), with certain corrections based on recent thinking (Dr. Gotchy, p. 2). Since the tailings pile source was a continuous, long-term source (as contrasted to the deep mining and milling sources, which represent one-time releases) Dr. Gotchy had to make assumptions about the persistence of pile stabilization and the variation in such matters as population distribution over future time. He assumed that U.S. population would rise to a stable 300 million by 2020, and that the tailings piles would emit 1 Ci/AFR per year for 100 years, 10 Ci/AFR per year for the next 400 years and 100 curies per year per AFR thereafter, corrected for decay (Dr. Gotchy, pp. 3-4). He noted that these latter figures are consistent with those of Mr. Magno, but pointed out that assumptions on how long overburden would last were speculative (p. 4).

109. Dr. Gotchy obtained the following values for population doses from radon from this source (p. 5):

ESTIMATE OF RADON-222 POPULATION DOSES FROM STABILIZED PILES PER AFR

		Environmental Dose Commitments (Man-Rem)		
Time (yr)	**Curies Released***	**Total Body**	**Lung****	**Bone**
1	1	0.026	0.56	0.68

ESTIMATE OF RADON-222 POPULATION DOSES FROM STABILIZED PILES PER AFR

(Continued from previous page.)

Time (yr)	Curies Released*	Total Body	Lung**	Bone
10	10	0.26	5.6	6.8
50	50	1.3	28	34
100	100	2.6	56	68
500[a]	4,090	110	2,300	2,800
1,000[a]	53,800	1,400	30,000	37,000

*Based on the decay of Thorium-230 and Ra-226 to Rn-222.

**All lung doses here refer to the bronchial epithelium.

[a]Assumes rate remains 100 Ci/yr/RRY and is unaffected by any large changes in stabilization due to severe weather changes and increased erosion due to the "greenhouse effect."

These figures did not include radon doses due to releases from open-pit mines, but Dr. Gotchy showed how these values could be corrected for such a source in stating that the long-term (100 to 1,000-year) figures for releases and for health effects would rise 50-60% (Tr. at 3894).

110. Dr. Gotchy used the projected doses together with risk estimators from the GESMO and from the Reactor Safety Study, WASH-1400, to estimate potential numbers of cancer cases resulting from such doses. He cautioned that many factors (population age distribution, life expectancy, technology, and climate among them) may change the values of all health effect risk estimators with time (Gotchy, pp. 6-7), but if one ignores this uncertainty and assumes all these variables remain as they are at present, the following summary results (p. 8):

ESTIMATES OF POTENTIAL RISK OF CANCER MORTALITY FROM MINING AND MILLING PER AFR

Period of Time	Cases Due To Milling	Cases Due To Mining	Milling and Mining Total Cases
100 years	0.025	0.085	0.11
500 years	0.11	0.085	0.19
1,000 years	1.1	0.085	1.2

As noted in dealing with the tabulated tailings pile doses, these figures assume a constant emission rate from tailings piles after 500 years, and they do not account for open-pit mining emission. Dr. Gotchy also notes that the use of EPA risk estimators would increase predicted lung cancer incidence by a factor of 1.6 to 2.5. Such cancers comprise about 60% of the totals in the table (p. 8).

111. Genetic effects were also estimated using GESMO risk estimators. Dr. Gotchy obtained (p. 10):

ESTIMATES OF POTENTIAL HEALTH EFFECTS OF GENETIC ORIGIN FROM MINING AND MILLING ONE AFR

Time	Total Effects
100 years	0.036
500 years	0.064
1,000 years	0.40

The assumptions are as in the previous tables.

112. Lastly, to put the matter of radon releases and exposures in its proper perspective, we note that Dr. Gotchy also calculated the fraction of natural background dose which the doses from mining and milling (excluding unreclaimed open-pit mines) would yield over various periods of time. He obtained (p. 15):

ESTIMATED LONG-TERM MAXIMUM PERCENTAGE OF BACKGROUND RADON-222 POPULATION DOSE AND HEALTH EFFECTS DUE TO MINING AND MILLING ONE AFR

Time	Percent of Background
100 years	5.3×10^{-5}
500 years	1.9×10^{-5}
1,000 years	5.8×10^{-5}
5,000 years	9.2×10^{-5}
10,000 years	9.2×10^{-5}

113. Intervenors' witness, Dr. Pohl, took issue with Dr. Gotchy's evaluation of the health impacts of these releases. He would make two minor changes which tend to increase Dr. Gotchy's estimates (Pohl, p. 2):

a. He would consider world population rather than U. S. population. This, he says, would double the results, according to an EPA estimate.

b. He would base all numbers on a gigawatt(e)-year, rather than on AFR, which increases the value another 25%.

The Board does not view the difference between the gigawatt(e)-year basis and the AFR basis as significant. As long as one bears in mind what the

basis is, the meaning of the numbers is clear. We feel that the AFR basis probably reflects reality somewhat better, since reactors do not operate at 100% capacity throughout their lives. As to the use of world population rather than U. S. population, that is probably a good idea, but we note that later testimony showed that the change in this assumption would yield less than 25% increase, rather than a factor of two (Magno, Tr. 3959-3962). Dr. Pohl tacitly accepted this as more recent information than his (Tr. 4047).

114. The chief disagreement between the values given by Dr. Gotchy and those by Dr. Pohl lies in the question of how long a period one must consider in integrating total health effects (Pohl written testimony, Fig. 1). Indeed, Dr. Pohl used Dr. Gotchy's figures in arriving at his estimate. However, instead of stopping consideration at 1,000 years, as Dr. Gotchy had, he continued integration essentially to infinity, thus raising the value obtained by a factor of about 250 (Pohl, pp. 2-3, Fig. 1). This calculation assumes that all the demographic, geographic, meteorological, and geophysical factors involved in the calculation remain unchanged over eons, thus deliberately carrying the calculation into time periods where its originator deemed it of doubtful applicability (Gotchy, p. 12). Such long-range extrapolation of his figures, according to Dr. Gotchy, is "meaningless" and "obscures the important fact that . . . the potential health effects in *any* population living now or in the distant and uncertain future as a result of radon-222 emissions from the uranium fuel cycle will *always* represent an immeasurably small increase in those health effects occurring as a result of background radiation and other naturally occurring and manmade environmental pollutants" (Gotchy, p. 12). Applicants' witness, Dr. Whipple, corroborates Dr. Gotchy's position in this matter (Tr. 4121-4124).

115. Because of the seemingly pivotal relation between the length of time over which these estimates are extrapolated and the result in absolute numbers, the Board asked the parties to brief the question: When considering a proposed action with potential environmental effects which may manifest themselves over very long periods of time and taking into account the uncertainties inherent in extremely long-range projection, what period of time does NEPA require a decisionmaker to use in quantifying these effects? Both Applicants and Staff researched this question. Neither they, nor for that matter the Board, found any case directly in point as to the length of time over which NEPA requires environmental impacts to be considered. Our only guidance appears to be the very general NEPA case law mandates to make "good faith" efforts to predict reasonably foreseeable environmental impacts (*Scientists' Institute for Public Information, Inc.* v. *AEC*, 481 F.2d 1079, 1092 (D. C. Cir. 1973)), and, after taking a "hard look" at environmental consequences, to apply a "rule of reason" (*Sierra Club* v. *Morton*, 458 F.2d 827, 834, 838 (D. C. Cir. 1972)), while eschewing pure

speculation or prophesy. However, some element of speculation is implicit in NEPA and agencies need not have complete information on all issues before proceeding. *Alaska* v. *Andrus*, 11 ERC 1321, 1327 (D. C. Cir. 1978).

116. We believe that to attempt to fix absolute figures for health impacts over hundreds of thousands of years, as Dr. Pohl did, represents pure speculation. We further feel that the only certainty here advanced is that these effects, at least for the 60 to 80 AFR, which Black Fox will require, are miniscule compared to the health effects from the natural background of radon, a background which we can assume would be present indefinitely. Our "rule of reason" then, would be to look at absolute figures only for those periods for which reasonable estimates can be made (even Dr. Gotchy's thousand-year estimates seem to us to be overly extended) and to accept the notion that effects beyond that time can be adequately quantified by noting that they are "immeasureably small" compared to natural backgrounds.

117. Dr. Pohl, in Part 3 of his testimony, points out that there are small local areas around tailings piles where radon levels comparable to natural background levels arise from the piles (Pohl, pp. 7-9, Fig. 2). These areas are, however, of very low population (Pohl, p. 10; Tr. at 3910, *et seq.*). Future piles will, by the criteria now set for licensees, be required to be located "in areas remote from people" (Miller, Tr. 3908). The Board does not feel that a radon concentration that approaches background in a small area remote from people represents a serious impact on the environment.

118. Intervenors' witness Dr. Ferguson testified regarding the results of preliminary epidemiologic studies of neoplasms in Mesa County, Colorado, a mining and milling site for uranium since about 1900. Here mill tailings have been used in the construction of both private and public buildings since the early 1950's (Ferguson, p. 1). The preliminary findings are that leukemia incidence appears to be high in this area, especially among females, but that lung tumors are not more frequent here than expected (Ferguson, p. 2). Historically, since lung cancer (and possibly bone cancer), but not leukemia, is associated with radon inhalation (Ferguson, p. 2; Gotchy, pp. 7-8), this admittedly preliminary result seems to us of questionable probative value. Indeed, it may be taken to show that even where people come into rather close contact with tailings, the malignancies predicted by our present risk estimators do not arise. Much of Dr. Ferguson's written testimony was not directed at radon at all. He did not recommend cessation of uranium mining in Colorado (Tr. at 4028). He did not think the construction permit for BFS should necessarily be denied because of the radon question (Tr. at p. 4029).

119. We now turn to the question of comparison of the health impact of coal and nuclear fuel as alternatives. The FES (Staff Ex. 1) at Section

9.1.2.3 and Tables 9.12 and 9.13 indicates that a coal-fired plant would have substantially more adverse health impacts than proposed BFS. The question now arises whether, after considering in greater detail the impact of radon from the uranium fuel cycle, we can still reach that conclusion.

120. Nothing comparable to the Staff's analysis of the uranium-radon question has been done for coal (Gotchy, Tr. 4106-4110), but some data are available. Coal-fired plants emit a number of toxic trace elements, including arsenic, antimony, cadmium, lead, selenium, manganese, thallium, beryllium, chromium, nickel, titanium, zinc, molybdenum, cobalt, radium, thorium, and the daughters of radium and thorium (Gotchy, Tr. 4108). Stack gas also contains organic carcinogens such as benzo alpha pyrene, a compound which studies have shown can by itself produce one to four deaths per plant year (Gotchy, Tr. 4108A). Coal plants also release carbon monoxide, mercury, oxides of sulfur, oxides of nitrogen, and radon-222 (*ibid.*, Tr. 4106-4110). The effects of these materials have not been quantified in general (*ibid.*, Tr. 4110), but sulfates and suspended particulates account for essentially all the short-term effects associated with plant operation, that is, 10 to 100 deaths per year (*ibid.*, Tr. 4108A, 4112). Toxic trace metals could leach from coal ash and contaminate water sources to yield adverse impacts over thousands of years (*ibid.*, Tr. 4109-4110).

121. Coal mining releases radon-222, but this release has not been quantified. Since coal has, in general, only one or two parts per million of uranium concentration (Gotchy, Tr. 4000), the releases would probably be less than those from uranium mining, but some effects would occur.

122. The concentration of uranium in coal ash is much greater than that in coal itself because the mass of material is reduced by a factor of about ten when the coal is burned (Gotchy, Tr. 4001, 4097). The coal ash pile for one plant year of operation will have about the same mass as the uranium tailings pile for one AFR (Miller, Tr. 4098), while the concentration of thorium would be a factor of 10 to 100 less in the coal ash pile (Gotchy, Tr. 4103). Coal piles are not stabilized as tailings piles are, however, and the lower overburden on the coal ash pile could result in releases quite comparable to those from stabilized uranium mill tailings (Gotchy, Tr. 4104).

123. Interestingly, Dr. Doyle Edwards, testifying for the Applicants, stated that Missouri coal, the most likely fuel for a coal-fired plant alternative to Black Fox, contains on the order of 25 parts per million of uranium (Tr. at 4150). Thus, ash piles from that potential alternative would be about ten times as strong a source as the "typical" ash piles discussed above.

124. We were also informed, by Applicants witness Dr. John Zink, that PSO has a firm contract with Mobil Oil Corp. for three million pounds of uranium that is to be produced from Mobil property in Texas using *in situ*

leaching (Tr. at 4144-4145). This process is one in which uranium is leached directly from the ore body and brought to the surface as a solution. Thus no large tailings pile is created, and radon emissions from the mining and milling phases are greatly reduced (Wilde, Tr. 3810-3811, 3858-3859). While this is a practice that may reduce the radon impacts, we note that the present commitment covers only about ten percent of the lifetime fuel requirement for Black Fox (Zink, Tr. 4146), and accordingly we cannot give the information any great weight in this decision.

125. After careful consideration of all the evidence, we find that the environmental impact of radon-222 emissions is negligibly small and has no effect on the environmental cost-benefit balance. Further, we see no reason to believe that consideration of radon-222 would change the conclusions in the FES (Staff Ex. 1) to the effect that the adverse health effects of an alternative coal-fired plant would be greater than those of the proposed nuclear station.

2. Somatic and Genetic Effects

Contention 36:

Intervenors contend that the Applicants and Regulatory Staff have not adequately assessed the somatic and genetic effects of the low level gaseous and liquid radioactive discharges which will result from the normal operation of Black Fox 1 and 2 on humans, including but not limited to, persons engaged in shipping operations on the McClellan-Kerr Navigation Channel, as well as the plants, fish, waterfowl, and wildlife.

126. Applicants have argued in several submissions that this contention constitutes an inadmissible challenge to 10 CFR Part 50, Appendix I (Applicants' Motion for Summary Disposition on the Pleadings (Environmental); Applicants' Proposed Findings; Applicants' Brief in Support of Proposed Findings). Their position is that once compliance with Appendix I is established, this Board, in making its cost-benefit analysis, is precluded from considering somatic and genetic effects of radioactive discharges because the Environmental Impact Statement that accompanied RM 50-2 (the rulemaking hearing that produced Appendix I) looked into these effects and established them for all time. They also argue that the following decisions of the Commission and the Appeal Board preclude our consideration of these effects and limit our consideration of residual environmental impacts to consideration of the radiological doses themselves, regardless of whether later data may show some change in the health effects

of those doses—*Maine Yankee Atomic Power Company* (Maine Yankee Atomic Power Station), ALAB-161, 6 AEC 1003, 1012 (1973), remanded on other grounds, CLI-74-2, 7 AEC 2 (1974); *further statement of Appeal Board views*, ALAB-175, 7 AEC 62 (174), *aff'd sub. nom. Citizens for Safe Power* v. *NRC*, 524 F.2d 1291, 1301 (D.C. Cir. 1975); *Tennessee Valley Authority* (Hartsville Nuclear Plant), ALAB-367, 5 NRC 92, 103, n. 52 (1977).

127. The Staff has asserted that compliance with Appendix I is not tantamount to full consideration of the genetic and somatic effects of radioactive discharges from the plant.

128. We denied Applicants' Motion for Summary Disposition for the reasons set forth in our Order of July 20, 1977, 6 NRC 167 (1977). We have read the cases currently cited and see no reason to disturb our previous ruling. In the *Hartsville* case, in fact, we note that the Appeal Board said that, where a coal plant would be a viable alternative, an explicit statement of the risk of diseases and genetic effects is "imperative." Nowhere did the Appeal Board suggest that the existence of Appendix I precludes review of these effects.

129. Intervenors presented Dr. Rosalie Bertell (Intervenors' Exhibit 1). The Staff presented Dr. Marvin Goldman (written testimony, pp. 1-10, fol. Tr. 1022). Applicants presented Dr. G. Hoyt Whipple (Tr. 1215, *et seq.*).

130. There was no dispute over the fact that the Black Fox Station will comply with Appendix I to 10 CFR Part 50. Nor did Intervenors' witness have any opinion contradicting the technique used to estimate emission rates for radionuclides, transport of radionuclides, or doses due to radionuclides emitted by the plant. The chief disagreement between the Staff's witness and the Intervenors' witness centered about the health effects expected from the doses which were predicted (Bertell, Tr. 820, 821).

131. Dr. Goldman assessed the somatic effects of proposed releases from Black Fox in terms of the increase over natural radioactive background and the possibility of an altered cancer rate as a result. He dealt with statistics applicable to the one million people who reside within about 50 miles of the plant (Goldman, p. 3). He noted that there would be about 1,704 cancer deaths per year expected in this population, that current estimates of cancers caused by radiation would suggest the approximately 100,000 man-rem[14] per year which this population receives from the natural background radiation is responsible for about ten of these deaths, and that Black Fox, which he assumed would add about 2[15] man-rem to this

[14]For a definition of "man-rem" see footnote 2 to Summary Table S-4, 10 CFR Part 51.

[15]The Board notes that the FES suggests the value for the population dose within 50 miles

(Continued on next page.)

burden, would result in about 0.0002 additional deaths, thus yielding a total of 1704.0002 (Goldman, p. 4). He also stated that recent data lead him to believe that even this estimate is too high (Goldman, pp. 4, 5).

132. Dr. Bertell testified that the diseases associated with exposures to ionizing radiation were diseases associated with old age and lowered immunocompetency, that this affected the ability of an exposed person to cope with other environmental hazards, and that the effects of ionizing radiation can be statistically accounted for by an upward shift in age proportional to exposure (Intervenors' Exhibit 1 at p. 8). She made no quantitative estimates of the increase in cancer incidence due to Black Fox Station effluents, but did append to her testimony two tables prepared by others purporting to show that accepted estimates of risk for given radiation levels were low, perhaps by a factor of more than ten (Intervenors' Exhibit 1 at p. 7). Her own work, primarily a statistical analysis of epidemiological data, suggested to her that there might be a small group of very radiation-sensitive people, and that, for very low doses, the effects might be much larger than would be assumed by extrapolation from high dose levels (Tr. 823-829). Again she gave no quantitative values for this increase. We note, however, that when pressed for quantitative estimates and led through such a calculation under cross-examination, she agreed to values that were, if anything, slightly smaller than those computed by the Staff's witness for expected cancer-related mortality due to Black Fox (Tr. 852-853; 858-859).

133. Applicants' witness, Dr. Whipple, testified that the risk coefficients used in Dr. Goldman's analysis were such as to overestimate the adverse effects caused by the plant (Tr. 1221). He alleged that these effects would be so small that to detect them in a systematized statistical survey of population health would require that one study the health records over thousands of years (Tr. 1225).

134. The Board has considered all the testimony presented and the qualifications of the witnesses. Dr. Goldman is Director of the Radiobiology Laboratory of the University of California at Davis; Dr. Whipple is a Professor of Radiological Health at the University of Michigan. Dr. Bertell's degree is in mathematics, and although without formal medical qualification, she has worked "in a medical community" (Tr. 818). She appears not to be familiar with nuclear reactors and their effluents (Tr. 768, 770, 884). Further Dr. Bertell's views seem, at present, so unquantified as to be of limited use in constructing a cost-benefit analysis, and when quantification is attempted, her views do not seem to yield data that suggest the other witnesses' estimates are far too small.

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would be 12 man-rem (FES Table 5.9 at p. 5-23). Even at this level the change would only be from 1,704 to 1704.0011.

135. We have also considered the absolute size of the estimated effects. Even were the estimates too low by a factor of ten or more, as the tables in Dr. Bertell's testimony might be taken to imply, the somatic effects would be miniscule. Health effects would not only be an indistinguishably small fraction of those occurring without the plant, they would be a small fraction of those anticipated from the coal alternative (*cf* FES Table 9.12 at 9-15). We see no reason to believe that these effects tip the environmental balance against the plant, or that they would support selection of a coal alternative.

136. The Staff's witness, Dr. Goldman, assessed the genetic effects of radioeffluents from Black Fox. He computed that, at Appendix I limits, the normal mutation rate of 52,000 per million live births would be raised to 52,006 (Goldman, p. 7) in the first generation. He also calculated the risk of genetic effects on plant personnel, who, the Staff calculates, may receive as much as 500 man-rem per year at each unit (FES at p. 5-21). He assumed that the 1,000 man-rem is a total body dose and that only one parent is occupationally exposed. He found that the genetic frequency would be raised above spontaneous effects by one one-thousandth (Goldman, pp. 7, 8).

137. Dr. Bertell asserted that there existed an increased risk of certain diseases for offspring of persons who had x-ray exposure (Tr. 829, 830) where such exposure was enough to deliver several tens of millirads to bone marrow (Tr. 830). She asserted that this genetic effect would cause this increased risk in "a small one percent" of the next generation (Tr. 829). She made no further attempt to quantify the risk.

138. As with the somatic effects, we observe that, while Dr. Bertell and Dr. Goldman may differ in theory the practical effect of their difference is not large, and any assessment of expertise must weigh in Dr. Goldman's favor.

139. We see no reason why the genetic effects anticipated should weigh strongly against Black Fox either in the environmental balance or in the comparison with alternatives.[16]

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[16]Although the matter is not directly mentioned in Contention 36, Intervenors' witness Dr. Bertell, made extensive reference to her belief that a health monitoring program was necessary in the population surrounding Black Fox to detect possible radiological health effects (Intervenors' Exhibit 1 at pp. 10-12; Tr. 879-880). The Board felt this matter might bear upon health effects in the cost-benefit analysis and admitted the testimony over Applicants' objection (Tr. at 897-898). Dr. Goldman also addressed this matter (Tr. 1182-1185), as did Dr. Whipple (Tr. 1223-1226).

Because of the latency period inherent in many health effects, and because of the total amount of data which must be gathered to establish the existence of such effects, the response time of such a system is long. Dr. Whipple thought the studies would require thousands of years (Tr. 1225). He felt that the matching of proper sets of control individuals would be im-

(Continued on next page.)

3. Radiological and Bioaccumulation Monitoring

Contention 37 (a) and (b):

Intervenors contend that the Applicants preoperational and operational radiation monitoring program is insufficient in that:

(a) the preoperational monitoring program will not provide an adequate baseline of background radiation because the data utilized is from areas too remote from the site; and

(b) the operating monitoring program will not adequately measure the concentration and magnification of radiation in the food chain.

140. Applicants' witnesses were Dr. John Robinson (written testimony, pp. 1-12, fol. Tr. 597) and G. Hoyt Whipple (Tr. 1215-1226). Intervenors presented Dr. Rosalie Bertell (Intervenors' Exhibit 1). Staff's witnesses were Richard Emch (written testimony, pp. 1-4, fol. Tr. 1022) and Dr. Marvin Goldman (written testimony, pp. 1-10, fol. Tr. 1022). Mr. Robert Craig, of the Oklahoma State Health Department, was called by Staff to present limited testimony on a State program for monitoring public water supplies (Tr. 2258-2266).

141. Intervenors contend the preoperational monitoring program is inadequate because they believe 2 years of data to be insufficient for meaningful analysis. They feel that the preoperational monitoring should have begun prior to this hearing. Intervenors further contend that the preoperational monitoring program is deficient because it does not include any human health monitoring.

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possible (Tr. 1226). Dr. Goldman characterized such a program as "an exercise in futility" citing the smallness of the population at risk and the difficulties in seeing the small effects (Tr. 1183).

Dr. Bertell was much more sanguine about the prospects, probably because of her theories, discussed above, that very small amounts of radiation produce disproportionately large health effects. But even by her estimate, if the entire population of Oklahoma were regarded as being the population at risk, nothing would be seen for a few years (Tr. 880-881).

From the evidence presented here, the Board concludes that a system which would tell us that something was awry only after a lapse of years would be of little value as an addition to the monitors already planned. We are aware that some investigators have claimed detection of health effects at levels too low to measure. Indeed, Dr. Bertell apparently was alluding to such studies when she mentioned nine extra deaths near small reactors (Tr. 853). But we saw nothing in this hearing that would suggest a real casual relationship exists between health effects and levels undetectable by detection systems that respond in a very short time.

We see no reason to condition issuance of any license for this plant upon population health surveys, either before or during operation.

142. With respect to the operational monitoring, Intervenors criticize it also for not including health data for the general population and specific incidence of diseases in order to evaluate the effect on health. They claim important pathways, such as cheese, waterfowl, and squirrels are ignored and that the choice of pathways was based on data from *Monticello* which has little relation to Black Fox because it is remote, in a different climate, and is of different design.

143. The preoperational and operational monitoring programs proposed are described in the FES, Sections 6.1.2 and 6.2.2. These were amplified by Dr. Robinson (p. 6) and Mr. Emch (p. 2). The preoperational monitoring would begin no later than 2 years prior to the scheduled startup date (Robinson, Tr. 673). Sampling locations were selected in accordance with NRC and EPA guidelines, and provide for sampling from areas likely to be affected by Black Fox and from control areas unlikely to be influenced by Black Fox (Robinson, p. 6). Media to be sampled represent four pathways—air, water, food, and external radiation—and include air particulates, air iodine, direct radiation, surface and ground water, aquatic plants, benthic organisms, bottom sediments, fruits and vegetables, selected fish, game birds and animals, meat, poultry, eggs, and milk (FES, pp. 6-2 to 6-5, Table 6.1). Soil will also be monitored in preoperational programs, but not in initial phase of operation program. Applicants state that they will use techniques for analysis necessary to determine compliance with standards for exposures (Robinson, Tr. 693).

144. The operational monitoring is essentially a continuation of the preoperational program (FES, pp. 6-12 to 6-13) except that it will be modified to reflect experience gained in the preoperational period and changes in land use. With respect to Intervenors' concern about using data from remote areas with different climates, Dr. Robinson's unrefuted testimony (Tr. 683) was that the difference in climate of two areas was not important in assessing the influences of climate to be considered in designing a monitoring program.

145. Mr. Emch (p. 4) stated that the Applicants' radiological monitoring program meets the recommendations of Regulatory Guide 4.8. This was not refuted.

146. The Board finds that the proposed pre and postoperational radiological monitoring programs consider the most likely pathways to humans and that the intermediate media are ones most apt to affect concentration in the food chain. The Board sees no objection to using data from other plants in other locations in the design of monitoring programs.

147. During the hearing, Intervenors called the Board's attention to news articles about radium being found in deep-well water supplies of northeastern Oklahoma communities and raised questions about how this

information might influence the design of the radiological monitoring program for Black Fox. At the request of Intervenors and the Board, Staff arranged for Robert Craig, Director of Radiation Protection Division, State Department of Health, to appear. Mr. Craig testified that deep-well water supplies for three towns in northeastern Oklahoma exceed EPA and State standards for radium—5 picocuries/liter. The highest was 10 picocuries per liter in a supply 53 airline-miles from Black Fox Station. However, he saw no possible interaction between Black Fox Station and those water supplies. Also, any radiation from Black Fox Station to a worker who lived in the community would be insignificant compared to natural background radiation. Mr. Craig also stated that the State would conduct its own monitoring program and would compare its results with those of Applicants' monitoring program (Tr. 2258-2269).

148. As to the Intervenors' position that a proper monitoring program should include the measurement of health effects in the population surrounding Black Fox Station, this matter is discussed in some detail in our treatment of Contention 36 in footnote 14, *supra.*

149. The Board finds that the preoperational and operational programs proposed are adequate and meet NRC regulatory guidelines. Initiation of the preoperational monitoring at least 2 years prior to startup is sufficient time to establish baseline environmental conditions to evaluate the influence of Black Fox. The various media samples proposed appear to be sufficient even though the plan does not include every conceivable item of food that may be consumed. The Board finds that monitoring food and other media will provide data that can be used to modify operations quickly should any concentrations appear in these items that would cause concern, and thus prevent unacceptable exposures to people.

4. Occupational Radiation Exposures

Contention 65:

The Black Fox facility will not meet the employee exposure limitations of 10 CFR Part 20, and the health effects of employee exposures have not been adequately considered.[17]

[17]This contention was admitted by the Board in its Third Prehearing Conference Order of March 9, 1977, in connection with allowing intervention by petitioner Ms. Sherri Ellis. When the Appeal Board reversed our admission of Ms. Ellis (ALAB-397, 5 NRC 1143), the status of this contention was left undefined. Staff and Applicants presented testimony. Staff numbered the contention "67" and Applicants and Intervenors numbered it "65." The wording of these versions also differed slightly. We here adopt the Staff's wording and the other parties' numbering.

150. The Staff presented Dr. John Nehemias (written testimony, pp. 1-3, fol. Tr. 1022). Applicants' witness was Dr. John West (written testimony, pp. 1-4, fol. Tr. 704). When it developed that certain portions of Dr. West's testimony had been prepared under the supervision of Dr. M. John Robinson, Dr. Robinson was called to the stand to verify such material and it was introduced as his testimony (Tr. at 722-727).

151. The Staff's testimony dealt largely with historical experience at power plants. Dr. Nehemias pointed out that, on the average, worker exposure in 1975 was only 0.8 rem, less than one-fifth of the lifetime average yearly exposure permitted by 10 CFR Part 20 and less than one-twelfth of the limit permitted in a year under some circumstances (p. 1). Further, a review of the Applicants' safety analysis report has led the Staff to conclude that, not only will the numerical requirements of 10 CFR Part 20 be met, but exposures will also meet the criterion of being as low as reasonably achievable (Nehemias, p. 3).

152. Applicants' witnesses prepared an estimate of the total number of man-rem to be expected per year by estimating dose rates and occupancy levels throughout the plant and adding allowances for use of outside personnel and for exposures during unplanned outages (West, p. 4; Tr. 727). All calculations were based upon an assumed equilibrium value to be reached after some years of operation (Robinson, Tr. 729). The result indicated an estimated exposure of about 400 man-rem per year at each unit (West, p. 4). The Staff's estimate, based on operating experience, indicated a value of about 500 man-rem per year per unit (FES §5.4.1.4 at p. 5-17).

153. After questioning the Applicants' witnesses in some detail about the number of people over which this four or five hundred man-rem will be distributed (Tr. 744-748), the Board is convinced that exposures can be kept within 10 CFR Part 20 limits. The PSO has stated its commitment to keep exposures as low as reasonably achievable (West, p. 3).

154. We see no indications that the requirements of 10 CFR Part 20 will not be met.

155. As to whether the health effects on employees have been adequately considered, we noted the treatment of this matter by Staff's witness Dr. Goldman in connection with Contention 36, *supra*. He calculated that the genetic effects due to plant personnel exposures would be very small. The Staff estimated a total of about eight additional cancer deaths throughout the plants' lifetime if currently accepted risk coefficients are used (FES §11.1.5.32 at p. 11-13). The total numbers involved are small, too small to be noticed against the incidence of such effects that occurs in the plants' absence, and are as noted above, small compared to health effects from the coal alternative (*cf.* FES Table 0.12 at 9-15).

156. While Intervenors did not present testimony directed exactly to this

contention, much of what Dr. Bertell said bore upon the validity of the risk coefficients involved. Attachment 2 to her testimony (Intervenors' Ex. 1) was, in fact, a report by a group who studied certain workers and reached the conclusion that risk coefficients are currently underestimated. Her own work on an epidemiological study called the "Tri-State Study" has led to generally similar conclusions (Tr. 811). (Quantitative results from the Tri-State Study were not presented here.)

157. The Staff's witness, Dr. Goldman, and Applicants' witness, Dr. Whipple, had several criticisms of these findings (Goldman, Tr. 1172-1173; Whipple, Tr. 1222-1223). As noted earlier in connection with offsite effects, Dr. Bertell's opinions seem too unquantified to be used as a basis for reliable estimates of health effects.

158. The Board has considered all of this evidence. It appears that the worker exposure, measured as population exposure in man-rems, is expected to be considerably larger than the population exposure from effluents. Nevertheless, even assuming the currently accepted risk coefficients to be too low, we find that the incidence of total effects will be small compared to the spontaneous incidence of such effects in the total population at risk. We do not feel they tip the environmental balance against the plant or militate in favor of an alternate energy source.

H. Need for Power

1. Variability of Demand

Contention 48:

Intervenors contend that the Applicants' and the Regulatory Staff's projected power requirements are inaccurate because they do not adequately consider elasticity of demand in that:

(a) the analysis fails to consider the effect of promotional rate structures and alternative rate structures that might control electricity demand;

(b) the analysis fails to consider measures which affect energy demand as a result of efforts to promote more efficient utilization of electric energy; and

(c) the analysis fails to consider measures designed to flatten peak-loads, including the charging of more money for electricity used during periods of peak demand, load staggering, and selective load shedding.

a. Rate Structure

159. Intervenors presented no testimony on this contention.

160. Applicants' witness was Mr. Frank Meyer (written testimony, pp. 1-39, fol. Tr. 2391) who testified that PSO does not have a promotional rate structure (pp. 19-20). He noted that PSO does have a declining block structure and does offer a low rate for large customers, but he asserted that these features were meant to reflect the cost of producing and delivering electric power and were not meant to encourage use. He stated that retail rates placed in effect in May of 1975 eliminated all special rates that may have been alleged to be promotional (p. 20).[18]

161. Staff presented Dr. Alan Wolsky (written testimony, pp. 1-10, fol. Tr. 2799). This witness discussed in some detail the meaning of the phrase "promotional rate schedule." He concluded that the most reasonable meaning was that a lower rate was being offered than would be required to recover cost, *i.e.*, that some class of users was being subsidized (p. 2; Tr. 3107). He specifically stated that he did not feel that a declining block rate structure was "promotional." He agreed with Applicants' witness that declining block structures merely reflected cost to produce and he pointed out that, since the average monthly consumption of PSO's customers was above the level where rates cease to decline, there was no reason to assume that the declining structure encouraged greater use (p. 3).

162. Intervenors did not suggest any alternative structure that might curtail use in the manner which their contention implies.

163. In response to Board questioning, Staff's witness did agree that there might be some rate structure which would set electricity at so high a price that growth of demand might decrease to the point where BFS would not be needed (Tr. 3102, *et seq.*), but that such a price could not be estimated by available techniques and data (Tr. 3104, 3105) and that it would violate the usual principles of regulation (Tr. 3122). The FES states "neither adequate data nor studies exist that would support a conclusion that . . . price and rate structure changes would so reduce the projected need for power in the Applicants' service area in the next several years as to make unnecessary

[18]Mentioned in this regard were, *inter alia*, "discounts for . . . water heaters." The witness repeated under cross-examination that there are no water heater discounts "at this time," such discounts having been phased out " . . . sometime this spring" (Tr. 2404). Intervenors, apparently in an effort to discredit this witness, have included with their proposed findings an attachment purporting to be a PSO rate schedule and listing a lower rate in a limited range of consumption for "[e]lectric water heating customers only . . . " effective September 29, 1977. The Board notes that the attachment was neither tendered as an exhibit nor was the witness cross-examined thereon. In any event, the document does not serve to discredit the bulk of the witness's testimony.

the construction and operation of Black Fox Station" (Staff Ex. 1, §8.2.4.3 at p. 8-22).

164. The Board finds no evidence to indicate either that Applicants' rate structures are "promotional" or that there exist rate structures which could obviate the need for BFS.

b. Efficiency of Utilization of Energy

165. Intervenors did not present direct testimony, Applicants' witness asserted that PSO attempts in a limited way to encourage its customers to conserve, using media advertising to inform customers about ways to save energy (Meyer, p. 23; Tr. 2316). He also said that the anticipated effects of this advertising were included in Applicants' forecast, but he did not say exactly how this inclusion was accomplished (Meyer, p. 23). He noted also that Applicants' forecast allowed for improved space heating efficiency and improved appliance efficiency (Meyer, pp. 9-11). Staff's witness (Wolsky, p. 4) testified that the demand forecast included in the FES (Staff Ex. 1, §8.2.3.2 at p. 8-18) listed as its lower extremum in growth rate 4.9 per year and that this lower value was based upon the Federal Energy Administration's (FEA) "conservation scenario," a scenario which allows for:

(a) national thermal efficiency standards for new residential and commercial buildings,

(b) appliance efficiency improvements and mandatory labelling,

(c) tax incentives for insulation retrofit of homes and commercial buildings,

(d) incentives to stimulate load management by electrical utilities, beside other assumptions that pertain more directly to the conservation of oil and gas.

166. The FES examines energy efficiency in some detail and concludes that any significant reduction in the future peak demand for electricity due to conservation of energy is "highly uncertain at this time" (FES §8.2.4.5 at p. 8-24). It further concludes that, of the range of growth rates there predicted (4.9% to 6.4% per year) the higher growth rate is "more likely" (FES §8.2.3.1 at p. 8-18).

167. The Board sees no reason to believe that these analyses have in any way failed to consider "efforts to promote more efficient utilization of electric energy."

c. Flattening of Peakloads

168. The Staff witness, Dr. Wolsky, pointed out that, implicit in this contention, there is the notion that measures designed to flatten peakloads

would reduce the need for Black Fox Station. This notion he branded as simply "not so" (Wolsky, p. 4). He pointed out that the Staff's projections would show a need for Black Fox 1 by 1984 and for additional nongas-burning capacity by 1986 even if loads were totally flattened and entirely level (Wolsky, p. 5).

169. Applicants' witness, Mr. Meyer, testified that PSO has a study project to quantify the economic effects of load management, load staggering, and load shedding (Meyer, p. 22), but that no conditions presently exist wherein such actions could be beneficial (Meyer, p. 23).

170. Intervenors presented no direct testimony on this contention, but one of Intervenors' witnesses, Dr. Robert Halvorsen, called to testify on related Contention 49, *infra*, noted that the need for baseload plants such as BFS did not depend upon peak demand (Tr. at 2535).

171. The Board sees no reason to assume that such measures as those mentioned in Contention 48(c) will obviate the need for Black Fox Station.

2. Projected Power Requirements

Contention 49:

Intervenors contend that the Applicants' and Regulatory Staff's projected power requirements are inaccurate because they assume a linear growth based on historical precedents; *e.g.*, the economic environment of Applicants and the industry in general was substantially different and the historical data is, in future terms, overstated because of the past impact of air-conditioning, promotional activities, advertising, selection of generating mix operating practices. In addition, the validity of the projected industrial and commercial demands are not substantiated.

172. Applicants presented testimony by Mr. Frank Meyer (written testimony, pp. 1-39, fol. Tr. 2391). The Staff presented testimony by Dr. Alan Wolsky (written testimony, pp. 1-10, fol. Tr. 2799). Intervenors' witness was Dr. Robert Halvorsen (written testimony, pp. 1-9, fol. Tr. 2443).

173. Mr. Meyer discussed the techniques used by Applicants for projecting power requirements. For PSO, the methodology uses historic customer and sales data based on a 10-year period. Residential and commercial sales, adjusted to correct for weather-related effects, are used, and mathematical curves including parabolic, linear, and exponential curves are selected to "best fit" each class of customers in various geographic regions (pp. 7-8). The modeled projections are adjusted by "experienced judgment" guided by quantitative assessment of such factors as population shifts, economic changes, price elasticity, and electric appliance saturation estimates. Certain

large customers are treated individually. The separate forecasts are consolidated and further adjusted for accounting changes and distribution losses (p. 8). The witness gave details as to how the important parameters entered the calculation (pp. 8-16).

174. Associated Electric Cooperative and Western Farmers Electric Cooperative prepare their load forecasts in accordance with accepted methods and instructions contained in the Rural Electrification Administration Bulletin 120-1 (Rev.). The technique prescribed therein accounts for residential, commercial, and industrial development patterns of energy usage and appliance saturation and other factors (Meyer, pp. 16-19). The Applicants' methods for predicting power requirements, although fundamentally based on historical data, do not seem to the Board to constitute a simple linear extrapolation.

175. The Staff witness, Dr. Wolsky, testified that the Staff's method of projecting power requirements was not a linear extrapolation (p. 6). The FES indicates that during preparation of its forecast of the need for the capacity of the BFS, the Staff considered both national and regional projections of future economic growth and the market demand for electricity. The Staff began with the assumption that the regional growth in demand will be the same as that projected for the nation as a whole. The Staff expects a difference between these rates of growth only when fundamental regional demographic or economic variables are projected to be different from their national counterparts. Considerable weight was given to the forecast of national demand for electrical capacity prepared by the U. S. Federal Energy Administration (FEA) and the forecasts of regional growth in population and economic activity prepared by the U. S. Department of Commerce and the U. S. Department of Agriculture. The Staff has also considered the work of the Center for Economic and Management Research of the University of Oklahoma and that of the Oklahoma Energy Advisory Council. The FEA's forecast appears in the publication "1976 National Energy Outlook," which was, when the FES was prepared, the latest result of the most comprehensive energy analysis this nation has undertaken. This report considers the future demand for electricity within seven different scenarios. The greatest rate of growth, 6.4%, in the consumption of electrical energy is projected to occur if the nation implements a vigorous program to increase the end use of electricity in place of oil and gas. The least rate of growth, 4.9%, is projected in the FES to occur if the nation adopts a full set of conservation policies (Staff Ex. 1, §8.2.3.1 at p. 8-14).

176. After reviewing the forecasts for regional growth, the Staff concluded that economic growth in PSO's service area and in Oklahoma will be similar to that experienced by the nation as a whole and that therefore long-term growth in demand for electrical energy will be between 4.9% and 6.4%

(FES §8.2.3.2 at p. 8-18). The Staff concludes that, from the standpoint of maximum hourly load, Black Fox could be delayed until 1985 (FES §8.3.1 at p. 8-28), but that the need to reduce consumption of natural gas makes it desirable to install the facility as planned by Applicants (FES §8.3.1, §9.1.1; Wolsky, p. 8). We note, however, that Staff's low growth projection would leave PSO's reserve at only 13.9% in 1984 without Black Fox 1. Under the high growth assumption reserves would be zero at that time (FES Table 8.15, errata sheet, following Wolsky testimony).

177. Intervenors' witness on need for power, Dr. Halvorsen, advocates the use of econometric models to develop more accurate projections of electrical consumption in the Applicants' service area. He suggested that factors likely to affect consumption be derived by statistical analysis to determine the actual responsiveness of consumption to each factor (p. 2). He testified that because of projected higher costs of electricity in Applicants' service area, a change in the growth rate of electric energy should be anticipated (p. 4).

178. Dr. Halvorsen stated that because of rapidly increasing prices in Applicants' service area—which had traditionally experienced low electrical prices—the Staff's reliance on the FEA's national forecasts rather than its regional forecasts was misplaced (p. 6). The FEA's projected regional growth rates published in its "1976 National Energy Outlook" were examined by Dr. Halverson and he concluded that the Staff's forecast should be revised downward at least 1.4% (p. 7). He was shown two FEA printouts (Staff Exs. 3 and 4; Tr. 2526-29, 2531) representing more recent projections. These printouts, subsequently admitted into evidence (Tr. 3508), were for the region he had previously examined with one State, New Mexico, added (Tr. 3504). From these he calculated that the growth rate in the southwest region for the base (no conservation) case would be 6.23% (Tr. 2527-2528), a figure within the range used by the Staff.

179. Staff's witness Dr. Wolsky had also recalculated growth rates, using recent FEA data and the disaggregation technique of Dr. Halvorsen in his "Testimony of Alan Wolsky, to Rebut Intervenor's (Robert Halvorsen) Direct Testimony on Contention 49" (Wolsky rebuttal, pp. 1-3, fol. Tr. 2799). He obtained a range of yearly growth rates from 5.4% to 6.5% by his own method and from 5.4% to 6.4% by the method Dr. Halvorsen preferred.

180. The Board sees no particular reason to prefer one or another of these methodologies. All yield very similar answers. Using the latest figures on projected growth for the region, Dr. Halvorsen gets essentially the same growth rates as the Staff and the Applicants. Indeed, it appears that one of the main reasons he had originally projected a much greater possible delay in construction of Black Fox Station was that he anticipated much greater available capacity without Black Fox. For example, he projects a capacity of 4,057 MWe for PSO in 1984 (Halvorsen testimony, Table 6 at p. 15),

while Staff and Applicants project only 3,612 MWe at that time (FES Table 8-15, errata to FES, fol. Tr. 2799). It appears that this discrepancy is simply the result of Dr. Halvorsen's use of outdated information. He cites the Applicants' Environmental Report Supplement 4, Table 1.1-7a, as his source; the present version of this table, Supplement 8, shows the figure used by the Staff (Appls'. Ex. 3, Table 1.1-7a at p. 1.1-41).

181. We see no reason to assume that use of a different technique for projecting growth of demand would suggest that BFS will not be needed or could be substantially delayed. We further recognize that, when one considers the inaccuracies inherent in such predictions, it is wise to err on the side being prepared too early, especially in view of the dwindling supplies of natural gas which are anticipated.

3. Reserve Margin

Contention 50(d):

Intervenors contend that the Regulatory Staff and Applicants have not demonstrated a sufficient need for power to justify construction of Black Fox 1 and 2 in that:

(d) the projected demand could be reduced by using a reserve margin of less than the 15%-20%.

182. On this contention the Applicants presented Mr. Frank Meyer (written testimony, pp. 1-39, fol. Tr. 2391); the Staff presented Dr. Alan Wolsky (written testimony, pp. 1-10, fol. Tr. 2799). Intervenors did not offer direct testimony.[19]

183. As Dr. Wolsky points out, the wording of the contention misuses certain terms of art. "Reserve margin" is added to "projected demand" to assess the need for total generating capacity. Projected demand is independent of reserve margin (Wolsky, p. 7). We assume that what is at issue here is an assertion that the need for generating capacity (and hence the need for BFS) could be reduced by reducing reserve margin, not that "projected demand," as that term is customarily used, could be reduced.

184. PSO is bound by an agreement with the Southwest Power Pool to maintain a reserve margin of 15% (Wolsky testimony at p. 7; FES §8.3.2 at p. 8-28). Applicants' projections suggest that, even with Black Fox, reserve

[19]Intervenors assert in their proposed findings that "it appears *from the evidence* that PSO habitually overbuilds (see, *e.g.*, R. p. 2410-11)" (Intervenors' Proposed Findings at p. 98) (emphasis added). Review of the cited transcript pages shows that the allegation of excessive reserve margin came entirely from a document read by Intervenors' attorney, a document that was not admitted into evidence.

margins in the 1980's will be less than 15% and without Balck Fox would in some cases be negative (Meyer, p. 35 and Exhibit JM-6). Staff projections indicate that reserve margins with Black Fox range between 15% and 20% and without this facility would be zero in 1984 and negative in 1986 (Wolsky, p. 7; FES Table 8.15, errata, fol. Tr. 2799). Reserve margins for Associated and Western fluctuate more than those for PSO, but would be well below 15% with their respective shares of BFS, and in some years Western would have negative reserves if Black Fox were postponed even 1 year (Appls'. Ex. 3, Table 11-12b at p. 1.1-59; Table 1.1-12c at p. 1.1-59a).

185. Dr. Wolsky characterizes a 15% to 20% reserve margin as typical (Wolsky, p. 7). Mr. Meyer reports that a 15% reserve margin is lower than the normal recommendations of many utilities' managements, public service commissioners, and utility reliability planning groups (Meyer, pp. 34, 35).

186. The Board finds that reduction in reserve margins is not a workable alternative to the construction of Black Fox Station.

4. Sale of Power to Grand River Dam Authority

Contention 53:

Intervenors contend that the Applicants and Regulatory Staff have overstated the projected demand for the power to be produced by Black Fox 1 and 2 by including the sale of power to the Grand River Dam Authority.

187. Mr. Frank Meyer (written testimony, pp. 1-39, fol. Tr. 2391) testified for the Applicants. No other testimony was presented addressing this contention.

188. Intervenors did not discuss this contention in their proposed findings, except for a brief reference (on p. 99) to some past projections and an acknowledgement that sales to Grand River Dam Authority will not continue in the future.

189. Mr. Meyer (p. 30) testified that Applicants have no plans to sell power to the Grand River Dam Authority after 1981 and hence sales to GRDA have no effect on the need for Black Fox. Applicants did not include sales to GRDA in their projections of power needs after 1981 (Exhibit FJM-7). This was not refuted. Accordingly, we find no merit in this contention.

5. Solar and Wind Power

Contention 50(b):

Intervenors contend that the Regulatory Staff and Applicants have not demonstrated a sufficient need for power to justify construction of Black Fox 1 and 2 in that:

(b) the projected demand could be reduced by utilization of solar space heating and cooling.

Contention 64:

Intervenors contend that the Applicants and the Regulatory Staff have not adequately considered the relative costs and efficiencies of supplying power from solar . . . facilities.[20]

Contention 52:

Intervenors contend that, assuming a need for power, produced by Black Fox 1 and 2 the Regulatory Staff and Applicants have not adequately considered the alternative of supplying that power by producing the electricity from wind-generating facilities.

190. Applicants' witness was Frank J. Meyer (written testimony, pp. 1-39, fol. Tr. 2391). Testimony for Intervenors was provided by Richard McKim (written testimony, pp. 1-11, fol. Tr. 3550) and Dr. Karl Bergey (copy of statement before House Subcommittee on Energy, May 21, 1974, fol. Tr. 2327). Staff witnesses were Timothy Clifford (written testimony, pp. 1-7, fol. Tr. 2732, and pp. 1-5, fol. Tr. 2757), Howard McLain (written testimony, pp. 1-11, fol. Tr. 2732), Jack Roberts and Darrell Nash (written testimony, pp. 1-12, fol. Tr. 3586).

191. Intervenors' proposed findings on pages 105 to 107 are identical to those on pages 102 to 104. They fail to cite the evidentiary record in support of these findings. Intervenors argue that solar energy is already in use in Oklahoma and elsewhere to provide low grade thermal energy and that its use is increasing. They also contend that solar energy is economically feasible for uses other than air-conditioning and could ultimately supply 70% of residential demand. Use of wind power is another source Intervenors contend could meet some energy demand. They believe that, if these sources were used to their maximum, and conservation methods were fostered, there would be no need for Black Fox.

192. Applicants (Meyer, attached Ex. FJM-1) claim that, in PSO's service territory, a very small percent of space and water heat is supplied electrically. Thus solar energy would not have a great impact on need for electricity. Staff calculations show that the high initial cost of solar energy will limit its use to only a small percentage of housing in this area by mid-1980's.

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[20]This contention alluded to both solar and coal-fired facilities. We treat the relative costs of coal-fired facilities in Section H. 6, *infra*.

An optimistic estimate of savings of electricity was about 7.6% of Black Fox annual output, but a more realistic estimate was 2.2% (Clifford, fol. Tr. 2732, pp. 3-4, 6).

193. The Board is of the opinion that solar energy would not be a practical substitute for Black Fox in the generation of electricity to satisfy high quality electrical energy needs (see Section H for a discussion of energy needs). Low quality energy needs, such as space heating in residences, are currently met by other sources; hence expansion of solar energy for that purpose may be desirable but would have little effect on the need for Black Fox.

194. Wind power was not considered developed to the point that it is a realistic substitute for electrical generation in urban areas (McLain, pp. 7-11). Dr. Bergey concedes that it is not possible to buy a large-scale wind generator (statement before House Subcommittee on Energy). He also testified that small machines (50 kW), or larger ones, used for electricity generation would have to have a backup energy source or batteries (Tr. 2341). The Board finds that the evidence shows that large-scale wind-powered electrical generators are not available and are not a practical alternative to Black Fox.

6. Coal-Fired Facilities

Contention 64:

Intervenors contend that the Applicants and the Regulatory Staff have not adequately considered the relative costs and efficiencies of supplying power from coal-generated facilities.

195. Since the closing of the record in the instant case, the Atomic Safety and Licensing Appeal Board has issued *Consumers Power Company* (Midlant Plant, Units 1 and 2), ALAB-458, 7 NRC 155 (1978), in which the Appeal Board elucidated the extent to which Licensing Boards should pursue the relative economic costs of alternatives to a proposed plant. In that opinion at pages 162, 163, the Appeal Board said:

> . . .Unless the proposed nuclear plant has environmental disadvantages in comparison to possible alternatives, differences in financial cost are of little concern to us. . . .
>
> * * * *
>
> The passage of the National Environmental Policy Act increased our concern with the economics of nuclear power plants, but only in a

limited way. That Act requires us to consider whether there are *environmentally* preferable alternatives to the proposal before us. If there are, we must take the steps we can to see that they are implemented if that can be accomplished at a reasonable cost; *i.e.,* one not out of proportion to the environmental advantages to be gained. But if there are no preferable environmental alternatives, such cost-benefit balancing does not take place. Manifestly, nothing in NEPA calls upon us to sift through environmentally *inferior* alternatives to find a cheaper (but dirtier) way of handling the matter at hand. In the scheme of things, we leave such matters to the business judgment of the utility companies and to the wisdom of the State regulatory agencies responsible for scrutinizing the purely economic aspects of proposals to build new generating facilities. In short as far as NEPA is concerned, cost is important only to the extent it results in an environmentally superior alternative. If the "cure" is worse than the disease, that it is cheap is hardly impressive. [Footnotes omitted.]

In view of the Appeal Board's decision, this Board is of the opinion that much of the evidence presented by all three parties in connection with this contention (and certain others discussed) is irrelevant.[21] To be sure, were there some hint that a coal-fired plant could offer a lesser environmental impact, we would be bound to assess the economic cost differential occasioned by the choice of that alternative. But in this case, the evidence of record shows that the opposite is true. The evidence indicates that adverse health effects from a nuclear plant are considerably less than those from a coal-fired plant (Staff Ex. 1, §9.1.2.3 at p. 9-14, *et seq.,* and Section G.1. of this Decision). Applicants and Intervenors presented no direct testimony on the matter of comparison of impacts, although the magnitude of certain impacts which are peculiar to a nuclear plant were addressed in dealing with certain other contentions (*e.g.,* Contentions 36, 55, and 65). We conclude that a coal-fired generating station would not be environmentally preferable to the proposed Black Fox facility.

196. Further, the Appeal Board's decision clearly precludes from our consideration a "dirtier" alternative such as coal, mooting any question as to which is cheaper and mooting also the details of any fine-tuned relative cost calculations. (In this regard we see no substantial effect in the inclusion of the words "and efficiencies" in the contention.)

197. Much of the testimony and proposed findings on the following contentions were directed at a cost comparison with coal. To the extent they

[21]The witnesses who testified regarding this contention are identified in our discussions of Contentions 44, 45, 46, 47, and 55 in Section J.1., J.2., B.1., and J.3., respectively.

were so directed we have disregarded them. However, it has never been suggested that our responsibilities for cost-benefit analysis (as distinguished from costs of alternatives) are in any way preempted by the decisions of utility executives or public utility commissions. Accordingly, we here address ourselves to the question of whether the alleged inaccuracies specified in this contention are so large that electricity from Black Fox Station may ultimately be found to cost substantially more than it is worth when considered as a social benefit. (We pass over the socioeconomic convolution that suggests that a benefit is worth only what it would cost if bought from the cheapest alternative source; we examine only whether any of the inaccuracies mentioned would raise the cost of electricity from Black Fox Station so much that it would no longer seem attractive.) We proceed to consider Contentions 44, 45, 47, and 55.

I. Uranium Availability and Prices

Contention 47:

Intervenors contend that the Regulatory Staff and Applicants' cost-benefit analysis inadequately considers the cost and the availability of uranium to fuel Black Fox 1 and 2 during its expected life.

198. In order to discuss uranium availability and cost, we shall first need to define certain terms of art as they are used by those who examine uranium resources and needs. The definitions used here are those presented by Mr. John Patterson, a Staff witness, who prepared the FES section on uranium availability (Staff Ex. 1, §10.4.3 at pp. 10-7 *ff*) and presented supplemental testimony at the hearings (Patterson Supplemental Information, pp. 1-2, fol. Tr. 2632). Reserves are uranium resources with highest assurance regarding their magnitude and availability. Estimates of reserves are based on detailed survey data obtained from industry, and on detailed studies of the feasibility of mining, transportation, and milling. The methodology used is based on a 25-year effort in uranium resource evaluation. Resources that do not meet the stringent requirements of reserves are classed as potential resources. Potential resources are further subdivided into three categories: (1) probable resources are those contained within favorable mineral trends, largely delineated by drilling, within productive uranium districts; (2) possible resources are outside of identifiable mineral trends but in geologic provinces and formations that have been productive; (3) speculative resources are those estimated to occur in formations or geologic provinces which have not been productive, but which, based on evaluations of geologic data, are considered to be favorable for the occur-

rence of uranium deposits. The reliability of the estimates of the three potential resource classifications is greatest for the probable resources and least for the speculative (FES §10.3.4.3, p. 10-7). Further, the resources available are in some measure dependent upon the amount of money one is willing to spend to extract the uranium. Higher prices are required in order to produce uranium from ores of lower quality even if the deposits of such ores are well-delineated (FES at p. 10-8). To account for this fact the FES uses the concept of "cutoff cost." Such costs consider operating and future capital expenditures for mining, transporting, and processing ores, and are used to determine the quality limits of material to be included in a resource estimate. Cutoff costs are not prices, since prices are determined by total cost, profit, and market considerations (FES at p. 10-9). Some experts use the term "forward costs" in a similar way.

199. As to the amount of uranium required by all the reactors with which Black Fox Station will compete for fuel, two matters are of great importance: (a) "tails assay" at enrichment plants, the percentage of U-235 left in the depleted uranium leaving the enrichment stream, and (b) whether or not recycling is used to recover uranium and plutonium from spent fuel. As tails assay is increased, the amount of uranium needed to fuel a given number of reactors increases, rising about 20% as tails assay goes from 0.2% to 0.3%. Reprocessing of spent fuel, if allowed, would reduce uranium requirements (FES at p. 10-22).

1. Uranium Availability

200. Testimony on uranium availability was presented on behalf of Applicants by Mr. John M. Vallance (written testimony, pp. 1-26, fol. Tr. 3702). He estimated that over 3,500,000 tons of uranium were available on January 1, 1977, at a forward cost of $30 per ton (Vallance testimony at Ex. JV-1). This he felt was more than enough uranium to fuel the Black Fox plant, and indeed, all the plants presently projected for startup through 1990 during their lifetime. He pointed out that the 195 to 250 gigawatts total of reactors planned to be in operation by 1990 would require 1,000,000 to 1,300,000 tons of U_3O_8 if fuel is not recycled, and 600,000 to 800,000 tons if it is recycled, at a tails assay of 0.2%. Further, currently known reserves (including those up to $30 per pound forward cost) total 820,000 tons (Vallance testimony, pp. 17, 22; Ex. JV-4, Ex. JV-5, Ex. JV-10). He noted that the ERDA (now the Department of Energy) estimated resources including probable and speculative reserves (including those up to $30 per pound forward cost) total 3,510,000 tons (Vallance testimony at Ex. JV-1) and said that "I personally believe these estimates are reasonable and if anything will prove to be. . . low" (p. 6).

201. The Staff witness, Mr. Patterson, confirmed these values and noted that reserves, probable potential resources, and byproduct uranium from copper and phosphate production total 1,910,000 tons at $30 per pound cutoff cost and 2,350,000 tons at $50 per pound cutoff cost (Patterson Supplemental Information at p. 1 and Figure 1). He concluded that the 1,910,000 tons would be more than enough to fuel all nuclear power plants currently operable plus those under construction, on order, or announced for their lifetimes (Tr. 2633).

202. Intervenors presented Mr. Mike Males (written uranium testimony, pp. 1-32, fol. Tr. 2848). This witness presented information in the form of citations from various documents which claimed that less uranium is available than predicted by ERDA (pp. 21-29). However, this witness was not an expert in the field (Tr. 2849-2852), did not present a uranium supply computation (Tr. 2848-3006), or publish any literature in the field (Tr. 2999), and the authors of his resource estimations were not available for cross-examination (Tr. 3002). Due to the hearsay nature of Mr. Males testimony, and the lack of opportunity for cross-examination of the authors of the resource estimations, and the fact that he had no opinion of his own on the matter of uranium availability (Tr. 2917-18), the Board finds the information presented of doubtful probative value. Accordingly, the Board finds that his testimony, which is in direct disagreement with the preponderance of evidence presented at the hearing by two experts, indicates only that criticisms of the ERDA estimates do exist in the uranium literature.

203. In any event, it appears that Mr. Males primarily called into question whether there would be enough uranium for 600 to 1,000 reactors by the year 2000 (p. 6), although he acknowledges that there are only expected to be about 300 such plants by that time (Tr. p. 2961).[22] Based on the preponderance of the evidence presented at the hearing, the Board finds that there is a more than reasonable assurance that adequate uranium will be available during the lifetime of the plant so that no debit on the cost-benefit balance need be assessed for fuel availability.

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[22]In this connection the Appeal Board tells us that the proper base is the number of reactors "currently in operation, under construction, or on order." *Kansas Gas and Electric Company, et al.* (Wolf Creek Generating Station, Unit No. 1), ALAB-462, 7 NRC 320 (1978). We believe that is essentially the base herein addressed. We further note that the question of the fuel use efficiency of reactors was raised by Intervenors' witness Mr. Males (p. 13). Neither Applicants nor Staff addressed this issue in proposed findings, and Intervenors only hinted at it, giving no citation to the record (Intervenors' Proposed Findings at p. 81). Applicants' witness Vallance notes that with a nonreprocessing fuel cycle and 0.25% tailings assay, reactors similar to those at Black Fox Station will require about 5.6 tons of U_3O_8 per MWe for lifetime fueling. We did

(Continued on next page.)

2. Uranium Fuel Prices

204. Articles cited by the Intervenors' witness alleged that for a number of reasons, in recent times uranium prices had risen to as high as $50 per pound of U_3O_8 for 1980 delivery and might be well over $100 per pound in the future (Males, pp. 17-20), thus making nuclear power less attractive economically.

205. Testimony by the Applicants showed that uranium prices increased from $6-7 per pound in 1973 to a spot price for current delivery of around $42 per pound because the OPEC oil embargo and the artificiality of low 1973 prices resulted in a sellers' market. The Applicants expert saw U_3O_8 prices as staying stable at $30 to $50 per pound in 1977 dollars largely because higher prices have caused sufficient incentive to increase exploration efforts, and higher prices have made lower grade uranium deposits economic (Vallance, p. 18; Tr. 2639). This conclusion was supported by the Staff's expert who testified that, in terms of current dollars, the real price of uranium has probably gone down since 1976 (Patterson, Tr. 2639). Applicants' expert also testified that in the case of nuclear reactors, fuel price was not a strong factor in electric power costs. A change in price of $10 per pound of U_3O_8 results in a change of less than 1/10 of a cent per kilowatt hour in the fuel cost of a uranium fueled steam electric plant. For instance, the $7 to $42 per pound increase in uranium prices since 1973 resulted in only a 3/10 of a cent per kilowatt hour increase in production cost of electricity (Vallance, p. 19).

206. The Board finds that even though uranium prices increased substantially between 1973 and 1976, the chance is vanishingly small that further change will cause the cost of nuclear-generated electricity to increase to the point where the electric power is no longer a reasonable value. This

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(Continued from previous page.)
not hear testimony detailing the way in which this figure was derived nor did we hear details of the way in which the Staff, or Staff witness Patterson, arrived at the fuel requirement for a given number of plants. We note, however, that witness Males called fuel efficiency into question, not from his own knowledge but by referencing the work of Kazman, Huntington, and Selbin (p. 13). We note also that Messrs. Kazman and Huntington were witnesses in the *River Bend* case, 2 NRC 419 (1975), in which the issue of fuel efficiency and the figures used by the Staff and by Staff witness Mr. Patterson were examined in some detail. The Appeal Board remanded that issue for further examination (3 NRC 175 (1976)). After extensive examination, the Licensing Board concluded that the Staff's methods properly accounted for the fuel efficiency of reactors (4 NRC 293 (1976)), and that conclusion was upheld by the Appeal Board (6 NRC 760 (1977)). We see no reason to assume that witness Males' challenge to that technique, based as it is upon work not done by him, work which, in fact, has been thoroughly examined at both the Licensing Board and Appeal Board levels and found wanting, should in any way cast doubt upon the conclusion herein reached.

conclusion is based upon the facts that (a) prices of uranium appear to be levelling off, and (b) electric power prices from nuclear plants are very insensitive to the price of uranium.

J. Nuclear Power Plant Costs

1. Operational and Maintenance Costs

Contention 44:

Intervenors contend that the Regulatory Staff and Applicants have underestimated the operational and maintenance expense in the cost-benefit analysis for Black Fox 1 and 2 by understating the cost of:
(a) purchase power due to downtime of Black Fox 1 and 2;
(b) alternative means of producing electricity within Applicants' system due to downtime of Black Fox 1 and 2;
(c) [23]
(d) plant security; and
(e) maintenance dredging.

a. Cost of Power Purchased or Alternatively Produced During Downtime

207. Applicants presented testimony by Mr. Frank Meyer and Dr. M. John Robinson (written testimony, pp. 1-34, fol. Tr. 3413).

208. The Board believes it is axiomatic that the cost of electrical energy from Black Fox Station can be estimated by estimating total cost of construction and operation, estimating total energy produced, and forming the ratio. The fact that, during plant downtime, power must be either purchased or produced from another source clearly does not affect this ratio.

209. As Applicants' witnesses point out the estimated capacity factor accounts for downtime by reducing the total energy produced in an appropriate manner (Meyer/Robinson, pp. 13-14). The Board discusses, *supra,* the propriety of the capacity factors used by Staff and Applicants in dealing with Contention 46.

b. Security Costs

210. Applicants' witnesses were Mr. Frank Meyer and Dr. M. John Robinson (written testimony, pp. 1-34, fol. Tr. 3413). The Staff presented

[23]We granted summary disposition dismissing Contention 44(c). 6 NRC 167 (1977).

Mr. Jack Roberts and Mr. Darrell Nash (written testimony, pp. 1-12, fol. Tr. 3586).

211. Contrary to the assertion in the contention, unopposed testimony by witnesses appearing for both Applicants and Staff indicated that costs for security had been included in operating costs and that such costs were about 0.1 mills/kWh (Meyer/Robinson, p. 22; Roberts/Nash, p. 2), even when account is taken of the new, more stringent security measures dictated by 10 CFR §73.55 and the associated increased costs.

212. The Board sees no merit in the Intervenors' efforts to introduce some cost associated with "deprivation of civil liberties" (Intervenors' Proposed Findings at p. 77; Tr. 3428, *et seq.*), the concept being speculative, unquantifiable, and nebulous at best, and there having been no showing whatever that security measures at the plant will deprive people of civil liberties.

c. Maintenance Dredging

213. This contention survived a summary disposition motion only in order that the Board might satisfy itself that such costs are *de minimis* (6 NRC 167, 184 (1977)). Applicants presented testimony by Mr. David Guyot (written testimony, pp. 1-7, fol. Tr. 1916). Applicants' witness testified that it is not anticipated that any maintenance dredging will be needed, but if one assumes that such dredging is needed once every 10 years, present worth costs would be from $6,000 to $10,000 (Guyot, pp. 4-5). We agree that such costs are trivial.

2. Construction Costs

Contention 45:

Intervenors contend that the Regulatory Staff and Applicants have underestimated the construction cost of Black Fox 1 and 2 in the cost-benefit analysis by:

(a) understating decommissioning cost (including economic, environmental, and social cost);
(b) understating the inflation rate; and
(c) understating the interest rate for borrowing money.

a. Decommissioning Costs

214. In the FES, the Staff had estimated the following decommissioning costs (Staff Ex. 1, Table 9.11, p. 9-14).

Calculation of Cost of Decommissioning for Black Fox Station

	Lowest Cost			Highest Cost		
Annual Sinking Fund Payment, 10^6	.206			8.62		
Capacity Factor, %	50	60	70	50	60	70
Unit Cost, mills/kWh	.019	.016	.013	.79	.66	.56

Since no decommissioning plan presently exists (or is required under 10 CFR §50.82), the Staff calculated costs for several alternatives ranging from complete removal and restoration of the site to "mothballing," *i.e.,* removal of the most highly radioactive portions and capping and protectively sealing the piping and equipment. The table above shows costs for the extremes.

215. At the hearing, both Staff and Applicants presented testimony on costs for certain restorative actions. Staff presented as witnesses Mr. Jack Roberts and Mr. Darrell Nash (written testimony, pp. 1-12, fol. Tr. 3586). Applicants' witnesses were Mr. Frank Meyer and Dr. M. John Robinson (written testimony, pp. 1-34, fol. Tr. 3413). These estimates were both based upon an evaluation published by the Atomic Industrial Forum ("An Engineering Evaluation of Nuclear Power Plant Decommissioning Alternatives," AIT/NESP-009, November 1976). Again a spectrum of techniques was studied ranging from complete restoration to mothballing. The Staff obtained figures ranging from 0.04 mills/kWh to 0.18 mills/kWh (Roberts/Nash testimony, p. 3). The Applicants obtained figures only for an alternative called "entombing" in which most radioactive portions of the plant are removed, and the site left in a condition requiring less surveillance than would a mothballed site. The Applicants obtained figures of .083 mills/kWh for Unit 1 and .097 mills/kWh for Unit 2 (Meyer/Robinson testimony, p. 26). Intervenors presented no economic analysis of decommissioning. Their witness, Mr. Mike Males (written testimony on Contention 45, pp. 1-12, fol. Tr. 2848) simply used data supplied by the Staff in answer to an interrogatory, data which were essentially those of the FES table cited above (Tr. 2853).

216. The Board notes that the earlier estimates by the Staff gave a considerably wider range of costs, the highest of which were much higher than were later obtained by Staff or by Applicants. The later figures were, in fact, closer to those given in the Applicants' Environmental Report (Appls'. Ex. 3 at Tables 8.2a *ff*). In short, the Staff's early work suggested costs ranging from about 0.02 to 0.7 mills/kWh, depending upon the completeness of restoral, but later Staff values ranged from 0.04 mills/kWh to 0.2 mills/kWh, while Applicants, for an intermediate level of restoral (en-

tombment) obtained figures around 0.1 mills/kWh both in the Environmental Report and in the testimony of Meyer and Robinson. In some circumstances the discrepancy between the Staff's earlier figures and those obtained later might occasion some concern. However, where, as here, the variation we encounter is such that even the most pessimistic figure amounts only to about 1.5% of the total cost of the desired product (Staff Ex. 1, Table 9.1 at p. 9-4) we cannot weigh the variation heavily in the cost-benefit balance. Indeed, these costs are so small a fraction of the total that their presence or absence may be completely erased by the vagaries of economic divination when the latter is extended over a period of 40 years. We find that economic decommissioning costs have been properly accounted for.

217. As to environmental and social costs, the AIF study used by the Staff identified and considered nonradiological liquid and gaseous effluents; consumption of water and other resources; land committed on site and for radioactive waste burial; noise; economic public roads (Roberts/Nash, p. 4). None of the effects was considered significant. Applicants and Intervenors presented no testimony on this point. The Board concurs with the Staff's conclusion that the environmental and social costs of decommissioning are not significant.

b. Inflation Rate

218. Applicants applied an escalation rate of 7.7% for site labor, 6.9% for factory equipment, and 5% for site materials in preparing an economic analysis of the Black Fox Station (Meyer/Robinson, pp. 6-8). These escalation rates were arrived at through a review of numerous sources including historical data published by the Federal Government, industry publications and surveys and data exchanged with other public utilities (Meyer/Robinson, p. 7).

219. The NRC Staff used escalation rates of 7.6% for site labor, 6% for purchased equipment, and 4.7% for site materials in the nuclear construction cost analysis (Roberts/Nash, p. 4). These escalation rates were determined based on cost index data files from 20 major cities, each of which includes wage rates for 16 construction crafts and cost data for seven classes of site materials (Roberts/Nash, p. 4).

220. Intervenors' witness Mr. Males testified that until 1976 nuclear capital costs were escalating at a rate of 15% per year, but have since slowed down to about 8% per year (Males testimony on Contention 45 at p. 5). However, Mr. Males was referring only to average yearly rise in the total constructed cost of nuclear power plants. He made no effort to distinguish between escalation on materials and labor and accrued interest after such materials and labor were incorporated into the structure. Mr. Males'

analysis ignores the evolution of nuclear power plant design which has contributed to cost differences between different reactors but has no application to anticipated escalation on a single reactor design. Moreover, he ignored regional considerations, such as labor cost, which affect escalation. The Board notes that Mr. Males does not disagree with Applicants' escalation rates (Tr. 2898). The Board finds that the escalation rates used by the Applicants and the NRC Staff are consistent and reasonable, and will not result in any significant underestimation of the total cost of constructing the Black Fox Station.

c. Interest Rate

221. PSO currently uses an interest rate during construction of 7% as authorized by the Oklahoma Corporation Commission. However, since PSO estimates this rate will rise to 9% during the Black Fox Station construction period, and since the cooperatives are already using 9%, Applicants used 9% as an interest rate in calculating interest during construction (Meyer/Robinson testimony, p. 8).

222. Staff also used 9%, having derived the figure by taking a weighted average representative of the present rates for the participants (Robert/Nash testimony, p. 5; FES at p. 9-5, FES at p. 11-5). Staff compared this with values obtained by reviewing interest rates paid by publicly owned and investor-owned utilities and concluded that it was a reasonable value (Roberts/Nash testimony, pp. 5-7). Intervenors presented no direct testimony on interest rates. The Board sees no reason to believe that interest during construction has been substantially underestimated.

3. Waste Disposal Costs

Contention 55:

Intervenors contend that the Applicants and Regulatory Staff have underestimated the economic cost associated with that portion of the nuclear fuel cycle which is attributable to the disposition of high level radioactive waste.

223. Intervenors presented no testimony bearing directly on this contention. Their proposed findings mention extremely high costs for waste disposal "in the West Valley case" (Intervenors' Proposed Findings at pp. 87-88), but they do not cite any place in the record where these costs were mentioned.

224. The Staff presented testimony by Mr. Jack Roberts and Mr. Darrell

Nash (written testimony, pp. 1-12, fol. Tr. 3586) which showed that while the ultimate waste disposal problem has not been solved, the best estimates of waste disposal from the GESMO proceedings showed waste disposal costs which range from $30 per kilogram to $70 per kilogram with a reference value of $50 per kilogram. A 100% increase in waste disposal costs to $100 per kilogram would increase fuel costs by only 6% and would raise total levelized cost of power only 0.7 mills/kWh, an increase of only 1.4% (p. 12).

225. Applicants presented Mr. John Vallance (written testimony, pp. 1-26, fol. Tr. 3702) who had examined waste disposal costs for future scenarios envisioning either reprocessing to separate the wastes or disposal of spent fuel without reprocessing (pp. 23-26). He calculated that the cost of waste disposal in the reprocessed case would be 0.2 mills/kWh and in the unreprocessed case would be 0.4 to 0.6 mills/kWh (p. 25). The Board finds that the waste disposal costs estimated by the NRC Staff and Applicants are reasonable, and further, that these costs represent such a small percentage of the total cost of generating electricity at the Black Fox Station that even recognizing the uncertainty inherent in these figures, the economic cost of waste disposal is insignificant.

4. Power Distribution

Contention 29(c):

Intervenors contend that the Applicants and Regulatory Staff did not adequately analyze the proposed sites for Black Fox 1 and 2 because the following items were not adequately considered:

(c) the cost of distributing the electricity within the Applicants' service areas.

226. Applicants presented as a witness Mr. Vaughn Conrad (written testimony, pp. 1-5, fol. Tr. 3485). This witness pointed out that this site had been selected from a group of approximately 50 candidate sites by successive screenings based upon environmental and technical qualifying considerations (p. 3). It is near the city of Tulsa, where more than one-half of PSO's load is located (p. 2). Further, the addition of Associated Electric Cooperative and Western Farmers Electric Cooperative as participants in Black Fox Station has had minimal impact on the transmission facilities needed. No new interconnections were needed for Western, and Associated required only one 104.5-mile 345 kV line (p. 4).

227. Intervenors presented no testimony which would suggest that the proposed site entailed excessive environmental or economic costs. As we

noted in dealing with Contention 29(a), the Intervenors relied upon argumentation alone, and cited nothing in the record which would support a finding in their favor.

228. The Board finds that the proposed site represents a reasonable selection from the standpoint of environmental and economic costs associated with distribution of power.

K. Rombough-Koen Energy Model

Contention 43:

Intervenors contend that the Applicants and Regulatory Staff have not adequately analyzed the total energy requirements for the construction, operation, and decommissioning of Black Fox 1 and 2 in that there is not adequate justification for extrapolating the energy requirements for a project the size of Black Fox 1 and 2 from the model developed by Rombough and Koen.

Contention 63:

Intervenors contend that the Applicants and the Regulatory Staff have not complied with the National Environmental Policy Act and 10 CFR Part 51 in that by using the model of Rombough and Koen to produce the estimate of overall energy requirements noted in the Environmental Report at p. 5.7-3, they have applied the model inappropriately and have neglected alternative models which could have led to reduced overall energy requirements.

229. Applicants presented testimony by Dr. M. John Robinson (written testimony, pp. 1-17, fol. Tr. 588, and his supplemental affidavit, pp. 1-12, fol. Tr. 597). The Board has read the article by Rombough and Koen (Appls'. Ex. 19). We note that the Staff's estimation of the energy required to construct and operate the Black Fox Station (FES at p. 10-26, *et seq.*) is not dependent upon the model of Rombough and Koen.

230. The authors of the Rombough and Koen article calculated the energy needed to construct a reference 1,000 MWe plant by two methods: (a) determining the quantity of materials used and the energy required to produce construction materials, and (b) converting construction cost to energy cost through the use of energy cost ratios (Robinson affidavit, p. 8; Appls'. Ex. 19, p. 5). Both methods indicate that the construction energy commitment was approximately 1.4×10^{13} Btu, or approximately 2% of the expected output of the facility assuming a 30-year life and 80% capacity

factor (Appls'. Ex. 19, p. 6). The authors stated that the composite error introduced into their analysis was ±11%, which was calculated from uncertainties in the construction component, construction cost component, and design differences between plants (Robinson, affidavit, p. 9). The Board might question the technique used by Dr. Robinson to extrapolate construction cost from the model to Black Fox Station if the extrapolation were over some wide size difference. (Apparently he simply used the ratio of the gross electrical outputs, Robinson testimony at p. 8.) But here, when the extrapolation is only over 22% and the alleged accuracy of the estimate is itself only ±11%, the method seems a reasonable one. Surely it would apply at least as well to fuel cycle (operating) costs. Ultimately Dr. Robinson obtains a figure of about 7% for the total energy required to build and operate the plant when expressed as a percentage of the plant's output at 80% capacity factor over a 30-year life.

231. Using its own technique for estimating energy to construct, and using a fuel cycle energy requirement based upon Table 53 of WASH-1248, *Environmental Survey of the Uranium Fuel Cycle,* Staff estimated that a 1,000 MWe plant would require for its construction and fueling about 6% of the energy it would produce at 70% capacity factor over 30 years (FES at p. 10-29).

232. The figures of Staff and Applicants thus seem in good agreement as far as construction and operation are concerned. However, neither the Applicants nor the Staff directly addressed the energy cost for decommissioning the station. Dr. Robinson testified that it would be premature to estimate decommissioning energy costs at this time because it is not known precisely what type of decommissioning will be required 30 to 40 years from now (Robinson affidavit, p. 9). We do not feel that the energy used to assemble the station necessarily represents an upper bound for that used to dismantle it, as Applicants suggest in their proposed findings (Appls'. Proposed Findings at pp. 23, 24). But the small percentages which all of these figures represent of the total energy produced by the plant are such that even were they considerably in error they would not affect our cost-benefit balance. Further we see no reason to assume that this balance would be disturbed by the energy requirements for water supply as suggested by the Intervenors (Intervenors' Proposed Findings, p. 74).

233. In sum, the Rombough-Koen model as extrapolated by Applicants seems reasonable and gives answers in good agreement with the Staff's independent model. Finally, Intervenors could not suggest, nor could Applicants find, models which would be more suitable or which would point the way to any energy savings (Robinson testimony, p. 9; Robinson affidavit, p. 9).

L. Final Cost-Benefit Analysis

234. The Board finds that the methodology and the basic data used by the Staff in preparing the Final Environmental Statement are sound, that the judgments therein are reasonable, and that the weighing of costs against benefits in FES §10 was properly performed.

235. We further find that the conclusions reached in the FES are correct, *viz.* that the primary benefit of the plant outweighs the costs and that the overall cost-benefit balance would not be improved by any alternative site or system.

III. CONCLUSIONS OF LAW

The Board has given careful consideration to all of the documentary and oral evidence presented by the parties. Based upon our review of the entire record in this proceeding and foregoing findings, and in accordance with 10 CFR Part 51 of the Commission's regulations, the Board has concluded as follows:

1. The environmental review conducted by the Staff pursuant to the National Environmental Policy Act of 1969 as augmented by this Decision has been adequate.

2. The requirements of Section 102(2)(c) and (d) of the National Environmental Policy Act of 1969 and 10 CFR Part 51 have been complied with in this proceeding.

3. Based upon the available information and review to date, there is reasonable assurance that the proposed site is a suitable site for reactors of the general size and type proposed from the standpoint of radiological health and safety considerations under the Atomic Energy Act of 1954, as amended, and rules and regulations promulgated by the Commission pursuant thereto.

4. This Board has thus made all the findings required by 10 CFR §50.10(e)(2) with the result that the Director of Nuclear Reactor Regulation may authorize the Applicants in this proceeding to engage in limited construction activities for the Black Fox Station, Units 1 and 2, in accordance with applicable Commission rules and regulations.

5. This Board has independently considered the final balance among conflicting environmental factors contained in the record in the proceeding and determines that the appropriate action to be taken is the issuance of an LWA (and later a construction permit, if this Board, after hearing the evidence in the radiological health and safety phase of this proceeding, should make affirmative findings on the remaining safety issues) subject to the following conditions for the protection of the environment recom-

mended by the Staff and as supplemented and clarified by the direct testimony of the Staff, Intervenors, and Applicants in this proceeding and/or committed to by the Applicants:

a. The Applicants shall take the necessary mitigating actions, including those summarized in Section 4.5 of the Final Environmental Statement, during construction of the plant and associated transmission lines to avoid unnecessary adverse environmental impacts from construction activities, except that with regard to 4.5.1.1, item 2, the Board directs that no open and/or open-pit burning be permitted on the site.
b. In addition to the preoperational monitoring programs described in Section 6.1 of the Environmental Report, with amendments, the Staff recommendations included in Section 6.1 of the FES shall be followed. However, impingement studies will not be required of the Applicants nor will transmission line rights-of-way monitoring be required.
c. Before engaging in a construction activity not evaluated by the Commission, the Applicants will prepare and record an environmental evaluation of such activity. When the evaluation indicates that such activity may result in a significant adverse environmental impact that was not evaluated, or that is significantly greater than that evaluated in the Final Environmental Statement, the Applicants shall provide a written evaluation of such activities and obtain prior approval of the Director of Nuclear Reactor Regulation for the activities.
d. If unexpected harmful effects or evidence of irreversible damage are detected during facility construction, the Applicants shall provide to the Staff an acceptable analysis of the problem and a plan of action to eliminate or significantly reduce the harmful effects or damage.
e. No construction activity shall be undertaken prior to the issuance of EPA's NPDES permit which would preclude the subsequent construction of treatment facilities which would be required to meet the State's Water Quality Standards applicable to Black Fox Station.
f. Applicants shall establish a socioeconomic mitigation program in coordination with local governments and planning agencies in order to reduce the socioeconomic impacts to the communities in Rogers County occasioned by construction of the plant.
g. During the spawning period from March 1 to June 1, conduct no construction activities which would result in significant increases in silting in the Verdigris River.

6. In sum, the Board concludes that the action to be taken at this time is

the issuance of this Partial Initial Decision covering all environmental and site suitability issues subject to the conditions recited herein, recognizing that such action would permit the Director, Office of Nuclear Reactor Regulation, to issue the limited work authorization requested by the Applicants.

IV. ORDER

Based upon the Board's findings and conclusions, IT IS ORDERED that this Partial Initial Decision (as it may be subsequently modified) shall constitute a portion of the initial decision to be issued upon completion of the radiological health and safety phase of this proceeding.

IT IS FURTHER ORDERED, in accordance with Sections 2.754, 2.760, 2.762, and 2.764(a) of the Commission's Rules of Practice, 10 CFR Part 2, as amended, that this Partial Initial Decision shall be effective immediately and shall constitute the final action of the Commission forty-five (45) days after the date of issuance thereof, subject to any review pursuant to the Rules of Practice. Exceptions to this Partial Initial Decision may be filed by any party within ten (10) days after the service of this Partial Initial Decision. A brief in support of the exceptions shall be filed within thirty (30) days thereafter (forty (40) days in the case of the Staff). Within thirty (30) days of the filing and service of the brief of the appellant (forty (40) days in the case of the Staff), any other party may file a brief in support of, or in opposition to, the exceptions.

THE ATOMIC SAFETY AND
LICENSING BOARD

Frederick J. Shon, Member

Dr. Paul W. Purdom, Member

Sheldon J. Wolfe, Esquire
Chairman

Dated at Bethesda, Maryland,
this 24th day of July 1978.

[Appendix A has been omitted from this publication but is available at the NRC Public Document Room, 1717 H Street, Washingtion, D.C.]

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Victor Gilinsky, Acting Chairman
Richard T. Kennedy
Peter A. Bradford
John F. Ahearne

In the Matter of **Docket Nos. 50-443**
50-444

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, et al.

(Seabrook Station, Units 1 and 2) **August 9, 1978**

As a result of the EPA Administrator's decision approving once-through cooling at Seabrook Station, the Commission reinstates construction permits previously suspended in CLI-78-14, 7 NRC 952 (1978).

FWPCA: EPA AUTHORITY

A final decision of the Environmental Protection Agency may be relied upon by the Commission prior to the completion of judicial review of such decision.

MEMORANDUM AND ORDER

On June 30, 1978, we ordered the construction permits for the proposed Seabrook facility suspended, in the light of decisions by our Appeal Board[1] and the United States Court of Appeals for the First Circuit.[2] Subsequently, on July 17, 1978, we denied a request that the effective date of the suspen-

[1]ALAB-471, 7 NRC 477 (1978).

[2]The EPA Administrator had approved Seabrook with a once-through cooling system on June 10, 1977. That decision was overturned on procedural grounds by the United States Court of Appeals for the First Circuit on *SAPL* v. *Costle*, 572 F.2d 872 (1st Cir. 1978), and remanded to the EPA.

sion be postponed.[3] As a consequence of the court decision, uncertainty existed as to whether the Environmental Protection Agency would sanction once-through cooling for Seabrook. Thereafter, our Appeal Board determined that the environmental analysis conducted by an NRC licensing board for closed-cycle cooling had been inadequate. Under those circumstances the Commission[4] determined that should EPA not sanction once-through cooling, the Commission's ability to choose environmentally superior alternatives to Seabrook, if such existed, might be foreclosed by continued construction.[5] In our June 30 suspension decision we said that one of the factors[6] bearing on possible reinstatement of the Seabrook construction permits would be ". . . the decision rendered by the EPA Administrator as the result of the remanded hearings now being conducted . . . ."

On August 4, 1978, the EPA Administrator issued his "Decision on Remand" reaffirming his earlier approval of once-through cooling for Seabrook. On the basis of that decision, Public Service Company of New Hampshire ("PSCO") and the NRC staff filed motions for lifting of suspension of construction permits. We called for and have received and considered the parties' responses to PSCO's motion. We have concluded that the EPA Administrator's decision eliminates the condition which led to the suspension of the Seabrook construction permits, and therefore we grant PSCO's motion and reinstate the Seabrook construction permits.

The Seacoast Anti-Pollution League/Audubon Society of New Hampshire and new England Coalition on Nuclear Pollution contend in their submissions to us that the EPA proceeding leading to the Administrator's recent decision was defective in various respects. Noting the possibility of judicial reversal of the Administrator's decision, they urge us to continue the suspension in effect pending judicial review. These claims of error can be resolved in the normal course of judicial review. Twice previously we have rejected the claim that final decisions of the EPA cannot be relied upon until after judicial review is complete. 7 NRC at 28; 5 NRC at 521, n.20. We adhere to that review.[7] For the same reason, the Commission re-

[3]The history of this case is set forth in our four previous Seabrook opinions. *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-78-14, 7 NRC 952 (1978); *id.*, CLI-78-1, 7 NRC 1 (1978); *id.*, CLI-77-8, 5 NRC 503 (1977); *id.*, CLI-76-17, 4 NRC 451 (1976).

[4]Commissioner Kennedy dissented from the determination of the majority that suspension of the construction permits be ordered.

[5]See *Alaska* v. *Andrus*,_____F.2d_____, 8 ELR 20237, 20249-50 (D.C. Cir. 1978).

[6]7 NRC at 961. The other factor that independently could have led to reinstatement would have been approval of Seabrook with closed-cycle cooling by our Appeal Board following the remand hearing.

[7]SAPL/Audubon also refers to the fact that Commission review of seismic issues in this case has not yet been completed as another basis for continuing the suspension. That factor has no

(Continued on next page.)

jects another SAPL/Audubon contention—that the Commission should not reinstate the construction permits because it believes that the Commission's June 30 termination of the alternate sites inquiry in southern New England, assuming once-through cooling, will be reversed upon judicial review.[8]

The Commonwealth of Massachusetts does not oppose reinstatement of the Seabrook construction permits. The Commonwealth believes, however, that reinstatement should not be automatic and that we should employ a balancing test in deciding the pending motions. The Commonwealth also asks us to state that the choice of proceeding with construction is the company's, and that money spent will be at the company's risk, if we are to reinstate the permits. Of course, in any case where a permit from an administrative agency is subject to judicial review, the permit holder proceeds at the risk that judicial review may result in invalidation of the permit. The company would be proceeding at its own risk in that sense. This decision does not order construction resumed. That decision remains up to the applicant.[9] Moreover, the Supreme Court made it clear long ago that the holder of a permit to construct a nuclear power plant ". . . proceeds with construction at its own risk and that all of its funds may go for naught . . . "[10] if it cannot later meet the Commission requirements for obtaining an operating license.[11]

For the reasons stated above, the suspension of the construction permits

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(Continued from previous page.)
bearing on the suspension question. Mr. Farrar of our Appeal Board dissented from the Appeal Board majority's resolution of certain seismic issues, but he made clear that his position on these seismic issues, even were it accepted, would not preclude continued construction of the Seabrook facility, nor would it be likely to affect the alternate site question. ALAB-422, 6 NRC at 106; *id.*, n.1 (Mr. Farrar, dissenting).

[8]In this connection, we note that the United States Court of Appeals for the First Circuit, in denying a request from SAPL/Audubon for a stay of that same termination decision, stated that:

> [E]ven if the EPA did approve once-through cooling and construction began again, we would not be able to say that petitioners would be [irreparably] prejudiced in the interim between the resumption of construction and the time when this petition for review will come before us in the normal course this fall.

SAPL v. *NRC*, No. 78-1172, decided July 26, 1978.

[9]As our Appeal Board noted the applicants themselves must weigh the risk of judicial review "in terms of the consequences that would flow from such a suspension." ALAB-423, 6 NRC 115, 119 (July 26, 1977).

[10]*Power Reactor Development Corp.* v. *Electricians Union*, 367 U.S. 396, 415 (1961).

[11]We do not reach the question whether further progress in the construction of Seabrook would be given weight in any future Commission consideration of the Seabrook application.

for the Seabrook facility is lifted, and those permits are in full force and effect, effective immediately.

It is so ORDERED.

For the Commission

Samuel J. Chilk
Secretary of the Commission

Dated at Washington, D.C.,
this 9th day of August 1978.

COMMISSIONER KENNEDY CONCURRING:

The Commission has today decided to reinstate the construction permits for the Seabrook Nuclear Power Plant. I fully concur in that decision. But it is regrettable that this decision ever had to be made for, in allowing construction to resume, the Commission is doing no more than permitting what should have been permitted all along.

The Administrator's decision allowing the use of once-through cooling was issued on August 4, 2 weeks to the day after work stopped at Seabrook at the order of the Commission. The EPA General Counsel in her July 13 letter in fact had forecast issuance "perhaps as early as the first week" in August.[1] In my opinions of June 30 and July 17, I urged that construction should be permitted while the Administrator prepared his decision. The construction which would have taken place in the intervening few weeks could not have been so significant as to prejudice future decisions by the Commission. Balancing the real and tangible harm that a cessation of construction would cause against the speculative effects of allowing construction to continue, it seemed clear to me that the public interest lay with continued construction. I would have accepted the risk that subsequent events might show that the decision to allow continued work was erroneous. The Commission majority saw the public interest differently. It preferred to impose the certainty of personal and economic hardship and to take the risk

[1]See, attachment to Commission Memorandum and Order, CLI-78-15, July 17, 1978, 8 NRC 1 [the attachment was deleted on publication but is available in the NRC Public Document Room, 1717 H Street, N.W., Washington, D.C.].

that subsequent events would show—as indeed they have shown—that the end of construction, the unemployment of many hundreds of workers, and the partial dispersal of the work force were all unnecessary.

It might be tempting to regard these weeks of suspended construction as a brief interlude, caused by a procedural necessity, with little actual impact on the plant, the work force, or on the people and economy of New Hampshire, and without lasting significance for the NRC. Such a view, however, would ignore the very real harm that the needless suspension has caused. And it would deny this Commission the opportunity of learning by its mistakes.

To begin to measure the harm done by the Commission's suspension, one need only recognize the plight of the construction workers at Seabrook who found themselves suddenly unemployed and forced to look elsewhere for work. For those workers and their families, the news that construction will resume must be cold comfort indeed. Surely, they must now be asking, "How long this time?" In addition to the personal hardship and disruption, the places in the work force of those skilled employees who in search of reasonable security for their families sought other work must be filled. All that will take time—time that will delay completion of the plant still further, to the detriment of New England's consumers. Once again one must ask, who has gained from these decisions?

Neither this agency, nor indeed any other government agency, would tolerate a situation in which, because of bureaucratic bungling, its own employees were forced to go without pay, or the public to go without essential services, for several weeks. And yet that is the sort of result that the Commission decreed for the Seabrook work force and for the people of the region, because of the past procedural errors that in no small measure must be laid at the doorstep of the Commission and its own staff.

Had the Commission waited for the Administrator's promised decision, it could justly claim to have helped bring a measure of rationality and order to the regulatory morass of Seabrook. As it is, however, the Commission's stop-start decisionmaking has only worsened the problem.

If Seabrook accomplishes nothing else, it should promote a more reasoned and humane understanding of the hardships which can be caused when a Federal agency wields its regulatory axe without giving sufficient consideration to the consequences. For it is one thing not to care where the chips fly; it is quite another not to consider where the trees may fall.

COMMISSIONER BRADFORD CONCURRING:

I concur in the decision to permit resumption of construction at Seabrook based on the EPA determination that cooling towers are not re-

quired.[1] The possibility that another site can now be found obviously superior to Seabrook built without cooling towers is vanishingly slight and does not warrant further stoppage.

What this means is that the requirement of the National Environmental Policy Act that this agency do "a detailed statement on . . . alternatives to the proposed action" will have been ignored as to the southern New England sites.[2] Construction and its effect on our cost-benefit calculation has now foreclosed precisely the evaluation that the law requires. The end result of continued construction during the protracted series of regulatory decisions is a violation of the National Environmental Policy Act.

To assure that the Commission does not in future countenance another applicant's building its way through NEPA, I think we are going to have to modify the interpretation and perhaps the wording of 10 CFR §2.764, which makes the decisions of our licensing boards "effective immediately." The effect of that provision can be to permit tens and even hundreds of millions of dollars worth of construction to go on while the project and alternatives to it still face months or years of evaluation within the NRC. The National Environmental Policy Act's goal of an environmentally reasoned decision from the Commission itself, presumably with timely court review, cannot be attained under these circumstances.

The regulation in question allows the presiding officer, upon a showing of good cause by a party, to prevent a permit from becoming immediately

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[1]About today's other concurring opinion, I can only remark the wisdom of the historian F.W. Maitland in noting the importance of remembering that events now past were once in the uncertain future. When the EPA Administrator's August 4 decision was still in the future, Commissioner Kennedy in dissent from the decision that he deplores today wrote that "[It is] perhaps the hardest of the Seabrook decisions with which the Commission has been faced to date.. . . failure to suspend construction will be viewed by some as evidence that the alternative site review process being conducted by the Commission is a sham proceeding and a fraud on the public.. . . While I sympathize with this view I nevertheless believe that the equities in this case lie in favor of allowing construction to continue."

The implication of his concurrence today is that the EPA decision proves our decision to suspend construction harmful and erroneous. In light of the possible effect of this view on our licensing and appeal boards, I am here pointing out my own continued belief that the Commission's suspension was clearly required by the law as applied to the circumstances in June and that we should have done it following the Appeal Board decision of late April instead of on June 30. Even taking full account of the adverse impact on the construction workers of the 2 weeks of actual suspension, less harm has occured under the Commission's chosen course than would have occurred in this case and in others if we had stood passively by while construction continued without a legally valid basis at Seabrook.

[2]For reasons set forth in my separate opinion in our June 30 decision in this case (*Public Service Company of New Hampshire*, CLI-78-14, 7 NRC 952 (1978)), I believe that NEPA required some consideration of alternatives in southern New England.

effective. I would encourage the Boards to use this provision in cases involving a seriously disputed evaluation of site or energy source alternatives until the Commission completes the review promised in our January 1978 Seabrook Opinion.[3]

To withhold the construction permit until the analysis of alternatives has been finally approved within the Commission might in some cases slow commencement of all construction not done pursuant to limited work authorizations, but it would prevent equally costly overcommitments, sudden suspensions, and hasty decisions. Furthermore, questions involving alternatives of site or source could be heard and reviewed on an expedited basis. In any case the effects would be minimized in those cases in which States or regions had undertaken meaningful need for power determinations and energy site planning and in which applicants had taken advantage of the NRC's provisions allowing for approval of power plant sites well in advance of construction.

[3]CLI-78-1, 7 NRC 1 at pp. 6-7 (1978).

Cite as 8 NRC 187 (1978) ALAB-488

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Michael C. Farrar

In the Matter of

Docket Nos. 50-443
50-444

PUBLIC SERVICE COMPANY OF
NEW HAMPSHIRE, et. al.

(Seabrook Station, Units 1 and 2)

August 18, 1978

In an order issued subsequent to prehearing conference, the Appeal Board denies applicants' oral motion to dismiss various intervenors from the proceeding. In addition, notwithstanding EPA's issuance of a decision approving once-through cooling at Seabrook, the Board expresses its intention to continue the alternate site inquiry assuming use of cooling towers at Seabrook, in view of the judicial challenge to the EPA decision. The Board also directs staff to issue status report concerning its investigation of alternative sites.

RULES OF PRACTICE: RESPONSIBILITIES OF PARTIES

Intervenors' adversary posture did not mean they acted unjustifiably in choosing to await outcome of staff investigation before taking definitive position as to which of numerous alternate sites might meet "obviously superior" standard.

RULES OF PRACTICE: RESPONSIBILITIES OF PARTIES

Party seeking to be relieved of obligation to submit memorandum requested by Appeal Board should file written request stating good cause for such relief.

RULES OF PRACTICE: RESPONSIBILITIES OF PARTIES

Party seeking to be excused from prehearing conference should present justification in request filed before conference date.

Messrs. Thomas G. Dignan, Jr., John A. Ritsher, and **R. K. Gad III,** Boston, Massachusetts, for the applicants, Public Service Company of New Hampshire, *et. al.*

Mr. Robert A. Backus, Manchester, New Hampshire, for the intervenors Seacoast Anti-Pollution League and Audubon Society of New Hampshire.

Ms. Karin P. Sheldon, Washington, D.C., for the intervenor New England Coalition on Nuclear Pollution.

Ms. Ellyn R. Weiss, Washington, D.C., Special Assistant Attorney General of Massachusetts, for the Commonwealth of Massachusetts.

Ms. Marcia E. Mulkey and **Messrs. Edwin J. Reis, James M. Cutchin IV,** and **Lawrence Brenner** for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

In its June 30, 1978, decision in this construction permit proceeding,[1] the Commission directed, *inter alia,* that this Board (rather than the Licensing Board) conduct the further hearing ordered in ALAB-471[2] on the question whether there is an alternate New England site which would be "obviously superior" to the Seabrook site were a nuclear facility at the latter site to require cooling towers.[3] Responding to that directive, this Board issued a notice on July 5 in which it scheduled a prehearing conference for

[1]CLI-78-14, 7 NRC 952.

[2]7 NRC 477 (April 28, 1978).

[3]In the same decision, the Commission ordered a termination of the inquiry into the existence of a southern New England site "obviously superior" to the Seabrook site with once-through cooling.

July 25 in Bethesda, Maryland.[4] The notice called upon the parties to file memoranda in advance of the conference. The memoranda were to enlighten us respecting (1) which New England sites the parties viewed as the "leading candidate" alternatives to Seabrook with cooling towers;[5] and (2) what issues the parties believed will need to be considered in comparing Seabrook with cooling towers to alternate sites.

Memoranda were filed by two intervenors (the New England Coalition on Nuclear Pollution (Coalition) and the Commonwealth of Massachusetts), the applicants, and the NRC staff. It appeared therefrom that none of the parties was then prepared to identify "leading candidate" alternate sites and, indeed, that only the staff acknowledged a responsibility eventually to do so. In the discharge of that responsibility, the staff had embarked upon a further investigation of 22 alternate sites and proposed to meet with representatives of the other parties in early August for the reason that it thought desirable "extensive and ongoing interaction with all parties as [it went] about the process of gathering and analyzing the data and as [it worked] with the methodology for narrowing to candidate sites and for comparing candidate sites to Seabrook with closed-cycle cooling." Insofar as the issues to be considered at or in conjunction with the hearing were concerned, the various memoranda reflected a marked difference of opinion among the parties.

All of the parties which had filed memoranda were represented by counsel at the prehearing conference. But counsel for two other intervenors, the Seacoast Anti-Pollution League and the Audubon Society of New Hampshire (SAPL/Audubon), did not appear. Although the secretary to the Board had been notified by telephone on July 20 that those intervenors did not intend to submit a memorandum, no advance notice was provided respecting their counsel's decision not to attend the conference.

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[4]Prior to the Commission's June 30 decision, the Licensing Board had itself scheduled a prehearing conference on July 25, albeit in Nashua, New Hampshire. We changed the situs of the conference both because of the other demands on this Board's time and because a majority of the counsel expected to be in attendance were located in the Washington, D.C., area.

[5]The Commission had suggested in its June 30 decision (7 NRC at 956) that

> it should be relatively easy to screen the range of alternatives to select those few [sites] which appear to be the leading candidates as alternatives to Seabrook with towers. By making such a preliminary winnowing, the Board and the parties will be able to focus on the relatively few alternative sites which are most likely to be obviously superior to Seabrook with towers.
>
> By focusing the inquiry the Board will be able to shorten the time needed to complete the remand and, equally important, to examine the alternatives before it in greater depth. Of course, such a screening should be made only after the staff and the other parties have had an opportunity to present their views as to which alternatives are the leading candidates, including possible sites in southern New England.

At the inception of the prehearing conference, the applicants orally moved to dismiss the Coalition, Massachusetts, and SAPL/Audubon from the proceeding. In the case of the Coalition and Massachusetts, the motion was based upon their failure to have come forward with the names of sites assertedly "obviously superior" to the Seabrook site with cooling towers (Tr. 5-6). As applied to SAPL/Audubon, the motion was founded on the same considerations as well as the fact that those parties had neither filed the memorandum called for by the July 5 notice nor appeared at the conference (Tr. 7). The Coalition and Massachusetts responded both orally and later in writing to the motion. SAPL/Audubon filed a written response within the period allotted for that purpose in an order entered by us on July 26.

Since the prehearing conference, there have been two significant developments. On August 4, 1978, the Administrator of the Environmental Protection Agency issued his decision on remand, reaffirming the approval of the proposed once-through cooling system for Seabrook contained in his June 10, 1977, decision. *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), Case No. 76-7.[6] On August 8, 1978, the staff filed a report with us on the progress of the endeavor to narrow the number of alternative sites to be considered at the hearing.

We do not intend in this order either to memorialize the discussion at the prehearing conference or to pass upon every question which was touched upon during that discussion. Rather, we shall confine ourselves to those relatively few matters which require treatment at this stage.

1. The oral motion of the applicants to dismiss the Coalition, Massachusetts, and SAPL/Audubon from the case is *denied.* With respect to the first two of those intervenors, the motion is plainly without merit. Neither established law nor reason supports the thesis upon which the applicants rely. That, as applicants stress (Tr. 6), the intervenors are in an "adversary posture" does not mean that they acted unjustifiably in choosing to await the outcome of the staff's further investigation before taking a definitive position on which alternate sites embraced by the investigation might be "obviously superior" to Seabrook with cooling towers.

We are disturbed, however, by SAPL/Audubon's failure either to file the requested memorandum or to attend the prehearing conference. To begin with, although their counsel did advise the secretary to this Board by telephone that no memorandum would be submitted, our July 5 notice had not made that option available to SAPL/Audubon. If SAPL/Audubon

[6]On the strength of the August 4 EPA decision, the Commission reinstated the Seabrook construction permits, which it had suspended in its June 30 decision. CLI-78-17, 8 NRC 179 (August 9, 1978).

thought they had good cause to be relieved of the obligation to submit the memorandum, they should have put that cause before us in the form of a written request for such relief.

That SAPL/Audubon counsel did not appear at the prehearing conference is an equally, if not more, serious matter. His justification—articulated for the first time after the fact—is (1) that the conference was being held in Bethesda rather than in Nashua;[7] (2) that it seemed unlikely that the conference would in actuality lead to a narrowing of the number of alternate sites to be considered at the hearing; and (3) that he had arranged to have counsel for another of the intervenors represent SAPL/Audubon's interests at the conference (a fact which was not disclosed during the conference). Even assuming those to be sound reasons, again the time to have presented them to us was *before,* not *after,* the date of the conference, by way of a request that SAPL/Audubon be excused from participation. This is particularly so with regard to the emphasis now being laid on the expense which would have been involved in attending a conference in Bethesda. SAPL/Audubon counsel presumably received the July 5 notice within a few days after its issuance. If he thought that the change in the location of the conference announced therein would work a financial hardship on his clients, he had ample opportunity to so inform us prior to July 25. Receiving no complaint from any party, we had the right to assume—and did assume—that the change was acceptable to all concerned.

Because on all other occasions SAPL/Audubon have adequately discharged their responsibilities as parties, we are disinclined to dismiss them from the proceeding on the basis of this one lapse. We expect, however, that in future SAPL/Audubon will not take it upon themselves to make unilateral decisions regarding the need to fulfill obligations imposed by directives of this Board.

2. It is our understanding that SAPL/Audubon have filed a petition in the Court of Appeals for the First Circuit for review of the EPA Administrator's August 4 decision. In these circumstances, it is not as yet definitively established that the applicants will be permitted to employ once-through cooling at the Seabrook site. Accordingly, as we concluded last year in connection with the June 1977 EPA decision,[8] the alternate site inquiry being performed on the assumption that the Seabrook site would require cooling towers cannot be deemed to have become moot.

For this reason, we intend to continue with that inquiry unless either the Commission directs its termination or the applicants inform us that they do not wish it to be pursued at this time. In the latter regard, as we noted in

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[7]See fn. 4, *supra.*

[8]See ALAB-422, 6 NRC 33, 73, fn. 47 (1977).

ALAB-471, *supra,* 7 NRC at 499, in essence the inquiry is being performed "at the applicants' behest—*i.e.,* only because they suggested that they could rely on Seabrook with towers as a backup to their primary proposal [Seabrook with once-through cooling] and thus not await EPA's final determination." It is thus open to them to withdraw, at least for the time being, the backup proposal and to take their chances that the latest EPA decision will survive judicial scrutiny and thereby achieve finality. To date, they have not manifested any inclination to adopt that course. We presume that, if the matter is still under serious consideration, any determination not to press now the cooling tower proposal will be made and disclosed in the near future so as to save everybody further time and effort.

3. Obviously, in light of the EPA and Commission decisions earlier this month, the alternate site question before us is now less urgent. Nonetheless, good reason exists why the resolution of that question should not be unduly delayed. More specifically, to avoid any possibility of an unnecessary dislocation of work, our findings and conclusions should, if at all feasible, be in place by the time the First Circuit rules on the challenge to the EPA decision. Particularly because the SAPL/Audubon petition for review was just recently filed, it is difficult to predict by when that ruling likely will issue. But for our scheduling purposes, it is reasonable to proceed on the basis that the court might speak soon after the turn of the year.

The staff's August 8 report reflects that, at a meeting held on August 2 which was attended by representatives of each of the parties, "agreement was reached that of the 22 alternate sites which are the subject of reconsideration on remand, nine specified sites (to be shortly narrowed to eight)[9] should be brought forward at this time as the apparent leading candidate alternatives to Seabrook with cooling towers." The report went on to note the possibility that, as a consequence of disclosures in the course of the staff's further investigation of those sites, one of them might be removed as a "leading candidate" and another of the 22 substituted for it.[10]

The report shed no additional light, however, on when the staff's further investigation might be completed and the results of it made available to the other parties. At the prehearing conference, staff counsel stated that it was then expected that "the work being conducted by the staff's multidisciplinary team [would] be completed in August such that testimony

[9]Either the Lamprey Pond or the Philbrick Pond site is to be eliminated.

[10]The staff report also stated that SAPL/Audubon counsel had suggested at the meeting that at least one alternate site in addition to the 22 should have been on the staff's list for preliminary scrutiny. In the event that SAPL/Audubon presses that suggestion by way of a response to the report, it will be considered by us after the other parties have had an opportunity to comment on it.

arising out of that work [could] be prepared in September, hopefully by mid-September" (Tr. 23). Whether that estimate still holds is unclear. So too is the period which might be required by other parties for possible discovery once the staff investigation has been finished.

Given these uncertainties, it seems best at this juncture simply to call upon the staff for a further status report, to be in our hands no later than the close of business on *Thursday, September 7, 1978.* We assume that the "extensive and ongoing interaction with all parties" to which the staff made reference in its memorandum submitted prior to the prehearing conference (see p. 189, *supra*) continues to be a reality. Such interaction necessarily will facilitate the consummation of the prehearing process; among other things, it should have the effect of cutting down the amount of needed discovery.

Upon receipt of the staff's further report (and any response to it which may be submitted by other parties within 7 days of service of the report), this Board will schedule a second prehearing conference or take such other action as may appear justified in the circumstances.

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Richard S. Salzman, Chairman
Dr. John H. Buck
Michael C. Farrar

In the Matter of Docket No. STN 50-437

OFFSHORE POWER SYSTEMS

(Floating Nuclear Power Plants) August 21, 1978

Ruling on two certified questions, the Appeal Board (1) vacates a Licensing Board order scheduling the presentation of staff environmental documents as inadequately founded and (2) holds that, in preparing the environmental statement on this application to manufacture floating nuclear power plants, the staff may consider the consequences of Class 9 accidents.

ADJUDICATORY HEARINGS: STATUS OF NRC STAFF

The responsibilities of licensing boards are independent of those of the staff. But in order to achieve "sound and timely" decisionmaking in accordance with Commission policy, the staff and boards must coordinate their operations and maintain a "partnership" relationship.

RULES OF PRACTICE: SCHEDULING

A licensing board may order the staff to submit its environmental statement to the Board by a set day if found necessary to avoid unjustifiable delay.

RULES OF PRACTICE: SCHEDULING

If a licensing board finds no reasonable cause for delay in the publication of staff environmental documents, it may order the documents submitted by a specified date and then hear other matters (if any) or suspend

the proceedings until the documents are filed. It may also refer its ruling to the Appeal Board. If that Board affirms, it would certify the matter to the Commission.

NEPA: SCOPE OF INFORMATION REQUIRED FOR LICENSING (CLASS 9 ACCIDENTS)

In the proposed annex to former Appendix D to 10 CFR Part 50, the Commission establishes probability rather than consequences as the criterion governing when the most severe accident is to be considered; this approach is consistent with NEPA and has gained judicial acceptance.

NEPA: SCOPE OF INFORMATION REQUIRED FOR LICENSING (CLASS 9 ACCIDENTS)

The proposed annex to former Appendix D to 10 CFR Part 50 does not cover floating nuclear plants. Hence, the annex does not preclude consideration of Class 9 accidents at those plants in the environmental impact statement.

RULES OF PRACTICE: CHALLENGE TO COMMISSION REGULATIONS

The ECCS Final Acceptance Criteria and the general rule against challenging Commission regulations in individual licensing proceedings do not preclude assumptions of ECCS failure for other purposes. *Vermont Yankee Nuclear Power Corp.* (Vermont Yankee Station), CLI-74-40, 8 AEC 809, 811-14 (1974). Such assumptions do not amount to a challenge to Commission regulations.

RULES OF PRACTICE: DUE PROCESS

As the law does not require consistency in treatment of parties in different circumstances, the staff is not violating principles of fairness in considering Class 9 accidents in an environmental impact statement involving floating nuclear plants but not in those involving land-based plants.

Messrs. Barton Z. Cowan and **Thomas M. Daugherty**, Pittsburgh, Pennsylvania, argued the cause for the applicant, Offshore Power Systems; with them on the briefs were **Mrs. Samantha Francis Flynn** and **Messrs. John R. Kenrick, Vincent W. Campbell** and **Karl K. Kindig**, Pittsburgh, Pennsylvania.

Mr. Anthony Z. Roisman, Washington, D.C., argued the cause for intervenor National Resources Defense Council; with him on the briefs was **Ms. Frances Beinecke**, Washington, D.C.

New Jersey Deputy Attorney General **Mark L. First**, Trenton, New Jersey, argued the cause for intervenor the State of New Jersey; with him on the briefs was Attorney General **John J. Degnan**, Trenton, New Jersey.

New Jersey Public Advocate **Stanley C. Van Ness** and Assistant Deputy Public Advocate **R. William Potter**, Trenton, New Jersey, filed a brief for intervenor Atlantic County Citizens Council on Environment.

Messrs. Martin G. Malsch and **Stephen Sohinki** argued the cause for the Nuclear Regulatory Commission staff; **Mr. Mark Staenberg** on the briefs.

DECISION

Opinion of the Board by Mr. Salzman in which Mr. Farrar joins and Dr. Buck joins except for Part III:

Delays and disagreements have abounded in this proceeding, which involves the first application to manufacture floating nuclear power plants (FNP's).[1] The difficulties have given rise to important questions about the Licensing Board's relationship with the NRC staff: (1) may the Board fix a deadline by which the staff must prepare and file its environmental impact statement? and (2) should the Board have directed the staff to exclude consideration of "Class 9 accidents" from that statement?[2] We brought both questions before us on certification,[3] the staff having petitioned us to hear the former and Offshore Power Systems ("OPS" or "applicant") the latter. Both stem directly from a Licensing Board order issued on March 30, 1978. To put the Board's order and the resulting questions in context, we begin by summarizing the relevant events.

[1]Manufacturing licenses are issued according to the provisions of 10 CFR Part 50, Appendix M.

[2]We use the term "Class 9 accident" in the sense employed by the Commission in the proposed "annex" to former Appendix D of Part 50 of the Commission regulations. See 36 Fed. Reg. 22851-52 (December 1, 1971) and Part III, *infra*. (For convenience, we shall refer to this statement of Commission guidance simply as "Annex.")

[3]See 10 CFR 2.718(i) and 2.785(b)(1).

I. BACKGROUND

1. Scheduling the Final Environmental Statement

OPS applied in 1973 for a Commission[4] license to manufacture floating nuclear plants. Its application was formally docketed and noticed for public hearing that same year. In due course the staff undertook to evaluate the potential environmental effects of granting the license. Commission regulations require the staff to complete this evaluation and prepare a final environmental impact statement before taking any position on environmental issues at the licensing board hearing on the proposal. 10 CFR 51.52(a).

For reasons sketched in the margin below, completion of the final impact statement here has been delayed.[5] Several times the staff announced projected publication dates for the document, but those dates passed without the statement forthcoming. (The staff's own predicted FES completion date, initially June 2, 1976,[6] has slipped more than 2 years.) The appli-

[4]"Commission" refers to either the Atomic Energy Commission or the Nuclear Regulatory Commission as the context requires. The AEC's responsibilities for regulating nuclear energy devolved on the NRC on January 19, 1975, by virtue of Title II of the Energy Reorganization Act of 1974, 42 U.S.C. 5841 *ff.*

[5]Initially, the staff planned a two-part Final Environmental Statement, *i.e.*, "FES I," covering environmental impacts associated with the construction and operation of the manufacturing facility in Jacksonville, Florida; and "FES II," making (1) generic considerations of the environmental impacts of operating FNP's in offshore, estuarine, and riverine locations and (2) the overall cost-benefit balance for the project. FES I was published in October 1975 and FES II in September 1976. The Environmental Protection Agency and the Council on Environmental Quality, however, criticized the staff's analysis of the estuarine and riverine siting options as inadequate. The staff agreed to expand its analysis of those matters, notwithstanding OPS' contention that FES II satisfied the requirements of the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321, *et seq.* See *Applicant's Answering Brief* at 7. This was the "FES II Addendum," circulated in draft form for comment on March 9, 1978—13 months (and numerous postponements) after the staff agreed to prepare it. It was published in final form on June 30th. See fn. 13, *infra.*

FES III originated with the staff's undertaking, at the Advisory Committee on Reactor Safeguards' behest, of a "Liquid Pathway Generic Study" (LPGS). That study (prompted by the OPS application but carried out as a generic analysis) was to compare the consequences of accidental releases of radioactivity into the ocean surrounding FNP's with consequences of such releases at land-based reactors. The staff chose to consider consequences of Class 9 accidents in the study and, in a departure from usual practice, in the FES for this proceeding as well. See pp. 210-211, *infra.* Because the staff thus intended to include the results of the study as they pertained to OPS in the overall cost-benefit balance, that balance had to be part of FES III rather than FES II. The staff issued its draft LPGS in September 1976 and its draft of Part III the following month, but ACRS criticism of the former necessitated staff revision of both. The final LPGS was published in February 1978, and on May 2nd the staff circulated Part III in revised draft form for comment.

[6]The staff gave this date to the Board below at a prehearing conference held August 13, 1975. Tr. 487.

cant, blaming the staff for the delay and the concomitant holdup in the licensing proceedings,[7] twice sought a Licensing Board order setting a deadline for completion of the environmental impact statement; twice the Board refused.

Nevertheless, on March 30, 1978, after observing that it had itself "become increasingly concerned about the lack of progress toward closing the evidentiary record in this case"—but without finding the staff the cause of that delay or otherwise at fault—the Board below did direct the staff to publish the outstanding environmental documents by specific dates.[8] On April 19th we granted the staff's petition to consider whether the Board had authority to give that directive to the staff. (Pending our resolution of the question, we in essence suspended the effectiveness of the Board's FES deadlines.)[9] We address this issue in Part II, *infra.*

2. Discussion of the "Class 9 Accident"

It is fair to say that the delay in completing the impact statement on floating nuclear power plants is in some measure attributable to the decision to include a discussion of the consequences of a "Class 9 accident" afloat. In the spectrum of nuclear power reactor accidents, those characterized as belonging in Class 9 are the most serious but the least likely.[10] The staff's environmental statements on applications to build land-based plants have not covered the consequences of accidents of this kind, a forebearance based on published Commission guidance that "it is not necessary to discuss such events."[11]

Offshore Power Systems moved the Licensing Board to order the staff to exclude assessment of the Class 9 accident from its Final Environmental Statement on this application, too. The staff objected on the ground that such relief was uncalled for and, moreover, beyond the Board's authority to grant. Without reaching those questions, the Board denied applicant's mo-

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[7]The staff attributes the delay to the applicant's dilatory and inadequate responses to requests for necessary information.

[8]The Board set deadlines of April 24, 1978, for Part III and June 16, 1978, for the Addendum to Part II. See fn. 5, *supra.*

[9]See our orders of April 19th and June 12th directing the staff either to publish the documents by the deadlines set by the Board or to furnish a detailed explanation why that was not possible. As noted above (fn. 5, *supra*), the documents were filed on May 2 and June 30 respectively. (We had assured the parties that publishing the documents would not result in our treating the matter as moot.)

[10]Annex, fn. 2, *supra.*

[11]*Ibid.*

tion on February 23rd as "premature" and, on March 30th, declined to reconsider that ruling. The staff sought certification of that portion of the March 30th order directing it to publish the FES by specified dates (see p. 198, *supra*); the applicant opposed that request and asked us to certify the question of the need to discuss Class 9 accidents. Having agreed to certify the Class 9 question, we address that issue in Part III, *infra.*

II. SCHEDULING THE FINAL ENVIRONMENTAL STATEMENT

1. **The order below.** The March 30 Licensing Board order that brought this scheduling question to the fore was triggered by OPS' motion for reconsideration of an order issued February 23, 1978. The Board had there refused, *inter alia,*[12] to direct the staff to publish on dates specified by OPS two outstanding sections of the environmental impact statement for the proposed floating nuclear plants.[13] In denying reconsideration on March 30th, the Board reiterated that OPS had failed to establish that the staff was responsible for the publication delays, and concluded that affidavits and analyses subsequently submitted by OPS were inadequate to overcome that failure.[14] As indicated above, however, the Board in that same order nevertheless fixed publication dates for the staff documents—with minimal explanation and without specifying its authority to do so (see p. 198, *supra*).

2. **The parties' positions.** The parties take opposing stands not only on how we should resolve the scheduling issue but also on the issue's very character. In an analysis actively supported by two of the four intervenors, the staff frames the issue in jurisdictional terms.[15] It "whole-heartedly en-

[12]In its February 23 order, which dealt with a "Motion for Relief" filed by applicant on February 2, 1978, the Board also refused to direct the staff to exclude from this proceeding consideration of Class 9 accidents. As with the scheduling matter, it declined in its March 30th order to reconsider that denial, thus prompting applicant's petition for certification. See p. 198, *supra.*

[13]These are the sections referred to as "FES II Addendum" and "FES III." See fn. 5, *supra.* Those sections (the latter in revised draft form) have since been published (see fn. 9, *supra*).

[14]The Board said in part that OPS could have submitted the affidavits and analyses with its February 2 motion and concluded that, in proffering them only with its motion for reconsideration, OPS was attempting to answer the staff's "well-taken" argument concerning OPS' failure to prove staff's responsibility for the delays. The Board held OPS could not so answer without a right of reply granted pursuant to 10 CFR 2.730(c).

[15]Intervenors Natural Resources Defense Council (NRDC) and Atlantic County Citizens Council on Environment (ACCCE) filed briefs (and earlier papers) in support of the staff's position; NRDC also participated in oral argument. Shortly after the applicant moved in February for relief (see fn. 12, *supra*) on the scheduling matter, intervenor Kenneth B. Walton filed an answer in support of that motion. The State of New Jersey, the fourth intervenor, neither briefed nor argued the scheduling issue.

dorses" the notion "that adjudicatory proceedings should be conducted in a timely and orderly manner" but urges that the issue here is an instance of the Licensing Board overstepping its authority to the possible detriment of the licensing process. OPS' answer is that this proceeding concerns not a clash of authority but a necessary and fully sanctioned response by the Licensing Board to staff delays that have been "mak[ing] a mockery out of" that process. The applicant first asserts that the Board has the authority to issue such scheduling orders and then focuses on the particular delay-beset history of this proceeding.[16] Given the context, OPS argues, the order was a legitimate and appropriate means of maintaining the integrity of the hearing process and protecting its due process rights as an applicant.

In pressing its point, each party presents an extensive interpretation of the relationship between the staff and the licensing boards in the licensing process. The staff (along with NRDC and ACCCE) emphasizes separation of functions, the independence of operations, and the necessity of preserving those characteristics if the agency is to produce sound licensing decisions. It relies heavily on subpart (a) of 10 CFR 2.102 ("Administrative review of application"), which provides that:

> In the case of a docketed application for a construction permit or an operating license for a facility, *the staff shall establish a schedule for its review of the application, specifying the key intermediate steps from the time of docketing until the completion of its review* [emphasis added].

From its interpretation of this regulation, as well as adjudicatory decisions and legislative materials, the staff concludes that the timing of publication of "critical staff documents" turns on the staff's "assessment of the adequacy and completeness of the information which it possesses at any given time, and the time required to satisfactorily analyze that information."[17] The staff thus considers decisions such as those involved here to be exclusively within its own province. The publication directive is seen by the staff as an unauthorized move by the Board to substitute its judgment for the staff's, a move that (the staff believes) could find it "coerced into releasing an incomplete and poorly supported evaluation."[18]

[16]The staff tells us that it does "not believe the issue of delay relevant to the instant question" (*Staff Brief on Certified Question,* p. 5, fn. 7) but rather, as explained in the text, sees the question as one of jurisdiction. It does, however, append to its brief two affidavits to refute OPS' allegation of staff responsibility for the delays. Moreover, the Licensing Board has explicitly approved the staff's argument that OPS failed to show at the proper time that the staff was at fault (see fn. 14, *supra,* and accompanying text). Thus, the question of responsibility for the delays is important at least in relation to the evolution of this problem.

[17]See *Staff Brief on Certified Question* at 12-13.

[18]*Id.* at 18.

For its part, OPS focuses on the Licensing Board's duty to conduct proceedings in a timely fashion and the Board's authority to take action to avoid unwarranted delay in those proceedings. It counters the staff's emphasis on 10 CFR 2.102 with its own reliance on the Commission directives embodied in 10 CFR 2.718. That regulation vests in a "presiding officer" (*i.e.*, a licensing board)[19] "the duty to conduct a fair and impartial hearing according to law, to take appropriate action to avoid delay, and to maintain order"; it also grants "all powers necessary to those ends."[20] According to OPS, the staff has flouted the regulations with postponements that OPS characterizes as "repeated broken promises," "a serious breakdown in staff discipline," and "unwarranted official inaction." OPS urges that the Licensing Board had authority to issue the scheduling order as a means of fulfilling the public interest and protecting the parties' adjudicatory rights. Indeed, the applicant goes on, staff delays had caused such deterioration in the hearing process that the Board was obliged to take such action.

3. **Resolution of the dispute.** (a) As the preceding summary of their positions indicates, the parties offer similar inducements for their opposing viewpoints: each contends that its position upholds and furthers the licensing process but each focuses on different aspects of it. Settlement of this disagreement calls for an understanding of the licensing process in general and its environmental elements in particular. Conveniently, the Supreme Court has recently summarized how the process is designed to operate:[21]

> In order to obtain the construction permit, the utility must file a preliminary safety analysis report, an environmental report, and certain information regarding the antitrust implications of the proposed project. See 10 CFR 2.101, 50.30(f), 50.33(a), 50.34(a). This application then undergoes exhaustive review by the Commission's staff and by the Advisory Committee on Reactor Safeguards (ACRS) . . .. Both groups submit to the Commission their own evaluation, which then becomes part of the record of the utility's application. See 42 U.S.C. 2039, 2232(b). The Commission staff also undertakes the review required by the National Environmental Policy Act (NEPA), 42 U.S.C. 4321, *et seq.*, and pre-prepares a draft environmental impact statement, which, after being circulated for comment, 10 CFR 51.22-51.26, is revised and becomes a final environmental impact statement. 10 CFR 51.26. Thereupon the three-

[19]See 42 U.S.C. 2239 and 2241, and fn. 36, *infra*.

[20]10 CFR 2.718 restates Section 7(b) of the Administrative Procedure Act, now revised and codified at 5 U.S.C. 556(c).

[21]*Vermont Yankee Nuclear Power Corp.* v. *NRDC*, 435 U.S. 519, 526-27 (1978) (footnotes omitted). See also *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-77-8, 5 NRC 503, 523-526 (1977).

member Atomic Safety and Licensing Board conducts a public adjudicatory hearing, 42 U.S.C. 2241, and reaches a decision which can be appealed to the Atomic Safety and Licensing Appeal Board, and, in the Commission's discretion, to the Commission itself. 10 CFR 2.714, 2.721, 2.786, 2.787. The final agency decision may be appealed to the courts of appeals. 42 U.S.C. 2239; 28 U.S.C. 2342.

In the case before us, the staff's production of the final environmental statement has been prolonged, and the Licensing Board's conducting of a public hearing on these issues has been delayed accordingly. Both are crucial elements of the licensing process. As we have explained,[22]

> the FES stands as the product of the study made by that segment of the agency which has the specific function of ferreting out the baseline facts upon which the final environmental judgments required by NEPA must be made. That being so, it necessarily is a prime ingredient in the ultimate fashioning of the agency's NEPA determinations by the adjudicatory tribunals.

And, as just described, those determinations are mandatory components of the licensing process. The environmental documents in suit must be introduced into evidence at the hearing before the licensing board.[23] Indeed, the staff may not take a position on environmental matters at the hearing until those documents are published.[24]

It is a virtual watchword of the Commission's system that "[t]he responsibilities of the boards are independent of those of the staff."[25] But in fulfilling its obligations during licensing proceedings, neither the boards nor the staff may be irresponsible or totally insulated. The Commission's policy on the conduct of licensing proceedings (set forth in its statement of General Policy and Procedure, 10 CFR Part 2, Appendix A, p. 74 (1977 Rev.)) makes manifest that autonomy is not an end in itself:

> The Statement reflects the Commission's intent that such proceedings be conducted expeditiously and its concern that its procedures maintain sufficient flexibility to accommodate that objective. This position is founded upon the recognition that fairness to all the parties in such cases and the obligation of administrative agencies to conduct their functions

[22] *Texas Utilities Generating Company* (Comanche Peak Steam Electric Station, Units 1 and 2), ALAB-260, 1 NRC 51, 55 (1975).

[23] 10 CFR 51.52(b)(1).

[24] 10 CFR 51.52(a).

[25] *Cleveland Electric Illuminating Company* (Perry Nuclear Power Plant, Units 1 and 2), ALAB-298, 2 NRC 730, 737 (1975). See also *New England Power Company* (NEP, Units 1 and 2), LBP-78-9, 7 NRC 271, 279-80 (1978).

with efficiency and economy, require that Commission adjudications be conducted without unnecessary delays.

The statement also sets forth a controlling theme, reiterated elsewhere in Commission regulations[26] and adjudicatory issuances[27]—that decisionmaking within the Commission should be "both sound and timely." If this is to be achieved, the boards and staff must coordinate their operations. Otherwise, the important albeit discrete tasks entrusted to each will not be timely completed. As we see it, the proper relationship between the licensing boards and the staff is essentially analogous to that between reviewing courts and administrative agencies: "a 'partnership' in furtherance of the public interest [between] 'collaborative instrumentalities of justice.'"[28] The question thus comes down to how to resolve the "partners" disagreements concerning the time needed to produce key environmental documents.

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[26]See, *e.g.*, 10 CFR 2.402 (separate hearings on separate issues and consolidation of proceedings with regard to plants of duplicate design at multiple sites); 2.714 (intervention); 2.716 (consolidation of proceedings); 2.718 (power of presiding officer—discussed extensively herein); 2.755 (oral argument before presiding officers); 2.756 (informal procedures); 2.757 (authority of presiding officer to regulate procedure in a hearing); 2.760-61a (initial decision and Commission review); 2.785 (functions of appeal board); 2.909 (rearrangement or suspension of proceedings involving Restricted Data and/or National Security Information); Part 2, Appendix A, Section V (hearings); 51.52(d) (pertinence of rules of general applicability to environmental hearings).

[27]See, *e.g.*, *Seabrook, supra,* where the Commission expressed its "obvious and appropriate concern" over that proceeding's widespread image "as a serious failure of governmental process to resolve central issues in a timely and coordinated way," 5 NRC at 517. In a recent *Seabrook* opinion (CLI-78-14, 7 NRC 952, 956-957 (June 30, 1978)), the Commission remanded environmental proceedings to the Appeal Board rather than the Licensing Board in an effort "[t]o alleviate to some extent the burden which this course of serial adjudication has placed on applicant and intervenors alike and to avoid unnecessary future delays in bringing the process to an end." It emphasized, however, that elimination of the Licensing Board phase did *not* mean that the Appeal Board's "primary goal should be speed rather than quality" and that the Board was "to assure a thorough hearing on the remanded issues and to make a sound disposition of them" (footnote omitted).

See also, *e.g.*, *Perry, supra,* ALAB-298, 2 NRC at 737; *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-417, 5 NRC 1442, 1445-46 (1977).

[28]*Greater Boston Television Corp.* v. *FCC,* 444 F.2d 841, 851-52 (D.C. Cir. 1970), *certiorari denied,* 403 U.S. 923 (1971). See also *United States* v. *Morgan,* 313 U.S. 409, 422 (1941) (Frankfurter, J.); *Environmental Defense Fund* v. *EPA,* 465 F.2d 528, 541 (D.C. Cir. 1972); *Kennecott Copper Corp.* v. *EPA,* 462 F.2d 846, 848-49 (D.C. Cir. 1972).

In its recent decision in *Vermont Yankee, supra,* the Supreme Court vigorously criticized the lower court for treading too far into the NRC's realm and, in essence, upsetting the balance of court-agency partnership. The Court said (55 L. Ed. 2d at 488): "Time may prove wrong the decision to develop nuclear energy, but it is Congress or the States within their appropriate agencies which must eventually make that judgment. In the meantime courts should perform their appointed function."

(b) Beyond doubt, the proceedings here hardly exemplify timeliness.[29] Some action was called for to correct the situation. Regulating the course of the hearing is a responsibility expressly imposed on the presiding officer—here the Licensing Board—by both the Administrative Procedure Act[30] and Commission regulations.[31] OPS thus understandably—and we think appropriately—saw that Board as a source of relief. We assume that the Licensing Board took a similar view and issued its scheduling directive as a remedial step, an attempt to get the proceedings onto the right track. Solely in terms of the dates the Board specified, the order was hardly a case of push coming to shove—it merely adopted publication dates projected by the staff itself.[32] The questions before us are whether the Board has the authority to push at all—and, if it does, whether it went about it properly.

As we mentioned, 10 CFR 2.718 vests the licensing boards with broad power over the licensing process. With the OPS application almost 5 years into that process,[33] Section 2.718 and past readings of it are properly at the center of our discussion. In placing them there, we are not denigrating the functions of the staff or the regulations governing them. Rather, we are recognizing that the dispute here concerns something the Board did—and that we must therefore determine what the Board is empowered to do.

The Commission and its adjudicatory boards have liberally interpreted the language of 2.718, emphasizing in a number of rulings a licensing board's extensive discretionary authority over the management of licensing proceedings.[34] Significant here because of the discussion of the licensing board's power to take action to avoid delay is our decision (and the Commission's affirmance) in *Kansas Gas and Electric Company and Kansas City Power and Light Company* (Wolf Creek Station, Unit No. 1), ALAB-321, 3 NRC 293 (1976), *affirmed,* CLI-77-1, 5 NRC 1 (1977). On the question of the Licensing Board's jurisdiction to consider whether applicants

[29]Without either finding fault with the staff for revising documents that were initially unsatisfactory or assigning blame for the numerous delays, we can certainly state the obvious: the current state of these proceedings is beneficial to no one and is antithetical to Commission policy.

[30]5 U.S.C. 556(c).

[31]10 CFR 2.718(e).

[32]See fn. 8, *supra.*

[33]Pursuant to 10 CFR 2.717, a licensing proceeding and the board's concomitant jurisdiction "commence when a notice of hearing or notice of proposed action pursuant to 2.105 is issued"—an event which, in this case, occurred on December 10, 1973 (38 Fed. Reg. 34008) (see p. 197, *supra*).

[34]Court cases have stressed the comparable authority of other agencies subject to the Administrative Procedure Act and regulations similar to 2.718 (see fn. 20, *supra*). See, *e.g., NLRB* v. *Phaostron Instrument and Electric Company,* 344 F.2d 855, 858 (9th Cir. 1965); *Swift & Company* v. *United States,* 308 F.2d 849, 852 (7th Cir. 1962).

could commence certain offsite activities without a limited work authorization, both we and the Commission pointed to portions of 2.718 that are relevant in the instant situation. We stressed, for example, that

> For this purpose, our examination of the Commission's regulations begins and ends with 10 CFR 2.718. In terms, that regulation gives the boards "all powers necessary" to accomplish their "duty . . . to take appropriate action to avoid delay." Then, as if to emphasize that "all" powers are conferred, it enumerates certain powers but concludes by giving boards the authority to "take *any* other action consistent with" the Atomic Energy Act, the Commission's other regulations, and the Administrative Procedure Act. 10 CFR 2.718(1).

3 NRC at 302 (emphasis in original; footnote omitted).

Two rulings we issued this year further elucidate the licensing board's authority. In *Marble Hill* we remarked on the breadth of that authority and also said, "[r]esponsibility for the conduct of the hearings, including the order of presentation of evidence and the scheduling of witnesses, is committed by law and regulation to the officers presiding at the trial."[35] And in *Midland* we reiterated that the delegation to the licensing boards of responsibility for the conduct of hearings "must be thought to carry with it broad discretion to shape the course of the proceedings."[36]

That discretion is, of course, not unbridled.[37] For example, last year in *Midland* (see fn. 37, *supra*), we reversed a series of licensing board rulings sequestering staff witnesses. While we acknowledged that rulings causing

[35]*Public Service Company of Indiana, Inc.* (Marble Hill, Units 1 and 2), ALAB-459, 7 NRC 179, 188 (1978).

[36]*Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-468, 7 NRC 465, 468 (1978). Our ultimate finding there—that the licensing board had too rigidly construed an order to conduct hearings expeditiously—cannot diminish the acknowledgment of general authority over the conduct of hearings.

That affirmation is reinforced by the terms of the Administrative Procedure Act, the underlying authority governing the power of presiding officers at agency hearings. Section 7(b)(5) of the APA directly vests presiding officers with authority "to regulate the course of the hearing." 5 U.S.C. 556(c). The APA refers to "hearing examiners" (since retitled administrative law judges); in the NRC, that authority is exercised by the licensing boards, which the Commission may employ in their stead. 42 U.S.C. 2239 and 2241. While an agency may, by "published rules," lay down policies and procedures to govern the exercise of the presiding officer's power, the pertinent NRC regulation, 10 CFR 2.718, merely tracks Section 7(b) of the APA. We see nothing in the NRC regulations suggesting that the Commission intended to cut back on the presiding officer's basic authority to schedule the receipt of evidence into the hearing record.

[37]See, *e.g.*, *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-379, 5 NRC 565 (1977); *Detroit Edison Company* (Greenwood Energy Center, Units 2 and 3), ALAB-376, 5 NRC 426 (1977).

mere "inconvenience" to the parties would not warrant our intrusion into the Licensing Board's conduct of the proceedings, we went on to hold that those in question "could [have] hamper[ed] the staff's ability to contribute to the development of a sound record," "threaten[ed] to impede rather than assist the search for truth" and were, therefore, abusive of the Board's discretion. See 5 NRC at 566-68.

Our point is that licensing boards may neither ride roughshod over the parties nor dance attendance on them. Their obligation is to tread a middle ground in order to be able to issue "sound and timely" decisions that have the public interest in mind.[38] To this end, the boards have broad and strong discretionary authority to "conduct their functions with efficiency and economy." However, they must exercise it with "fairness to all the parties" (10 CFR Part 2, Appendix A). Their power is not a weapon with which to domineer proceedings but a tool with which to actuate them.

Turning to the particulars of this case, we find that the Board below was attempting with its scheduling order to give these proceedings a prod. An effort to avoid delay—part of the *Board's* mandate—is simply not, by itself, in conflict with an effort to prepare an adequate environmental statement—part of the *staff's* mandate. It is one thing to recognize that the staff must have both independence and time to fulfill its environmental obligations. It is quite another to infer that the staff's responsibilities override or dilute the Licensing Board's. Once an applicaiton is on its way through the hearing process (see fn. 33, *supra*), the Licensing Board must be able to insure the "prompt and orderly dispatch of [this] public business" and a "sound and timely" decision.[39] Especially in the face of numerous and prolonged delays, one step toward that end can be a properly executed scheduling order.

We do not mean that the Board may force the staff to file the final environmental statement on a set day if, when that day comes, the statement is not finished or the staff is dissatisfied with its substance. An order to that effect would be self-defeating. It could at best elicit a questionable statement; it would also trench on the staff's right to prepare a document up to its own standards of adequacy. Nor can the Board simply dismiss the staff

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[38]The House Judiciary Committee expressed similar thoughts when it issued its report on the proposed Administrative Procedure Act in 1946:

> Presiding officers must conduct themselves . . . with due regard for the rights of all parties as well as the facts, the law, and the need for prompt and orderly dispatch of public business.

H.R. Rep. No. 1980, 79th Cong., 2d Sess. (1946), reprinted in S. Doc. No. 248, 79th Cong., 2d Sess. 233, 269 (1946). See also S. Rep. No. 572, 79th Cong., 1st Sess. (1945), reprinted *id.* at 185, 207.

[39]See pp. 202-203 and fn. 38, *supra.*

from proceeding for its tardiness. The staff is a necessary party; its dismissal would merely penalize the applicant.

One thing the Board may do is ascertain why the staff document in question has not been forthcoming. Certainly if it is to conduct the hearing in accordance with responsibilities assigned to it, the Board must at a minimum be entitled to look behind the staff's explanation for delay in submitting the environmental statement. If the staff can provide adequate assurance that it is acting as quickly and reasonably as the circumstances permit—and we emphasize the word *reasonably*—then the Board can ask no more and should reschedule the filing date accordingly.[40]

Where the Board finds, however, that the staff cannot demonstrate a reasonable cause for its delay, the Board may issue a ruling (with appropriate findings supported by the record) noting the staff's unjustified failure to meet a publication schedule. It may then either proceed to hear other matters or, if there be none, suspend the proceedings until the staff files the necessary documents. In either situtation the Board, on its own motion or on that of one of the parties, may refer the ruling to us. See 10 CFR 2.730(f). We would hear such referrals expeditiously; and, were we to agree with the Board, we would certify the matter to the Commission.[41] Its authority to rectify the situation is undoubted.

This procedure has several things to commend it. First it does not impinge on the staff's independent responsibility for preparing impact statements. Second, it would bring to the Commission's attention only those cases where boards at the licensing and appeal levels agreed about the cause of the delay. *Cf.*, 10 CFR 2.786(b)(4)(ii). And, third, it can aid in pinpointing responsibility for delays in the licensing process, a matter of concern to all.

To place this decision in context, however, we must make several things clear. The first is that, over the many years we have been reviewing licensing board decisions (the most junior member of this Board is in his fifth year of such service), we have had few occasions to find fault with the time needed by the staff to complete the environmental impact statements. (Indeed, earlier cases suggested to us that the staff was inclined to err in the other direction and submit those documents prematurely.) To be sure, there have been "slippages," but none that compares with this one in magnitude. We are inclined to believe the delays encountered here are atypical. Second, the staff has generally cooperated in doing its part in the licensing process. To

[40]For obvious reasons, we cannot say what excuses would be acceptable; that is a matter at least initially for the trial board.

[41]Assuming, of course, that we could devise no other solution to the impasse ourselves.

be sure, we have often taken issue with the results it reached, criticized its conclusions, and expressed dissatisfaction with its procedures. But we have not found the staff recalcitrant. Our experience therefore leaves us confident that the procedures just outlined should be adequate to resolve those few instances in which they might need to be involved.

Turning again to the circumstances at bar, we remind the parties of pertinent observations we made in *Douglas Point.*[42] We there noted "the absence of any rigid scheduling criteria established by statute or regulation,"[43] and stressed accordingly that responsibility for scheduling lies with the licensing boards. In doing so, we emphasized in particular that "although entitled to recognition, the convenience of litigants cannot be deemed dispositive on scheduling matters. The paramount consideration is where the broader public interest lies."[44]

That "broader public interest" does not lie in a proceeding stalled needlessly by the staff (or any other party) any more than it lies in one that receives a premature push in deference only to the applicants. The Licensing Board must take appropriate action to avoid delay—but the scheduling directive issued in this case (and supported by OPS) is inappropriate. As we described at the outset, the Licensing Board appears to have accepted the staff's explanations for the delay in filing the environmental documents, did not find it at fault, but without explanation imposed a publication deadline anyway.[45] See pp. 198, 199, *supra.* Because the Board did not make the type of record we have described as necessary to justify such a finding, we are constrained to overturn its action. Experience has taught us that a situation as complicated as this one cannot be resolved fairly on *post-hoc* affidavits.

Accordingly, we answer the first certified question with a qualified yes: The 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 justified. In the present case, however, the decision to fix a firm date for filing the documents demanded does not rest on any such finding. In the circumstances, that portion of the Board's order of March 30, 1978, scheduling the staff's submission of environmental documents may not stand.

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[42]*Potomac Electric Power Company* (Douglas Point, Units 1 and 2), ALAB-277, 1 NRC 539 (1975).

[43]*Id.* at 547.

[44]*Id.* at 552.

[45]The dates were, of course, ones suggested by the staff. See p. 204, *supra.* But, in light of the obvious difficulties that were being encountered in completing the documents, it was not reasonable to convert what were manifestly "best estimates" subject to revision into unconditional guarantees; and it was certainly inappropriate to do so without giving the staff notice and eliciting its concurrence or objection.

III. CONSIDERATION OF CLASS 9 ACCIDENTS

A.1. **The Annex.** The phrase "Class 9 accident" is a term of art. It stems from a 1971 Commission proposal to adopt standard assumptions about nuclear power plant accidents for use in preparing environmental impact statements. The concept was put forward in an "Annex"[46] proposed to be added to Commission regulations implementing NEPA (then found in Appendix D to 10 CFR Part 50 (1970 Rev.)). The Annex divided the spectrum of such accidents into classes from the least consequential—Class 1—to the most severe—Class 9—and characterized each class in accordance with the likelihood of its occurring and the consequences it might entail. These factors were proposed as the ones to be considered for each project in the applicant's "Environmental Report" (see 10 CFR 51.20) and weighed in the Commission's environmental impact statement on each application to build a nuclear facility.

There were to be two exceptions to that requirement: Class 1 and Class 9 accidents could be ignored, the former inconsequential, the latter for quite different reasons. The accidents grouped in Class 9, resulting in the exposure of the radioactive core, are of the most severe kind. But occurrences of this nature—*e.g.*, "breach of containment" and "core-melt" accidents—would necessarily involve the simultaneous malfunction of numerous safety systems designed and built into the nuclear facility. Though the results of a Class 9 accident might be extremely severe, the likelihood of one occurring is deemed highly improbable; so unlikely, in fact, that a nuclear power plant need not be designed with protective systems or safety features to guard against it.[47] The proposed Annex therefore provided that "it is not necessary to discuss such events in applicants' Environmental Reports."[48] And, because the same considerations govern preparation of the staff's environmental impact statements, Class 9

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[46]36 Fed. Reg. 22851-52 (December 1, 1971).

[47]As explained in the Annex (36 Fed. Reg. at 22852):

> The occurrences in Class 9 involve sequences of postulated successive failures more severe than those postulated for the design basis for protective systems and engineered safety features. Their consequences could be severe. However, the probability of their occurrence is so small that their environmental risk is extremely low. Defense in depth (multiple physical barriers), quality assurance for design, manufacture, and operation, continued surveillance and testing, and conservative design are all applied to provide and maintain the required high degree of assurance that potential accidents in this class are, and will remain, sufficiently remote in probability that the environmental risk is extremely low.

Accord, Denial of Rulemaking Petition of Connecticut Citizen Action Group, et al., 43 Fed. Reg. 16556 at 16557 (April 19, 1978) (NRC Doc. No. PRM-50-19).

[48]36 Fed. Reg. at 22852.

accidents need not be discussed in those either.[49]

The Commission voiced the expectation when it published this proposal in 1971 "that the provision of the proposed amendments [set forth in the Annex] will be useful as interim guidance until such time as the Commission takes further action on them."[50] In 1974, the Commission revised other parts of its NEPA regulations, codifying them in 10 CFR Part 51, but left the Annex untouched. That proposal was "still under consideration," it said, stressing that the new "Part 51 does not affect the status of the proposed Annex. . . ."[51] Hence, the document continues to be the Commission's "interim guidance" on the treatment to be accorded Class 9 accidents in environmental impact statements.

Until now, the Commission staff has not discussed accidents beyond the "design basis" for a plant—*i.e.*, those in Class 9—in its environmental statements. Instead, the staff has maintained that the possibility of such an event is so remote that it need not be considered at all in Commission proceedings on applications to license individual plants. Not only we[52] but the courts of appeals[53] have upheld the correctness of that position in the face of vigorous challenges.

2. **The staff's view.**[54] In this case the staff says an evaluation of Class 9 accidents is appropriate, candidly acknowledging that such "evaluation *is* a departure from staff review practices of several years ago."[55] Nevertheless, the staff asserts that its course here is consistent with the Annex and does not run counter to Commission policy. It supports that position by pointing to the statement in the Annex that, "[i]n the consideration of the environmental risks associated with the postulated accidents, the probabilities

[49]"The accident assumptions and other provisions of the proposed amendments set forth would also be applicable to AEC draft and final Detailed [Environmental Impact] Statements." Statement of considerations accompanying the proposed Annex, 36 Fed. Reg. at 22851; see also fn. 1 of the Annex, *ibid.*

[50]36 Fed. Reg. at 22851.

[51]39 Fed. Reg. 26279 (July 18, 1974).

[52]*Duke Power Company* (Catawba, Units 1 and 2), ALAB-355, 4 NRC 397, 415-16 (1975); *Commonwealth Edison Company* (Zion Station, Units 1 and 2), ALAB-226, 8 AEC 381, 407 (1974); *Long Island Lighting Company* (Shoreham Station), ALAB-156, 6 AEC 831, 833-36 (1973); *Wisconsin Electric Power Company* (Point Beach, Unit 2), ALAB-137, 6 AEC 491, 502 (1973); *Duke Power Company* (McGuire Station, Units 1 and 2), ALAB-128, 6 AEC 399 (1973), *affirming* LBP-73-7, 6 AEC 92, 122; *Consumers Power Company* (Midland, Units 1 and 2), ALAB-123, 6 AEC 331, 345-48 (1973). *See also Long Island Lighting Company* (Jamesport Station, Units 1 and 2), LBP-77-21, 5 NRC 684, 690-91 (1977) (appeal pending).

[53]*Carolina Environmental Study Group* v. *United States*, 510 F.2d 796, 799-800 (D.C. Cir. 1975); *Porter County Chapter* v. *AEC*, 533 F.2d 1011, 1017-18 (7th Cir.), *certiorari denied*, 429 U.S. 945 (1976). *Cf. Ecology, Action* v. *AEC*, 492 F.2d 998, 1002 (2nd Cir. 1974).

[54]Intervenors NRDC, New Jersey, and ACCCE essentially support the staff's position.

[55]*Staff Class 9 Brief* at 38 (emphasis in original); App. Tr. 126.

of their occurrence and their consequences must both be taken into account."[56] The staff asserts that, because the potential consequences of Class 9 accidents are essentially similar at all land-based plants, in the absence of special circumstances demonstrating greater probability of such an event at a particular land-based facility, the risk, *i.e.*, the likelihood times the consequences, is the same at all of them—extremely low.[57]

While the staff does not dispute that the *probabilities* of experiencing a Class 9 accident at a nuclear power plant ashore or afloat are the same,[58] it asserts that the potential *consequences* are not. For example, in a "core-melt" accident on land, the radioactive debris would be deposited in the surrounding earth, which would in large measure retain it.[59] But a floating plant lacks that natural constraint; a similar accident there would infuse radioactivity and radioactive material into the water, where tides and currents could spread those dangerous contaminants far and wide.[60] As the staff sees it, because the consequences of a Class 9 accident at an offshore plant would be so different, even though the *chances* of its occurrence are no greater, the *risks* entailed might be.[61] The staff therefore holds itself obliged by NEPA to consider that possibility in its impact statement, to weigh it in the cost-benefit balance it must strike on this application, and (if need be) to recommend license conditions to reduce the danger to the environment.

The tentative results of the staff's evaluation appear in the draft version of FES III it circulated on May 2nd. Those conclusions (in the form of recommended license conditions) are, among other things, that (1) siting barge-mounted nuclear plants in rivers or estuaries be prohibited unless the site is surrounded by impermeable breakwaters or set in lagoons on artificial islands, and (2) the manufacture of floating plants be licensed only if the pad under the reactor vessel, now designed to be of concrete, is redesigned and replaced with one made of material more resistant to melting and less likely to form large volumes of gases in the event a Class 9 accident brings it into contact with a molten reactor core.[62]

3. **The applicant's position.** OPS asserts that the Commission has adopted a firm policy against evaluating the consequences of Class 9 ac-

[56]36 Fed. Reg. at 22851.

[57]See, *Carolina Environmental Study Group* v. *United States, supra,* 510 F. 2d at 799.

[58]See *Liquid Pathway Generic Study* (NUREG-0440, February 1978) at vi.

[59]The staff refers to this as "interdiction at the site."

[60]*Viz.*, "the liquid pathway"; see *Liquid Pathway Generic Study* at 2-4 to 2-6.

[61]*Ibid.* See also App. Tr. 125-31, 140-41, 153.

[62]These recommendations appear in the Revised FES III at xiv:

Therefore, on the basis of the considerations set forth in this [Final Environmental] State-

(Continued on next page.)

cidents in environmental impact statements on individual license applications. That policy rests, the applicant says, on the Commission's considered judgment that the probability of such an accident is so remote that it presents no significant risk of environmental harm. The staff's decision to consider Class 9 accidents in connection with this application is a violation of that policy, according to OPS, because the chances of such an accident at a floating nuclear plant are no greater than at one on shore.

The applicant also asserts that the staff's position assumes that the reactor core will melt, which necessarily implies a failure of the facility's emergency core cooling system (ECCS). It argues that this assumption in essence challenges the adequacy of the Commission's ECCS regulations, an attack not permitted in an adjudicatory hearing under 10 CFR 2.758. Finally, the applicant says the staff action of which it complains arbitrarily and unfairly singles it out for treatment not allotted other applicants similarly situated.

OPS' position is bottomed on its understanding of the Annex and interpretations thereof in appeal board and court decisions, on Commission pronouncements in a related rulemaking proceeding, and on staff testimony on other cases.[63] We turn to the merits of its contentions.

B.1. Certainly insofar as land-based reactors are concerned, the applicant reads the Annex correctly. The policy that environmental statements on those plants generally need not consider Class 9 accidents rests on a 1971 Commission judgment that their likelihood is so remote as to make them incredible. The Annex does not tie the need to make such assessments to the consequences which may flow from such an accident; only a showing of special circumstances that increase the probability of such an event necessitates its consideration.

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ment, the action called for under the National Environmental Policy Act of 1969 (NEPA), Appendix M to 10 CFR Part 50, and 10 CFR Part 51 is the issuance of a manufacturing license for the manufacture of eight floating nuclear plants subject to the following conditions for the protection of the environment:

* * *

d. The applicant shall replace the concrete pad beneath the reactor vessel with a material that provides increased resistance to a melt-through by the reactor core and which does not react with core debris to form a large volume of gases. Any such feature shall not compromise other safety requirements for the facility.

e. The siting of floating nuclear plants in estuarine and riverine waters is precluded unless such sites are appropriately modified in an environmentally acceptable manner so as to insure timely source interdiction of radioactive material, and limit the introduction of such material into the surrounding water body in the event of a core-melt accident.

[63]See *Applicant's Class 9 Brief* at 7-9 and 64-66.

That result was not unintended. It follows from the problem the Commission faced in 1971: to what extent did the National Environmental Policy Act of 1969 require evaluation of possible accidents at nuclear power plants? As is now settled, NEPA mandates assessment of those environmental consequences that are reasonably anticipatable; possibilities unlikely to occur as a result of the proposed activity need not be considered.[64] Moreover, the decision to tie the need to discuss reactor accidents—no matter how serious their theoretical consequences—to a showing of a reasonable likelihood of occurrence was an approach that has since gained judicial acceptance.[65]

To be sure, as the staff stresses, the Commission did observe in the Annex that "[i]n the consideration of the environmental risks associated with the postulated accidents, the probabilities of their occurrence and their consequences must both be taken into account." 36 Fed. Reg. at 22851. That comment, however, is prefatory, a part of an introductory discussion; it is not in the portion of the Annex providing guidance about when Class 9 accidents are to be considered. In the latter section, the Commission made no effort to discuss what consequences might flow from an accident beyond the designed capability of a nuclear plant to prevent or withstand. It merely acknowledged without comment that accidents beyond a plant's "design basis" might have consequences potentially "severe." *Id.* at 22852. What those might be is not even hinted at in the Annex. In contrast, the Commission went to some pains to elucidate why the probability of a Class 9 event was "extremely low." For example, it explained in the Annex that (*ibid.*):

> Defense in depth (multiple physical barriers), quality assurance for design, manufacture, and operation, continued surveillance and testing, and conservative design are all applied to provide and maintain the required high degree of assurance that potential accidents in this class are, and will remain, sufficiently remote in probability that the environmental risk is extremely low.

It was immediately following this discussion that the Commission announced: "[f]or these reasons, it is not necessary to discuss such events in applicants' Environmental reports." *Idid.* On the other hand, the Annex is devoid of any suggestion that the consequences of a Class 9 accident, by themselves, were to govern when such an event need be considered in an environmental statement.

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[64]See, *e.g.*, *Sierra Club* v. *Hodel*, 544 F.2d 1036, 1039 (9th Cir. 1976); *Swain* v. *Brinegar*, 542 F.2d 364, 368 (7th Cir. 1976) (in banc); *Natural Resources Defense Council* v. *Morton*, 458 F.2d 827 (D.C. Cir. 1972); *Environmental Defense Fund* v. *Corps of Engineers*, 348 F. Supp. 916, 933 (N.D. Miss. 1972), *affirmed*, 492 F.2d 1123 (5th Cir. 1974).

[65]*Carolina Environmental Study Group* v. *United States*, *supra*, 510 F.2d at 798-99; *Porter County Chapter* v. *AEC*, *supra*, 533 F.2d at 1017-18.

Any doubt that the Commission intended "probability" rather than "consequences" to control when Class 9 events were to be touched upon is put to rest by its instructions for handling of Class 8 accidents, the most serious type deemed to be a credible event. According to the Annex, these were to be treated as those in Class 9 (*i.e.*, disregarded) where "the applicant can demonstrate *that the probability of one occurring has been reduced* and thereby the calculated risk to the environment made equivalent to that which might be hypothesized for a Class 9 event" (emphasis added). In other words, the need to discuss Class 8 events was unmistakably made to turn on their likelihood, not on their effects, and this was expressly equated with the treatment to be accorded Class 9 events. In the circumstances, a fair reading of the Annex points ineluctably to probability, not consequences, having been selected as the triggering factor by the Commission.

2. The foregoing discussion merely elaborates on what we have held over the course of several years in cases such as *Midland, McGuire, Point Beach, Shoreham, Zion,* and *Catawba.*[66] We need not rehearse them all here; it suffices to note that, in each instance, the result reached was the one we understood was being urged by staff counsel and supported from the witness stand by senior staff officials.[67]

(a) The staff's rejoinder is essentially threefold. First, it suggests that we have misapprehended its position in those cases. It now says that it never meant that intervenors were precluded from triggering consideration of a Class 9 event, notwithstanding its low probability, if they could demonstrate that particularly severe consequences might follow from such an incident. The staff would therefore distinguish our line of decisions on the ground that "in not one of those cases was any effort made to show special circumstances . . . about the consequences [of a Class 9 accident]." App. Tr. 148-49.

That argument will not stand scrutiny. For one thing, it rests on a misreading of past Commission proceedings. In *McGuire,* for example, in-

[66]See fn. 52, *supra.* In 1973 we ruled in *Shoreham,* for example, that (6 AEC at 836):

> In the absence of a showing that, with respect to the reactor in question, there is a reasonable possibility of the occurrence of a particular type of accident generically regarded as being in Class 9, NEPA does not require a discussion of that type of accident. It does not require an impact statement or a licensing board to exhaust all theoretical possibilities, whether or not they have been identified by a party.

[67]The applicant also calls to our attention, *inter alia,* the *Monticello* proceeding. During that proceeding Mr. Edson G. Case, now NRC Deputy Director of Nuclear Reactor Regulation, was asked on cross-examination whether "for Class 9 accidents, is it true that not only do you not consider their consequences in making the environmental assessment, but applicants are not required to provide any engineering safeguards to mitigate their consequences?" His response was: "That is correct." *Northern States Power Company* (Monticello, Unit 1), Doc. No. 50-263, Tr. at 821 (May 6, 1975).

tervenor Carolina Environmental Study Group did attempt precisely what staff counsel here suggests; *i.e.*, to have the Commission consider in its impact statement and at the licensing hearing the "potentially catastrophic effects" of a Class 9 incident at that facility. The staff declined to do so. The Licensing Board upheld the staff on the ground that "the probability of occurrence [of such events] is so low that they need not be considered," resting its ruling squarely on the guidance in the Annex; we affirmed.[68]

The Study Group then sought judicial review in the District of Columbia Circuit. It contended before the court of appeals essentially what the staff does here, *viz.*, that the Boards had made the "fundamental mistake of equating probability with risk."[69] Asserting that the consequences of a Class 9 accident had been estimated by the AEC itself as "up to 3,400 deaths, 43,000 injuries, and $7 billion property damage," intervenor told the court (in phrases strikingly similar to the ones the staff uses to us) that NEPA mandates agency consideration of such events.[70]

In its brief, the Commission responded that under NEPA it was entitled to "limit its consideration to effects which are shown to have some reasonable likelihood of occurring." It then stressed that "petitioner does not dispute the immense improbability of a breach-of-reactor-containment accident," but only "argues that since the 'consequences' of such an accident could be severe, that it is sufficient reason to require a thorough analysis of its impact." The Commission expressly rejected that reasoning and insisted that

> The extent of potential harm caused by such an occurrence is not the measure of an accident's probability. And it is precisely because the accident itself is so improbable, that an evaluation of its postulated impact is not within the reasonable ambit of NEPA's requirements.[71]

Manifestly, the staff's analysis of those proceedings is 180 degrees out of phase with the Commission stand. Moreover, the court of appeals there adopted the reasoning the Commission had urged upon it and upheld the refusal to consider Class 9 accidents on the very ground the staff would abandon here. The court took express note that "[t]he probability of a Class 9 accident is remote and that its consequences would be catastrophic are undisputed," but nevertheless affirmed the Commission's decision to

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[68] *McGuire, supra,* LBP-73-7, 6 AEC at 122, *affirmed,* ALAB-128, *supra,* 6 AEC 399.

[69] *Petitioner's Opening Brief,* pp. 8-13, in *Carolina Environmental Study Group* v. *United States,* No. 73-1869, D.C. Cir.

[70] *Ibid.*

[71] *Brief for the Commission,* filed January 1974, in No. 73-1869, D.C. Cir., *Carolina Environmental Study Group* v. *United States,* at 10-11. The Commission's brief was submitted by Marcus A. Rowden, then General Counsel of the Atomic Energy Commission.

disregard these events because "[t]here is a point at which the probability of an occurrence may be so low as to render it almost totally unworthy of consideration," accepting the Commission's representation that Class 9 accidents were beyond that point. *Carolina Environmental Study Group* v. *United States, supra,* 510 F.2d at 799-800.[72]

The reading we have given the Annex on the numerous occasions we have had that guidance before us[73] fully comports with the Commission's stand in court. The Commission has neither overturned nor otherwise criticized those decisions. Of course its silence does not imply acceptance of everything we said in those opinions. But, given all the circumstances, it hardly suggests that we have been wrong in our interpretation.[74]

(b) The staff next points out that all the cases, administrative and judicial, involved only whether there was an *obligation* to consider the Class 9 accident; none, it stresses, reached the issue here: whether such events may be examined *voluntarily.* The staff argues that the Annex merely "suggests that a potential impact 'need not' be considered in order to comply with the strict requirements of NEPA," but is not "an outright proscription that the impact 'shall not' be evaluated at all," as the applicant would have it.[75] According to the staff, "if the consequences of a core-melt accident were the destruction of the entire planet, the applicant's reasoning would suggest that the staff could still not consider those consequences in weighing the costs and benefits of the proposed project."[76]

That "*reductio ad absurdum*" is a paper tiger, a diversion from the real issue of whether the staff is faithfully adhering to policies laid down by the Commission. If a Class 9 event at a proposed facility would truly present extraordinary dangers, it need not be ignored under the construction of the Annex applicant favors. The staff could easily alert the Commission to that possibility and seek its leave to investigate further.

But the staff has not done that here. Instead, it candidly admits that it has acted on its own "to reconsider whether or not it was or was not a good idea to have a detailed consideration of Class 9 accidents in environmental reviews." App. Tr. 146.[77] We do not take this as a staff admission that it has arrogated the Commission's prerogative to control agency policy.

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[72]*Accord, Porter County Chapter* v. *AEC, supra,* 533 F.2d at 1017-18.

[73]See fn. 52, *supra.*

[74]See *New England Power Company* (NEP, Units 1 and 2), ALAB-390, 5 NRC 733, 742-43, *review declined,* CLI-77-14, 5 NRC 1323 (1977).

[75]See *Staff Class 9 Brief* at 21.

[76]*Id.* at 33.

[77]The staff does not represent that it has the Commission's permission for its actions here; we presume, therefore, that it has not. *Cf.* App. Tr. 144. The applicant calls our attention to

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Rather, the contention is that the guidance in the Annex is "flexible" and allows the staff to discuss Class 9 accidents in impact statements whenever it thinks it appropriate.[78]

Nothing in the decided cases, however, lends weight to the suggestion that the guidance is flexible enough to let the staff—as distinct from the Commission—make agency policy in this area. The staff's statement "that the matter of depth to which the staff should go in discussing accident scenarios in an EIS is a matter of discretion which the court was not willing to disturb,"[79] is simply a misreading of the *Carolina Environmental Study Group* decision. The court of appeals was deferring there to the discretion Congress vested in the Commission, not in its staff.[80]

To be sure, the Annex says only that it is "*not necessary* to discuss [Class 9] events in applicant's Enivronmental Reports," and in the impact statements drafted by the staff.[81] But the Annex is a proposed NEPA regulation,[82] and the Commission's NEPA regulations are generally cast in similar terms. To give but one example, the regulation directing that the values in "Table S-3" form the basis for considering the environmental effects of uranium fuel cycle activities in Environmental Reports (and in impact statements), concludes with the sentence: "No further discussion of the environmental effects addressed by the Table shall be *required.*" 10 CFR 51.20(e). Like the Annex, that regulation does not *forbid* consideration of additional matters in so many words. Nonetheless, that is precisely what was intended; it allows no departure from the Table S-3 values by the applicant, the staff, or the adjudicatory boards themselves.[83] We have been given

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remarks made by staff officials at a Commission open meeting on May 17, 1978, as bearing on this. See App. Tr. 9-12. We decline to take official notice of those remarks in light of the Commission's "Sunshine" regulations, 10 CFR 9.101, *et seq.*, 42 Fed. Reg. 12875 (March 7, 1977). We recognize that those regulations in terms appear to proscribe references to or reliance on such remarks only in papers filed before the Commissioners themselves. See Sections 9.101(a) and 9.103. However, we agree with the staff (App. Tr. 108-11) that the rationale underlying the rules—that such statements do not necessarily represent the speaker's final views—makes manifest that the proscription was intended to apply to all Commission adjudicatory tribunals and, perhaps, to other Commission organizations as well.

[78]See, *e.g.*, App. Tr. 144, 155-159; *Staff Class 9 Brief* at 38.

[79]*Staff Class 9 Brief* at 29.

[80]What the court said was: "Viewing the record as a whole, we cannot say that the *AEC's* general consideration of the probabilities and severity of a Class 9 accident amounts to a failure to provide the required detailed statement of its environmental impact." 510 F.2d at 799 (emphasis added).

[81]See pp. 209-210, *supra.*

[82]See p. 209, *supra.*

[83]*Public Service Company of New Hampshire,* (Seabrook Station, Units 1 and 2), ALAB-

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no reason to believe (and we perceive none ourselves) that the Commission intended to achieve the opposite result when it structured the Annex in similar fashion.

We have no quarrel with the staff's insistence that an agency may and should develop new review practices as it gains in knowledge and experience.[84] Nor do our conclusions serve to freeze the development of administrative decisionmaking. Of course the Commission is free to change the policy respecting the proper scope of environmental impact statements.[85] And, to be sure, it may delegate that authority to the staff. It is simply our considered judgment that the Commission has not done so in the case of power reactors covered by the Annex.[86]

(c) This brings us to the staff's final argument. It starts with the proposition that, while the likelihood of a core-melt accident may not be more probable or its consequences more severe at a floating nuclear plant, it presents risks of a different kind than those associated with plants ashore. We do not take it to be disputed that such an event afloat could spread dangerous radioactivity far wider than a similar incident ashore through what the staff terms "the liquid pathway."[87] The staff stresses that[88]

> Prior to the filing of the application to manufacture floating nuclear plants, the staff had only evaluated the risk of accidents for land-based plants, and the conclusions in the proposed Annex could only apply to the plants previously evaluated. With specific regard to Class 9 events, the staff had examined, prior to the development of the proposed Annex, the probabilities and consequences of such an event for land-based reactors.

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349, 4 NRC 235, 239, *vacated on other grounds,* CLI-76-17, 4 NRC 451 (1976); *Metropolitan Edison Company* (Three Mile Island, Unit No. 2), ALAB-456, 7 NRC 63, 65-66, *affirmed on this point,* CLI-78-3, 7 NRC 307, 309 (1978).

[84]See, *e.g., NLRB* v. *Weingarten, Inc.,* 420 U.S. 251, 265-66 (1975).

[85]See the discussion in *New England Power Company,* ALAB-390, *supra,* 5 NRC at 742; *Cf. Chisholm* v. *FCC,* 538 F.2d 349, 364 (D.C. Cir.), *certiorari denied,* 429 U.S. 890 (1976).

[86]The staff also asserts that (*Class 9 Brief* at 15) once it had undertaken to analyze core-melt accidents at floating plants, it was obliged to include the analysis and the conclusions based on it in the environmental impact statement because "NEPA is a full disclosure statute" and "to do otherwise . . . would be contrary to established law and guidance on this subject."

The short answer to that "bootstrap" argument is that one cannot justify intruding in proscribed areas by violating the proscriptions. *See FMC* v. *Seatrain Lines, Inc.,* 411 U.S. 726, 745 (1973).

[87]See p. 211, *supra.*

[88]*Staff Class 9 Brief* at 24-25.

> Further while the Reactor Safety Study (WASH-1400) had evaluated the liquid pathway impacts for a land-based plant and suggested that they were not significant contributors to risk, this had been based primarily upon (1) assumptions of relatively slow release of radioactivity from core debris, (2) a substantial radioactive decay that occurs during the long transport time of activity through the ground water, and (3) the perception that effective mitigative actions could be taken to isolate releases at the source and to prevent exposures from contaminated pathways. These effects were seen to be potentially significantly different for the FNP.

From this the staff reasons that floating nuclear plants pose environmental risks of a character not previously considered—risks "outside the parameters [*sic*] of the original analysis which was the underpinning of the Proposed Annex"[89]—and presumably not covered by the policies there announced.

With deference to our dissenting colleague, we find this staff argument a cogent one. To be sure, there is no way to know for certain what considerations motivated the Commission in 1971 when it issued the Annex. Such factors are, however, peculiarly within the staff's ken, for it participates closely in the development of rulemaking proposals. Indeed, we have previously taken "official notice of the fact that many, if not most, of the changes made in Commission regulations over the years were initiated (and properly so) by a staff proposal."[90] Given the type of nuclear facilities then in use or planned, it is reasonable to accept the staff's assertion that the policy reflected in the Annex had been developed and adopted without any focus on the floating nuclear plant or the discrete problems it presents. The authorities applicant cites do not support a contrary conclusion,[91] and those

[89] *Id.* at 26.

[90] *New England Power Company, supra,* ALAB-390, 5 NRC at 742.

[91] The applicant cites Commission statements made in denying the rulemaking petition related to floating nuclear plants filed by the Atlantic County Citizens Council on Environment as evincing a Commission intent to treat such plants in the same manner as land-based facilities for purposes of preparing environmental impact statements. See 42 Fed. Reg. 25782-84 (May 19, 1977) (NRC Doc. No. PRM-50-12). ACCCE sought to have the NRC require full-scale operational system testing of pilot models or prototypes before licensing the manufacture of certain kinds of nuclear power plants. The statements applicant relies upon were made in that context and were not intended to bear on the question before us. An administrative tribunal, like a court, "does not decide important questions of law by cursory dicta inserted in unrelated cases." *Permian Basin Area Rate Cases,* 390 U.S. 747, 775 (1968).

Applicant also relies on the Commission's "Interim General Statement of Policy" issued in connection with the "Rasmussen Report," *An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants,* WASH-1400 (NUREG-75/014), October 1975. However, as the

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relied upon in the dissent are similarly *post-hoc* events with, at best, inferential relevance to the question at hand.

It is one thing to hold the staff to clearly articulated, reiterated policy guidance that the Commission has chosen to let stand. It is quite another to extend that policy to situations not considered at its adoption. And doing so is particularly inappropriate where that "guidance" is a proposed Atomic Energy Commission regulation—proffered but not adopted in 1971—and allowed to languish ever since. We therefore cannot share our dissenting colleague's faith in the Annex's vitality for seasons and circumstances never contemplated.

In sum, we agree with the staff that the Annex should not be read as extending to floating nuclear plants—a concept unknown when the Annex was put out as interim guidance. We have been given no reason to disbelieve the staff's assertion that, until it studied the matter, it did not know how the consequences of serious accidents at floating plants would stack up against the consequences of similar accidents on land. It follows that the staff had to inform itself of the consequences of using this novel siting concept. And NEPA demands—rather than forbids—that the staff publish the results of its study. It is too late in the day to argue that NEPA is not an environmental full disclosure law.[92]

The applicant and our colleague both say, however, that this goes beyond the limits of the "rule of reason" implicit in the application of NEPA.[93] We do not think so. The first question likely to be asked by anyone confronted with the concept of an offshore nuclear power plant is "what will happen in the ocean in the event of a serious accident?" The staff is to be commended, not criticized, for doing precisely what is reasonable—attempting to find out the answer to that question.

Accordingly, though read literally the policy guidance in the Annex might apply to offshore plants as well as to those on land, the better con-

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Staff's Class 9 Brief suggests (p. 26), that report did not evaluate accidents at floating plants. For example, the report assumed that in a core melt, "most of the gaseous and particulate radioactivity that might be released would be discharged into the ground which acts as an efficient filter, thus significantly reducing the radioactivity released to the above-ground environment," manifestly not the situation at a floating plant. WASH-1400 at 28 (Main Report); see also *id.* at §1.9.

[92]In this connection, our reluctance to extend the coverage of an annex proposed in 1971 is consistent with our understanding of this Commission's policy of frankness and full disclosure. In saying this, we do not mean to disparage our colleague's carefully articulated dissent. Our point is, rather, that in this area it is a mistake to assume too readily that the NRC would automatically extend, *sub silentio,* policies formulated by the Atomic Energy Commission in a different era.

[93]See *NRDC* v. *Morton,* 458 F. 2d 827 (D.C. Cir. 1972).

struction is that the former were "not within the intention of the [Commission], and therefore cannot be within the [rule]."[94] Given NEPA's mandate to study the environmental consequences of major Federal actions "to the fullest extent possible,"[95] we cannot fault the staff's election to discuss Class 9 accidents in its Final Environmental Statement on this application to build floating nuclear power plants.

3. This conclusion requires us to answer two objections posed by the applicant: first, that it amounts to allowing an impermissible challenge to other Commission regulations and, second, that it subjects the applicant to unfair and inequitable treatment. Neither is meritorious.

(a) The applicant is correct that the Final Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors (set out in 10 CFR 50.46 and Appendix K to 10 CFR Part 50) are Commission regulations, that (except in circumstances not present here) the Commission does not allow challenges to its regulations in adjudicatory hearings on individual license applications,[96] and that the acceptance criteria assume that the emergency core cooling system will operate in the case of a nuclear power plant accident. It is also right that Class 9 accidents postulate ECCS failure. The applicant reasons that, by allowing consideration of those accidents, we are entertaining an impermissible challenge to the ECCS regulations.[97]

Applicant's argument carries certain logical strength. Its weakness is that it has been previously rejected by the Commission, and this is fatal. Some years ago in *Vermont Yankee* we read the acceptance criteria essentially the way applicant urges be done; the Commission disagreed with our reading and squarely held those criteria not to preclude the use of inconsistent assumptions about ECCS failure for other purposes.[98] We are of course bound by the Commission's construction of its own regulations and this means that we must reject the applicant's contrary premise.[99]

(b) OPS' second objection invokes the principle that it is arbitrary to treat similarly situated parties inconsistently. Applicant contends that to discuss the consequences of Class 9 accidents in connection with its applica-

[94]*Church of the Holy Trinity* v. *United States,* 143 U.S. 464, 472 (1892); *see also, Toledo Edison Company* (Davis-Besse, Unit No. 1), ALAB-323, 3 NRC 331, 344 (1976).

[95]42 U.S.C. 4332.

[96]10 CFR 2.758.

[97]The applicant relies, *inter alia,* on our decisions in *Shoreham, supra,* 6 AEC at 847, and *Zion, supra,* 8 AEC at 408.

[98]*Vermont Yankee Nuclear Power Corp.* (Vermont Yankee Station), ALAB-229, 8 AEC 425, 432, *reversed on this point,* CLI-74-40, 8 AEC 809, 811-14 (1974). This decision of course vitiates the force of the appeal board and licensing board decisions relied on by applicant.

[99]In particular see 8 AEC at 814; see also, *Union of Concerned Scientists* v. *AEC,* 499 F.2d 1069, 1089-90 (D.C. Cir. 1974).

tion when the staff has never done so in impact statements prepared on other proposals to build power reactors lacks "fundamental fairness" and is, therefore, impermissible.

We have no disagreement with the principle stated and we are in accord with the judicial and administrative decisions (including our own) applying it that the applicant calls to our attention.[100] But this does not advance applicant's cause. For reasons we previously discussed, the situation of a nuclear plant afloat is not the same as that of one on *terra firma*.[101] The staff is consequently correct in relying upon the principle that the law does not require consistency in treatment of two parties in different circumstances; what is required is a reasoned and reasonable explanation why the differences justify a departure from past agency practice.[102] The staff has provided here an adequate explanation for conducting its study and discussing the results.[103]

OPS further reminds us that we said in *New England Power Company, supra,* that (5 NRC at 744):

> Applicants for nuclear licenses are entitled to know both what they must undertake to do in connection with their applications and against what criteria the acceptability of their proposal will be measured. . . . Otherwise, no applicant would ever be able to make a reasonable appraisal of whether its proposal satisfies regulatory requirements—for what was yesterday authoritatively determined to be the effect of the terms of a given regulation might be just as easily discarded tomorrow. In our view, no regulatory process can properly be taken to work in this fashion.

The applicant contends it was not apprised in advance of submitting its application that the consequences of a Class 9 accident might be taken into consideration. The staff disputes this, responding that OPS was put on notice of the possibility 4 years ago. Each side has submitted affidavits supportive of its respective position (the applicant has moved to strike the staff's).

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[100]The applicant cites, *inter alia, Distrigas of Massachusetts Corp.* v. *FPC,* 517 F.2d 761, 765 (1st Cir. 1975); *HC & D Moving & Storage Company* v. *United States,* 298 F. Supp. 746 (D. Hawaii 1969); *New England Power Company,* ALAB-390, *supra,* 5 NRC at 741, *review denied,* CLI-77-14, 5 NRC 1323 (1977).

[101]See pp. 218-219, *supra.*

[102]*See, e.g., Secretary of Agriculture* v. *United States,* 347 U.S. 645, 653 (1954); *International Union* v. *NLRB,* 459 F.2d 1329, 1341 (D.C. Cir. 1972).

[103]Whether the discussion in the environmental statement is accurate and whether it justifies the conclusions reached are matters for the trial board. The applicant will have an opportunity there to explore these matters (if it wishes).

We think it inappropriate and unnecessary for us to attempt to resolve this dispute. Inappropriate because the matter is before us on certification and, hence, without the benefit of a record in which the question was fully explored. Trial by affidavit is not an adequate substitute. We are thus in no position to decide "who struck John." The most we can fairly say is that the staff's position on Class 9 accidents at floating plants has been evolving and, during the course of reviewing this application—perhaps the ACRS was the catalyst[104]—it crystallized differently than applicant anticipated. We can understand how the staff may have thought it was signalling its intentions all along and at the same time we can appreciate why they may not have registered with the applicant.

Little would be served, however, by attempting to apportion blame for the situation between the disputants. Fortunately, it is not essential that this be done. Our ruling—that the consequences of a Class 9 accident may be considered in this environmental statement—carries with it no connotation that the staff's judgments expressed there are necessarily sound, much less that its recommended license conditions are warranted. These are matters yet to be explored in the pending proceedings before the Licensing Board. 10 CFR 51.52. We are confident that the Board will give the applicant sufficient time and a fair opportunity to prepare and to address them. Accordingly, the Licensing Board had no occasion to direct the staff to exclude from its environmental impact statement considerations of Class 9 accidents at floating nuclear plants. We therefore answer the second certified question, "no."[105]

4. One thing remains to be touched upon before we leave this point. Apart from whether the staff timely alerted OPS that Class 9 events might be taken up in connection with its application, a broader problem is present: The regulatory guides and review plans promulgated by the staff do not effectively convey its current attitudes respecting these events.

Arguing to the contrary, staff counsel told us that the "Staff's Standard Review Plan" made its position "quite clear" (at least in certain circumstances). App. Tr. 133. After the argument we asked counsel to specify for us the portions of the plan which supported his statement. His response is reporduced in the margin below.[106] The provisions to which our attention

[104]See fn. 5, *supra.*

[105]The disposition we have made of this point makes it unnecessary to decide whether certain affidavits submitted by the staff should be stricken, or to reach the question whether the Licensing Board has authority to order the staff to excise portions of its environmental impact statement. We express no opinion about those issues.

[106]By letter of June 20, 1978, staff counsel answered our request as follows:

This is in response to your June 19, 1978, letter regarding NUREG-75/087 and NRC Reg-

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was invited at best hint (and we choose that word carefully) at the possibility that a site otherwise satisfactory for a nuclear power plant might be rejected were an acceptable alternative available in a less populated area. Be that as it may, this is not the equivalent of advising applicants straightforwardly that there are circumstances where the staff expects Class 9 accidents to be discussed, much less of warning them that the possibility of such events may color the staff's evaluation. Certainly, the "Standard Review Plan" material cited gives applicants no indication that a nuclear power plant might have to be redesigned to provide additional protection against the consequences of a Class 9 incident. Even cognoscenti would have difficulty divining that possibility.[107]

Our concern is not about whether Class 9 accidents should or should not be disregarded. That is a policy judgment for the Commission (or, if it has not spoken, initially for the staff). We wish, rather, to reiterate what we stressed in *New England Power, supra:* "Applicants for nuclear licenses are entitled to know both what they must undertake to do in connection with their applications and against what criteria the acceptability of their proposal will be measured." 5 NRC at 744. Against the background of the guidance in the Annex that Class 9 accidents are too unlikely to require discussion, the line of decisional authority that the possibility of these incidents is not to be considered, and the rule that nuclear plants need not be designed to guard against them, the idea that Class 9 events are, nevertheless, to be taken account of for some purposes is not plainly spelled out in the staff's regulatory guides and appendices. Although this applicant has been alerted to what is expected, fairness calls for the forthright and formal publication of the staff's position on Class 9 accidents to all applicants. Failure to do so invites repetition of the unfortunate misunderstandings encountered in this case.

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ulatory Guide 4.7, Revision 1. The pertinent provisions of NUREG-75/087 are paragraphs II (first full paragraph, page 2.1.3-2) and III (paragraph on the bottom of page 2.1.3-3 and continuing to the top of page 2.1.3-4). The pertinent provisions of NRC Regulatory Guide 4.7, Revision 1, are Section C.3 (page 4.7-9) and Appendix A, item A.3 (page 4.7-16). Item A.3 of Appendix A of NRC Regulatory Guide 4.7, Revision 1, states that the basis of the policy that nuclear power stations should not be located in a densely populated area is to ensure that exposure of populations from radiation as a result of a serious accident is minimized. The "special consideration" called for in the case of high population density sites would therefore entail some consideration of population exposures from serious accidents at the proposed site and alternative sites.

[107]We note that the Standard Review Plans are devoid of phrases such as "Class 9 incidents," "core-melt situations," "accidents beyond the design basis," or similar terms that might alert knowledgeable applicants.

The certified questions are answered as indicated in Parts II and III, *supra*; the Licensing Board's order of March 30, 1978, insofar as it fixes specific dates for the staff's filing of certain environmental documents is *vacated;* and the cause is remanded to that Board for further proceedings consistent with this opinion.

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

Opinion of Dr. Buck, concurring in part and dissenting in part:

I am in accord with my colleagues' conclusions regarding the relationship between the NRC staff and the licensing boards. I also agree with the initial part of the Class 9 accident discussion, to the extent that it concludes that (1) interpretations of the proposed Annex to 10 CFR Part 50, Appendix D, heretofore sanctioned by this Board, the Commission, and the courts are not to to changed by the staff alone; and (2) the Annex, contrary to the staff's position, must be construed to permit the low probability alone of Class 9 accidents to serve as a basis for eliminating consideration of the consequences of such accidents in the NEPA review.

However, I strongly disagree with the majority's further conclusion that the Annex was not intended to, and does not, apply to floating nuclear plants (FNP's) and, hence, that the consequences of "Class 9" accidents may be taken into account in evaluating the acceptability of the FNP's design. That conclusion is erroneous because (1) it is inconsistent with the Annex, as properly construed, and with a long line of applicable decisional authority; (2) it permits the staff alone to modify existing NRC policy on a question which the Commission itself has under study; and (3) it ignores the very real question whether an applicant is entitled to have the rules under which its application is to be judged clearly spelled out.

A.1. As none of the parties (or the Board majority) seriously disputes, there are innumerable accident scenarios which conceivably might eventuate from the operation of a nuclear reactor. In its safety reviews, both prior to enactment of the National Environmental Policy Act (NEPA) and continuing to the present time, the Commission has limited its accident considera-

tion to those deemed "credible" (see 10 CFR 100.11, fn. 1).[1] In the first draft "Guide to the Preparation of Environmental Reports" issued to implement NEPA (dated February 1971), the staff noted (p. 11, fn. 7) that accidents "will be evaluated in the context of the Part 50 licensing procedure and need not be discussed in the Environmental Report."

Following the *Calvert Cliffs'* decision,[2] however, the staff changed its position and, on September 1, 1971, in order to provide guidance as to which of the multifarious accidents must be reviewed in environmental reports (and statements), promulgated a document denominated "Scope of Applicants' Environmental Reports With Respect to . . . Accidents." The Annex which was issued by the Commission 3 months later upgraded the status of the staff advice by incorporating almost verbatim the Class 9 accident discussion which had first appeared in the September 1, 1971, memorandum and by providing for its use as "interim guidance."

The Annex offered guidance as to the manner in which the entire spectrum of accidents was to be treated in environmental reports (and statements as well). Insofar as the most serious (Class 9) were concerned, it stated:

> The occurrences in Class 9 involve sequences of postulated successive failures more severe than those postulated for the design basis for protective systems and engineered safety features. Their consequences could be severe. However, the probability of their occurrence is so small that their environmental risk is extremely low. Defense in depth (multiple physical barriers), quality assurance for design, manufacture, and operation, continued surveillance and testing, and conservative design are all applied to provide and maintain the required high degree of assurance that potential accidents in this class are, and will remain, sufficiently remote in probability that the environmental risk is extremely low. For these reasons, it is not necessary to discuss such events in applicants' Environmental Reports.

It further provided that

> . . . it is not necessary to take into account those Class 8 accidents for which the applicant can demonstrate that the probability has been reduced and thereby the calculated risk to the environment made equivalent to that which might be hypothesized for a Class 9 event.

36 Fed. Reg. 22851, 22852 (December 1, 1971).

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[1]In other contexts, the Commission has referred to a "maximum hypothetical accident" or "design basis accident." The accidents cover a range of incidents.

[2]*Calvert Cliffs' Coordinating Committee* v. *AEC*, 449 F.2d 1109 (D.C. Cir. 1971).

On the basis of the methodology spelled out in the Annex, therefore, it can be seen that the Commission has treated "incredible" or Class 9 accidents similarly for both its safety and environmental reviews.[3] Unlike accidents which are reviewed, where the assumptions underlying the reviews may vary depending on the conservatisms employed in the particular analysis, there is a common theme or philosophy underlying the Commission's consideration of incredible accidents: as made clear by the Annex, their consequences need neither be considered nor subjected to ameliorative design features.

2. My colleagues correctly construe the Annex as defining both those accidents which need, and those which need not, be analyzed in environmental reports and statements in terms solely of the probability of their occurrence.[4] That construction has been mandated by a long line of Appeal Board and judicial decisions.[5] The potential severity of an accident's consequences is thus not to be considered in determining whether or not to provide safety features to preclude or mitigate those consequences; for, as the Annex states, the probability of their occurrence is "so small" that—perforce—"the environmental risk is extremely low." Put another way by a court which specifically upheld the Commission's treatment of Class 9 accidents in this manner:

> Because each statement on the environmental impact of a proposed action involves educated predictions rather than certainties, it is entirely proper, and necessary, to consider the probabilities as well as the consequences of certain occurrences in ascertaining their environmental impact. There is a point at which the probability of an occurrence may be so low as to render it almost totally unworthy of consideration.

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[3]"To say that [safety concerns] must be regarded independently of the constantly increasing consciousness of environmental risks reflected in proceedings with reference to NEPA, would make for neither practicality nor sense." *Citizens for Safe Power* v. *NRC*, 524 F.2d 1291, 1299 (D.C. Cir. 1975).

[4]As my colleagues have pointed out, the staff has taken the statement in the Annex, "[i]n consideration of the environmental risks associated with postulated accidents, the probabilities of their occurrence and their consequences must be taken into account," completely out of context (see pp. 210-211, 213, *supra*).

[5]For example, see *Duke Power Company* (Catawba Nuclear Station, Units 1 and 2), ALAB-355, 4 NRC 397, 415-16 (1976); *Long Island Lighting Company* (Shoreham Nuclear Power Station), ALAB-156, 6 AEC 831, 835-36 (1973); *Carolina Environmental Study Group* v. *United States*, 510 F.2d 796 (D.C. Cir. 1975). Our *Shoreham* ruling was, with respect to Class 9 accidents, upheld by the Court of Appeals for the District of Columbia Circuit in an unpublished order dated November 9, 1976 (*Lloyd Harbor Study Group, Inc.* v. *AEC*, No. 73-2266, judgment vacated on other grounds, _____ U.S. _____, 46 U.S.L.W. 3642 (April 17, 1978)).

Carolina Environmental Study Group v. *United States,* 510 F.2d 796, 799 (D.C. Cir. 1975).

My colleagues do not apply this well-accepted method of analyzing accidents to FNP's because, they say, the Annex does not apply to such plants. I disagree. Even they concede that, when read literally, its language can be applied to offshore plants (*supra*, p. 220). And a careful reading of its terms reveals that it is *reactor specific—i.e.*, it is applicable to pressurized water reactors and boiling water reactors—but not *site specific.* It applies to those types of reactors wherever they may be located.

My colleagues attempt to differentiate FNP's from land-based plants on the basis that, because of the liquid pathway for radioactive materials released as a result of a Class 9 accident, the consequences of such an accident would be "more severe" than from a land-based plant; they go on to conclude that the Commission did not consider FNP's in its promulgation of the Annex. It is true, of course, that the regulations permitting the licensing of the manufacture of FNP's were part of the Commission's "Standardization" program and were not proposed until April 1973,[6] well after the promulgation of the Annex. But the Commission had standardization concepts under consideration for a substantial period of time prior to issuance of the proposed regulations. It issued a policy statement on the subject on May 1, 1972 (see 38 Fed. Reg. at 10159), and in the years 1972-1973 the Commissioners and other senior officials made numerous speeches referring to standardization (and, specifically, the applicability of the manufacturing license option to offshore siting).[7] Moreover, the complex application here under review was filed only about a month after the issuance of the proposed manufacturing license regulations—scarcely enough time to have prepared an application of this type from scratch.

Beyond that, when the Commission in 1974 reissued its environmental regulations as a new Part 51, it explicitly left standing the proposed Annex (39 Fed. Reg. 26279, July 18, 1974). Even if the Commission had not been directly focusing on FNP's when the proposed Annex was issued in 1971, it cannot be seriously claimed that the Commission was not aware of FNP's when it reissued the Annex in 1974. And given the then-pending manufacturing license application for FNP's, it would surely have then excluded such facilities from coverage by the Annex had it intended that result to occur.

[6]38 Fed. Reg. 10158 (April 25, 1973). The manufacturing license regulations were issued in final form on November 2, 1973 (38 Fed. Reg. 30251).

[7]See, *e.g.*, remarks of Commissioner James T. Ramey, dated September 27 and 29, 1972 (S-15-72 and S-16-72); Commissioner William O. Doub, dated December 11, 1972, (S-21-72) and November 12, 1973 (S-13-73); and L. Manning Muntzing, Director of Regulation, dated May 10, 1973 (S-7-73).

That it did not do so is perhaps best explained by the fact that there appear to be insignificant technical differences between the proposed FNP's and other pressurized water reactors. The Commission, in denying a rulemaking petition which advocated more stringent testing procedures for FNP's than for land-based plants, has acknowledged that the FNP's "do not represent basic new technology" and that they are "essentially the same as land-based plants except for certain unique features associated with mounting the nuclear steam supply system on a floating foundation." 42 Fed. Reg. 25782-3 (May 19, 1977).[8] It is not at all clear, in fact, either that the consequences of a Class 9 accident at all land-based plants are similar or that they uniformly are less "severe" than those resulting from such an accident at an FNP.[9] In the Liquid Pathway Generic Study the staff does conclude that

> the risks associated with releases to the liquid pathway at an FNP are less than those at an LBP for the spectrum of design basis events and are greater than those at an LBP for events beyond the design basis.[10]

In other words, on the staff's own analysis, FNP's are more favorable to the environment than land-based light-water reactors in normal operation and under all design basis accidents. Moreover, the type of FNP here under review is an "ice-condenser" pressurized reactor, which has a relatively small containment and as to which airborn releases are likely to be more significant than liquid pathway releases in the event of a Class 9 accident.[11] The difference in consequences between a Class 9 accident at a land-based plant and at the FNP's under review might therefore be narrow or nonexistent. Finally, it is conceded by all the parties, and not disputed by my colleagues, that the occurrence of a Class 9 accident at an FNP is as unlikely as

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[8]I am not persuaded by my colleagues' attempt to down-play these statements as being taken out of context (fn. 91, p. 219-220, *supra*). The rulemaking petitioners' purpose in seeking more stringent testing procedures was, in part, to achieve adequate safety to preclude the occurrence of a Class 9 accident.

[9]See discussion, p. 232, *infra*.

[10]NUREG-0440, Liquid Pathway Generic Study—Impacts of Accidental Radioactive Releases to the Hydrosphere from Floating and Land-Based Nuclear Power Plants, February 1978, at p. viii.

[11]Reactor Safety Study (WASH-1400 or NUREG-75/014), Main Report, p. 28: "For small containments, the pressure due to the combination of [hydrogen and carbon dioxide] would represent the most likely path to containment failure."

See also NUREG-0440, where it is stated (p. vi): " . . . core-melt events in reactors of the ice-condenser type would ultimately lead to containment failure by overpressurization, with subsequent melt-through. This would be expected to occur whether the reactors are land based or floating."

at a land-based plant.[12] In these circumstances, it is difficult to read the Annex as excluding FNP's without an express direction to that effect—a direction which here notably is not present.[13]

Even assuming, *arguendo,* that the Annex was promulgated for land-based, light-water reactors only, it does not follow that the policies comprehended by the Annex should not be applied to FNP's. As we have seen, the policy of not considering in a NEPA review the consequences of Class 9 accidents because of the extremely low probability of their occurrence has been explicitly sanctioned by the courts. The same doctrine has been applied to Federal actions in other areas.[14] It is a necessary adjunct to the "rule of reason"—a recognition that NEPA does not require the consideration of environmental consequences which at best are remote and speculative.[15] Moreover, the policy has long been part and parcel of the Commission's safety review of reactors.[16] That being so, there should be no departure from the firmly established method of considering the effects of accidents without express direction to that effect from the Commission.

B. As I have shown, the treatment of Class 9 accidents with respect to FNP's adopted by the staff and sanctioned by my colleagues is inconsistent both with the Annex and with the judicially approved policy for considering accidents which the Commission has long followed in its safety and environmental reviews. Beyond that, however, there are several undesirable side effects which stem from the majority's course of action.

1. In the first place, it permits the staff alone to establish a policy which in effect countermands an existing Commission policy. The Annex has the specific imprimatur of the Commission; but even if it is not technically applicable, the policy for considering improbable accidents which it embodies has long been an integral part of the Commission's regulatory philosophy

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[12]See, in particular, NUREG-0440 at p. vi.

[13]To describe, as do my colleagues, the well-accepted, judicially approved methods for analyzing accidents traditionally followed by the Commission in the licensing process for light-water reactors as a "*post-hoc* event" (p. 220, *supra*) obviously misses the point I am making—*i.e.*, that this treatment of accidents is so fundamental a part of the review process that, for there to be a deviation, an express Commission direction is called for.

[14]See, *e.g., Sierra Club* v. *Hodel,* 544 F.2d 1036, 1039 (9th Cir. 1976); *Swain* v. *Brinegar,* 542 F.2d 364, 368 (7th Cir. 1976); *Trout Unlimited* v. *Morton,* 509 F.2d 1276, 1283 (9th Cir. 1974); *Natural Resources Defense Council* v. *Morton,* 458 F.2d 827 (D.C. Cir. 1972).

[15]It need not be reiterated too strongly that no so-called Class 9 accident has ever occurred.

[16]We recently applied the policy to the question of protection of a facility from aircraft crashes—holding that a plant must be designed against such crashes if their probability were greater than about 10^{-7} annually but that consequences of a crash of a heavier than design basis plane need not be considered if the probabilities of its crash were less than about 10^{-7} annually. *Metropolitan Edison Company* (Three Mile Island Nuclear Station, Unit 2), ALAB-486, 8 NRC 9, 28, and fn. 38 (July 19, 1978).

and on a number of occasions has received the Commission's blessing (see, *e.g.*, pp. 215-216 of the majority opinion). My colleagues agree that the staff acting alone should not be permitted to overturn a longstanding, Commission-approved policy,[17] *but they then turn around and construe that policy so narrowly that they in effect allow the staff to do just that.* In my view, a fundamental change in Commission policy such as is involved here should not be put into effect without explicit Commission approval.

We had occasion last year to consider a similar staff excursion into policymaking, concerning the issue of evacuation from areas outside the low population zone. *New England Power Company* (NEP, Units 1 and 2), *et al.*, ALAB-390, 5 NRC 733 (1977).[18] There, we overruled the staff's attempt to reinterpret Commission regulations and thereby force consideration by the applicants of evacuation of population beyond the low population zone, contrary to previous Appeal Board and Commission decisions. We were particularly critical of the staff for attempting to require such evacuation plans without clear criteria of just how far out such evacuation should occur or for what reasons. We suggested that rulemaking was the appropriate vehicle for the staff to use if it wished to achieve the result it sought. *Id.* at 742-44, 747. The Commission agreed. CLI-77-14, 5 NRC 1323 (1977).

The same situation is present in this case, and in my opinion, the decision by my colleagues ignores that precedent. Indeed, the staff's actions here are even more egregious than with respect to the evacuation question because, in July 1977, the Commission published a notice of the formation of a Risk Assessment Review Group which, *inter alia,* is to provide "advice and recommendations on developments in the field of risk assessment methodology . . . ." 42 Fed. Reg. 34955 (July 7, 1977). In June of this year the charter of this committee was extended through September 1978. 43 Fed. Reg. 28263 (June 29, 1978). It seems strange indeed that the staff should be imposing its risk assessment methodology on the review of FNP's during the very period when the Commission's review committee chartered to study this matter is still in the process of completing work designed to "assist the Commission in establishing policy regarding the use of risk assessment in the regulatory process" (42 Fed. Reg. 34955).[19]

2. I strongly disagree with the majority opinion's rejection of the ap-

[17]Indeed, at oral argument, the staff counsel stated flatly that the staff was in the process of modifying its interpretation of the Annex with respect to Class 9 accidents for at least some land-based plants (App. Bd. Tr. 131).

[18]ALAB-390 was a decision issued jointly in two proceedings involving two different appeal boards (which employed five panel members, including all three assigned to this case).

[19]More bluntly, the staff (and my colleagues) appear to be putting the cart before the horse.

plicant's claim that it is being treated differently from other parties in the same situation (*i.e.,* by being forced to discuss Class 9 accidents when other applicants for PWR and BWR licenses are not required to do so). My colleagues reason that "the situation of a nuclear plant afloat is not the same as that of one on *terra firma*" (p. 222, *supra*). But that is not necessarily accurate—as I have shown, the points of similarity appear to far outweigh the differences. The only difference to which they point is the type of consequences which might eventuate from a Class 9 accident; but the staff, at oral argument, admitted that the total consequences of a Class 9 accident at an FNP might be no different from those at certain land-based plants (App. Bd. Tr. 126). More important, under longstanding Commission policy (embodied in the Annex and elsewhere), the consideration of consequences is never reached given the low probability of occurrence which is involved here.

It is in the application of this longstanding Commission policy where the applicant is being accorded different treatment from other applicants. It is being asked to analyze Class 9 accidents without being afforded any guidance as to the standards for doing so or the circumstances when it must be done—the very evil we criticized in the *NEP* case, *supra.* Even my colleagues concede that the staff's "regulatory guides and review plans . . . do not effectively convey its current attitudes respecting [Class 9 accidents]" (p. 223, *supra*).[20] And the applicant is being asked to analyze Class 9 accidents even though the consequences may be no greater than at certain land-based plants, where they would not have to be analyzed.[21] Before an applicant such as this one should be subjected to such a significant change in review standards as is here involved, it should not only be forewarned by the Commission itself of the change in standards but, as well, it should be provided with guidance as to the application of the new standards.

3. Not only have applicants not been given guidance as to the standards for evaluating Class 9 accidents, but the Licensing Board as well is being provided with no such standards by my colleagues' decision. The staff has stated, in effect, that in the case of FNP's, Class 9 accidents are "severe" or "more severe."[22] What standard is the Licensing Board to use to judge between "severe" and "more severe?"

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[20]This can only be classified as the understatement of the year. In my opinion there is not the slightest hint in the regulatory guides and appendices that Class 9 accidents are to be considered.

[21]Assuming, of course, that my colleagues' reading of the terms of the Annex is left standing.

[22]See App. Bd. Tr. 140-41.

The Annex was promulgated to avoid such purely judgmental decisions. My colleagues would apparently open up the Licensing Board hearings to a whole panoply of accident-consequence scenarios for every reactor site—a truly chaotic situation.

4. One further point warrants a brief comment. My colleagues stress that NEPA is "an environmental full disclosure law" (p. 220, *supra*). I have no quarrel with that concept. But I fail to perceive any inconsistency with the views I have set forth and the "full disclosure" requirements of NEPA. In my view, the staff is free to perform any sort of generic environmental study it wishes and can—indeed should—release it for public scrutiny. But studies of this type, to the extent they represent a fundamental deviation from current licensing practice (as is the case with the Class 9 aspects of the liquid pathway study), should only be factored into the licensing process through action of the Commission itself—presumably as a result of rulemaking.

I would instruct the Licensing Board *not* to consider either the consequences of Class 9 accidents or design requirements based on those consequences. Further, I would instruct it to delete discussion of such matters from any documents (such as environmental statements) which are sought to be introduced into evidence before it.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Michael C. Farrar

In the Matter of	**Docket Nos. 50-400**
	50-401
CAROLINA POWER & LIGHT COMPANY	**50-402**
	50-403
(Shearon Harris Nuclear Power Plant, Units 1, 2, 3, and 4)	**August 23, 1978**

Upon review of need for power issue raised on appeal by joint intervenors, as well as remaining issues and underlying record on a *sua sponte* basis, the Appeal Board affirms the Licensing Board's initial decision (LBP-78-4, 7 NRC 92) in all respects except as to the Rn-222 issue, which it defers.

NEED FOR POWER: APPLICABLE STANDARD

Need for power issues are judged according to whether a forecast is "reasonable and . . . additional or replacement generating capacity is needed to meet that demand." *Energy Research and Development Administration* (Clinch River Breeder Reactor Plant), CLI-76-13, 4 NRC 67, 77 (1976); see also *Kansas Gas and Electric Company* (Wolf Creek Generating Station, Unit No. 1), ALAB-462, 7 NRC 320, 328 (1978).

NEED FOR POWER: FORECASTING FUTURE DEMAND

Considerable weight should be given to an electricity demand forecast provided by a State public utilities commission that is charged by law with the responsibility of preparing up-to-date analyses of probable demand growth and which has conducted an extensive public hearing on that subject.

NEPA: NEED FOR POWER

Although NEPA requires the Commission to satisfy itself as to the need for the power to be generated by a proposed facility, it does not foreclose placing heavy reliance on demand forecasts of local regulatory bodies, at least where those forecasts are not facially defective and are explained in detail and where the local regulators have made a principal forecaster available for examination.

Messrs. George F. Trowbridge and **Ernest L. Blake, Jr.**, Washington, D.C., for the applicant, Carolina Power and Light Company.

Mr. Thomas S. Erwin, Raleigh, North Carolina, for the intervenors, Conservation Council of North Carolina and Wake Environment, Inc.

Mr. Charles A. Barth for the Nuclear Regulatory Commission staff.

DECISION

I

By its initial decision of January 23, 1978, the Licensing Board authorized the issuance of construction permits for Units 1, 2, 3, and 4 of the Shearon Harris Nuclear Plant, a facility to be located approximately 20 miles southwest of Raleigh, North Carolina. LBP-78-4, 7 NRC 92.[1] An appeal from the decision has been filed by the Conservation Council of North Carolina and Wake Environment, Inc., joint intervenors below. The appeal is addressed to only one of the issues litigated before the Licensing Board: the need for the power to be generated by the facility. We conclude that the Board's disposition of that issue should not be disturbed.

A. The applicant claimed that the power from the first unit of the facility would be needed by 1984 (the year in which that unit is scheduled to come on line) and that the other units would be needed at 2-year intervals through 1990 (the year in which the last unit is scheduled to be completed). It sup-

[1]Pursuant to that decision, construction permits CPPR-158, CPPR-159, CPPR-160, and CPPR-161 have been issued. 43 Fed. Reg. 4465 (February 2, 1978).

ported this claim with both its own analyses and a study performed by the North Carolina Utilities Commission (NCUC). The NRC staff concluded that the applicant's and NCUC's analyses were reasonable; additionally, on the basis of its own study, it reached essentially the same year-of-need conclusions as had the applicant.

The studies prepared by the applicant, NCUC, and the staff used a variety of forecasting techniques, both econometric and noneconometric, which took into account such factors as past electricity demand growth trends; future projections of population growth, commercial and industrial growth, and appliance saturation; the projected price of electricity *vis-a-vis* the price (and availability) of competing energy sources; weather conditions; and potential conservation efforts. For their part, the intervenors did not offer an alternate load forecast, although they did attempt through cross-examination to discredit the applicant and staff forecasts. Instead, their affirmative case was limited to the testimony of Amory Lovins. That witness specifically conceded that he had undertaken no specific studies of energy supply and demand in the North Carolina region (Tr. 1534-35, 1538). He advanced the generic thesis, however, that conservation should be emphasized if not mandated; that electricity usage should be restricted; and that, in any event, electrical power should be supplied through many small producing units rather than through large baseload generating plants.

The Licensing Board declined to accept Mr. Lovins' analysis, primarily because it did not address either (1) the projected need for electricity in the applicant's service area during the next 15 years; or (2) the effect of energy conservation, alternative energy sources, and increased electrical rates on demand for electricity in that service area over that same period of time. 7 NRC at 135. The Board went on to review the projections of the applicant, the staff, and the NCUC (including a revised forecast of the applicant, dated December 9, 1977, NCUC's "1978" forecast, and a revision of the staff analysis to incorporate those revised forecasts). *Id.* at 135-37. It also independently analyzed the data in the record and made its own projection based thereon. *Id.* at 139.[2] It found that there was "an overwhelming weight of uncontradicted probative evidence, not only that the four Harris units will be needed within the time frame presently scheduled by the Applicant, but that energy conservation, increased consumer use of alternative

[2]The Board indicated, however, that

> We do not rely upon our projection because the parties have not had an opportunity to address it, but even if we were to accept its predictions, our conclusions would remain unaltered. The effect could be that the timing of the Harris units might be changed, but the need to schedule the Harris units for construction would remain.

7 NRC at 139.

energy sources, and increasing electrical rates over the next 15 years will not substantially reduce this need"; and, further, that the four units "will be needed as now scheduled, or sooner." *Ibid.*

B. In challenging the Licensing Board's need for power findings, the intervenors raise no question respecting the treatment given to Mr. Lovin's testimony. Nor do they dispute the standard under which "need for power" issues have traditionally been judged—*i.e.*, whether a forecast is "reasonable and . . . additional or replacement generating capacity is needed to meet that demand." *Energy Research and Development Administration* (Clinch River Breeder Reactor Plant), CLI-76-13, 4 NRC 67, 77 (1976); see also *Kansas Gas and Electric Company* (Wolf Creek Generating Station, Unit No. 1), ALAB-462, 7 NRC 320, 328 (March 9, 1978). Their claim is instead that the demand forecasts introduced into evidence by the applicant and the staff were so unreliable that they could not properly undergird a "need for power" determination.

This claim rests essentially on the fact that, although each forecaster predicted a *total* electricity demand growth rate in the range of 6% to 7%, there were wide variations in the growth rates assigned to each segment of electricity demand:

	Staff	Applicant	NCUC	
Years:	1974-1990	1976-1996	1975-1986	1986-1990
	(%)	(%)	(%)	(%)
Residential	7.2	4.7	5.80	5.20
Commercial	6.7	5.6	6.22	6.35
Industrial	4.9	7.1	8.39	6.65
Total	6.2	6.2	6.96	6.20

Staff prepared testimony (Spore), fol. Tr. 1991, Table 1.9, p. 1-43.[3] According to the intervenors, disparities such as that between the industrial growth rate of 8.39% predicted by NCUC and that of 4.9% predicted by

[3]The growth rates forecasted by the applicant and NCUC, as well as the staff's forecast were set forth (and analyzed) in the staff testimony. For convenience, where possible citations herein will be to that testimony alone, even though the applicant's or NCUC's analyses may be the actual source of the information in question.

The staff offered separate projections founded upon a "base case" (utilizing predicted future prices in current dollars of natural gas, refined petroleum products, and coal, and under which residential electricity prices are estimated to increase in real terms at an average rate of 1.8% (Spore, p. 1-12)); a "low price case" (where all real fuel prices and costs are assumed to remain constant at their 1974 levels); and a "high price case" (where the growth rates of all price and cost components are double the base case in real terms (Spore, p. 1-41)). There is no

(Continued on next page.)

the staff are so great that they must be explained before the Licensing Board's determination can be accepted as "credible." In their words, "[t]hese visions of the next decade and beyond are not reconcilable. They cannot both come true."[4]

Before turning to the mertis of the intervenors' argument, it should be noted that, following the close of the evidentiary hearing, the applicant transmitted to the Licensing Board for its information[5] (1) a revised forecast which embodied somewhat lower growth rates than had the earlier forecast proffered by its witness; and (2) the newest (1978) NCUC forecast of growth rates.[6] The applicant's revision predicted a compound total growth rate for the years 1977-90 of 5.8% (compared to the 6.5% it had forecast for those same years at the hearing).[7] The NCUC 1978 report set forth the following total and market segment growth rates:

		NCUC	
Years:	**1976-1985**	**1985-1990**	**1990-1992**
	(%)	(%)	(%)
Residential	5.7	5.5	5.5
Commercial	6.4	6.6	6.6
Industrial	8.5	7.9	7.9
Wholesale and other sales	5.7	5.2	5.2
Total	6.8	6.6	6.6

The Board, acting *sua sponte,* incorporated the two revised forecasts into the record.[8] But, because it viewed them as more favorable to the in-

(Continued from previous page.)
suggestion in the record that the "high price case," which produced the lowest growth forecast in the industrial (but no other) segment, has any likelihood of occurring; indeed, the NCUC study (Applicant's Exhibit CC) presents a persuasive case that prices of electricity will not rise in real terms in the foreseeable future—particularly because new facilities are averaged into the rate base with older, less expensive facilities. For these reasons, when considering the staff's projections we will refer to the "base case" which the staff presented as its primary forecast.

[4]Brief, p. 4-5.

[5]See *Duke Power Company* (William B. McGuire Nuclear Station, Units 1 and 2), ALAB-143, 6 AEC 623, 625-26 (1973).

[6]NCUC is under a statutory obligation to "keep current an analysis of the long-range needs for expansion of facilities for the generation of electricity in North Carolina, including its estimate of the probable future growth of the use of electricity, the probable needed generating reserves, the extent, size, mix, and general location of generating plants and arrangements for pooling power . . . ." See Spann, prepared testimony, fol. Tr. 1731, Attachment 2.

[7]Spore, Table 1 (revised), p. 29a (NRC Staff Amendment to NRC Staff's Proposed Findings, dated January 18, 1978). The applicant did not provide growth rates for the component parts of its new forecast.

[8]Orders dated December 21, 1977, and December 27, 1977 (unpublished).

tervenors' position than was the earlier evidence, it declined to hold a further evidentiary hearing to permit cross-examination on those forecasts. LBP-78-2, 7 NRC 83, 86-87 (January 12, 1978). The Board used the revised forecasts in its initial decision.

1. The record sheds considerable light on the reasons why the various forecasts for each market segment of electricity demand were not uniform. Dr. Spore, the staff witness who had reviewed the applicant's and NCUC's forecasts and had been involved in the preparation of the staff forecast, explained that the variations in question "reflect differences in methodology, historical data bases, geographical area, explanatory variables considered, and the projected values of these variables" (Spore, p. 1-41; see also Tr. 2015-25). Some of the differences are readily apparent.

To begin with, the applicant's projections employ base years 1976-96; NCUC's employ 1975-90 (1976-92 for the revised 1978 forecast); and the staff's employs 1974-90. The bases for population projections are also different; the staff's figures are derived from base data and projections for North and South Carolina collectively, whereas the other forecasters used figures for the applicant's service area (Spore, p. 1-40; Tr. 2047). Further, the applicant's witness noted that, in taking into account the historical rate of growth among commercial customers, he had made certain adjustments in market segment classification to ameliorate the wide year-to-year variations in the "commercial" demand for electricity associated with residential construction (Morgan, prepared testimony, fol. Tr. 1659, p. 7). There is no positive indication that any of the other forecasters made like adjustments; indeed, what is before us strongly suggests that none of them did so.

Still further, the NCUC prediction of a high rate of growth in industrial demand was molded in part by the State's "program for providing additional industrial jobs in North Carolina" (Applicant's Exhibit CC, pp. I-4, I-5), its public goal of pursuing "policies and programs which result in sustained economic growth" (*id.*, p. II-4), and by its expectation of "industrial shifts to the 'sunbelt,'" including North Carolina (Spann, p. 11). In addition, all of the forecasters provided different projections respecting the future real price of electricity *vis-a-vis* that of other fuels. The comparative price of competing energy sources may, of course, have a different effect upon the use of electricity depending upon the particular customer class which is involved.[9]

In short, the record reflects a number of concrete reasons why the projections of the various forecasters for segments of the electricity market in the applicant's service area might vary to a considerable degree. What it lacks is any attempt to justify the precise forecast variations in terms of

[9]See *e.g.*, Spann, p. 10 and Attachment 5.

these reasons or to make a choice among the differing assumptions underlying the differing predictions. The staff witness, who had reviewed the predictions of the applicant and NCUC (and had compared them with each other as well as with the staff analysis), explicitly conceded that he had made no such analysis (Tr. 2018, 2031-32, 2034).

2. To be sure, the Licensing Board might have insisted upon a closer examination of the market segment forecast variations.[10] We are nonetheless satisfied that its failure to have done so provides insufficient cause to reject its ultimate conclusion that the total demand growth will be in a range which justifies the construction of the Shearon Harris units on the planned schedule. In this connection, there is no assertion by the intervenors that, even taking the applicant's posthearing revised forecast of a lower annual demand growth, acceptable reserve margins could be maintained without those units or some other additional generating facilities.

Irrespective of the extent to which its market segment forecasts comported with those of the applicant or the staff, we think that the NCUC total demand forecast is entitled to be given great weight. As earlier noted (see fn. 6, *supra*), that body is charged by law with the responsibility of providing up-to-date analyses of, *inter alia,* the "probable future growth of the use of electricity." The record reflects that in January 1977, prior to the issuance of its report the following month, the NCUC conducted a public hearing on the matter of projected load growth (Applicant's Exhibit CC, p. I-2). The numerous participants in that hearing included at least one of the intervenors in this proceeding, the Conservation Council of North Carolina (*ibid.*). Among the other participants were industrial, commercial, and public interest organizations—as well as the Attorney General of North Carolina (*ibid.*).

The intervenors have pointed to nothing in either the 1977 or 1978 NCUC reports which might lead us to believe that that expert body committed some fundamental error in carrying out its analyses. Indeed, they declined even to cross-examine the witness (Dr. Robert M. Spann) who had participated in the preparation of the NCUC study (Tr. 1732). Beyond that,

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[10]The Board eschewed calling for such an examination on this basis:

> If one compares the subforecasts of different forecasters for a particular class of customers, one would actually expect different results. Some would be high, some would be low. When the subforecasts of an individual forecaster are added to get the final forecast of that forecaster, the high forecasts and low forecasts of that forecaster tend to cancel and approach the forecasts of the other forecasters. Of course, this would not occur if one forecaster was uniformly optimistic or pessimistic.

7 NRC at 134, par. 143. We entertain considerable doubt respecting the validity of that approach. For reasons that will appear, however, those doubts need not be pursued here.

as has been seen, the most notable variations from NCUC's market segment forecasts are to be found in the staff's residential and industrial forecasts. But, once again, the fact that NCUC predicted a substantially greater industrial demand rate growth than did the staff is explainable (at least in part) in terms of the effect which the former gave to the State policy of encouraging further industrial development.

We do not wish to be understood as suggesting that in all circumstances the electricity demand forecasts of a State public utilities commission must be presumed to be reliable and thus perforce to provide an acceptable foundation for need for power determinations. Despite that such commissions might be expected to possess considerable familiarity with the primary factors bearing upon present and future demand, they are no more entitled to be treated as infallible than are other governmental agencies. It therefore must always be open to a party to one of our proceedings to establish that, for one reason or another, the analysis underlying the utility commission's predictions of future demand is in error. By the same token a licensing board must be free to disregard utility commission predictions which it is convinced rest upon a fatally flawed foundation.

But where a utilities commission forecast is neither shown nor appears on its face to be seriously defective, no abdication of NRC responsibilities results from according conclusive effect to that forecast. Put another way, although the National Environmental Policy Act mandates that this Commission satisfy itself that the power to be generated by the nuclear facility under consideration will be needed, we do not read that statute as foreclosing the placement of heavy reliance upon the judgment of local regulatory bodies which are charged with the duty of insuring that the utilities within their jurisdiction fulfill the legal obligation to meet customer demands. This is so at least where, as here, the utilities commission not merely has spread on the record a detailed development of the reasons for its conclusions but, as well, has made available for examination by the parties to our proceeding one of the principal participants in the load forecast undertaking.

II

Although the intervenors raised only one issue on appeal, we have reviewed the entire initial decision and the underlying record. Only two other matters warrant comment.

A. In the course of its initial decision, the Licensing Board evaluated the environmental impacts of releases of radon (Rn-222) generated by mill tailings produced in the course of the mining and milling of uranium in terms of the radon release values included in Table S-3 of 10 CFR 51.20(c). 7 NRC at 119. Subsequent to the issuance of that decision, the Commission deter-

mined that the Table S-3 radon release values were erroneous and directed that there be undertaken in ongoing proceedings a reevaluation of such impacts. *Metropolitan Edison Company* (Three Mile Island Nuclear Station, Unit No. 2), CLI-78-3, 7 NRC 307 (1978). Thereafter, in *Philadelphia Electric Company* (Peach Bottom Atomic Power Station, Units 2 and 3), *et al.*, ALAB-480, 7 NRC 796 (May 30, 1978), we established procedures which were to be followed in all cases before us involving the radon matter (including this one) and which, in substance, designated one proceeding as a lead case and permitted supplementation of the record and decision in that case. The intervenors here have not sought to participate on this subject (although they were given the right to do so by ALAB-480), but the issue nevertheless remains before us for resolution. We anticipate reaching the radon issue in this case after we have disposed of the issue in one or more of the cases in which it is contested.

B. 1. In a January 23, 1975, letter to the parties, the Board requested the staff to address at the evidentiary hearing certain specific questions relating to its assessment of the management capabilities of the applicant. In this connection, the Board evinced an interest in the applicant's "experiences, both good and bad," in the management of its other nuclear facilities as well as "[h]ow have these experiences been utilized to improve [its] management capabilities." Still further, the Board inquired into whether the applicant had added sufficient additional personnel to manage adequately the Shearon Harris facility.

In response to this request, two supervisory inspectors assigned to the Commission's regional office having territorial jurisdiction over North Carolina submitted prepared testimony which was introduced into evidence on October 4, 1977 (Tr. 2076). One of the members of the Licensing Board posed a few oral questions to the witnesses with regard to the statement (Tr. 2077-78). Neither the other Board members nor the parties choosing to interrogate them, the witnesses were then excused (Tr. 2078).

On April 18, 1978, after the initial decision had been rendered and the intervenors' appeal on the need for power issue taken, staff counsel advised us by letter that one of the line inspectors at the applicant's two-unit Brunswick facility (which is in operation) believed that "his views on the management capability of [the] [a]pplicant to staff and operate the Harris facility had not adequately been presented to the Licensing Board." Attached to the letter were handwritten notes dated September 16, 1977, which the line inspector apparently had furnished to the supervisory inspectors at their request to assist them in the preparation of their testimony. The letter stated that the staff had reviewed both the notes and the testimony and had concluded that the latter "adequately reflected the factual content" of the former.

2. Whether or not that conclusion be justified, especially when read in the context of the line inspector's notes the testimony of the two witnesses is troublesome in some respects.

The notes placed substantial emphasis on the asserted facts, *inter alia,* (1) that there had been a high turnover of management-level personnel at Brunswick in recent years; and (2) that, because of an underestimation of staffing requirements, personnel were assigned "extended work weeks" over lengthy periods of time. In the line inspector's opinion, the perceived manpower shortages may have contributed not merely to the turnover rate, but additionally, to the numerous instances of noncompliance with prescribed procedures, plant malfunctioning, and other problems which have been encountered at Brunswick.

In their prepared testimony,[11] the supervisory inspectors referred to the "high turnover of middle and upper management in the past 3 years" at Brunswick, as well as the "extended work weeks that continued from weeks to months." To that they added, without elaboration, that "[r]ecognition of staffing needs may have not been fully recognized." Given the line inspector's articulated belief, not disputed by the witnesses, that inadequate staff was at least partially responsible for the problems and difficulties encountered at Brunswick, we do not think that this one sentence, seemingly offered in passing, sufficed as a full response to the Board's inquiry. The Board was entitled to a far more comprehensive discussion on the point. Failing to have received elucidation in the prepared testimony itself, the Board should then have probed further in its questioning of the witnesses.

The Board did not do so. Rather, the one member who interrogated the witnesses limited himself to a few broad questions designed to determine whether the staff had any remaining "concerns" regarding the ability of the applicant to manage the construction and operation of the Shearon Harris facility (Tr. 2077-78). Receiving an equally broad negative response, the Board member terminated his inquiry (Tr. 2078).

We fail to understand either the basis for this response or the Board's seeming ready willingness to accept it without further exploration of its foundation. To be sure, the prepared testimony of the supervisory inspectors made reference to corrective measures which the applicant had taken to obviate a repetition of the problems experienced not only at Brunswick but at another of its facilities (H.B. Robinson). But, no matter the confidence the witnesses may have possessed that those measures would be successful, it is impossible to fathom how responsible officials of the Commission's Office of Inspection and Enforcement could have stated that they were free of all concern about the matter.

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[11]Brownlee and Dance, fol. Tr. 2076, at p. 13.

To the contrary, confronted with the management record pertaining to the other nuclear plants owned by this applicant, one would have thought that those officials would have manifested not merely concern but, additionally, a firm resolve to keep the construction and operation of the Shearon Harris facility under particularly close surveillance to insure that the remedial measures indeed prove to be effective—*i.e.,* that, in fact and not just in theory, there will be a rectification of the situation identified in the prepared testimony (at p. 13): "[m]any plant malfunctions have occurred more than once indicating that corrective actions and corporate resources may not have been as timely, thorough, or effective as [they] should have been." Be that as it may, we fully expect that such surveillance will be both undertaken and maintained.

For the reasons assigned above, our determination on the environmental impacts of the release of Rn-222, and its effect on the Licensing Board's cost-benefit balance in this proceeding, is hereby *deferred.* In all other respects, the initial decision is *affirmed.*

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Michael C. Farrar

In the Matter of **Docket Nos. 50-338 OL**
50-339 OL

VIRGINIA ELECTRIC AND POWER COMPANY

(North Anna Nuclear Power Station, Units 1 and 2) **August 25, 1978**

Upon *sua sponte* review of LBP-77-68, 6 NRC 1127 (1977), and LBP-78-10, 7 NRC 295 (1978), the Appeal Board affirms the decisions on all contested issues. However, it retains jurisdiction over the issue of settlement beneath the unit's pump house because of developments of possible significance occurring after the close of the record.

The Appeal Board finds that the record adequately explains all uncontested generic safety issues with the exception of protection from missiles generated both inside and outside the plant. It requests an affidavit from the staff on this issue.

The Board also retains jurisdiction over the radon release issue currently pending in a number of cases.

NRC: ADJUDICATORY RESPONSIBILITIES

The role of NRC adjudicatory boards in operating license proceedings—as distinguished from construction permit prodeedings—is quite limited insofar as uncontested matters are concerned.

APPEAL BOARD: SCOPE OF REVIEW

The absence of an appeal on a contested issue does not foreclose review of that issue. But in an operating license proceedings the appeal board must be more judicious about taking up matters not previously in controversy.

RULES OF PRACTICE: CONSIDERATION OF ISSUES

An unresolved safety issue, identified either in reports of the Advisory Committee on Reactor Safeguards or in the staff's "Task Action Plans," cannot be disregarded in an individual licensing proceeding simply because the issue is generic; rather, for an applicant to succeed, there must be some explanation why construction or operation can proceed although an overall solution has not been found.

OPERATING LICENSES: CRITERIA

Explanations of why an operating license should issue in spite of unresolved generic safety issues should appear in the Safety Evaluation Report. *Gulf States Utilities Company* (River Bend, Units 1 and 2), ALAB-444, 6 NRC 760 (1977).

DECISION

After a lengthy and controversial licensing proceeding, the Virginia Electric and Power Company obtained permission to operate the first two units of its nuclear power plant located on Lake Anna in Louisa County, Virginia.[1] The matter is before this Board only *sua sponte.* That is, no appeals were taken from the Licensing Board's decision, even though a group of local citizens had actively opposed VEPCO's request for operating licenses ever since we allowed the intervention of one of their representatives in late 1973.[2] While foregoing an appeal, they did ask us, by letter of May 20, 1978, to conduct a thorough review of not only the problems raised by the settlement of the land beneath the North Anna pumphouse—a sub-

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[1]The Licensing Board's initial decision (LBP-77-68) first authorizing the award of operating licenses is reported at 6 NRC 1127 (December 13, 1977). As it turned out, the licenses were not issued then, for shortly thereafter the Board directed that the proceeding be reopened to consider an alleged new instance of "VEPCO's failure to provide the Commission with information on certain safety matters in a timely manner." After taking additional evidence, the Board resolved the matter essentially in VEPCO's favor. LBP-78-10, 7 NRC 295 (1978). The operating licenses were then duly issued.

[2]See ALAB-146, 6 AEC 631 (1973). (At that time, it was predicted that construction of Unit 1 would be completed in April 1975 and that of Unit 2 by January 1976. These estimates proved to be inaccurate.) The Licensing Board was also aided by the presence of other parties. The Commonwealth of Virginia participated below as an interested State. See 10 CFR 2.715(c). The Sun Shipbuilding and Dry Dock Company, which had manufactured certain support structures, participated in that aspect of the proceeding dealing with the structural integrity of those supports. See 6 NRC at 1129-31 and 1167-74.

ject to which the Board below had devoted considerable attention—but also unspecified "other serious defects."

In this connection, we cannot overlook that the role of NRC adjudicatory boards in operating license proceedings—as distinguished from those involving construction permits—is quite limited insofar as uncontested matters are concerned. The Commission's regulations tell both the licensing boards and us that, while we may give "appropriate consideration" to a "serious safety, environmental, or common defense and security matter . . . that has not been raised by the parties," we are to exercise that authority "sparingly and only in extraordinary circumstances." 10 CFR 2.760a, 2.785(b)(2). To be sure, there is no doubt that the absence of an appeal does not deprive us of the right to review an issue that was contested before a licensing board. But we must be more judicious about taking up new matters not previously put in controversy.

We have reviewed the record with this limitation in mind. Our conclusion is that, although we are satisfied as to the great majority of the matters which we have studied, we need further information in two areas before we can expose a final opinion.

1. **Matters Contested Before the Licensing Board.** We have no essential difficulty with the Licensing Board's consideration and disposition of the issues that were contested before it. With respect, however, to one of the subjects it considered—*i.e.*, pump house settlement—new developments of possible significance have taken place since the record closed below. The staff has furnished us a series of communications between itself and VEPCO inquiring about, reporting on, and providing some analysis of the further subsidence that has occurred. Until we receive the results of the further analysis now being performed, we will be unable to express our own opinion on the subject. Accordingly, we must retain jurisdiction of this matter.[3] In all other respects, we are satisfied that the opinion below contains no error warranting correction.

2. **Uncontested Matters.** In our *River Bend* decision of last fall,[4] we dealt at some length with the significance of the so-called "unresolved generic safety issues" in a construction permit proceeding. These safety issues—identified either in the reports of the Advisory Committee on Reactor Safeguards to the Commission or in the staff's "Task Action

[3]Because this issue involves matters which are peculiar to this facility and well-known to the parties, we do not burden this opinion with a detailed recitation of this problem's nature and history. To the extent necessary, we will do so in a subsequent opinion dealing with the merits of the issue.

[4]*Gulf States Utilities Company* (River Bend, Units 1 and 2), ALAB-444, 6 NRC 760 (1977).

Plans"[5]—are applicable to reactors in general (or at least to a large class of them) and are the subject of ongoing attempts to find a universally applicable solution. Of course, these "unresolved" issues cannot be disregarded in individual licensing proceedings simply because they also have generic applicability; rather, for an applicant to succeed, there must be some explanation why construction or operation can proceed even though an overall solution has not been found.

In *River Bend,* we said that such explanations should appear in the Safety Evaluation Report for the facility. We also described generally the type of reason which would be sufficient to let *construction* to go on in the face of an unresolved generic question.[6] Where *operation* of a facility is involved, similar analysis is necessary; but, as to certain issues, the justification for giving an applicant the green light can obviously be more difficult to come by. For example, the reason often given for allowing construction activity is that there is still time to find a solution and build it into the plant's design. At the operating license stage, that reason is not available. But there may be one or more other justifications for permitting the plant to operate. The most common are that a solution satisfactory for the particular facility has been implemented; a restriction on the level or nature of operation adequate to eliminate the problem has been imposed; or the safety issue does not arise until the later years of plant operation.

We have undertaken to ascertain whether the staff dealt appropriately with the "unresolved" issues in this operating license proceeding.[7] Our task

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[5]Those of the ACRS's generic concerns to which the staff attaches high priority have been included in the staff's first set of Task Action Plans. Lower priority items—*i.e.,* those of lesser safety significance—are to be dealt with in subsequent sets.

[6]In short, the board (and the public as well) should be in a position to ascertain from the SER itself—without the need to resort to extrinsic documents—the staff's perception of the nature and extent of the relationship between each significant unresolved generic safety question and the eventual operation of the reactor under scrutiny. Once again, this assessment might well have a direct bearing upon the ability of the licensing board to make the safety findings required of it on the construction permit level even though the generic answer to the question remains in the offing. Among other things, the furnished information would likely shed light on such alternatively important considerations as whether (1) the problem has already been resolved for the reactor under study; (2) there is a reasonable basis for concluding that a satisfactory solution will be obtained before the reactor is put in operation; or (3) the problem would have no safety implications until after several years of reactor operation and, should it not be resolved by then, alternative means will be available to insure that continued operation (if permitted at all) would not pose an undue risk to the public.

6 NRC at 775 (footnotes omitted).

[7]We wish to say precisely what we have and have not done. In view of the limitations imposed by regulation, and the fact that our review was necessarily unaided by any of the parties, we have

(Continued on next page.)

was aided somewhat by the staff's Safety Evaluation Report, which included in Supplement 7 an appendix listing those ACRS generic issues germane to the North Anna reactors and explaining how some of the issues had been resolved for this facility (or furnishing a reference to such an explanation). Unfortunately, there is no similar listing treating the other issues now contained in the staff's Task Action Plans.[8] And, equally important, for some of the ACRS issues the statement in Supplement 7 was inadequate on its face. In particular, we found it unhelpful for the staff simply to note that a search for a generic solution was still underway without analyzing why the absence of a generic solution did not call into question the safety of current operation.[9] Similarly, there were instances in which the main body of the SER did not alert us to the existence of a generic problem bearing on the particular aspect of plant design under discussion.

In any event, we have searched the entire record to see if there are adequate explanations on all the issues. With a single exception, we have found an apparent basis for the staff's decision to allow operation to go forward (see fn. 7, *supra*).[10]

The exception concerns the question of protection from missiles generated either inside or outside the plant. Three of the staff's Task Action Plans (Nos. A-32, A-37, and A-38) deal with this topic, as does the first of the generic items identified by the ACRS.

We should like the staff to provide us, in affidavit form, a full and detailed explanation of why it is acceptable to permit the North Anna units to operate in the face of the safety issues under study.[11] That explanation should include, among other things, specification of both (1) the present status of the generic studies and (2) all the measures employed at North Anna to compensate for the current absence of the answers sought by those

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(Continued from previous page.)
not probed deeply into the substance of the reasons put forth by the staff for allowing operation to go forward. Rather, we have only looked to see whether the generic safety issues have been taken into account in a manner that is at least plausible and that, if proven to be of substance, would be adequate to justify operation. Scrutiny of the substance of particular explanations will have to await a contested proceeding.

[8]Although the Task Action Plans are of relatively recent vintage, many of the issues they embrace appeared in the staff's earlier "Technical Safety Activities Report."

[9]In saying all this, we recognize that SER Supplement 7 was published several months before *River Bend.* Accordingly, our comments are meant more as guidance for the future than as criticism of the past.

[10]This being an uncontested case, we do not recite our justification for reaching this conclusion on each of the large number of issues involved.

[11]*Cf.* our discussion of turbine missiles in *River Bend.* 6 NRC at 782-84. Once again, that was a construction permit proceeding; moreover, the orientation of the turbine there was favorable, unlike the situation at North Anna.

studies. The staff's document is to be filed by September 15, 1978; the other parties may comment within 2 weeks thereafter.

The decisions of the Licensing Board are *affirmed* except insofar as we have retained jurisdiction over the issues mentioned in this opinion.[12]

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

[12]The radon release issue currently pending in a number of cases (see *Philadelphia Electric Company* (Peach Bottom, Units 2 and 3), ALAB-480, 7 NRC 796 (May 30, 1978)) also remains before us for resolution here. We anticipate reaching it after we have disposed of that issue in one or more of the cases in which it is contested.

Cite as 8 NRC 251 (1978) ALAB-492

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Richard S. Salzman, Chairman
Michael C. Farrar
Dr. W. Reed Johnson

In the Matter of **Docket No. STN 50-484**

NORTHERN STATES POWER COMPANY, et al.

(Tyrone Energy Park, Unit 1) **August 29, 1978**

The Appeal Board dismisses intervenor's appeal from the Licensing Board's refusal to entertain some but not all of its contentions.

RULES OF PRACTICE: APPELLATE REVIEW

Appellate review of a licensing board ruling rejecting some but not all of a party's contentions is available only at the end of the case.

Mr. Thomas A. Baxter, Washington, D.C., for the applicants, Northern States Power Company and others.

Mr. Richard Ihrig, Winona, Minnesota, for intervenor Northern Thunder, appellant.

Mr. Stephen H. Lewis for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

This case is before the Licensing Board on remand to evaluate certain changes proposed by the applicant as a consequence of a ruling of the Wisconsin Public Service Commission.[1] The Board has agreed to consider

[1]See ALAB-464, 7 NRC 372 (March 17, 1978), and ALAB-483, 7 NRC 982 (June 7, 1978).

several contentions advanced by intervenor Northern Thunder but has refused to entertain others.[2] Northern Thunder has appealed from the Board's ruling on one of the rejected contentions.

The appeal must be dismissed as interlocutory. 10 CFR 2.730(f); *Boston Edison Company* (Pilgrim, Unit 2), ALAB-269, 1 NRC 411 (1975); *Puerto Rico Water Resources Authority* (North Coast, Unit 1), ALAB-296, 2 NRC 213 (1975); *Gulf States Utilities Company* (River Bend, Units 1 and 2), ALAB-329, 3 NRC 607, 610-11 (1976); *cf.*, 10 CFR 2.714a. Under the Commission's rules, appellate review of the challenged ruling must abide the end of the case. *Pilgrim, supra,* 1 NRC at 413.

Appeal *dismissed.*

It is so ORDERED.

FOR THE APPEAL BOARD

Margret E. Du Flo
Secretary to the Appeal Board

[2]Memorandum and Order, July 28, 1978.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Richard S. Salzman, Chairman
Dr. John H. Buck
Michael C. Farrar

In the Matter of

Docket Nos. STN 50-546
STN 50-547

PUBLIC SERVICE COMPANY
OF INDIANA, INC.

(Marble Hill Nuclear Generating
Station, Units 1 and 2)

August 30, 1978

The Appeal Board affirms LBP-78-12, 7 NRC 573 (1978), which authorized the issuance of construction permits. On reconsideration, ALAB-459, 7 NRC 179 (1978) (determining that proposed cooling system intake and discharge structures lie in Indiana, not Kentucky, and that it was therefore proper for applicants to obtain a §401 FWPCA certificate from Indiana), is adhered to. A motion for a stay pending a decision on the radon-222 issue raised in *Philadelphia Electric Company* (Peach Bottom, Units 2 and 3), ALAB-480, 7 NRC 796 (1978), is denied.

FWPCA: SECTION 401 CERTIFICATION

The certificate required by §401 of the Federal Water Pollution Control Act must come from the State into whose waters the effluent would be discharged.

RULES OF PRACTICE: MOTION FOR RECONSIDERATION

Where a party petitioning the court of appeals for review of the decision of an administrative agency is also petitioning the agency to reconsider its decision, and where the same petitioner has asked the Federal court to stay its hand pending the agency's disposition of the motion to

reconsider, and the court has done so, the Hobbs Act does not preclude the agency's reconsideration of the case.

RULES OF PRACTICE: MOTION FOR RECONSIDERATION

Application of "the law of the case doctrine" is a matter of discretion. Where an administrative tribunal is convinced that its declared law is wrong and would work an injustice, it may apply a different rule of law in the interests of settling the case before it correctly.

RULES OF PRACTICE: APPELLATE REVIEW

The Commission's refusal to entertain a discretionary appeal does not indicate its views on the merits.

RULES OF PRACTICE: MOTION FOR RECONSIDERATION

The Commission's refusal to entertain a discretionary appeal does not cut off the Appeal Board's right to reconsider a question in an appeal otherwise still pending before it.

STATUTES: INTERPRETATION

When an aid to the construction of the meaning of statutory language is available, there is no rule of law which forbids its use, however clear the statute may appear on superficial examination. *Train* v. *Colorado PIRG*, 426 U.S. 1, 10 (1976).

LICENSING BOARD: JURISDICTION

A licensing board may refuse to hear witnesses or allow discovery for the purpose of reviewing the Rural Electrification Administration's decision to guarantee a loan to an applicant. Those matters have been committed to the REA Administrator's discretion and are outside the scope of a licensing board's jurisdiction.

RULES OF PRACTICE: RIGHT TO PARTICIPATE

An intervenor may not step into and out of the consideration of a particular issue at will.

RULES OF PRACTICE: EX PARTE COMMUNICATIONS

Litigants may confer and cooperate with one another although all interested parties are not present. The *ex parte* rule only proscribes litigants from discussing matters with members of an adjudicatory board when all interested parties are not present.

RULES OF PRACTICE: STAY (BURDEN OF PROOF)

The burden of persuasion is on the party moving for a stay. 10 CFR 2.788.

Mr. Harry H. Voigt, Washington, D. C., argued the cause for applicant Public Service Company of Indiana, Inc.; with him on the briefs were **Messrs. E. David Doane** and **Michael F. McBride**, Washington, D. C.

Mr. Frank E. Spencer, Madison, Indiana, argued the cause and **Mr. Thomas M. Dattilo** filed briefs for intervenor Save the Valley/Save Marble Hill.

Kentucky Assistant Attorney General **David K. Martin**, Frankfort, Kentucky, argued the cause for the Commonwealth of Kentucky; with him on the briefs were Attorney General **Robert F. Stephens** and Assistant Attorney General **David C. Short**, Frankfort, Kentucky.

Mr. Lawrence Brenner argued the cause for the Nuclear Regulatory Commission staff; with him on the briefs was **Mr. Jeffrey F. Lawrence.**

DECISION

We have previously affirmed two Licensing Board rulings in this case.[1] These authorized the Public Service Company of Indiana to undertake

[1]See ALAB-459, 7 NRC 179 (February 16, 1978), *Commission review denied* April 21, 1978 (unpublished), *appeal pending*; and ALAB-461, 7 NRC 313 (March 1, 1978).

limited preliminary work on its proposed nuclear plant at "Marble Hill," a site in southern Indiana on the Ohio River. Subsequently the Board below rendered a decision authorizing construction of the entire plant. LBP-78-12, 7 NRC 573 (1978).[2] The Commonwealth of Kentucky and Save the Valley/Save Marble Hill, intervenors in the proceeding, have excepted to that decision, and their appeals are now before us.

Following our earlier decisions, only two issues remained before the Licensing Board: Whether the applicants are financially qualified to construct a nuclear powered generating facility, and whether the requirements of Section 401 of the Federal Water Pollution Control Act, 33 U.S.C. 1341(a)(1), had been satisfied. Kentucky's exceptions are confined to the latter issue, and we turn to them first.[3]

I

1. The planned operations of the Marble Hill facility will release effluent into the Ohio River. Section 401 of the Water Act requires applicants for a Federal permit that may result in a discharge into navigable waters to obtain "a certification from the State in which the discharge originates or will originate . . . ." The applicants sought and obtained a Section 401 certification from the State of Indiana. In its decision of August 22, 1977, the Licensing Board held that this satisfied the Water Act because the nuclear power plant would be located in that State.[4] We set aside that ruling on Kentucky's appeal, holding in ALAB-459 (as Kentucky urged) that the certification called for by Section 401 must come from the State into whose waters the effluent would be discharged.[5] (This reading of the Water Act has since been adopted by the General Counsel of the Environmental Protection Agency in a formal opinion issued at the instance of parties to this case.)[6]

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[2]As a technical matter, "construction permits"—*i.e.*, NRC licenses—are issued by the Director of Nuclear Reactor Regulation, but he must have the Board's permission to do so. 10 CFR 2.764. In this case, pursuant to the decision now before us on appeal, the Director has issued construction permit nos. CPPR-170 and 171 to the applicants.

[3]Kentucky also excepted generally to the authorization of a construction permit, but without a further specification of its reasons. We presume that the Commonwealth was acting out of an abundance of caution to preserve its appellate rights respecting the earlier decisions.

[4]LBP-77-52, 6 NRC 294, 337 (1977).

[5]7 NRC at 189-93.

[6]Opinion of the EPA general counsel, "Certification and Permitting of Dischargers Located on Waters Forming Boundaries Between States" April 19, 1978 (unpublished). As we noted in ALAB-459, EPA is the agency charged with principal responsibility for administering the Water Act. See 7 NRC at 191-92.

The Commonwealth of Kentucky also asked us to rule that any discharge from Marble Hill would necessarily be into Kentucky waters because its jurisdiction over the Ohio River extends to the present low water mark on the Indiana shore. For this reason the Commonwealth insisted that the applicants needed a Section 401 certification from Kentucky, not Indiana. On this point we disagreed with Kentucky. For reasons elaborated in ALAB-459, we held that controlling Supreme Court decisions placed the boundary at the low water mark on the Indiana shore at the location of that mark when Kentucky was admitted to the Union in 1792.[7] We remanded the cause to the Licensing Board in light of that holding with instructions to locate the 1792 mark, to "find whether the Marble Hill discharge pipe will end in Indiana or Kentucky waters, and [to] conclude, on the basis of that finding, whether applicants have obtained the certification required under Section 401 of the Water Act."[8]

On the remand, applicants moved for summary disposition of this issue, supporting their motion with affidavits indicating that the discharge pipe would end in Indiana waters.[9] Indiana[10] favored applicants' motion but the staff did not. Although it agreed with the applicants' conclusion, the staff preferred to rest on the evidence of its own experts, whose affidavits accompanied its response to the applicants' motion. The Commonwealth of Kentucky filed no countering affidavits. It chose to stand on the legal position (which we had rejected in ALAB-459) that its boundary extends to the present-day low water mark on the Ohio's Indiana shore, and because the pipe will intrude beyond that mark, it necessarily terminates within the Commonwealth's jurisdiction.

None of these parties evinced a desire to present additional testimony or to cross-examine the authors of the affidavits. The Board had no ques-

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[7]*Accord, Perks* v. *McCracken*, 169 Ky. 590, 184 S.W. 891 (1916):

> The case turns on whether or not the island is Kentucky territory or is a part of the State of Illinois. When Virginia ceded to the United States the Northwest Territory in the year 1784, she retained title to the bed of the Ohio River to the low water mark on its north or northwest side. When Kentucky became a State on June 1, 1792, she succeeded to the rights of Virginia. Her jurisdiction continues just as it existed at the time of her admission to the Union, and is not affected by the action of the forces of nature upon the course of the river. . . . The question is, where was the low water mark at the time Kentucky became a State, and does the island in question lie between the low water mark as it then existed and the Kentucky shore? If so, it is a part of Kentucky. [Citations omitted.]

[8]See 7 NRC at 193-96.

[9]See 10 CFR 2.749. Summary disposition is the equivalent in Commission practice of a motion for partial summary judgment.

[10]Indiana was represented by an official of the Indiana Environmental Management Board.

tions for them and elected to treat the matter as submitted on the papers. Declaring itself persuaded by the staff's evidence, the Board found the historical low water mark and held "that the proposed intake and discharge structures [of the Marble Hill Nuclear Generating Station] are located within the State of Indiana."[11] It therefore concluded "that the Applicants possess a valid 401 certification."[12]

2. The Commonwealth reasserts before us the legal position it espoused below. With one exception, it simply reiterates arguments made on its prior appeal. Kentucky proffers no good reason for reconsidering contentions we previously held unmeritorious,[13] and we decline to do so.

Kentucky's new argument invokes a 1943 interstate compact between itself and Indiana. According to the Commonwealth, that agreement settled the longstanding dispute by setting Kentucky's boundary at the present low water mark on the Indiana shore of the Ohio River (except at Green River Island, where the boundary was settled by a survey made under Supreme Court auspices).[14] This agreement, Kentucky says, is memorialized in enactments of the respective State legislatures approved by Congress in 1943.[15] Because the location of that boundary is critical in determining which State is to issue a Section 401 certification for the Marble Hill Plant, Kentucky asks us to reconsider ALAB-459 in light of that interstate compact.

The staff and the applicants dispute Kentucky's reading of the compact. As a threshhold matter, however, they argue against our even reaching the question. We are reminded that Kentucky has petitioned the Court of Appeals for the District of Columbia Circuit to review ALAB-459,[16] invoking the court's jurisdiction under the Hobbs Act.[17] The staff contends that we should not reconsider our decision while review is pending in the court of appeals. In any event, both these parties say that ALAB-459 is now "the law of the case" and should not be disturbed.

It has been said that the filing of a petition for judicial review of an

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[11]The Board's summary and evaluation of the evidence appears in the opinion below. See 7 NRC at 577-80.

[12]*Id.* at 581.

[13]See ALAB-459, *supra*, 7 NRC at 193-95.

[14]See *Indiana* v. *Kentucky*, 136 U.S. 479 (1890), and 163 U.S. 520 (1896). See also ALAB-459, *supra*, 7 NRC at 193-94.

[15]See Ch. 116, §2, Ky. Acts (1942); Ch. 2, §2, Ind. Acts (1943); P.L. 100, 57 Stat. 248, 78th Cong., 1st Sess. (1943). Congressional consent to the interstate compact was required by Article I, Section 10, of the Constitution of the United States.

[16]*Kentucky ex. rel. Stephens* v. *NRC*, No. 78-1369, D.C. Cir., filed April 21, 1978.

[17]28 U.S.C. 2341-52. Final orders of the Nuclear Regulatory Commission are subject to review by the courts of appeals under that Act. 42 U.S.C. 2239 and 28 U.S.C. 2342(4); *Vermont Yankee Nuclear Power Corp.* v. *NRDC*, 435 U.S. 519 (1978).

administrative decision under the Hobbs Act means that the agency "has no authority to conduct further proceedings without the court's approval."[18] In this case, however, the Commonwealth of Kentucky is both the party petitioning the court for judicial review of ALAB-459 and the party asking us to reconsider that decision. Moreover, Kentucky has expressly asked the court of appeals to stay its hand until these proceedings are completed.[19] The Commission seconded the Commonwealth's suggestion and the court acceded to it, extending Kentucky's time to file its brief until "thirty (30) days following completion of administrative review."[20] We therefore do not believe we would encroach on judicial prerogative or act at cross-purposes with the court were we to reach and decide the interstate compact question.[21] Holding that we could not do so in these circumstances would be just that mechanical application of technical rules developed in another context which the courts and the Commission have cautioned against.[22]

The staff and the applicant both urge that we treat the boundary question decided in ALAB-459 as "the law of the case." That doctrine, which applies where the proceeding, parties, and legal issues are the same, has been characterized in a Seventh Circuit decision cited to us by the applicant as "a rule of practice, based on sound policy that, when an issue is once decided, that should be the end of the matter. The unreserved decision on a question of law or fact made during the course of litigation settles that question for all subsequent stages of the suit."[23] The staff further argues that the Commonwealth raised this issue in its petition for Commission review of ALAB-459, and review was declined. The Rules of Practice preclude such petitions when matters are still pending before us

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[18]*Greater Boston Television Corp.* v. *FCC*, 463 F.2d 268, 283 (D.C. Cir. 1971) (*dictum*), *certiorari denied*, 406 U.S. 950 (1972). See also, 28 U.S.C. 2347(c); *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-76-24, 4 NRC 522 (1976); *Northern Indiana Public Service Company* (Bailly Generating Station), ALAB-249, 8 AEC 980, 982 (1974).

[19]Perhaps it has done so because the Supreme Court has "recognized in more than a few decisions, and Congress has recognized in more than a few statutes, that orderly procedure and good administration require that objections to the proceedings of an administrative agency be made while it has the opportunity for correction in order to raise issues reviewable by the courts." *FPC* v. *Colorado Gas Company*, 348 U.S. 492, 500 (1955).

[20]Order of June 27, 1978, (unpublished) in No. 78-1369, D.C. Circuit.

[21]*See, e.g.*, *American Farm Lines* v. *Black Ball Freight*, 397 U.S. 532, 541-42 (1970); *Wrather-Alvarez Broadcasting, Inc.* v. *FCC*, 248 F.2d 646, 648-49 (D.C. Cir. 1957).

[22]*See*, *FCC* v. *Pottsville Broadcasting Company*, 309 U.S. 134, 141 (1940), and *Vermont Yankee Nuclear Power Corp.* (Vermont Yankee Station), CLI-76-14, 4 NRC 163, 166 (1976).

[23]*Barrett* v. *Baylor*, 457 F.2d 119, 123 (7th Cir. 1972) (citations omitted).

on reconsideration.[24] The staff therefore contends that it would be contrary to the spirit if not the letter of those rules to reconsider a matter the Commission has declined to review.

The doctrine of the law of the case is not an ironclad rule; its application a matter of discretion. Where a court is convinced that its declared law is wrong and would work an injustice, it retains the power to apply a different rule of law in the interests of settling the case before it correctly.[25] Surely an administrative tribunal has comparable flexibility. We do not understand the Commission's *refusal* to entertain a discretionary appeal to be any indication of its views on the merits.[26] Neither do we believe that such action by the Commission is intended to cut off our right to reconsider a question in an appeal which is still pending before us.[27]

There are instances when the failure to make an argument at the first opportunity may bar its later consideration. Here, however, Kentucky put the applicants on notice some time ago that it was challenging their right to build the Marble Hill facility without a Section 401 certificate from the Commonwealth and that its assertions rest on the precise location of the Kentucky-Indiana border. To be sure, Kentucky did not invoke the interstate compact as a legal basis for its position until relatively recently. But we perceive no injury flowing from that fact, and the applicant does not assert that it has changed its position significantly in reliance on our decision a few months ago in ALAB-459.

There is much to be said for deciding questions once only. But where a State Attorney General tells us (albeit belatedly) that we have decided an important legal question in a manner inconsistent with interstate agreements sanctioned by Congress, sound discretion calls for us to consider that argument on its merits when we have the opportunity to do so.

3. In the course of settling disputed claims to Green River Island in the Ohio River, the Supreme Court ordered part of the Kentucky-Indiana border surveyed and adopted the results as the boundary between those States. *Indiana* v. *Kentucky*, *supra*. As ordered by the Court, that 1896 boundary survey traced the 1792 low water line on the Ohio's right bank.

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[24]10 CFR 2.786(b)(4)(iv).

[25]*Johnson* v. *Cadillac Motor Company*, 261 F. 878 (2nd Cir. 1919), is the leading case; see also 1B *Moore's Federal Practice* (1974 ed.), §0.404 at 404-05, 431-32 and 406-07.

[26]See the analogous Supreme Court practice on certiorari petitions discussed in *Maryland* v. *Baltimore Radio Show*, 338 U.S. 912, 919 (1950) (separate opinion of Frankfurter, J.), and *Hughes Tool Company* v. *Trans World Airlines*, 409 U.S. 363, 365, fn. 1 (1973).

[27]"The power to reconsider is inherent in the power to decide." *Spanish International Broadcasting Company* v. *FCC*, 385 F.2d 615, 621 (D.C. Cir. 1967); *accord*, *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-235, 8 AEC 645, 646-47 (1974). The case might be otherwise were agency review completed. See 10 CFR 2.717(a).

For reasons we shall presently touch upon, neither terminal of that survey reached the actual riverbank. Thereafter, disagreements again arose over the demarcation in those areas, and ultimately, the governors of Indiana and Kentucky acted to end the disputes. They appointed new boundary commissioners who agreed upon new lines, which the two States ratified in the interstate compact mentioned earlier.[28]

> It is Kentucky's contention that, by entering into the compact, Indiana has not only acquiesced in the Commonwealth's assertion of jurisdiction over the [Ohio] river to low water mark, but has enacted a positive law recognizing that the present low water mark is the boundary, rather than some historical line that would have to be established.[29]

Pointing out that the compact retraces the earlier boundary surveyed by the Supreme Court commissioners, Kentucky emphasizes that it then goes on to extend new lines from the 1896 terminal points "to the low water mark on the right side of the Ohio River" and thence upstream and downstream respectively "at [the] low water mark on the right side of said river."[30] The Commonwealth reasons that[31]

> [i]t defies logic and the plain meaning rule of construction to maintain that "said low water mark" is the 1792 low water mark, the one abruptly departed from at the beginning of the line drawn by the 1943 compact. Such a line would end at the point it began. Moreover, no gloss can be put on this plain meaning of the statute. Where the meaning of a statute is plain, one can look no further than the words of the statute in interpreting it.

Kentucky thus construes the interstate compact as fixing (except at Green River Island itself) the entire Indiana-Kentucky border at the present low water mark on the right bank of the Ohio in lieu of the historic line of 1792 adopted by the Supreme Court.

Kentucky's position is not well taken. To begin with, we are not barred from considering the genesis of the compact by the notion that its meaning is plain on its face. "When aid to construction of the meaning of words, as used in the statute, is available, there certainly can be no 'rule of law' which forbids its use, however clear the words may appear on superficial examination." *Train* v. *Colorado Public Interest Research*

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[28]See fn. 15, *supra*.
[29]*Kentucky's Brief in Support of Exceptions*, p. 6.
[30]57 Stat. 248-49.
[31]*Kentucky Reply Memorandum*, pp. 4-5.

Group, 426 U.S. 1, 10 (1976).[32]

This is another case where "a page of history is worth a volume of logic."[33] The decisions of the Supreme Court in *Indiana* v. *Kentucky*, supplemented by the report of the court-appointed boundary commissioners included with them, recite that history. Those documents dispel Kentucky's idea that the low water mark of 1792 and the corresponding current mark are irreconcilable and that the former boundary line was necessarily abandoned in favor of the latter by the 1943 interstate compact.

When the Commonwealth of Kentucky was admitted to the Union in 1792, its northern boundary was set at the low water line on the Ohio's right bank; Green River Island was part of the Commonwealth because it was then separated from the Indiana shore by a channel of the river.[34] By the late 19th century, however, the Ohio had shifted, leaving the channel north of Green River Island largely dry and the 1792 low water mark in that area an historic line only.[35] But it appears that this shift in the course of the river was confined to the environs of Green River Island. Relatively nearby points both up and downstream were not greatly affected by the change; there, the actual low water line and the historic line were one and the same. This is clear from the boundary commissioners' report to the Supreme Court in 1896. The commissioners had surveyed the 1792 low water line in the area immediately north of Green River Island and, as we noted earlier, terminated their survey short of the riverbank. The representative of Kentucky had suggested to them that they "run at each end [a line] to the points *where the low water mark in 1792 coincides with the low water mark of the present time* [*i.e.*, 1896]."[36] The commissioners declined to do so. However, they refused not because the task was difficult but because they understood themselves "not authorized to lay down any line beyond the upper and lower limits of Green River Island as it existed in 1792."[37]

Failure to adopt that prescient suggestion led to new boundary disputes. For example, at one point Kentucky authorities even sought to tax the Evansville, Indiana, municipal waterworks, built immediately downstream

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[32]*Accord, United States* v. *American Trucking Assns.*, 310 U.S. 354, 543-44 (1940); *Toledo Edison Company* (Davis-Besse, Unit 1), ALAB-323, 3 NRC 331, 335-37 (1976). See also, Murphy, *Old Maxims Never Die: The "Plain Meaning Rule" and Statutory Construction in the "Modern" Federal Courts*, 75 Colum. L. Rev. 1299, 1315-16 (1975).

[33]*New York Trust Company* v. *Eisner*, 256 U.S. 345, 349 (1921) (Holmes, J.).

[34]See *Indiana* v. *Kentucky*, *supra*, 163 U.S. at 518-19.

[35]*Ibid.*

[36]163 U.S. at 528, Exhibit "A," letter of R.H. Cunningham to the Supreme Court commissioners (emphasis supplied).

[37]163 U.S. at 524. Presumably their understanding was correct, for their report was confirmed. *Id.* at 536.

from Green River Island. That facility lay in the gap between the 1896 survey and the riverbank and, arguably, intruded into Commonwealth jurisdiction.[38] But, like the disagreements just described, these disputes were centered around Green River Island; general dissatisfaction about the entire stretch of Kentucky-Indiana border was not the problem.

This is confirmed in statements made on the floor of the House by Representative Vincent of Kentucky, who sponsored the joint resolution to approve the 1943 interstate compact.[39] Arguing for adoption, the congressman pointedly focused on the boundary problems "[i] in the vicinity of Evansville, Indiana."[40] These, he said, were caused when "the Ohio River many years ago changed its course and cut off several hundred acres of land [*i.e.*, Green River Island] and left it north of the river."[41] Observing that in *Indiana* v. *Kentucky* the Supreme Court "did not settle the question in issue," the congressman went on to explain that the State governors had ultimately undertaken to do so by "appoint[ing] Commissioners to go upon the land and ascertain a true and legal boundary line," and that the legislatures of Kentucky and Indiana had approved the line "as agreed upon by the commissioners."[42] In urging ratification, Mr. Vincent told the House that "we are asking you today to give your approval to this agreement."[43]

The survey and report illustrates that the boundary commissioners made no attempt to trace the current (or any other) low water mark on the Ohio's right bank.[44] Nor did they try to continue the 1896 survey of the

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[38]See the remarks of Representative Vincent of Kentucky at 89 Cong. Rec. 5931 (June 15, 1943), and the 1942 Survey and Report of the Kentucky-Indiana Boundary Commission. The latter shows the position of the municipal facility in relation to the downstream terminal of the 1896 survey line. (Copies of that Survey and Report were filed with State and county authorities in Kentucky and Indiana pursuant to the State legislation ratifying the lines drawn by the commission. See fn. 15, *supra*. The applicant furnished all the parties with copies of the document; none having objected to its authenticity, we may take official notice of it. A copy is appended to this opinion.)

[39]We have neither found nor been cited to Senate debates on the joint resolution. The Senate approved the House resolution without discussion. 89 Cong. Rec. 6266 (June 22, 1943).

[40]89 Cong. Rec. 5931 (remarks of Mr. Vincent).

[41]*Ibid.*

[42]*Id.* at 5932.

[43]*Ibid.* Congressman LaFollette of Indiana, representing the district "immediately adjacent to this land in controversy," endorsed Mr. Vincent's explanation and similarly urged Congressional consent to the compact.

[44]The survey and report shows on its face that the only lines run were perpendicular to the river. Except at the points where those lines intersect, the Ohio River does not appear at all on the survey.

1792 low water mark to the points where it intersected the river.[45] (Perhaps this could no longer be done as easily as it might have half a century earlier. See p. 262, *supra*.) Rather, the commissioners simply ran short, straight lines to the riverbank from each terminal of the 1896 survey.[46]

When read in light of what went before, it is patent that Congress gave its consent in 1943 only to the boundary lines run by the commissioners. The Senate committee report on the joint resolution to approve the compact gives no hint that any major interstate boundary dispute was being put to rest. That report—hardly a page in length—merely recites that[47]

> [one] section of the surveyed line between Vanderburgh County, Indiana, and Henderson County, Kentucky, does not connect at either terminal with the low water line of the right side of the Ohio River. *The location of the extension of this section of the surveyed line to the low water line at both terminal points has been jointly agreed upon* by a statutory enactment of the Legislatures of Indiana and Kentucky and approved by the Governors of both States.
>
> Ratification of the Government of the United States *upon the boundary line so agreed upon* is sought in this resolution. [Emphasis added.]

The Senate Committee on Public Lands and Surveys obviously assumed (and so instructed the rest of the Senate) that consent was being sought only for the "extension . . . of the surveyed line to the low water line at both terminal points" of the 1896 survey at Green River Island. The House committee report was even terser. It stated only that the joint resolution before it was identical to one pending before the Senate and referred the reader to the Senate committee report we just described.[48] Nowhere in the Congressional history of the compact is there any suggestion that more than a local disagreement was before the national legislature.

The wording of the compact itself also points in this direction. Far from repudiating the historic line fixed by the Court in *Indiana* v. *Kentucky*, the compact acknowledges it but notes that "neither of [its] terminal points reached the low water mark." It then recites that commissioners had been appointed to ascertain the "boundary line thus in dispute," and concludes that the boundary commissioners had "agreed upon the true

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[45]No suggestion of this appears anywhere in the survey and report of the 1942 commissions. Compare the reports of the 1896 Commission at 163 U.S. at 521 *ff*.

[46]The line from the downstream terminal runs 730 feet due west; that from the upstream terminal about 200 feet almost due south. See 57 Stat. 248-49 and the 1942 survey and report.

[47]S. Rep. No. 282, 78th Cong., 1st Sess. (1943).

[48]H. R. Rep. No. 549, 78th Cong., 1st Sess. (1943).

and legal boundary line."[49] All they "agreed upon," as we explained, were lines extending a few hundred feet from the terminal points of the 1896 survey to the low water mark on the right bank of the Ohio.

Kentucky's position thus rests on nothing more than its reading of the boundary description contained in the compact. This traces the 1896 survey and the new lines run in 1942 "to the low water mark on the right side of the Ohio River" and thence upstream and downstream "at low water mark on the right side of said river." Kentucky says the term "low water mark" used there must mean the *present* mark. But the compact does not say that, and in light of its history, we may not reasonably infer that meaning.

First, to do so would mean abandonment of the historic low water mark which the Supreme Court had approved in *Indiana* v. *Kentucky* as the demarcation between those States. Were the interstate agreement intended to overturn that decision, we are confident it would have said so expressly in these circumstances.

Second, for reasons we have mentioned, we do not find the historic line and the current low water mark incompatible.[50] Rather, we agree with the staff[51] that the 1942 lines were simply drawn arbitrarily to close a gap left in the area of Green River Island, an *ad hoc* political solution (in the best sense of that term) to a thorny local boundary dispute. Were the entire Kentucky-Indiana border of several hundred miles involved, that would have been made unmistakable in light of interests elsewhere along the river which would be affected by such a change. We find it hard to believe that the Ohio has remained in its historic channel everywhere except at Green River Island.

Finally, the "simple" answer which Kentucky derives from its reading of the compact is inconsistent with the nature of the problem sought to be remedied. The Commonwealth fails to explain why the two States would wish to disturb a boundary for hundreds of miles to close a gap of a few hundred yards. As we have observed before, "in construing statutes, 'context and purpose outweigh syntax.'"[52]

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[49]See fn. 15, *supra*.

[50]See p. 262, *supra*.

[51]See *Staff Brief of May 24, 1978* at 8-9.

[52]*Davis-Besse, supra*, ALAB-323, 3 NRC at 337, citing *Kansas Gas and Electric Company* (Wolf Creek, Unit 1), ALAB-321, 3 NRC 293, 311 (1976).

Kentucky also relies on an opinion of the Attorney General of Indiana to the effect that the boundary between the two States is indeed the current low water mark on the right bank, or at least that mark in 1943. Opinion No. 23, 1971 Op. Indiana Att'y Gen. 61. We decline to follow that advice. First, the author never saw the survey and report of the 1942

(Continued c

We cannot close this point without responding to Kentucky's repeated assertions that we lack jurisdiction to establish its border with Indiana. Of course we have no such authority—but that is not the question here. We stress again that the issue before us is one arising under Section 401 of the Federal Water Pollution Control Act, which requires that these applicants obtain a certificate from the State into whose waters Marble Hill will discharge its effluent.[53] To decide whether they have the proper certificate, we must know both where the discharge pipe ends and where Kentucky begins. We held in ALAB-459 that the boundary was settled by the Supreme Court in *Indiana* v. *Kentucky* and that the Commonwealth's jurisdiction extends to the low water mark on the right (Indiana) bank of the Ohio River as it existed in 1792. Kentucky has not persuaded us that we are wrong about this. The uncontroverted evidence in the record places the Marble Hill discharge pipe in the Ohio River on Indiana's side of that line. The applicants' possession of a Section 401 certificate from that State is thus sufficient and there is no basis for rescinding the Marble Hill construction permits for want of a similar document from Kentucky. The Commonwealth's exceptions must, therefore, be rejected. We turn now to matters sought to be raised by intervenor Save the Valley.

II

1. The second question before the Licensing Board involved the ability of Wabash Valley Power Association, a rural electric cooperative, to finance its 17 percent share of the Marble Hill nuclear facility.[54] The cooperative proposed to do so with a loan guaranteed by the Rural Electrification Administration of the Department of Agriculture.[55]

In pertinent part, Commission regulations require an applicant for a

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(Continued from previous page.)
boundary commissioners and he assumed, contrary to fact, that they "established the 1942 low water mark." Second, the applicant has presented us with an opinion of the Attorney General of *Kentucky*, rendered after the compact (but not mentioning it) *to the opposite effect, i.e.*, one which says that the border is the "low water mark of the river in 1792," and advising anglers to have fishing licenses from both States. Op. No. 63-847, Op. Kentucky Atty. Gen., September 13, 1963. The Kentucky attorney general was either ignorant of the compact—which we think doubtful—or understood it not to apply. At all events, such opinions are only advisory; we consider the matter a wash and disregard both of them.

[53]See ALAB-459, *supra*, 7 NRC at 189 *ff.* and fn. 39.

[54]The Board had previously found Public Service financially qualified. See LBP-77-67, 6 NRC 1101, 1115 (1977), *affirmed*, ALAB-461, *supra*.

[55]REA loans are authorized by the Rural Electrification Act, now codified at 7 U.S.C. 901, *et seq.* The loan guarantee program is specifically authorized by 7 U.S.C. 936.

construction permit to demonstrate that it "possesses the funds necessary to cover estimated construction costs and related fuel cycle costs or that the applicant has reasonable assurance of obtaining the necessary funds, or a combination of the two." 10 CFR 50.33(f). The applicants presented the Licensing Board with an REA commitment to guarantee a $360,684,000 loan to Wabash Valley for the express purpose of financing the cooperative's share of Marble Hill.[56] On the basis of that guarantee, the Board found the cooperative to have provided reasonable assurance of its financial qualifications to undertake the project.[57]

Save the Valley disputes this finding. In its papers, intervenor neither denies the existence of the REA loan guarantee nor challenges the adequacy of the amount involved. Its complaint is, rather, that the Licensing Board would not let it cross-examine or depose REA officials to inquire into whether they had "adequately considered" REA criteria in deciding to guarantee the loan. That refusal rested on a judgment that an inquiry of this kind was "beyond the jurisdiction of the Licensing Board."[58] We agree.

The REA Administrator has been authorized by Congress since 1936 to make loans to rural cooperative associations "for the purpose of financing the construction and operation of generating plants, electric transmission and distribution lines and systems . . . ." 7 U.S.C. 904. In 1973, Congress enlarged his authority specifically to allow the guarantee of loans for these purposes. 7 U.S.C. 930, 936.[59] For reasons we need not rehearse here, the courts have settled that these loans are matters committed to the REA Administrator's discretion. Even *judicial* review at the behest of one objecting to an REA loan is generally proscribed, and this remains true notwithstanding allegations—akin to those made by intervenor here—that the administrator's "procedural efforts were arbitrary, capricious, and illegal." *REA* v. *Northern States Power Company*, 373 F.2d 686, 699 (8th Cir.), *certiorari denied*, 387 U.S. 945 (1967).[60] The Board below was therefore plainly correct in refusing to hear witnesses or allow

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[56]PSI Exh. No. 20.

[57]LBP-78-12, *supra*, 7 NRC at 577.

[58]See the Licensing Board's orders of February 2, 1978 (unpublished), and March 10, 1978 (unpublished), cited in LPB-78-12, *supra*, 7 NRC at 577.

[59]See H.R. Rep. No. 93-91, 93rd Cong., 1st Sess. (1973), 1973 *U.S. Code Cong. & Ad. News* 1365.

[60]*Accord, Alabama Power Company* v. *Alabama Electric Co-Op.*, 394 F.2d 672, 674-75 (5th Cir. 1968), rehearing denied, 397 F.2d 809, *certiorari denied*, 393 U.S. 1000 (1968); *REA* v. *Central Louisiana Electric Company*, 354 F.2d 859, 865-66 (5th Cir.), *certiorari denied*, 385 U.S. 815 (1966). *Cf., Public Service Company of Indiana* v. *Hamil*, 416 F.2d 648 (7th Cir. 1969), *certiorari denied*, 396 U.S. 1010 (1970).

discovery for purposes of reviewing REA's decision to guarantee a construction loan for Wabash Valley. The matter was not an issue open for consideration by a board conducting a construction permit proceeding under the Atomic Energy Act. If relief is warranted from the REA's decision to guarantee the loan in question, it must be sought elsewhere. See, *REA* v. *Northern States Power Company, supra*, 373 F.2d at 700.[61]

2. As we discussed in Part I, the first issue before the Board below concerned the location of the 1792 low water mark in relation to the end of the planned discharge pipe. By agreement among the concerned litigants, that question of fact was submitted and resolved on the papers.

Save the Valley was served with copies of the Board's orders and the papers submitted by other parties on this issue, including the affidavits upon which the Board ultimately relied. The gist of its complaint to us is that it was not given enough time to review those submissions and was denied the right to cross-examine the affiants and challenge the accuracy of the affidavits. According to Save the Valley, this situation was caused by the procedures adopted by the Licensing Board to decide the issue. These were arranged through conference calls from which intervenor was excluded. Save the Valley argues that this question must be reopened so that it may exercise its right to participate in the development of the record on this point.

The difficulty with Save the Valley's argument to us is that it contradicts what it told the Licensing Board earlier. The applicants call to our attention that, when this matter was initially under consideration, counsel for this intervenor specifically informed the Board below that (Tr. 5277):

> . . . Save the Valley does not wish to get involved in the legal argument between the States. So we will skirt that issue.

To be sure, the boundary dispute bears on the validity of the Section 401 certification from Indiana, an issue with which Save the Valley was concerned. But it had expressly restricted its interest in this issue to the propriety of the Indiana administrative proceedings leading to the issuance of the certification. *Ibid.* As we decided that question earlier, it was not before the Licensing Board in the proceeding now on appeal. See ALAB-459, *supra*, 7 NRC at 196, fn. 41. At the initial hearing, Save the Valley submitted no contentions, proffered no evidence, proposed no findings, and suggested no conclusions of law to the Board below respecting the

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[61] *Cf., Duke Power Company* v. *Carolina Environmental Study Group*, 438 U.S.____, ____(fn.), 46 U.S.L.W. 4845, 4856 (1978): "One would not assume, however, that mere neighbors have standing to litigate the legality of a utility's financing" (Stevens, J., concurring).

boundary's location. Neither did it except to that Board's initial conclusion that Indiana was the appropriate jurisdiction to issue the Section 401 water quality certification. In the circumstances, the Licensing Board was fairly entitled to assume on remand that this intervenor still "did not wish to get involved" in determining the State boundary and, accordingly, to limit participation in the proceedings to parties interested in that question. "[I]ntervention in an NRC adjudicatory proceeding does not carry with it a license to step into and out of the consideration of a particular issue at will." *Northern States Power Company* (Prairie Island, Units 1 and 2), ALAB-288, 2 NRC 390, 393 (1975). Particularly as Save the Valley does not purport to possess relevant evidence that has not been but should be considered, we are satisfied that the Licensing Board did not abuse its discretion in proceeding as it did.

3. Finally, Save the Valley asserts that it was denied "due process" in the hearing below. Its grievance in this regard consists of unparticularized allegations of "*ex-parte* communications" among the "Staff and Applicants and third parties not of this proceeding," including officials of Indiana, EPA, and REA.[62] Save the Valley complains that the Board below ignored its requests to call these to a halt and admonish the parties for engaging in them.

The short answer is, of course, that the communications intervenor decries are permissible. Litigants may confer and cooperate with one another; what is proscribed (in the absence of all interested parties) is their discussing matters in litigation *with members of the Board.* See 10 CFR 2.780. Save the Valley specifies no occasion when this is alleged to have occurred, and we are aware of none.[63] We therefore reject this claim as bootless.

III

1. Pending before us is a group of recently filed motions on the "radon" issue. As explained in ALAB-480,[64] this matter came to the fore when the Commission amended Table S-3 of 10 CFR Part 51 to delete the value assigned to the emissions of radon-222 expected to occur as a result of the mining and milling of uranium, and directed that the environmental con-

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[62]*STV Brief* at 7-8.

[63]Save the Valley was not party to the conference calls during which the Board scheduled the boundary line issue. But having told the Board that it was not interested in this issue (see p. 268, *supra*), it cannot now be heard to complain about not being consulted.

[64]*Philadelphia Electric Company* (Peach Bottom, Units 2 and 3), ALAB-480, 7 NRC 796 (May 30, 1978).

sequences of those emissions be considered in individual licensing proceedings.

Two organizations now seek to litigate aspects of those problems in this proceeding: intervenor Save the Valley and the Sassafras Audubon Society. The latter was formerly an intervenor, but was dismissed from the proceeding by the Licensing Board for lack of participation; it now wishes to be treated as a "friend of the court" for purposes of participation in the radon hearings. In addition, Save the Valley has moved for suspension of the Marble Hill construction permits until the radon questions have been resolved. All the motions are opposed by the applicant, the staff, or both.

The radon issue has been injected in a number of cases which are pending before different boards. See ALAB-480, *supra*. Before proceeding further with the issue in this case, we wish to be certain that we do not act at cross-purposes with the other boards. We therefore defer our rulings on most aspects of Save the Valley's radon motion and the Sassafras Audubon Society's request to participate until we have had a chance to scrutinize those other proceedings. We expect to be able to do this shortly; in the interim, we intimate no views on the merits of these two motions.

2. We cannot, however, similarly postpone Save the Valley's motion for a stay of construction. The applicants possess the requisite construction permits and, in accordance with our decision today, are otherwise entitled to continue building Marble Hill. We therefore turn to that motion.

In opening the radon question to litigation in individual licensing proceedings, the Commission declined to call a general halt to the issuance of licenses pending resolution of that question. Instead, it ruled that "construction permits . . . already issued shall remain effective unless a stay of the decision issuing the license . . . is granted upon the request of a party pursuant to the criteria set forth in 10 CFR 2.788." 43 Fed. Reg. at 15616. Those criteria, the familiar ones articulated initially by the District of Columbia Circuit some 20 years ago in *Virginia Petroleum Jobbers Ass'n* v. *FPC*, 259 F.2d 921, 925 (1958), are:

1. whether the moving party has made a strong showing that 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 burden of persuasion on those questions is thus on the "moving party." In the course of this litigation we have previously called Save the Valley's attention expressly to those prerequisites for a stay.[65] Neverthe-

[65]See ALAB-437, 6 NRC 630, 631 (1977).

less, its present motion papers discuss none of them. It does not even elucidate the key question of its own injuries, much less demonstrate that they would be irreparable.[66] We should not have to guess at matters peculiarly within a litigant's own knowledge. Intervenor has similarly failed to alert us to its position on the other three factors. These circumstances give us little choice other than to deny the motion for a stay.

Except for the radon issues discussed at pp. 269-270, *supra*, over which we retain jurisdiction, the decision of the Licensing Board is *affirmed*; on reconsideration, ALAB-459 is *adhered to*; the motion for a stay is *denied*.[67]

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

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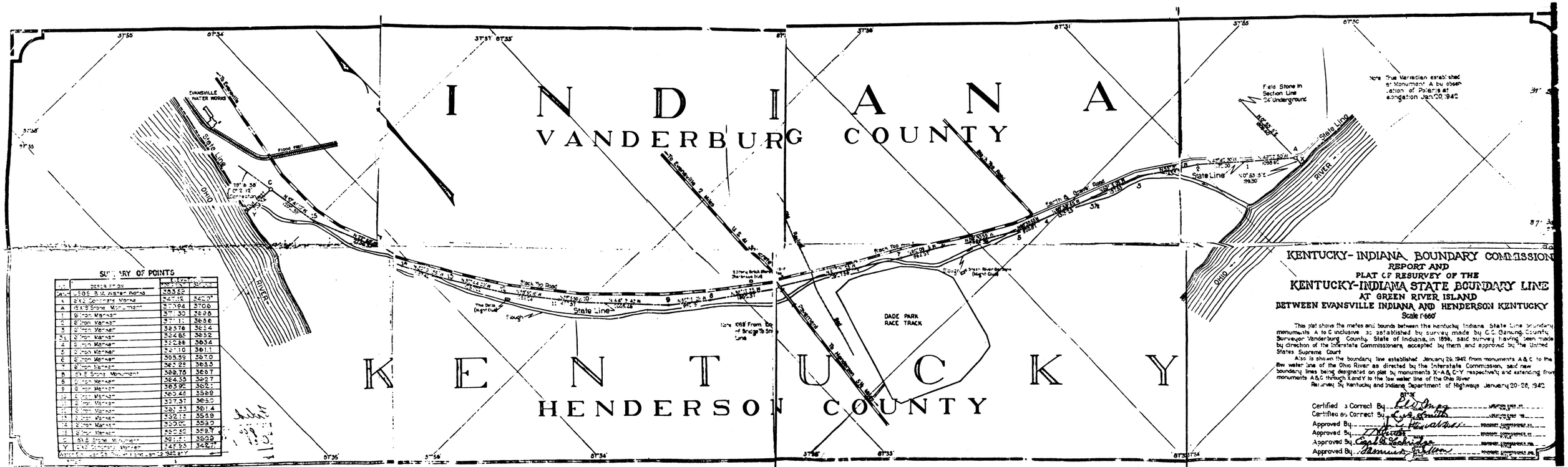
[66]"It is the 'established rule that a party is not ordinarily granted a stay of an administrative order without an appropriate showing of irreparable injury.'" *Permian Basin Area Rate Cases*, 390 U.S. 747, 773 (1968), quoted in *Marble Hill, supra*, ALAB-437, 6 NRC at 632.

[67]The city of Louisville, Kentucky, initially excepted to the decision below but on May 2nd sought to withdraw those exceptions. In the absence of any objections, the city's motion is granted.



SUMMARY OF POINTS

No.	Description	Elevation Mon.	Elevation Water
Water	U.S.G.S. B.M. Water Works	383.52	
A	24" Concrete Marker	347.16	342.07
A	15"x18" Stone Monument	370.94	370.0
1	Gilman Marker	377.30	368.8
C	Gilman Marker	377.11	363.6
3	Gilman Marker	363.76	365.4
3½	Gilman Marker	362.65	365.2
4	Gilman Marker	362.88	365.4
5	Gilman Marker	362.10	361.1
6	Gilman Marker	365.59	367.0
7	Gilman Marker	362.29	363.3
8	6"x8" Stone Monument	362.76	360.7
8	Gilman Marker	362.53	362.7
9	Gilman Marker	363.92	362.1
10	Gilman Marker	360.42	359.0
11	Gilman Marker	357.31	360.0
12	Gilman Marker	362.33	361.4
13	Gilman Marker	362.13	358.9
14	Gilman Marker	360.00	359.0
15	Gilman Marker	362.50	359.7
G	6"x8" Stone Monument	362.11	360.0
Y	24" Concrete Marker	346.53	342.78

Water Elevations Taken Jan. 20, 1942

KENTUCKY-INDIANA BOUNDARY COMMISSION

REPORT AND PLAT OF RESURVEY OF THE KENTUCKY-INDIANA STATE BOUNDARY LINE AT GREEN RIVER ISLAND BETWEEN EVANSVILLE INDIANA AND HENDERSON KENTUCKY

Scale 1:600'

This plat shows the metes and bounds between the Kentucky Indiana State Line boundary monuments A to C inclusive as established by survey made by C.C. Gehring, County Surveyor Vanderburg County, State of Indiana, in 1896, said survey having been made by direction of the Interstate Commissioners, accepted by them and approved by the United States Supreme Court.

Also is shown the boundary line established January 26, 1942 from monuments A & C to the low water line of the Ohio River as directed by the Interstate Commission, said new boundary lines being designated on plat by monuments X-A & C-Y respectively and extending from monuments A & C through Kandy to the low water line of the Ohio River.

Resurvey by Kentucky and Indiana Department of Highways January 20-28, 1942

Certified as Correct By _____ Indiana State Line Commissioner
Certified as Correct By _____ Kentucky State Line Commissioner
Approved By _____ Indiana State Line Commissioner
Approved By _____ Kentucky State Line Commissioner
Approved By _____ Indiana State Line Commissioner
Approved By _____ Kentucky State Line Commissioner

Cite as 8 NRC 275 (1978) LBP-78-27

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD
Ivan W. Smith, Chairman
Lester Kornblith, Jr.
Dr. Frederick R. Cowan

In the Matter of **Docket Nos. 50-329 OL**
50-330 OL

CONSUMERS POWER COMPANY

(Midland Plant,
Units 1 and 2) **August 14, 1978**

The Licensing Board provisionally orders a hearing on an application for operating licenses and admits an individual petitioner for intervention under 10 CFR 2.714 and the State of Michigan as an interested State under 10 CFR 2.715(c). It denies the petition for intervention of the Saginaw Valley Nuclear Study Group and the State of Michigan under 10 CFR 2.714.

RULES OF PRACTICE: STANDING TO INTERVENE

Standing to intervene, unlike the merits of contentions, may be the subject of an evidentiary inquiry before intervention is granted. *Florida Power & Light Company* (St. Lucie, Unit 2), CLI-78-12, 7 NRC 939, 948-49 (1978).

RULES OF PRACTICE: INTERVENTION

Intervention petitions must specify the aspect or aspects of the subject matter of the proceeding as to which petitioner wishes to intervene. An "aspect" is broader than a "contention" but narrower than a general reference to the Commission's operating statutes.

RULES OF PRACTICE: DECLARATORY RELIEF

An intervention petitioner's "reservations" are not to be regarded as motions for declaratory relief under the Administrative Procedure Act, 5 U.S.C. 554(e), because the reservations would not terminate a controversy or remove uncertainty.

MEMORANDUM AND ORDER

On May 4, 1978, the Nuclear Regulatory Commission published in the FEDERAL REGISTER a notice of an opportunity for a hearing with respect to the application for an operating license by the applicant, Consumers Power Company, 43 Fed. Reg. 19304. The license would authorize the applicant to operate nuclear power reactors, Units 1 and 2, at its Midland Plant in Midland County, Michigan. The notice provided that any person whose interest may be affected by the proceeding may file a petition for leave to intervene and request a hearing pursuant to 10 CFR 2.714 on or before June 5, 1978. By petition dated June 1, 1978, Mrs. Mary P. Sinclair requested a hearing and leave to intervene on behalf of the Saginaw Valley Nuclear Study Group (Saginaw). Frank J. Kelley, the Attorney General of the State of Michigan, filed a petition for leave to intervene dated June 2, 1978. This Board has been designated to rule upon intervention petitions and requests for hearings.

Saginaw Petitioners

Saginaw's petition, setting forth many areas of interest, asserts that it is an association of residents of Michigan involved in the study of nuclear power and in stimulating public interest in this subject.

Several of Saginaw's stated concerns are founded upon the allegation that the nuclear plant "will be situated essentially at the heart" of the small community of Midland where a majority of its members are said to reside.

Saginaw points to its intervention in the construction permit proceeding of this case and alleges that its interests in an operating license proceeding are the same or even stronger.

The Applicant opposes the petition. One reason is because, except for Mrs. Sinclair, the petition does not set forth the number, names, or addresses of the persons who comprise the petitioning association, nor does it show that Mrs. Sinclair is authorized to represent the association. Applicant recognizes that Saginaw participated in the construction permit proceeding for Midland, but does not concede that Saginaw's interests and membership remain the same or that Mrs. Sinclair is Saginaw's representative for this proceeding.

The NRC Staff does not oppose intervention by Saginaw but points out that the standards for determining cognizable interests in our proceedings have changed, and that Saginaw's standing to intervene should be judged upon current standards, citing, for example, *Sierra Club* v. *Morton,* 405 U.S. 727 (1972), *Tennessee Valley Authority* (Watts Bar), ALAB-413, 5 NRC 1418 (1977), and with respect to representation, *Allied General Nuclear Services* (Barnwell), ALAB-328, 3 NRC 420, 423 (1976). Staff's acquiescence

to Saginaw's petition depends, however, upon the Board taking note of filings by Mrs. Sinclair in other Midland proceedings which would indicate her authority to represent Saginaw.

The Board believes that the applicant is entitled to have a clear and current showing that a significant number of Saginaw members do in fact reside near the plant, that their interests are those set forth in the petition, and that Mrs. Sinclair is the authorized representative for this proceeding of the petitioning organization if such is the case. While it is possible that this information already reposes in other filings before the Commission, there is no reason why the Board should search extra-record sources when the information is conveniently available from the petitioners, and there is no apparent reason why petitioners would object to such a showing. Therefore the Board denies the intervention petition insofar as it purports to be the petition of the Saginaw association, subject to the provisions set forth below.

In this and other proceedings the address for Mrs. Sinclair has been given as "5711 Summerset Drive, Midland, Michigan 48604." No one has disputed that she is a resident of Midland, but this point has never been directly in issue as far as we know. We are proceeding under the assumption that Mrs. Sinclair does in fact reside in Midland, and we assume further that those interests set forth in the petition which relate to the proximity of the Midland Plant are also Mrs. Sinclair's personal interests.[1] We find that at least ¶ No. 7, page 6, of the petition relating to radioactive effluents and the consumption of food and water sufficiently demonstrates these interests and meets the "interest" requirements of §2.714.

Under the Rules of Practice which became effective on May 26, 1978, petitioners under §2.714 are not required to submit contentions until 15 days prior to the special prehearing conference required under §2.751a. 43 Fed. Reg. 17798, April 26, 1978. The notice of hearing, published before the effective date of the new rule, required that contentions be submitted with the petition. Petitioner submitted a lengthy statement of contentions. Applicant agrees that the more liberal new rules should apply (Answer, p. 5). The Staff also views the petition under the new rules and so shall the Board.

The new rule retains the provisions of the old rule requiring that petitions initially specify the aspect or aspects of the subject matter of the proceeding

[1]While conceding that Mrs. Sinclair may be a member of Saginaw (Answer, n. p. 4), Applicant does not concede that her interests are those of the association (*id.*, p. 5). The Board will not preside over quibbling on this point. But, if in fact Mrs. Sinclair does not reside in Midland, or nearby, it is a matter for the Board to consider. Standing to intervene, unlike the factual merits of contentions, may appropriately be the subject of an evidentiary inquiry before intervention is granted. *Florida Power & Light Company* (St. Lucie, No. 2), CLI-78-12, 7 NRC 939, 948-949 (June 21, 1978). The Applicant may pursue this point further if it has *bona fide* doubts about Mrs. Sinclair's residency.

as to which petitioner wishes to intervene. Applicant asserts that petitioners have failed to meet this requirement except in the area of "need for power" (Answer, p. 13).

We have been unable to identify any Commission decisions which offer guidance as to the meaning of "aspect" as it appears in the intervention rule. Under the old rule it was not an important consideration. We believe that an "aspect" is probably broader than a "contention" but narrower than a general reference to our operating statutes.

This view does not seem to square with Applicant's analysis. Applicant, although recognizing that contentions are not yet due, analyzes each of the petitioner's proffered contentions in a manner traditional under the old rules, concludes that most of the contentions are inadequate for one reason or another, and urges that the petition be denied or severely limited because the petition fails to satisfy the "aspect" requirement of the intervention rule. We do not accept this reasoning.

Because the petitioner has the right to amend its contentions later, it is premature for the Board to rule upon their adequacy as issues in controversy. We have, however, evaluated the contentions to determine whether any of them specify proper aspects for an operating license proceeding and find that some have. Contentions numbered 11 through 14 for example identify appropriate subject matters and meet the "aspect" requirement. There may be others, but there is no need to rule upon them.

Therefore, all requirements of §2.714 having been met, in our order below we admit the petitioner Sinclair as a party intervenor.

Section II of Saginaw's petition contains "reservations." The Board will not now rule upon the reservations except to observe that it recognizes no right of the petitioners unilaterally to bind the Board and the parties simply by reciting its intentions to take certain actions. We do not regard the reservations as motions for declaratory relief under the Administrative Procedure Act, 5 U.S.C. 554(e), because the reservations would not terminate a controversy or remove uncertainty.

State of Michigan

Mr. Kelley, the Michigan Attorney General, petitions for leave to intervene on behalf of the people of the State of Michigan and its governmental agencies (hereafter "Michigan"). The petition does not state whether Michigan wishes to intervene as a party to the proceeding under §2.714 or whether it wishes to participate, not as a party, but as an interested State under §2.715(c). The Staff treats the filing as a request under §2.715(c) and recommends that the petition be granted under that section. Applicant treats the petition as a pleading under §2.714. Applicant states further that counsel

for the Attorney General informed Applicant's counsel that Michigan intended to participate "as a full party" in the proceeding.

The Board deems the petition to be filed under §2.714. Many of the requirements of that section are discussed in the petition. But, as a §2.714 petition, it fails. Michigan has not specified the aspect or aspects of the subject matter of this proceeding as to which it wishes to intervene as required by §2.714(a)(2). The petition insofar as it is a petition to intervene as a party is therefore denied subject to the provisions of our order below.

However the petition does demonstrate that the petitioner qualifies as an interested State under §2.715(c) and the Board will admit Michigan as a participant under that section. Section 2.715(c) as modified effective May 26, 1978, provides as follows:

§2.715 Participation by a person not a party.

* * * * *

(c) The presiding officer will afford representatives of an interested State, county, municipality, and/or agencies thereof, a reasonable opportunity to participate and to introduce evidence, interrogate witnesses, and advise the Commission without requiring the representative to take a position with respect to the issue. Such participants may also file proposed findings and exceptions pursuant to §§2.754 and 2.762 and petitions for review by the Commission pursuant to §2.786. The presiding officer may require such representative to indicate with reasonable specificity, in advance of the hearing, the subject matters on which he desires to participate.

As can be seen, the prerogatives of a nonparty interested State include many of those afforded a party under §2.714. In that an interested State need not take a position on issues, its position may be somewhat better than that of a party. On the other hand if a State is not admitted as a party, and does not offer its own contentions, it could face the danger of having no forum for its views in a discretionary proceeding such as an operating license proceeding if the intervention petition were to be withdrawn or dismissed. The foregoing is not a declaratory order or ruling by this Board. There may be other advantages and disadvantages to either method of participating that do not occur to us. We are only trying to be helpful so that the State of Michigan may select the mode of participation better designed to satisfy its requirements.

ORDER

1. A hearing on the application for an operating license for the Midland Plant is ordered. A notice of hearing to this effect will be issued in the near

future. At that time the Board will also schedule a prehearing conference pursuant to §2.751a.

2. Mrs. Mary A. Sinclair is admitted as a party to this proceeding. The Saginaw Valley Nuclear Study Group is denied admission. On or before 15 days prior to the prehearing conference required under §2.751a, Saginaw may demonstrate its eligibility to be admitted as a party and may establish the authority of Mrs. Sinclair or other agent to represent it in this proceeding. The contentions contained in the Saginaw intervention petition of June 1, 1978, may be amended and supplemented on or before that date.

3. The State of Michigan represented by its Attorney General is denied admission as a party under §2.714 but admitted as a participant under §2.715 (c). Leave is granted to Michigan to file an amended petition under §2.714 on or before 15 days before the prehearing conference required under §2.751a. Any such petition shall contain Michigan's contentions. In any event, whether Michigan elects to participate as an interested State under §2.715(c) or as a party under §2.714, it shall specify the subject matters on which it desires to participate on or before 15 days prior to the special prehearing conference.

4. This action which orders a hearing, and grants and denies petitions for leave to intervene is a provisional order. This is because the Board cannot rule upon contentions and the need for an evidentiary hearing, until after the special prehearing conference required under §2.751a, and because the petitioners denied intervention status as parties may qualify upon refiling. Therefore the Board will not enter the order referred to in §2.714a pertaining to appeals on petition rulings until later. Therefore this action is not appealable under that section.

BY ORDER OF THE BOARD.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD DESIGNATED
TO RULE UPON PETITIONS

Ivan W. Smith, Chairman

Dated at Bethesda, Maryland,
this 14th day of August 1978.

Cite as 8 NRC 281 (1978) LBP-78-28

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Sheldon J. Wolfe, Chairman
Dr. Paul W. Purdom
Frederick J. Shon

In the Matter of

Docket Nos. STN 50-556
STN 50-557

PUBLIC SERVICE COMPANY
OF OKLAHOMA
ASSOCIATED ELECTRIC COOPERATIVE,
INC.
WESTERN FARMERS ELECTRIC
COOPERATIVE, INC.

(Black Fox Station, Units 1 and 2)

August 24, 1978

The Licensing Board grants Applicants' unopposed motion for reconsideration and clarification of portions of LBP-78-26, 8 NRC 102 (July 24, 1978).

NEPA: WEIGHT TO BE ACCORDED STATE ENVIRONMENTAL REVIEW

In conducting its NEPA analysis, NRC gives great weight to action taken by a competent and responsible State authority in enforcing a State environmental statute.

ORDER GRANTING APPLICANTS' MOTION FOR RECONSIDERATION AND CLARIFICATION

On August 2, 1978, Applicants filed a Motion for Reconsideration and Clarification of Portions of the Board's Partial Initial Decision Authorizing Limited Work Authorization. Intervenors did not file a response. In its reply of August 21, 1978, the Staff supported the granting of the instant motion.

1. At the time the Board issued its Partial Initial Decision Authorizing Limited Work Authorization (PID) on July 24, 1978 (LBP-78-26, 8 NRC 102), we were unaware of and had not been advised that on January 6, 1978, the Air Quality Service, Environmental Health Services, Oklahoma Depart-

ment of Health, had issued a permit to Applicants allowing open burning of certain materials. In the conduct of our NEPA analysis, we give substantial weight to such action taken by a competent and responsible State authority (Accord. *Public Service Company of New Hampshire, et. al.* (Seabrook Station, Units 1 and 2), CLI-77-8, 5 NRC 503 (1977)), and we conclude that the enforcement of Oklahoma's Clean Air Act (63 O.S. §§2001, *et seq.*) should be left to the Oklahoma Department of Health which is directly responsible for the enforcement of this Act. Accordingly we grant the motion for reconsideration and strike the following portions of our findings in the PID:

> 85. . . .Admittedly, the proposed methods of burning could produce smoke (Guyot, Tr. 1519 and 1522). Since particulate levels in this area are already at the secondary standards and any increment may cause these standards to be violated, the Board finds that reasonable alternative methods are available which should be used to avoid additional particulate generation by open burning or by open-pit incineration.
>
> 88. . . . The Board fails to see the necessity for the Applicants to burn vegetation and combustible construction materials in the open or in an open-pit incinerator with resulting particulate generation. Such air pollution in some isolated areas might create no special problems, but in this area any additional pollution may cause standards to be violated. Hence activities that add to the pollution burden should be avoided. The Board, therefore, directs that alternate methods of solid waste disposal be used. . . .

Further, we strike the following portion of our Conclusions of Law in the PID:

> 5a. . . . except that with regard to 4.5.1.1, item 2, the Board directs that no open and/or open-pit burning be permitted on the site.

2. The balance of paragraph 5a. of our Conclusions of Law in the PID, which remains after the deletion effected above, reads/:

> The Applicants shall take the necessary mitigating actions, including those summarized in Section 4.5 of the Final Environmental Statement, during construction of the plant and associated transmission lines to avoid unnecessary adverse environmental impacts from construction activities.

Paragraph 5b. reads:

> In addition to the preoperational monitoring programs described in Section 6.1 of the Environmental Report, with amendments, the Staff recommendations included in Section 6.1 of the FES shall be followed.

However, impingement studies will not be required of the Applicants nor will transmission line rights-of-way monitoring be required.

While we did not mention any spoils effluent limitation in these two paragraphs, certain references therein to sections of the Final Environmental Statement might be taken to mean that the Board had indeed imposed effluent limitations. We grant Applicants' request for clarification and state that the Board does not by these two paragraphs (conditions) intend to impose any effluent limitations which by virtue of §511(c)(2) of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. §1371(c)(2)) it is prohibited from imposing.

IT SO SO ORDERED.

THE ATOMIC SAFETY AND LICENSING BOARD

Dr. Paul W. Purdom, Member

Frederick J. Shon, Member

Sheldon J. Wolfe, Esquire
Chairman

Dated at Bethesda, Maryland,
this 24th day of August 1978

Cite as 8 NRC 284 (1978) LBP-78-29

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Edward Luton, Chairman
Cadet H. Hand, Jr.
David L. Hetrick

In the Matter of

Docket Nos. 50-500
50-501

THE TOLEDO EDISON
COMPANY, et al.

(Davis-Besse Nuclear
Power Station, Units
2 and 3)

August 30, 1978

In an uncontested proceeding, the Licensing Board makes findings and conclusions requisite to the award to the applicant of an LWA-2 authorizing it to undertake a remedial grouting program and a bedrock verification program.

TECHNICAL ISSUES DISCUSSED: Bedrock stability.

SUPPLEMENTAL PARTIAL INITIAL DECISION

Appearances

Bruce W. Churchill, Esq., and Ernest L. Blake, for the Applicant

Gregory Fess, Esq., for the NRC Staff

1. This Supplemental Partial Initial Decision concerns a request for a limited work authorization (LWA-2)[1] to conduct certain safety-related activities at the proposed Davis-Besse Nuclear Power Station, Units 2 and 3.

[1]See 10 CFR §50.10(e)(3)

2. On August 28, 1974, the U. S. Atomic Energy Commission[2] issued a Notice of Hearing on Application for Construction Permits with respect to the application filed by the Toledo Edison Company, the Cleveland Electric Illuminating Company, the Duquesne Light Company, the Ohio Edison Company, and the Pennsylvania Power Company (hereinafter collectively referred to as "Applicant").[3] The application seeks authority to construct two pressurized water nuclear reactors designated as Davis-Besse Nuclear Power Station, Units 2 and 3 ("Davis-Besse 2 and 3" or "facilities").

3. The notice of hearing set forth the requirements pursuant to the Atomic Energy Act of 1954, as amended, and the National Environmental Policy Act of 1969 ("NEPA") which are to be met prior to the issuance of construction permits, and invited intervention by any persons whose interests might be affected by the proceeding. No petitions for leave to intervene were filled and the proceeding is uncontested.[4]

4. On October 13, 1975, the Applicant filed with the Commission a request for authorization, under the provisions of Section 50.10(e) of 10 CFR Part 50, to conduct certain, nonsafety-related, preconstruction permit activities at the site of the facilities.

5. On November 13, 1975, the Atomic Safety and Licensing Board (the "Licensing Board") conducted an evidentiary hearing in Toledo, Ohio, to determine: whether there was reasonable assurance that the site was a suitable location for nuclear power reactors of the general size and type proposed by the Applicant from the standpoint of radiological health and safety considerations under the Atomic Energy Act of 1954, as amended, and the rules and regulations promulgated by the Commission pursuant thereto; whether the final environmental review performed by the Staff pursuant to NEPA, as presented in the Staff's Final Environmental Statement, was adequate; whether the requirements of Section 401(a)(1) of the Federal Water Pollution Control Act Amendments of 1972 had been met; and whether the applicable requirements of Section 102 of NEPA and 10 CFR Part 51 had been met.

6. The Licensing Board issued a Partial Initial Decision on December 31, 1975, wherein it concluded that the site was a suitable location for two nuclear power units of the general size and type proposed by the Applicant. LBP-75-75, 2 NRC 993, 1019-27 (1975). In the Partial Initial Decision, the

[2]In accordance with the Energy Reorganization Act of 1974, 88 Stat. 1233, the Atomic Energy Commission has been abolished and its regulatory responsibilities have been assumed by the Nuclear Regulatory Commission. All references in this decision to the "Commission" shall refer, unless otherwise indicated, to the Nuclear Regulatory Commission.

[3]The Toledo Edison Company is acting as agent for all the companies in the design and construction of the proposed facilities.

[4]See 10 CFR §2.4(n).

Licensing Board also concluded that the requirements of NEPA, 10 CFR Part 51, and the Federal Water Pollution Control Act Amendments of 1972 had been met, and that the environmental review performed by the Staff pursuant to NEPA was adequate. *Id.* at 1027.

7. No exceptions were filed to the Licensing Board's Partial Initial Decision.

8. On December 31, 1975, the Commission's Director of Nuclear Reactor Regulation issued, in accordance with the Licensing Board's Partial Initial Decision and pursuant to the authority contained in 10 CFR §50.10(e)(1), a limited work authorization (LWA-1) to the Applicant for conducting certain nonsafety-related activities at the site.

9. On January 26, 1976, the Atomic Safety and Licensing Appeal Board issued an order (unpublished) wherein it deferred review of the environmental and site suitability matters addressed in the Licensing Board's Partial Initial Decision pending consideration of the remaining radiological health and safety issues and the Licensing Board's rendition of its initial decision on these issues.

10. By letters dated May 25, 1978, and June 6, 1978, the Applicant requested authorization to conduct additional work at the site of the proposed facilities. See Applicant's Exhibits 6 and 7. The activities for which authorization was requested consist of performing a bedrock rock verification program, including exploratory drilling and remedial grouting in the containment, auxiliary building, and turbine building areas, beginning September 1, 1978. Since the activities for which authorization was requested are in the nature of subsurface preparation for the installation of structural foundations for structures which prevent or mitigate the consequences of postulated accidents that could cause undue risk to the public health and safety, the requested activities are subject to the provisions of 10 CFR §50.10(e)(3), which require that the Board determine whether there are any unresolved safety issues relating to these activities that would constitute good cause for withholding authorization.

11. A public evidentiary hearing on the Applicant's LWA-2 authorization request was held on July 25, 1978, in Silver Spring, Maryland. At the evidentiary hearing, the Applicant presented two witnesses and the NRC Staff three witnesses. In addition, the Applicant introduced into the record seven Exhibits (Applicant's Exhibits 5 through 11), which are more fully described in Appendix A to this Supplemental Decision.

FINDINGS OF FACT

12. The geology of the site consists of a thin layer of soil, 12 to 24 feet thick, overlaying bedrock. The soil layer is composed of two distinct types

of glacial soil deposits: a stiff fissured, desiccated, gray and brown silt clay which overlies a hard, fissured, desiccated gray-to-brown silty and sandy clay. The bedrock underlying the soil deposits is the Tymochtee Formation, a flat-lying, soft-to-hard, thin-bedded to massive-laminated argillaceous dolomite containing various amounts of gypsum and anhydrite. Applicant's Testimony on Amended Limited Work Authorization Request, *incorporated into the transcript following Tr. 95* (hereinafter cited as "Applicant's Testimony"), at 2.

13. Portions of the dolomite foundation rock at the site are susceptible to solution activity. Preconstruction borings and rock probes in the station area for Units No. 2 and 3 encountered cavities, mostly in the zone between elevations 545 and 555 feet International Great Lakes Datum (IGLD). Most of the cavities encountered were shallow, ranging in size from 3 inches to 3 feet; typically, two or three cavities were found in a single boring, indicating possible solutioning at different elevations along bedding planes. Testimony of the NRC Staff on the LWA-2 Request of May 25 and June 6, 1978, by Robert Benedict, *incorporated into the record following Tr. 114* (hereinafter cited as "Benedict Testimony"), at 3-4. The cavities found in the area for Units 2 and 3 roughly correspond to the level where similar features were observed along the northern perimeter of the foundation for the Unit 1 cooling tower. Based on the subsurface investigatons completed to date, solution voids exist at the site in a zone of bedrock 20 feet above elevation 540 feet IGLD; the voids are concentrated in the 10-foot band between elevations 545 and 555 feet IGLD. Applicant's Testimony at 2-3.

14. To verify the competence of the bedrock beneath the foundations of the Units 2 and 3 structures, Applicant will employ, during foundation excavation and construction, a bedrock rock verification program. Applicant's Testimony at 3. The program will be composed of five separate activities: core borings and rock probes, rock surface geological mapping, surface resistivity surveying, microgravimetric surveying, and seismic reflection profiling. Applicant's Testimony at 3; *see also* Applicant's Exhibit No. 5, Appendix 2C. The Staff has reviewed this program and found it appropriate to detect solution cavities, the existence of which might affect the competence of the bedrock. However, because foundation conditions at this site are complex, it may be necessary during construction to conduct further investigations beyond the program now proposed. Additional borings and exploratory excavations may be used to further explore, inspect, and evaluate unanticipated solution features discovered during construction and during the course of the scheduled investigation program. Plant facility excavations that expose the foundation rock will be thoroughly evaluated during construction to assess rock conditions and the effectiveness of foundation treatment. The Staff will observe actual field conditions, and will

review with the Applicant the results of the additional foundation investigations and remedial foundation treatment. The Applicant has agreed (1) to notify the Staff when excavations which expose rock conditions are open for inspection, and (2) to provide, before work commences on the foundation mats, a final foundation report for review by the Staff during construction while the major excavations are still open. The Staff will use this information during site visits to assess the need for any additional exploration or for possible redesign of foundations. Benedict Testimony at 6.

15. The Applicant proposes to undertake a remedial treatment program of the rock beneath those structures whose foundations will lie within or above the zone of identified or suspected solution cavities. The structures involved are that portion of the auxiliary building founded above 545 feet IGLD (the "upper level of the auxiliary building"), and the turbine building. Remedial treatment will consist of grouting to fill cavities in the upper 20 feet of the bedrock which, if left untreated, could adversely affect the structural integrity of the foundations. The treatment simultaneously increases the bearing capacity of the bedrock and reduces the volume of voids into which the overlaying rock could move. Applicant's Testimony at 4.

16. To accomplish the remedial grouting program, a perimeter foundation grout line will be installed, consisting of grout holes on 10-foot centers; inside the perimeter grout line, a blanket grid pattern of grouting holes, 20 feet center to center, will be drilled. In areas of greater potential for solution voids, the primary grout hole spacing will be reduced to 10-foot centers. Grout hole spacing will continue to be reduced until grout takes have been reduced to below the criterion established (grout takes in excess of 0.5 $ft.^3$/lin. ft. of grout hole). See Tr. 103-04. Each grout hole will be inclined 15 degrees to the vertical, and will be bottomed at elevation 535 feet IGLD. In response to questions raised by the Licensing Board, Applicant's witness Mr. Millet explained that the grout holes are inclined from the vertical in order to traverse both horizontal and vertical joints and bedding planes, thereby providing greater assurance of adequate grout coverage throughout the bedrock. See Tr. 106-09.

17. The bedrock under the upper level of the auxiliary building will be overexcavated (Tr. 109-110) to elevation 545 feet IGLD, except that, if the groutability and competence of the bedrock in that area is confirmed by Applicant to the NRC Staff's satisfaction during adjacent foundation preparation, that area will not be excavated but will undergo remedial grouting as described above. Tr. 125; Applicant's Testimony at 4-5; Applicant's Exhibit 8 at item 15.

18. Grout holes used for the grouting of bedrock will be logged and used for exploratory purposes. Applicant's Testimony at 5; Applicant's Exhibit 10. Logging will consist of measuring changes in drilling penetration rates,

and noting rod drops and changes in the color of cuttings. This logging can aid in detecting anomalous zones and solution features that may not be detected by grout takes alone. Tr. 122-123; Benedict Testimony at 6. In addition, following grouting, Applicant will employ the bedrock rock verification program (*e.g.* surface resistivity surveys and microgravimetric surveys) to verify the effectiveness of the remedial grouting. Applicant's Testimony at 3, 5.

19. The Staff has reviewed the Applicant's proposed remedial grouting procedures and found them acceptable, based on the Applicant's agreement to perform the logging indicated above and to use the results of this logging to detect solution features that may not be detected by grout takes alone. Benedict Testimony at 6. The Staff has further concluded that there are no unresolved safety issues that would constitute good cause for withholding authorization for construction activities pertaining to the performance of the bedrock rock verification program, including exploratory drilling and remedial grouting, as appropriate, in the containment, auxiliary building, and turbine building areas. Benedict Testimony at 6-7. The Board has reviewed these conclusions and the supporting evidence and finds itself in concurrence therewith.

20. The Staff has reviewed the Applicant's quality assurance programs against the requirements set out in 10 CFR Part 50, Appendix B.[5] Benedict Testimony at 7. The Staff concluded that the quality assurance programs presented by the Applicant and its principal contractors comply with the requirements of Appendix B to 10 CFR Part 50. Benedict Testimony at 7.

21. NRC's Office of Inspection and Enforcement has conducted inspections to examine the implementation of the Davis-Besse, Units 2 and 3, quality assurance program to ascertain its conformance with related commitments in Applicant's Preliminary Safety Analysis Report (PSAR). The examination encompassed the organizations of the Applicant and the Applicant's major contractors. These examinations focused on quality assurance acitivities related to the design, procurement, and construction of the facilities and, for each organization examined, included a review of established procedures and instructions and the execution of provisions contained therein. Benedict Testimony at 8. On the basis of those inspections, the NRC Staff has determined that the implementation of the QA

[5]The quality assurance (QA) program for Davis-Besse, Units 2 and 3, is described in Chapter 17 of Applicant's PSAR (Applicant's Exhibit 5). Section 17.1.1 describes Toledo Edison Company's QA program. Sections 17.1.2, 17.1.3, and 17.1.4 reference the QA program descriptions for Bechtel Power Corporation (the architect-engineer), United Engineers and Constructors (the constructor), and Babcock and Wilcox Company (the nuclear steam supply system supplier), respectively, which are contained in topical reports and incorporated by reference in the PSAR.

program is acceptable. Benedict Testimony at 9-10.

22. Since both the Davis-Besse 2 and 3 QA program and the implementation of the QA program are acceptable, the NRC's Staff has concluded that there are no unresolved QA matters that would constitute good cause for withholding authorization for the requested activities. Benedict Testimony at 10. The Licensing Board concurs with the NRC Staff's determination.

CONCLUSIONS OF LAW

23. The Board has reviewed the entire record of this proceeding, including all of the Findings of Fact and Conclusions of Law submitted by the parties. On the basis of the record of this proceeding, including the evidentiary hearing on July 25, 1978, and the foregoing Findings of Fact, the Board concludes that there are no unresolved safety issues relating to the activities for which authorization is requested which would constitute good cause for withholding authorization to conduct such activities.

ORDER

24. 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 this Supplemental Partial Initial Decision shall constitute a portion of the ultimate Initial Decision to be issued upon completion of hearings to consider the remaining radiological health and safety issues in this proceeding.

25. IT IS FURTHER ORDERED, in accordance with 10 CFR §§2,760, 2.762, 2.764, 2.785, and 2.786, that this Supplemental Partial Initial Decision shall become effective and shall constitute, with respect to the matters covered herein, the final decision of the Commission 30 days after the date of issuance hereof, subject to any review pursuant to the above cited Rules of Practice. Exceptions to this decision may be filed within ten (10) days after service of this Supplemental Partial Initial Decision. A brief in support of such exceptions may be filed within thirty (30) days thereafter, forty (40) days in the case of the Staff. Within thirty (30) days after service of the brief of appellant, forty (40) days in the case of the Staff, any other party may file a brief in support of, or in opposition to, such exceptions.

THE ATOMIC SAFETY AND
LICENSING BOARD

Cadet H. Hand, Jr., Member

David L. Hetrick, Member

Edward Luton, Chairman

Dated at Bethesda, Maryland,
this 30th day of August 1978.

[Appendix A has been omitted from this publication but is available in the NRC Public Document Room, 1717 H Street, N.W., Washington, D.C.]

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Joseph M. Hendrie, Chairman
Victor Gilinsky
Richard T. Kennedy
Peter A. Bradford
John F. Ahearne

In the Matter of	**Docket Nos. 50-400**
	50-401
CAROLINA POWER & LIGHT COMPANY	**50-402**
	50-403
(Shearon Harris Nuclear Power Plant, Units 1, 2, 3, and 4)	**September 5, 1978**

In response to a letter from the Licensing Board raising questions regarding the forthrightness and accuracy of certain staff testimony, and in consideration of ALAB-490, 8 NRC 234, the Commission remands the proceeding to that Board for further hearing on applicant's ability to construct and operate the proposed unit. The Office of Inspector and Auditor is directed to conduct an inquiry into omissions in the staff's testimony and to report to the Commission and the Licensing Board. And the staff is further ordered to brief the Commission at a public meeting on the staff's implementation of the Commission's open door policy on differing professional opinions in adjudications.

ORDER

On January 23, 1978, the Atomic Safety and Licensing Board issued an initial decision authorizing a construction permit for the Shearon Harris Nuclear Power Plant. LBP-78-4, 7 NRC 92 (1978). On August 23, 1978, that initial decision was affirmed by the Appeal Board in ALAB-490, 8 NRC 234 (1978).

We have now received an August 30, 1978, letter from the members of the Licensing Board which served in the *Shearon Harris* proceeding raising questions regarding the forthrightness and accuracy of certain staff

testimony concerning the management capabilities of Carolina Power & Light Company. The letter was served on all parties and is now a part of this docket. Since the Licensing Board's letter concerns the integrity of the adjudicatory process in this proceeding, the Commission directs the following.

1. This proceeding is remanded to the Atomic Safety and Licensing Board for a further hearing on the management capabilities of CP&L to construct and operate the proposed Shearon Harris facility without undue risk to the health and safety of the public.

2. The Office of Inspector and Auditor (OIA) is to conduct a thorough inquiry into the basis for, and seriousness of, the alleged omission of the concerns of the line inspector from the written and oral testimony of the staff. Upon completion of that inquiry the Inspector and Auditor will report to the Commission. The results of this inquiry will be made public and filed with the Licensing Board to whom we have remanded the *Shearon Harris* proceeding.

3. The record in the *Shearon Harris* proceeding will not be closed until the parties have had an opportunity to assess what bearing, if any, the facts disclosed in the OIA inquiry have on the management capability of CP&L to construct and operate the proposed facility.

4. The staff shall brief the Commission at a public meeting, on the staff's present practice in implementing the Commission's open door policy about differing professional opinions (see materials collected in *A Survey of Policies and Procedures Applicable to the Expression of Differing Opinions,* NUREG-0500), with particular focus on staff testimony at licensing board hearings.

It is so ORDERED.

For the Commission

Samuel J. Chilk
Secretary of the Commission

Dated at Washington, D.C.,
this 5th day of September 1978

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Victor Gilinsky, Acting Chairman
Richard T. Kennedy
Peter A. Bradford
John F. Ahearne

In the Matter of **Docket No. 50-320**

METROPOLITAN EDISON CO., et al.

(Three Mile Island Nuclear Station, Unit No. 2) **September 15, 1978**

The Commission denies a petition for review of ALAB-486, 8 NRC 9 (1978), but outlines additional detailed data and analyses which the Appeal Board should request when it conducts the hearing on aircraft crash probabilities directed by ALAB-486.

ORDER

In ALAB-486 (8 NRC 9), decided July 19, 1978, the Atomic Safety and Licensing Appeal Board reviewed the Licensing Board decision which authorized the issuance of an operating license to the Three Mile Island, Unit No. 2, facility. A central issue before the Appeal Board was the adequacy of the record with respect to the probability of the crash into the facility of an airplane heavier than 200,000 pounds. The Appeal Board found that the record did not permit it to determine the future level of heavy aircraft traffic—which is being monitored under a technical specification in the operating license—at which further protective measures (such as reassessing structural design limits, restrictions on air traffic patterns, redesign of exterior structures, and plant shutdown) must be taken, and it directed a reopened hearing to address that matter. Stating that it would conduct that hearing itself, the Appeal Board instructed the parties as to the data it wished them to submit. ALAB-486, *supra,* 8 NRC at 44-46. The Appeal Board made clear that the further hearing would result not only in a determination with respect to crash probabilities at future air traffic levels,

but also in a firmer finding with respect to current crash probabilities than can presently be made, owing to differences in the data bases and calculational methods used in developing the present record. Finding that all data and analyses in the record led to acceptable crash probabilities at current air traffic levels, the Appeal Board ruled that there was a reasonable assurance of no undue risk to public health and safety from operation at this time, and it declined to suspend the operating license during the pendency of the reopened hearing.

A petition seeking Commission review of ALAB-486 pursuant to 10 CFR 2.786 was filed on August 8, 1978, by the representative of the Citizens for a Safe Environment and the York Committee for a Safe Environment. Since our review is not on the basis urged by the petition, the petition is hereby denied.

As noted, the Appeal Board has indicated in some detail the information it considers necessary for the reopened hearing. We believe that the Appeal Board should request still more detailed data and analyses. We have outlined in an attachment to this order areas we believe should be pursued. The Commission recognizes that the analysis will have to be done on the basis of available data. Nothing in this order should be construed as implying that calculations made in the absence of the full complement of data so outlined would necessarily be deficient.

It is so ORDERED.

For the Commission

Samuel J. Chilk
Secretary of the Commission

Dated at Washington, D.C.,
this 15th day of September 1978.

Data and Analysis To Be Pursued in Further Proceedings on Three Mile Island Nuclear Station, Unit No. 2

I. Crash Data. Crash data for operations in the U.S. during the last 5 years should be obtained by year and type of aircraft, for those over 200,000 pounds, segregated according to whether military, scheduled, or nonscheduled. Data should include, for each crash: cause, location, type of ground control equipment in use (*e.g.*, whether an instrument landing

system was present), weather conditions, speed at impact, and type of operation (takeoff, landing, touch-and-go). Sources of this information might include the National Transportation Safety Board, the Civil Aeronautics Board, the Federal Aviation Administration, the Department of Defense Office of Program Analysis and Evaluation, the U.S. Air Force Inspection and Safety Center at Norton Air Force Base, and insurance companies.

II. Flight Operations at Harrisburg International Airport. For operations during the past 5 years, to the extent possible, data should be obtained, on a year-by-year basis, on the actual aircraft type (*e.g.*, C-5A, 707), for aircraft over 200,000 pounds; the operator (*e.g.*, Air Force, scheduled, nonscheduled); the gross weight of each operation; the end of the runway used; and the type of operation (*e.g.*, takeoff, landing, touch-and-go). The type of ground control equipment at the Harrisburg International Airport should be specified, including any changes approved but not accomplished, either upgrading or abandonment of equipment.

III. Future Traffic. For traffic at the Harrisburg airport during the next 5 years, forecasts should be obtained on a year-by-year basis from the airport, the U.S. Air Force, and the Federal Aviation Administration.

IV. Information on Landing and Takeoff Patterns at Harrisburg International Airport. A template should be prepared showing the takeoff and landing patterns, and indicating the location of the Three Mile Island site. Information should be obtained on: standard guidance (if any) given to aircraft; whether one area or one landing and takeoff pattern is usual (*e.g.*, for noise control or because of prevailing wind conditions); whether, and if so, how often, the Three Mile Island site is overflown; and the feasibility of using landing and takeoff patterns which do not overfly the Three Mile Island site.

V. Analysis. An analysis and estimate should be made of the type of probability distribution appropriate in drawing conclusions on the basis of very limited data. The estimate should include an estimate of the uncertainty. It may be desirable to develop both an estimate of the probability of crash per operation for operations in the U.S., based on the data, and of the probability of hitting a given area in the event of a crash, based on aerodynamic analysis. The data outlined above should then be analyzed to give an estimate of the likelihood of crash by type of aircraft at Harrisburg International Airport. The analysis should also include an examination of the combinations of weight heavier than 200,000 pounds and lower speed which would lead to impact equivalent to that of the crash (200,000 pounds at 200 knots) that is the design basis for the Three Mile Island, Unit No. 2, facility.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Richard S. Salzman
Dr. W. Reed Johnson

In the Matter of Docket No. 27-39

NUCLEAR ENGINEERING COMPANY, INC.

(Sheffield, Illinois, Low-Level Radioactive Waste Disposal Site) September 5, 1978

The Appeal Board denies the State of Illinois' motion to disqualify a Licensing Board member on the basis of his affiliation with the American Nuclear Society, a local chapter of which is a party to the proceeding.

RULES OF PRACTICE: DISQUALIFICATION

Although an affidavit supporting a disqualification motion is normally required, its absence is not crucial where the motion is particularly narrow and founded on a fact first noted by the board in question.

DISQUALIFICATION: STANDARDS

An administrative trier of fact is subject to disqualification if he or she has a "direct personal, substantial pecuniary interest in" the result; is personally biased against a participant; has acted in prosecuting or investigating the facts in issue; has prejudged factual issues; or has engaged in conduct giving "the appearance of personal bias or prejudgment of factual issues." *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-101, 6 AEC 60, 65 (1973).

DISQUALIFICATION: STANDARDS

Membership in a national organization does not perforce disqualify a person from adjudicating a matter to which a local chapter of the organiza-

tion is a party. *In re Rhodes,* 370 F.2d 411 (8th Cir.), *certiorari denied,* 386 U.S. 999 (1967).

Messrs. Troy B. Conner, Jr. and **Mark J. Wetterhahn,** Washington, D.C., for the licensee Nuclear Engineering Company, Inc.

Messrs. William J. Scott, Attorney General of Illinois, and **Dean Hansell,** Assistant Attorney General of Illinois, Chicago, Illinois (**Mr. Russell R. Eggert** and **Ms. Susan N. Sekuler,** Chicago, Illinois, of counsel), for the intervenor State of Illinois.

Mr. John M. Cannon, Chicago, Illinois, for the intervenor Chicago Section, American Nuclear Society.

Mrs. Ellen Silberstein Friedell for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

1. This proceeding involves the Nuclear Engineering Company's application for renewal and amendment of its license to operate a low-level radioactive waste burial site near Sheffield, Illinois. One of the parties is the Chicago Section of the American Nuclear Society (Chicago Section).[1] In view of this circumstance, another party, the State of Illinois, seeks to disqualify Dr. Forrest J. Remick from further service as a member of the Licensing Board assigned to the proceeding because he is a member of the American Nuclear Society (ANS). According to Illinois' disqualification motion, although he is a Pennsylvania resident[2] and does not belong to the Chicago Section

> Because the Society intends to adduce evidence on matters which go beyond the narrow interests of the Chicago Section . . . Dr. Remick's af-

[1]The Licensing Board initially denied the Chicago Section's petition for leave to intervene. On the appeal taken from that denial, we agreed with the Board below that the Chicago Section lacked standing to intervene as a matter of right but nonetheless determined that it should be given another opportunity to demonstrate that it should be allowed to participate as a matter of discretion. ALAB-473, 7 NRC 737 (May 3, 1978). The Chicago Section availed itself of that opportunity and was admitted as a party by Licensing Board order of June 20, 1978.

[2]Dr. Remick is a part-time technical member of the Atomic Safety and Licensing Board Panel, from which the licensing boards for particular proceedings are drawn. He is principally employed by the Pennsylvania State University in State College.

filiation with the Society raises at least the appearance of impropriety. While the State is in no way suggesting that Dr. Remick would act in other than complete good faith, in fairness to all parties to this proceeding, as well as to the process itself, Dr. Remick should be disqualified as a member of this Licensing Board.

The motion was opposed by the Chicago Section, the licensee, and the NRC staff. On August 16, 1978, the Licensing Board entered an order in which it expressed the unanimous view that there was no reason why Dr. Remick should be disqualified and therefore referred the motion to us for determination.[3] On full consideration of the arguments of the respective parties, we reach the same conclusion.

2. In the *Midland* proceeding, we canvassed the statutory and judicial authority respecting the grounds on which disqualification of a member of an adjudicatory body such as a licensing board may be sought. Our conclusion was that

> . . . an administrative trier of fact is subject to disqualification if he has a direct, personal, substantial pecuniary interest in a result; if he has a "personal bias" against a participant; if he has served in a prosecutive or investigative role with regard to the same facts as are in issue; if he has prejudged factual—as distinguished from legal or policy—issues; or if he has engaged in conduct which gives the appearance of personal bias or prejudgment of factual issues.

Consumers Power Company (Midland Plant, Units 1 and 2), ALAB-101, 6 AEC 60, 65 (1973). None of these bases has even arguably been shown to be present here.

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[3]10 CFR 2.704(c) explicitly requires such a referral in circumstances where the Licensing Board does not grant a motion to disqualify one of its members and the member in question does not recuse himself.

As the Licensing Board pointed out, Section 2.704(c) also requires that a disqualification motion "be supported by affidavits setting forth the alleged grounds for disqualification." We have held that this requirement must be observed even if the motion is founded wholly on matters of public record. *Duquesne Light Company* (Beaver Valley Power Station, Units 1 and 2), ALAB-172, 7 AEC 42, 43, fn. 2(1974). By motion filed August 25, 1978, Illinois has sought to supply the missing affidavit. The document submitted, however, though signed by counsel of record, does not bear the attestation of a notary or other official authorized to administer oaths and is thus inadequate. Nonetheless, the absence of an affidavit here is not crucial. The Illinois motion is founded on a fact to which the Board itself had called attention in its March 1, 1978, order ruling upon various intervention petitions (at fn. 2). Further, in light of the narrow scope of the State's challenge to Dr. Remick's continued participation, an affidavit was not needed to reduce "the likelihood of an irresponsible attack upon the probity or objectivity of the Board member . . . in question." *Beaver Valley,* ALAB-172, *supra,* at fn. 2.

It is of course not claimed that, by reason of his ANS membership, Dr. Remick has a pecuniary interest in the outcome of the proceeding, is personally biased against Illinois or another of the parties, or has prejudged factual issues. Rather, as we have seen, Illinois explicitly disclaims any suggestion that Dr. Remick "would act in other than complete good faith." It puts its entire reliance upon the "appearance of impropriety" which assertedly would flow from his continued participation on the Licensing Board in the face of the ANS affiliation.

We can take official notice of the fact that the ANS is a professional organization of national scope. Its membership (which according to the staff totals approximately 13,000) is drawn from the ranks of (*inter alia*) industry, government, universities, nuclear medicine facilities, and research laboratories. This being so, it seems scarcely likely that anyone would presume that positions taken by the Chicago Section—in litigation or otherwise—reflect the viewpoints and interests of all of the members of that Section—let alone the nationwide ANS membership.[4] We think it is unreasonable to conclude that, simply because of his ANS affiliation, a risk exists that a Pennsylvania State University faculty member would be partial to the litigating posture of an ANS Section (to which he does not belong) in a proceeding involving a distant waste burial site in which he has no interest.[5]

Illinois has not cited, and we have not discovered on our own, any authority to support its thesis that membership in a national professional organization perforce disqualifies a person from adjudicating a matter to which a local chapter of the organization is a party. On the other hand, the staff has called attention to authority pointing in the opposite direction. *In re Rhodes,* 370 F.2d 411 (8th Cir.), *certiorari denied,* 386 U.S. 999 (1967) (judicial members of an integrated bar may hear disbarment proceedings). See also, *Abbott Labs., Ross Labs. Division* v. *NLRB,* 540 F.2d 662, 664-65 (4th Cir. 1976); *Overlook Nursing Home, Inc.* v. *United States,* 556 F.2d 500, 503 (Ct. Cl. 1977).

The staff further provided the Licensing Board with a copy of a letter from the Acting Assistant Attorney General in charge of the Antitrust Divi-

[4]In this regard, it is our understanding that the bylaws of the Chicago Section preclude it from acting for or in the name of the ANS and also provide that no expression of the Section shall be considered an expression of the ANS as a whole without prior approval of the latter's Board of Directors.

[5]This is true whether or not, as Illinois maintains, the Chicago Section proposes "to present evidence of relevance to questions of national policy." For one thing, there is nothing to indicate that the Chicago Section's views on appropriate national policy would coincide with those of Dr. Remick. For another, in its August 16 order the Licensing Board stated that it would entertain no evidence of that character.

sion of the Department of Justice to a judge of the District Court for the District of Columbia, dealing with whether membership in the American Bar Association disqualified her from hearing an antitrust action challenging the ABA's restrictions on advertising by lawyers.[6] The letter stated that, in the view of the United States, "mere membership in the ABA, an association of approximately 200,000 attorneys, would not create an appearance of partiality on the part of a judge hearing this matter" and thus would not require the judge to disqualify herself by reason of 28 U.S.C. 455(a).[7] In order for that section to come into play, the letter continued, the judge would have had to have been an active participant "in activities involving adoption or interpretation of the ABA's restrictions on advertising by lawyers." Although needless to say we are not bound by that analysis here, it appears both sensible and in full conformity with the jurisprudence on the subject. It therefore commends itself to us in the analogous circumstances of this case.

The motion to disqualify Dr. Remick is *denied.*

It is so ORDERED.[8]

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

[6]Letter from Acting Assistant Attorney General Joe Sims to Judge June L. Green, dated August 16, 1976, *re United States of America* v. *American Bar Association* (Civil Action No. 76-1182, D.C. D.C.).

[7]Section 455(a), added to the Judicial Code in 1974, provides that "[a]ny . . . judge . . . shall disqualify himself in any proceeding in which his impartiality might reasonably be questioned."

[8]Because he is a member of the American Nuclear Society (albeit not of the Chicago Section), Dr. Johnson did not participate in the consideration or disposition of this motion. In view of the conclusions reached by his colleagues, he will participate in any further matters coming before this Board for decision.

Cite as 8 NRC 304 (1978) ALAB-495

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Michael C. Farrar

In the Matter of **Docket Nos. 50-443**
50-444

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, et al.

(Seabrook Station, Units 1 and 2) **September 11, 1978**

Upon intervenors' motion to include new sites in the alternative site inquiry required by CLI-78-14, 7 NRC 952 (1978), the Appeal Board affords those intervenors the opportunity to file a supplemental memorandum setting forth with particularity the reasons the staff should include the additional sites in its alternative site analysis.

NEPA: CONSIDERATION OF ALTERNATIVES

Where from the inception of the case the parties proceeded on the assumption that there was no need to examine alternate sites other than those in the staff's FES, a party cannot insist at the eleventh hour that new sites be considered without a compelling showing that the new sites have greater potential as alternate sites than any of the other previously examined sites.

Mr. Robert A. Backus, Manchester, New Hampshire, for the intervenors Seacoast Anti-Pollution League and Audubon Society of New Hampshire.

Ms. Marcia E. Mulkey for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

1. We have been called upon by the Commission to determine, following an evidentiary hearing, whether there is an alternate New England site which would be "obviously superior" to the Seabrook site were a nuclear facility at the latter site to require cooling towers. See CLI-78-14, 7 NRC 952 (June 30, 1978); ALAB-488, 8 NRC 187 (August 18, 1978).[1] As the first step in this inquiry, the NRC staff promptly took a preliminary further look at a total of 22 alternate sites located both in northern and in southern New England.[2] Thereafter, on August 2, the staff met with representatives of all of the active parties to the proceeding. At that meeting, an agreement was reached respecting which of the 22 were the "apparent leading candidate alternatives to Seabrook with cooling towers." See ALAB-488, *supra*, 8 NRC at 192.

As also noted in ALAB-488, however, two of the parties (the Seacoast Anti-Pollution League and the Audubon Society of New Hampshire (SAPL/Audubon)) suggested during the meeting that at least one alternate site in addition to the 22 should have been on the staff's list for preliminary scrutiny. 8 NRC at 192, fn. 10. Pursuing that suggestion, SAPL/Audubon have now filed a memorandum with us in which it is claimed (at p. 5) that, at the very least, the staff should have included certain sites which, in compliance with New Hampshire law, one of the Seabrook applicants (New England Power Company) assertedly had identified as being subject to possible development within a 10-year period. According to SAPL/Audubon, these sites are "in Pittsburgh, New Hampshire, in the Connecticut Lakes, and on the Connecticut River in Monroe, New Hampshire, the so-called 'Comerford' site." No further details have been provided.

The staff's rejoinder to this claim is that it is foreclosed as a matter of law. Our attention is directed to the fact (1) that the 22 sites selected by the staff for examination included all of the 19 in northern New England which had been identified in the Final Environmental Statement; and (2) that we long ago had determined (and the Commission had implicitly agreed) that there was no necessity to consider still other northern sites. See ALAB-366, 5 NRC 39, 65 (1977); CLI-77-8, 5 NRC 503, 536, 540 (1977). Beyond that, we are reminded that, although it had had ample opportunity to do so, at no prior time during this protracted proceeding did SAPL/Audubon (or for that matter any other party) assert that the alternate site analysis for

[1]This inquiry was first undertaken long ago but, having been improperly performed, must be redone at this late stage in the proceeding.

[2]Each of these sites had been previously investigated to at least some extent in connection with alternate site inquiries conducted at earlier stages of this proceeding.

Seabrook (either with or without cooling towers) should embrace additional northern sites. Rather, the points of difference among the parties went only to (1) whether the 19 northern sites had been adequately analyzed; and (2) whether southern New England sites also should have been examined.

Apart from these considerations, the staff emphasizes that SAPL/Audubon have made no attempt to delineate the "qualities or characteristics" of the newly suggested northern sites which might make those sites worthy of consideration as alternatives to Seabrook with cooling towers. Thus, the staff maintains, in all events SAPL/Audubon have failed to make the threshold showing necessary to justify a broadening of the scope of the alternate site inquiry at this late date.

2. The staff's line of argument strikes a responsive chord with us. Since the very inception of this proceeding several years ago, all of the parties (as well as both adjudicatory boards and the Commission itself) have proceeded on the basis that there was no need to examine alternate sites in northern New England beyond the 19 which were referred to in the Seabrook FES. In that circumstance, there is much to be said for the view that it is not open to SAPL/Audubon to change their position at the eleventh hour and now to insist that still other northern sites must be compared with Seabrook.

This is at least so in the absence of a compelling showing that the newly suggested sites possess attributes which establish them to have greater potential as alternatives to Seabrook with cooling towers than the 19 sites already selected for comparison. In this regard, it is to be borne in mind that the latter are widely distributed in the coastal and inland regions of northern New England (see ALAB-366, *supra*, 5 NRC at 59), and it has never been asserted that an entire northern area which might be particularly suitable for the location of a nuclear facility was either overlooked or ignored.

As we have seen, SAPL/Audubon have not even attempted to demonstrate the possible superiority of one—let alone all—of the newly suggested sites to the 19 already investigated. Once again, all that has been provided is a bare notation of their specific or general location in New Hampshire; *i.e.*, that they are to be found "in Pittsburgh, New Hampshire, in the Connecticut Lakes, and on the Connecticut River in Monroe, New Hampshire, the so-called 'Comerford' site." This, of course, furnishes not the slightest clue as to their principal characteristics. And, as is equally clear, the mere fact that the sites may have been singled out by New England Power (at some unspecified time in the past) as candidates for furture development does not cure the deficiency. For one thing, there is no claim that that utility represented that they were suitable for the siting of a large nuclear facility. Of greater importance, even assuming such suitability (in New England Power's opinion), it scarcely follows perforce that any of them is a poten-

tially better candidate for relocation of the Seabrook facility than each of the 19 northern sites which to this point have been used—with the agreement of all concerned—as a basis for comparison.

In sum, it is manifest to us that, whether or not legally precluded from now seeking to inject new northern sites into the alternate site analysis, SAPL/Audubon have fallen far short of meeting the heavy burden which in the present posture of the proceeding attends upon a request for such relief. Although the matter might well be left at that, we nonetheless have decided to exercise our discretion to allow SAPL/Audubon one more opportunity to satisfy that burden. But because of the extreme lateness of the hour, and the consideration that the staff's further alternate site analysis is close to completion, SAPL/Audubon must avail themselves of this opportunity, if at all, with the utmost expedition.

More specifically, SAPL/Audubon may file, within 7 days of the date of this order,[3] a supplemental memorandum. That memorandum shall take account of what has been said above and, in that light, shall set forth with particularity the reasons why the alternate site analysis now being undertaken by the staff should include one or more of the additional northern sites referred to in SAPL/Audubon's prior memorandum.

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

Dr. Buck participated in the consideration of this matter and subscribed to the result reached. He was not available, however, to review this opinion following its preparation.

[3]The terms of this order were communicated to counsel by telephone today.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL PANEL

Alan S. Rosenthal, Chairman

In the Matter of Docket No. 50-344

PORTLAND GENERAL ELECTRIC COMPANY, et al. (Control Building)

(Trojan Nuclear Plant) September 12, 1978

An appeal from a licensing board order consolidating three intervenors is dismissed as an interlocutory appeal proscribed by 10 CFR 2.730(f).

RULES OF PRACTICE: CONSOLIDATION

An order consolidating the participation of one party with others may not be appealed prior to the conclusion of the proceeding.

Mr. David B. McCoy, Grants Pass, Oregon, appelant, *pro se.*

Mr. Joseph R. Gray for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

1. This proceeding arose out of an order issued on May 26, 1978, by the Acting Director of the Commission's Office of Nuclear Reactor Regulation. 43 FR 23768 (June 1, 1978). That order directed the modification of the control building of the Trojan facility and further provided, *inter alia*, that the licensee and "any other person whose interest may be affected may file a request for a hearing with respect to this order." Such requests were filed by, *inter alia*, David B. McCoy, C. Gail Parson, and Nina Bell. Following a prehearing conference, the Licensing Board entered an order on July 27, 1978, in which it granted intervention to each of these three individuals. Exercising the authority conferred by 10 CFR 2.714(e),[1] however, the Board

[1]Section 2.714(e) provides:

An order permitting intervention and/or directing a hearing may be conditioned on

(Continued on next page.)

decreed (order, p. 8) that they be

> consolidated as intervenor parties for all purposes in this proceeding. They shall participate directly in all conferences and hearings through a single spokesman to be designated by them.

Dissatisfied with the consolidation, Mr. McCoy seeks our intercession. His objection centers upon the fact that he lives at a distance of 200 miles from the Trojan facility, whereas Ms. Parson and Ms. Bell both reside within approximately 40 miles of it. According to his appellate papers:

> Consolidation with other parties would prejudice his interest in this case because he would not be able to coordinate his efforts with the other two parties with regard to discovery, presentation of evidence, cross-examination, preparation of briefs and proposed findings of fact and conclusions of law, proper arguments to the Board, and the other facets of an adjudicatory hearing. The lack of coordination would be due to the distance between these parties and the fact that when Mr. McCoy is in the vicinity of the Trojan plant he is engaged primarily in business activities which demand his time. Mr. McCoy has a family with two children in Grants Pass which also demands time.

Moreover, Mr. McCoy points to his participation in other proceedings involving this facility and opines that his interests would not "be well represented by the other two parties who are inexperienced in the maze of Commission rules and regulations."

2. As the NRC Staff correctly notes in its response to Mr. McCoy's submission, we have squarely held that an order consolidating the participation of one party with others may not be appealed prior to the conclusion of the proceeding. *Public Service Company of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-339, 4 NRC 20, 23 (1976). This holding rested on the provisions of the Commission's Rules of Practice which, subject to an exception not applicable to consolidation orders, proscribe interlocutory appeals from rulings of the Licensing Board. 10 CFR 2.730(f); see also, *Public Service Company of Oklahoma* (Black Fox Station, Units 1 and 2), ALAB-370, 5 NRC 131 (1977), and cases there cited.[2]

(Continued from previous page.)

such terms as the Commission, presiding officer, or the designated atomic safety and licensing board may direct in the interests of (1) restricting irrelevant, duplicative, or repetitive evidence and argument, (2) having common interests represented by a spokesman, and (3) retaining authority to determine priorities and control the compass of the hearing.

[2]The exception to the operation of Section 2.730(f) is to be found in 10 CFR 2.714a. Insofar as a petitioner for intervention is concerned, the latter section allows an appeal from an order concerning his petition if—but only if—the order denied the petition outright.

For this reason, Mr. McCoy's appeal cannot be entertained. In any event, it appears to be without substantial merit. The Licensing Board summarized its reasons for ordering consolidation as follows (July 27 order at pp. 7-8):

> In essence, these three Petitioners assert common interests, based primarily on the proximity of their residences or places of business to the Trojan facility. They also travel, work, or enjoy recreational activities in that vicinity. Each alleges that such interests might be affected by a seismic event that could affect the walls of the control building, disrupting the operation of the plant and causing the release of radioactive and toxic substances [which] might impact upon the Petitioners through the food chain or other paths, and could affect recreational activities along the Columbia River. The Board had an opportunity at the prehearing conference to observe the conduct and demeanor of these Petitioners, and to form a judgment as to their capabilities to participate as parties to this adjudicatory proceeding. There is no basis to conclude that their common interests would be prejudiced by consolidating them as intervening parties, or that they would individually have a significant ability to contribute on substantial issues of law or fact which will not otherwise be properly raised or presented. Varying degrees of asserted prospective injury do not affect their ability to jointly engage in discovery, the presentation of evidence, cross-examination, preparation of briefs and proposed findings of fact and conclusions of law, proper arguments to the Board, and the other facets of an adjudicatory hearing.

These reasons are weighty ones and Mr. McCoy has not pointed to any countervailing factors which might overcome them. True, as he asserts, the fact that Mr. McCoy does not live in relatively close proximity to the other two intervenors conceivably might make it more difficult for him to coordinate his efforts with theirs. But he has provided no cause to believe that effective coordination will prove impossible.[3] Further, having elected to seek intervention in a proceeding involving a facility located at an appreciable distance from his residence, he can scarcely complain of any additional burdens which are directly and wholly attributable to that distance. Beyond these considerations, nothing in the Licensing Board's order will prevent either Mr. McCoy or the other intervenors from later endeavoring to obtain full or partial relief from the provisions of that order

[3]Mr. McCoy can, of course, communicate with the other intervenors by mail or telephone and, additionally, if necessary can arrange to meet with them when in the vicinity of their residences on other business.

should the consolidation turn out in practice to be necessarily and significantly prejudicial to the protection of their interests.

Appeal *dismissed.*
It is so ORDERED.

FOR THE APPEAL PANEL
CHAIRMAN

Margaret E. Du Flo
Secretary to the Appeal Panel

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

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Michael C. Farrar
Dr. W. Reed Johnson

In the Matter of	Docket No. 50-409
DAIRYLAND POWER COOPERATIVE	Amendment to Provisional Operating License (Spent-Fuel Pool)
(LaCross Boiling Water Reactor)	

September 20, 1978

The Appeal Board affirms the Licensing Board's decision to deny two petitions to intervene in this spent fuel pool modification proceeding and denies petitioner's motion to disqualify the entire Licensing Board for alleged bias.

RULES OF PRACTICE: DISQUALIFICATION

10 CFR 2.704(c) specifically requires that a motion to disqualify a licensing board member be supported by affidavits setting forth the alleged grounds for disqualification.

RULES OF PRACTICE: DISQUALIFICATION

An affidavit setting forth the alleged grounds for disqualification must accompany a motion for disqualification even if the motion is based wholly upon matters of public record. An affidavit, given the solemnity of attestation under oath, reduces the likelihood of irresponsible attacks upon the probity or objectivity of a board member. *Duquesne Light Company* (Beaver Valley Power Station, Units 1 and 2), ALAB-172, 7 AEC 42, 43 (1974).

Messrs. O. S. Hiestand and **Kevin P. Gallen,** Washington, D. C., for the licensee, Dairyland Power Cooperative.

Ms. Ellen Sabelko, Eau Claire, Wisconsin, and **Mr. David S. Simpson,** Durand, Wisconsin, appellants *pro se.*

Ms. Colleen P. Woodhead for the Nuclear Regulatory Commission staff.

DECISION

In this proceeding, the Dairyland Power Cooperative seeks an amendment to its provisional operating license which would allow the expansion of the capacity of the LaCross facility's spent fuel pool. Petitions for leave to intervene in the proceeding were filed by, among others, Ellen Sabelko and David S. Simpson. These individuals reside more than 75 miles away from the facility. In an order entered on August 14, 1978, the Licensing Board denied their joint intervention petition on the grounds that (1) they had not established an interest sufficient to entitle them to intervene as a matter of right; and (2) no cause had been demonstrated for allowing them to participate as a matter of discretion. Petitioners appeal from those determinations under 10 CFR 2.714a. In addition, they seek the disqualification of all members of the Licensing Board on the ground of bias.

1. Insofar as the appeal itself is concerned, we are content to note our agreement with the Licensing Board's ultimate conclusions on both intervention as a matter of right and discretionary intervention. No useful purpose would be served by doing more than simply affirming the result it reached.

2. We decline to entertain appellants' assertion that the three members of the Licensing Board should be disqualified. The governing regulation, 10 CFR 2.704(c), specifically requires that a motion to disqualify a licensing board member "be supported by affidavits setting forth the alleged grounds for disqualification." We long ago held that a "party leveling a charge as serious as that of bias against a licensing board or its members has a manifest obligation to be most particular in establishing the foundation for the charge, as well as to adhere scrupulously to the affidavit requirement of Section 2.704(c)." *Duquesne Light Company* (Beaver Valley Power Station, Units 1 and 2), ALAB-172, 7 AEC 42, 43 (1974). We added that:

> This is so even if the motion is based wholly upon matters of public record (*e.g.*, rulings of the Licensing Board or statements made by a

> Board member which are reflected in the official transcript). In such circumstances, the affidavit requirement still serves a salutary purpose: given the solemnity of an attestation under oath, it reduces the likelihood of an irresponsible attack upon the probity or objectivity of the Board member or members in question. It is doubtless for this reason that Section 2.704(c) mandates that *all* disqualification motions be supported by affidavit.

Id. at fn. 2 (emphasis in original). Our reading of appellants' submission to us, which was *not* accompanied by an affidavit, gives us not the slightest cause to reconsider the validity of those observations.

The Licensing Board's August 14, 1978, order is *affirmed*; the motion to disqualify the members of the Licensing Board is *denied.*

It is so ORDERED.

FOR THE APPEAL BOARD

Romayne M. Skrutski
Secretary to the Appeal Board

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Dr. W. Reed Johnson
Jerome E. Sharfman

In the Matter of **Docket Nos. STN 50-556**
STN 50-557

PUBLIC SERVICE COMPANY OF OKLAHOMA

ASSOCIATED ELECTRIC COOPERATIVE, INC.

WESTERN FARMERS ELECTRIC COOPERATIVE, INC.

(Black Fox Station, Units 1 and 2) **September 21, 1978**

The Appeal Board (1) grants intervenors' motion to delay briefing exceptions relating to the Licensing Board's refusal to entertain certain radiological health and safety contentions pending that Board's decision on those issues; (2) denies intervenors' motions to revoke or suspend the units' limited work authorization and to dismiss applicants' appeal; and (3) grants applicants an extension of briefing time.

Mr. Paul M. Murphy, Chicago, Illinois, for the applicants Public Service Company of Oklahoma, *et al.*

Mr. Andrew T. Dalton, Jr., Tulsa, Oklahoma, for the intervenors Ilene H. Younghein, Lawrence Burrell, and Citizens' Action for Safe Energy.

Mr. L. Dow Davis for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

This construction permit proceeding involving the two units of the proposed Black Fox nuclear facility has come to us by way of appeals taken by the intervenors[1] and the applicants from the Licensing Board's July 24, 1978, partial initial decision.[2] In that decision, and subject to certain specified conditions, the Board resolved all environmental and site suitability issues in such a manner as to pave the way for the issuance of a limited work authorization for the facility under 10 CFR 50.10(e).

Several motions are now before us for consideration. We address them *seriatim.*

1. Two of the intervenors' exceptions to the partial initial decision (Nos. 104 and 113) challenge the refusal of the Licensing Board to admit to the proceeding as issues in controversy certain contentions advanced by the intervenors. These exceptions appear to relate wholly to radiological health and safety issues which remain to be decided by the Licensing Board. For this reason, the intervenors seek permission to defer the briefing of them pending the issuance of the further Licensing Board decision. No other party opposes such relief and it is hereby *granted.* The intervenors will be free to renew and brief the exceptions in question in connection with any appeal which they may take from the Licensing Board decision on the still outstanding health and safety issues.

In the same motion, the intervenors requested leave to support their appeal with a brief in excess of 70 pages. Contemporaneously, they filed a brief 137 pages in length.

Section IX(d) (2) of Appendix A to 10 CFR Part 2 (the Commission's Rules of Practice) states that "[a]lthough a limitation on the length of briefs is not now imposed, in most cases the issues raised by the exceptions should be susceptible of full treatment in a brief which does not exceed 70 pages." An examination of the intervenors' brief leaves us unpersuaded that that observation was inapplicable in this instance. Nonetheless, in view of the present absence of a strict page limitation, we have accepted the brief. The Bar is put on notice, however, that, unless there is a greater general effort to adhere to the Section IX(d) (2) guideline, it likely will be considered necessary to convert that guideline into a limitation.

2. In a separate motion, the intervenors call upon us to revoke or suspend the limited work authorization and, additionally, to dismiss the applicants' appeal. Two reasons are assigned for entitlement to this relief.

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[1]Ilene H. Younghein, Lawrence Burrell, and Citizens' Action for Safe Energy.

[2]LBP-78-26, 8 NRC 102. On August 24, 1978, the Licensing Board entered an order modifying the partial initial decision in some respects. LBP-78-28, 8 NRC 281.

First, our attention is directed to an article in a Tulsa, Oklahoma, newspaper under date of August 14, 1978, in which it was reported that an individual attending the ground-breaking ceremonies at the Black Fox site was physically assaulted by persons who may have been in the employ of a company engaged by the applicants to provide security at the site. Second, according to intervenors, the applicants have failed to comply with a July 7, 1978, Licensing Board order which directed them to pay expert witness fees to three witnesses for the intervenors who were deposed by applicants.

Neither of these reasons is sufficient to justify our taking the action suggested by the intervenors. To begin with, we have no way of knowing whether the newspaper account of what transpired is accurate, let alone whether responsibility for any assault which may in fact have occurred could fairly be placed at the applicants' doorstep. It seems a reasonable inference that, if it did occur, the alleged incident was looked into by Oklahoma law enforcement authorities, who of course have at least primary jurisdication over violations of State criminal law. Yet intervenors tell us nothing respecting the outcome of any such investigation. Beyond that, the intervenors do not even attempt to demonstrate the existence of a connection between the alleged incident and determinations which must underlie the grant by this Commission of a license to construct or operate a nuclear plant. Rather, their articulated assumption is that the Commission has broad authority to withhold or revoke licenses (and to dismiss appeals) simply as punishment for any type of applicant or licensee misconduct. That proposition is a novel one and its validity is certainly open to question.

Insofar as the applicants' purported noncompliance with the order calling for payment for witness fees is concerned, intervenors' counsel on these appeals no longer represents them before the Licensing Board. Applicants' counsel has supplied us with a copy of a letter written by him on August 25, 1978, to the attorney who now represents the intervenors before that Board. The letter confirms an agreement reached orally as to how the witness fees were to be paid. It is not claimed that the letter incorrectly reflects the understanding of the parties or that the applicants have failed to live up to the obligations imposed upon them by the agreement. Rather, it appears quite likely that, at the time he filed the motion in early September, intervenors' appellate counsel was unaware of the agreement.

Accordingly, the motion to revoke or suspend the limited work authorization and to dismiss the applicants' appeal is *denied.*

3. The applicants have moved for an extension until November 22, 1978, of the time within which to file their brief in response to the intervenors' appeal. The sought extension is lengthy and is opposed by the intervenors. Nonetheless, the applicants have shown good cause for seeking it, and additionally, the intervenors have not established that the extension might

prejudice them. In these circumstances, the extension is *granted.*[3]

It is so ORDERED.

FOR THE APPEAL BOARD

Romayne M. Skrutski
Secretary to the Appeal Board

[3]The extension shall also apply to the brief of the NRC staff on the intervenors' appeal, as well as to all briefs in response to the applicants' brief on their appeal. In other words, all responsive briefs on both appeals shall be due on November 22, 1978.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Michael C. Farrar

In the Matter of

Docket Nos. 50-443
50-444

PUBLIC SERVICE COMPANY OF
NEW HAMPSHIRE, et al.

(Seabrook Station, Units 1 and 2)

September 27, 1978

Because intervenor (in response to the invitation in ALAB-495, 8 NRC 304) did not set forth with particularity why NRC staff should include three new sites in its alternate site analysis, the Appeal Board declines to direct staff to investigate those sites but expects staff to explain on the record any consideration it did give them.

NEPA: CONSIDERATION OF ALTERNATIVES

A party seeking consideration at an advanced stage of a proceeding of a site other than the numerous alternative sites already explored in the proceeding must at minimum provide information as to the salient characteristics of the site and the reasons it might prove better than those already under investigation.

Mr. Robert A. Backus, Manchester, New Hampshire, for the intervenors Seacoast Anti-Pollution League and Audubon Society of New Hampshire.

MEMORANDUM AND ORDER

In ALAB-495, 8 NRC 304 (September 11, 1978), we addressed the assertion of intervenors Seacoast Anti-Pollution League and Audubon Society of New Hampshire (SAPL/Audubon) that the staff should be compelled to add three more northern New England sites to the list of 19 such sites which

have already been investigated as possible alternatives to the Seabrook site (were a nuclear facility at the latter site to require cooling towers). In evaluating the assertion, we first took note of the fact that "[s]ince the very inception of this proceeding several years ago, all of the parties (as well as both adjudicatory boards and the Commission itself) have proceeded on the basis that there was no need to examine alternate sites in northern New England beyond the 19"—all of which had been referred to in the Seabrook Final Environmental Statement. *Id.* at 306.[1] We went on to point out that the 19 sites "are widely distributed in the coastal and inland regions of northern New England . . . and it has never been asserted that an entire northern area which might be particularly suitable for the location of a nuclear facility was either overlooked or ignored." *Ibid.* Still further, we observed that:

> SAPL/Audubon have not even attempted to demonstrate the possible superiority of one—let alone all—of the newly suggested sites to the 19 already investigated. Once again, all that has been provided is a bare notation of their specific or general location in New Hampshire; *i.e.*, that they are to be found "in Pittsburgh, New Hampshire, in the Connecticut Lakes, and on the Connecticut River in Monroe, New Hampshire, the so-called 'Comerford' site." This, of course, furnishes not the slightest clue as to their principal characteristics. And, as is equally clear, the mere fact that the sites may have been singled out by New England Power (at some unspecified time in the past) as candidates for future development does not cure the deficiency. For one thing, there is no claim that that utility represented that they were suitable for the siting of a large nuclear facility. Of greater importance, even assuming such suitability (in New England Power's opinion), it scarcely follows perforce that any of them is a potentially better candidate for relocation of the Seabrook facility than each of the 19 northern sites which to this point have been used—with the agreement of all concerned—as a basis for comparison.

Id. at 306-307.

The collective weight of these several considerations led us to conclude that SAPL/Audubon had "fallen far short of meeting the heavy burden

[1]In a more recent submission in the wake of ALAB-495 (see p. 321, *infra*), SAPL/Audubon maintain that they never "approved the selection of the 19 as being in compliance with either the spirit or the letter of" the National Environmental Policy Act. Although it well may be that those parties did not affirmatively endorse the staff's alternate site choices (as set forth in the FES), it is equally true that at no point did they specifically contend that still other northern sites should be looked at, let alone identify any such sites. The staff, as well as the adjudicatory boards and the Commission, thus had every right to assume that SAPL/Audubon's quarrel with the adequacy of the alternate site analysis did not relate to how many or which northern sites had been factored into that analysis.

which in the present posture of the proceeding attends upon a request for [the] relief" which they sought. *Id.* at 307. Nonetheless, we decided to accord them an opportunity to file a supplemental memorandum, setting forth with particularity the reasons why the staff's alternate site analysis should include the three additional northern sites.

In response to ALAB-495, SAPL/Audubon's counsel advised us by letter on September 18 that, for two independent reasons, his clients did not propose to supply any further information regarding the newly suggested sites. We were told that (1) SAPL/Audubon have no obligation to do so; and (2) in any event, the alternate site inquiry now being pursued is a "sham." The latter conclusion was said to follow from the August 22, 1978, decision of the Court of Appeals for the First Circuit in this proceeding[2] which, *inter alia,* rejected a challenge to the Commission's holding in CLI77-8[3] that "in comparing construction costs of the proposed site and at alternate sites, acutal completion costs should be used."

We accept neither of these reasons. To begin with, further reflection has not altered our belief that, in the totality of the circumstances alluded to in ALAB-495, the staff should not be freighted with the obligation to make a close study of yet three additional sites in the absence of some concrete indication that those sites might prove to be better alternatives to Seabrook than the 19 already under investigation. Nor has a fresh look at the matter persuaded us that it was unreasonable to insist that, in bringing those additional sites forward, SAPL/Audubon provide more information about them than merely where located in New Hampshire. It may well be that, as they maintain in their latest submission, those parties lack the capability to make a detailed evaluation of sites. But it assuredly would not have taken much in either time or resources for SAPL/Audubon (1) to have determined by visual inspection the salient characteristics of the sites suggested by them; and (2) to have apprised us respecting why, in their judgment, those characteristics justified factoring the sites into the staff's analysis at the eleventh hour.

SAPL/Audubon's claim that the alternate site analysis now in progress has been rendered meaningless by the recent First Circuit decision is, of course, difficult to reconcile with their endeavor to increase the scope of that analysis. Be that as it may, the claim is footless. Giving the Seabrook site (with cooling towers) the full benefit of everything held or said in that decision, it still remains to be seen whether there is an alternate site in northern or southern New England which might be obviously superior.

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[2]*New England Coalition on Nuclear Pollution* v. *NRC,*_____F.2d_____(Nos. 77-1219, 77-1306, 77-1342, 78-1013).

[3]5 NRC 503, 532 (1977).

Because of SAPL/Audubon's failure to take advantage of the second opportunity given them to provide cause why the staff should make a detailed investigation of the additional sites suggested by them, we decline to direct that such an investigation be undertaken. We will, however, expect the staff to state on the record at the evidentiary hearing whether those sites received any consideration during the course of its site analysis and, if so, what led the staff to the conclusion that they need be looked at no further.[4]

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

[4]SAPL/Audubon's articulated belief that as a result of supervening judicial action the alternate site review has become a "sham" (or, as stated elsewhere in their submission, "absurd" and a "joke") leaves us in some doubt as to their intentions regarding future participation in the proceeding. Although we need not seek enlightenment on that score now, at such time as the evidentiary hearing is scheduled both the other parties and this Board will be entitled to be apprised respecting whether SAPL/Audubon propose to assume an active role in it.

Cite as 8 NRC 323 (1978) ALAB-500

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Richard S. Salzman, Chairman
Dr. John H. Buck
Michael C. Farrar

In the Matter of **Docket No. STN 50-437**

OFFSHORE POWER SYSTEMS

(Floating Nuclear Power Plants) **September 29, 1978**

The Appeal Board denies applicant's motion to reconsider the holding (in ALAB-489, 8 NRC 194 (August 21, 1978)) that staff may consider "Class 9 accidents" in its environmental statement on this application but grants applicant's motion to certify the Class 9 ruling to the Commission.

RULES OF PRACTICE: CERTIFICATION OF QUESTION TO COMMISSION

Certification is proper in a case involving a novel staff action that presents a major policy question relevant to a pending application, where the Appeal Board members have divergent views and the Rules of Practice preclude the parties themselves from petitioning for Commission review because the matter came before the Appeal Board on certification. 10 CFR 2.786(b)(1).

Messrs. Barton Z. Cowan, Thomas M. Daugherty, and **John R. Kenrick**, Pittsburgh, Pennsylvania, for the applicant, Offshore Power Systems.

Mr. Anthony Z. Roisman, Washington, D.C., for intervenor Natural Resources Defense Council.

New Jersey Attorney General **John J. Degnan**, and Deputy Attorney General **Richard M. Hluchan**, Trenton, New Jersey, for intervenor the State of New Jersey.

Messrs. Martin G. Malsch and **Mark Staenberg** for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

(On Motion for Reconsideration or Certification to the Commission)

1. Offshore Power Systems (OPS) moves for reconsideration of part of our decision in ALAB-489. We are requested to reexamine our holding that the staff may consider "Class 9 accidents" in its final environmental statement on OPS' application to manufacture floating nuclear power plants. ALAB-489, 8 NRC 194 (August 21, 1978). The motion is opposed by the Natural Resources Defense Council (NRDC), the State of New Jersey, and the staff. After a careful review of all the arguments presented, both the majority of the Board and the dissenting member remain convinced of their respective positions as set forth in ALAB-489. Accordingly, the motion to reconsider is *denied.*[1]

2. In the event we were to deny its motion to reconsider, OPS asked us to certify our Class 9 ruling to the Commission for its determination. See 10 CFR 2.785(d). The staff interposes no objection but the NRDC and New Jersey are opposed. NRDC particulary stresses that Commission review should await the development of a full factual record "so the Commission can address [the Class 9 accident] issue in the context of specific facts and a specific case." New Jersey contends that the issue is both narrow and unique to this one proceeding and does not merit Commission review.

We exercise our authority to certify questions to a burdened Commission sparingly.[2] A number of factors, however, impel that action in this case. First, consideration of Class 9 accidents in an environmental statement is a novel action on the staff's part. Second, New Jersey's contrary assertions notwithstanding, we think the staff's decision to look at Class 9 accidents does involve a "major . . . question of policy" that may have

[1]The applicant also asks that we preclude imposition of those license conditions proposed by the staff which rest on the consideration of Class 9 accidents. Such relief is premature and, in any event, unnecessary at this juncture. As we took care to stress in ALAB-489: "Our ruling—that the consequences of a Class 9 accident may be considered in this environmental statement—carries with it no connotation that the staff's judgments expressed there are necessarily sound, much less that its recommended license conditions are warraned. These are matters yet to be explored in the pending proceedings before the Licensing Board. 10 CFR 51.52." ALAB-489, 8 NRC at 223.

[2]*See, Vermont Yankee Nuclear Power Corp.* (Vermont Yankee Station), ALAB-421, 6 NRC 25, 27 (1977); *Consolidated Edison Company of New York* (Indian Point Generating Station, Unit No. 3), ALAB-186, 7 AEC 245 (1974).

ramifications beyond this case. To be sure, as NRDC suggests, a fuller record might assist in deciding what policy the Commission should adopt. However, the question is not what the policy ought to be but, rather, what policy governs OPS' pending application. That question is manifestly ripe now. Third, as ALAB-489 reflects, the members of this Board give divergent readings to current policy in this area, a division attributable in no small measure to the ambiguous character, history, and status of the "Annex" in which it is set forth. Only the Commission itself can clarify this. Finally, because we brought the matter before us by certification, the parties themselves are precluded under the present Rules of Practice from petitioning the Commission for review of ALAB-489. *Pacific Gas and Electric Company* (Diablo Canyon Plant, Units 1 and 2), CLI-77-23, 6 NRC 455 (1977); 10 CFR 2.786(b).

Accordingly, OPS' motion to certify to the Commission the question we decided in ALAB-489—that Class 9 accidents are a proper subject for consideration in the staff's environmental statement on the floating nuclear power plant application—is *granted.*[3]

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

[3]The members of the Board acknowledge the helpful briefs and arguments presented by all the parties both in the main case and on motion for reconsideration. That our decision on the merits is divided reflects the difficulty of the question presented and is not the fault of the thorough and comprehensive presentations of the litigants.

Cite as 8 NRC 327 (1978) LBP-78-30

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Sheldon J. Wolfe, Chairman
Dr. Paul W. Purdom
Frederick J. Shon

In the Matter of

Docket Nos. STN 50-556
STN 50-557

PUBLIC SERVICE COMPANY OF OKLAHOMA
ASSOCIATED ELECTRIC COOPERATIVE, INC.
WESTERN FARMERS ELECTRIC COOPERATIVE, INC.

(Black Fox Station, Units 1 and 2)

September 8, 1978

Upon consideration of Intervenors' contentions and of Applicants' and Staff's motions for summary disposition, the Licensing Board agrees to hear evidence on some issues raised by Intervenors but grants the motions as to other issue.

Motions for summary disposition granted in part and denied in part.

TECHNICAL ISSUED DISCUSSED: Flow-induced vibrations; ECCS; pool dynamic loads; seismic design criteria; tornado protection; fire protection measures; quality assurance program; spent fuel pool design; emergency plans; intergranular stress corrosion cracking (IGSCC); financial qualifications (rural electric cooperative); internally generated turbine missiles; security plan; off-gas (hydrogen) explosion prevention.

ORDER RULING ON MOTIONS FOR SUMMARY DISPOSITION

On July 30, 1978, Applicants filed a motion for summary disposition, which was supplemented on July 14, 1978, and on the latter date, the Staff filed its motion for summary disposition. The Intervenors filed a response in opposition thereto on August 11, 1978. On August 4 and August 11,

1978, the Staff and the Applicants respectively responded to each others' motions.

I. RULINGS ON MOTIONS FOR SUMMARY DISPOSITION

Contention 1:

Intervenors contend that the Applicants have not adequately assessed for Black Fox 1 and 2 flow-induced vibrations on the following components:
(a) Jet Pumps
(b) Sparges
(c) Fuel Pins
(d) Recirculation line valves
(e) Control rods
(f) Incore instrumentation

Staff and Applicants have moved for summary disposition. The Staff relies upon the affidavit of Mr. Bill Kane. Applicants rely upon the affidavits of Messrs. Aaron Levine and Joe Gilman. Intervenors oppose, relying upon a joint affidavit of Messrs. Gregory Minor, Richard Hubbard, and Dale Bridenbaugh (hereinafter referred to as the MHB affidavit).

Intervenors list numbered arguments in an effort to establish that there are triable issues of fact still unresolved by the materials submitted by Applicants and Staff. We shall treat each of these arguments in turn, numbered as in Intervenors' response:

1. There are new features in the facility which do not have the benefit of previous plant experience or adequate testing (MHB, p. 1-1, 1-2).

There is surely no requirement that all features of a proposed plant have the "benefit of previous plant experience." Indeed, if one could only use equipment which operating plants have already used, there would be an end to all development. Further, there is no requirement that all new equipment must have been tested by the time a construction permit is issued (cf. 10 CFR 50.35(a)).

Staff and Applicants argue, and their affidavits affirm, that flow-induced vibrations of the named components (and indeed all safety-related components) have been studied extensively and subjected to a dynamic analysis which has been reviewed by the Staff. A program will be undertaken involving flow testing of the lead plant of similar design and component testing in special facilities as well as preoperational testing at Black Fox Station itself, in accord with the applicable regulatory guide (Reg. Guide 1.20). We see nothing in the MHB affidavit which contradicts this, other

than a bare assertion that preoperational testing is not likely to be adequate. We see no triable issue of fact here.

2. Applicants' and Staff's affidavits and argument contradict each other.

Intervenors fail to specify wherein or at what points the alleged contradictions occur. However, the MHB affidavit at p. 1-2 asserts that apparently there is some conflict between the Levine/Gilman statement at p. 5 and a Staff statement to the effect that the integrity of reactor internals is important. We see no conflict between these two statements and conclude there is no triable issue of fact.

3. Experience of problems and failures to date have [sic] been on systems previously passed by users, vendor, and regulator. The existence and requirement of test programs confirms the validity of the contention (MHB, pp. 1-2, 1-3).

The thrust of argument "3." seems to be that any failures which may have occurred in the past occurred on systems which had been validated by research and testing programs, and that the existence of programs to study vibration shows that studies are, *ipso facto,* inadequate. However, affiants Levine and Gilman assert that (Affidavit, p. 5):

> . . . [P]revious experience has shown that neither a loss in plant safety nor the inability to safely shut down the plant has occurred because of flow-induced vibration.

It thus appears that such failures have been minor from the safety standpoint. Intervenors show no reason why more important failures are to be expected after further development takes place. There is no triable issue here.

4. The LPMS effectiveness has not been reviewed (MHB, p. 1-3).

We are aware that regulations do not require that a completely proven system exist at present. However, the SER (Section 5.2.1.3 of App. A) states that such a system will be required and the MHB affidavit says that a Task Action Plan (TAP B-60) and an ACRS meeting will address the subject.

We are mindful of the Appeal Board's dictum in *Gulf States Utilities Company* (River Bend Station, Units 1 and 2), ALAB-444, 6 NRC 760, 775 (1977) that:

> The SER is, of course, the principal document before the Licensing Board which reflects the content and outcome of the Staff's review. *The Board should therefore be able to look to that document to ascertain the*

extent to which generic unresolved safety problems which have been previously identified in a TSAR item, a Task Action Plan, an ACRS report, or elsewhere have been factored into the Staff's analysis for the particular reactor—and with what result. To this end, in our view, each SER should contain a summary description of those generic problems under continuing study which have both relevance to facilities of the type under review and potentially significant public safety implications. [Emphasis added.]

We will therefore hear evidence on the following question:
1-1. Is the capability of a loose-parts monitoring system the subject of TAP B-60 and of an ACRS investigation? How do these matters bear upon Black Fox Station and what is their status?

5. Staff's affidavits raise issues of fact. For example:
   a. Kane (p. 2) acknowledges concern and need for tests. In the same paragraph he states that the tests are not yet described and *only similar* loads will be used. Further, this hypothetical test program will come too late and would cause extensive and costly changes.

   b. Kane implicitly acknowledges problems with fuel assemblies but argues that 7 x 7 testing provides assurances using such limiting words as "nearly" and "similar" without explanation (Kane, p. 5).

   c. Kane (p. 4) creates additional doubt when he says that GE will test to demonstrate that "*similar*" vibrations will not cause damage. This is not the question. Furthermore, there is no indication of what will be done with adverse test results.

   d. Staff's argument (paragraph 3, p. 1-2) that tests are ensured for Black Fox is not supported by the reference, Kane affidavit, p. 7.

   e. Kane is not the Project Manager according to NRC correspondence dated July 6, 1976, [sic] summarizing a meeting of June 27, 1978, and, therefore, the "affidavit" should be disregarded and stricken.

Affiant Kane, at the places cited in 5.a., 5.b., and 5.c., offers a wealth of information in context to show what he means by "similar" and "nearly." We see no ambiguity here. As for 5.d., the Staff's argument evidently contains a typographical error. It is on p. 4 of the Kane affidavit that the material backing the argument on p. 1-2 is to be found. The error raises no issue of material fact. As to statement 5.e., it is unclear to the

Board how correspondence dated July 6, 1976, could summarize a meeting of June 27, 1978. At any rate, no such correspondence is before us, and we note that the Staff characterizes Mr. Kane as the "former" Project Manager of Black Fox Station. We have no reason to doubt his familiarity with the project. The statement raises no triable issue of fact, and we will neither strike nor disregard Mr. Kane's affidavit.

6. The Levine/Gilman "affidavit" admits the contention. The contention is that flow-induced vibrations have not been adequate [sic] addressed.

The "affidavit" details three types of analyses, *admittedly required,* which have *not* been done.

We read no such admission into the cited affidavit. Both Applicants and Staff agree that an ongoing program is required. Such a program and its implications comprise exactly the assessment required by 10 CFR 50.35(a) at this stage. We see no triable issue here.

7. The theoretical testing and monitoring which has been done has *not* solved the problem. Thus, on its face, that which has been done is inadequate.

As we noted above, we see no regulatory requirement for complete solutions to all problems at the construction permit stage.

8. Staff and Applicants are at odds concerning the significance of the problem addressed by this contention. *Yet each concede [sic] that the problem does exist* and seek [sic] to sweep the issue "under the rug" and away from public scrutiny.

We see no indication whatever that this argument is true, and Intervenors fail to cite any material in support thereof.

9. The cost factor for testing and incorporating test results is omitted by staff and Applicants.

The relevance of some allegedly omitted "cost factor" to Contention 1 is unclear. We see no triable issue.

10. Applicants (Levine/Gilman, p. 4) state that "improved design has resulted in components *less likely* to fail . . . ." This means that present components are likely to fail, but does not give criteria or standards from which reasonable assurance can be drawn as to just how "likely" it is that Black Fox components will fail. This is, of course, one of the functions of an adequate assessment. Intervenors are somewhat surprised that the utility would accept a system that is "likely" to fail.

Intervenors again indulge in a semantic quibble. In context, at the page cited, the affidavit simply states that past failures from vibration have not caused safety problems and newer designs are even less likely to do so. We see no triable issue here.

11. Flow-induced vibration is a chronic problem and historically undetected until damage or failure occurs (Intervenors Answer to Staff's First Round of Interrogatories, p. C1-1).

We see no such statement at the cited page of Intervenors' Answer to Staff's First Round of Interrogatories. Page C1-3 *ff* of an exhibit attached thereto mention several flow-induced vibration problems and suggest all instances were, at that time, well-known to the NRC Staff and the industry. Said exhibit cites no cases of safety failures or failure to achieve safe shutdown from this cause. We see no triable issue here.

12. The problem is critical to the economics of Black Fox (Intervenors' Answer to Staff's First Round of Interrogatories, p. C1-8).

We have pursued this cryptic statement to the cited document and beyond that to the GESSAR question cited at p. C1-8 of the exhibit attached to Intervenors' answer. The Intervenors' witness alleges costly inspections might be involved, but a close reading of the document which Intervenors' witness cites (GESSAR 238 NSSS Question 5.29-1, p. Q5.29-1) shows those inspections relate to weld heat affected zones and welds in stainless steel, not to vibration-induced defects. We see no relevance to Contention 1.

The motions with respect to Contention 1 are granted in part and denied in part. We will hear evidence on Question 1-1. above.

Contention 2:

Intervenors contend that the Applicants have not adequately demonstrated that the Emergency Core Cooling System for Black Fox 1 and 2 meets the requirements of 10 CFR Part 50, Appendix K.

Staff's motion for summary disposition relies upon the affidavits of Messrs. Gerald Mazetis and Ronald Frahm, and Applicants' motion relies upon the affidavit of Mr. Aaron Levine. Intervenors oppose, relying upon the MHB affidavit.

The thrust of both Applicants' and Staff's arguments and their supporting affidavits is that the ECCS calculations for Black Fox Station have been performed and reviewed in accordance with Appendix K.

Intervenors' arguments, numbered as in their response were:

1. Vendor and regulator do not agree about the independence or separability of thermal and hydraulic effects (MHB, p. 2-1).

The MHB affidavit, at the page cited, asserts that doubts as to the independence or separability of thermal and hydraulic effects were expressed at a meeting in January 1978 between General Electric and NRC. We will hear evidence on the following question:

2-1. Do doubts exist about the independence and separability of thermal and hydraulic effects in the specific calculations used to demonstrate compliance of Black Fox Station with Appendix K?

2. Descriptions in the PSAR are inadequate and incomplete thereby precluding adequate analysis to insure compliance with Appendix K (MHB, p. 2-1).

The Intervenors have distorted the meaning of their expert witnesses' affidavit. The affidavit alleges that the PSAR's deficiencies consist in a failure to describe "full-scale . . . testing . . . needed to meet the requirements of . . . Appendix K." In point of fact, full-scale testing is not required by Appendix K, as Staff points out in its Motion at p. 2-3.

3. Controversy exists about the adequacy of analytical models and their ability to predict results for the "real world."

4. The NRC has determined that the computer codes are in error and there has been inadequate attention to the problem by NRC.

The issue presented in these two arguments is perhaps ill-stated in that the nature of the controversy is not spelled out and in that erroneous codes are not identified. However, from our examination of the MHB affidavit we are led to believe that Intervenors' argument is drawn from Section D at p. 2-2 of the affidavit, wherein affiants assert that errors have been found by NRC in certain ECCS computer codes used by the Black Fox Station vendor, General Electric; that as a result, some existing reactors are under operating restrictions; and that, as recently as June 1978, the Staff was planning an audit of manufacturers' practices and quality assurance related to these codes. This assertion surely seems to the Board to bear upon the extent to which the Black Fox Station design can be expected to conform to Appendix K, since it raises questions of material fact about the extent to which the NSSS vendor is prone to error in code development and application. We will hear testimony on the following question:

2-2. What "recently discovered" errors may exist in G.E. ECCS evaluation codes? Are there errors other than those set forth in the SER at p. 6-10 of Appendix A?

5. NRC defines core spray distribution as a critical problem.

Again, the wording of this argument leaves unclear what Intervenors mean to advance as a triable issue. Presumably they refer to the almost equally elliptic statements in Section E at p. 2-2 of the MHB affidavit. Therein affiants assert that core spray distribution is a problem currently under review in Task Action Plan A-16 of NUREG-0410.

We are unable to find mention of this TAP in the SER, and we will therefore hear evidence upon the following question:

2-3. What bearing has TAP A-16 upon the Black Fox Station ECCS evaluation?

6. Staff's argument (p. 2-3) that judgment should be rendered as a matter of law is not supported by any citation of authority. Reference to a Westinghouse problem has nothing to do with a BWR. The argument is inconsistent with the facts in that NRC defines the problem as critical (NUREG-0410).

The thrust of this argument is at best obscure. Examining the cited portion of the Staff's argument, we are led to believe that Intervenors here intend merely to reassert their apparently persistent belief that Appendix K requires full-scale tests of certain equipment. We disagree, as we have stated, *supra.* We see no triable issue of fact here.

7. Staff has supplied, as an exhibit to the Mazetis/Frahm "affidavit," grounds to deny each of the motions. Errors in the evaluation are confirmed (6-10) some analyses were *not* performed and reactor operations are restricted (6-12), failures will occur (6-12), and design features are still being analyzed (6-12).

Again Intervenors fail to express exactly what issues they believe are raised. The citations are to an attachment to the Staff's affidavit, the attachment being a copy of parts of Section 6 of Appendix A to the SER. If Intervenors' assertion that "errors . . . are confirmed" refers to the errors listed in p. 6-10 of that document, the context clearly indicates they have been corrected. (Indeed, we have mentioned above that we were aware of those corrected errors and were interested in whether Intervenors' affiants might be referring to *other* errors.) As to the alleged lack of analyses or analyses in progress, the context indicates these matters were deemed grounds for certain operating restrictions, while the "failures" referred to are those hypothetical failures used in analysis of ECCS systems to impose maximum conservatism in the design. We see no issue of fact here.

8. Staff's motion is directed only to a fraction of Appendix K's require-

ments. Thereby leaving open every question of fact which could arise out of Appendix K. Even so, whatever the phrase "to the extent practicable" means,

a. just because Staff has exercised a "judgment" (*i.e.*, guess) does not mean that there are no material facts, and

b. it is obvious that the requirement has not been met when errors exist, operations are restricted,and analyses have not been performed.

This tortuous phraseology is apparently meant to repeat some portion of 4, 5, 6, and 7 above. We see no issue here not previously dealt with.

9. Staff's statement that it *supports* practicable confirmatory experimental programs (p. 2-3) is itself an open violation of Part II(4) of Appendix K. This section is mandatory and requires more than being merely "supportive." Affirmative action is necessary to meet the requirements and it is painfully obvious that *nothing* has been done except to realize that that which had been done was wrong.

It is unclear to the Board how a statement by the Staff supporting practicable testing could "violate" the cited section of Part II of Appendix K which reads:

4. To the extent practicable, predictions of the evaluation model, or portions thereof, shall be compared with applicable experimental information.

Intervenors' argument raises no triable issue of fact.

10. Applicants' "affidavit" is inconsistent with that of Staff in numerous instances, for example:

a. Applicants state (Levine, p. 2) that tests have been performed using BWR 8 x 8 fuel geometry. Staff states that they were on 7 x 7 (Kane, p. 6, Contention 6).

b. Applicants ignore Staff's admissions that the models were erroneous, analyses have not been performed, and operations are curtailed.

This argument is virtually unintelligible. Part 10.a. cites an affidavit of Kane on Contention 6. No such affidavit exists. If the Kane affidavit on Contention 1 is meant, that document mentions 7 x 7 fuel in connection with vibration experience, not ECCS performance. We see no inconsistency. Part 10.b. apparently simply reiterates matters dealt with above.

11. Applicants admit (Levine, p. 3) that tests in Europe have demonstrated effects not previously predicted from models.

The context of the citation indicates the effects mentioned were not deemed justification for alteration of the current licensing bases. We see no triable issue.

12. It must follow that the models are not verified in view of existing problems and derating of plants.

This apparently simply re-reiterates earlier assertions.

13. The lack of observation of perforation of cladding (Levine, p. 2-3) is simply a function of the test.

No issue of material fact is evident here.

14. Applicant incorrectly asserts (p. 2) that complete analysis and scale testing is all that Appendix K requires. Appendix K II(4).

We are unable to locate this assertion, but in any event, it appears the assertion is true.

15. Other contested issues of fact are:

a. The Moody model (Levine, p. 1) has not been verified (Minor Dep., p. 75).

b. Certain testing is not designed to obtain verification (Minor Dep., p. 69).

c. Core spray distribution is not predictable (Minor Dep., p. 66) and additional testing is required.

d. The ADS system (Levine, p. 3) is not sufficient (Minor Dep., pp. 78-82, 84, *et seq.*).

The argument in 15.a. is unsupported by the deposition as cited. In point of fact, all the deposition seems to indicate is that affiant Minor does not know what the Moody model is. At any rate, the Moody model is specified as acceptable in Appendix K, Section I.C.1.b. and any question as to its acceptability would be an impermissible challenge to Commission regulations. See 10 CFR 2.758. As to 15.b., when read in context the citation clearly is meant to pinpoint disputed matters centering around Task Action Plan A-16, a matter we have already decided to explore. (See our discussion regarding argument 5., *supra.*) Argument 15.c. refers to core spray distribution which, according to the Minor deposition at p. 67, is the subject of TAP A-16, which again has been dealt with above. Argument 15.d. alleges deficiencies in the ADS, but when the deposition citation is read in context, it is clear that the alleged difficulties hinge upon fire protection, a matter treated under Contentions 7, 8, and 9, *infra.*

Accordingly, the motions with respect to Contention 2 are granted in part and denied in part. We will hear testimony with respect to the questions listed above.

Contention 3:

Intervenors contend that the Applicant has not adequately demonstrated that the structures and components within the suppression pool have been designed to withstand the hydrodynamic forces of a high vertical water swell which result from the postulated Design Basis Accident for Black Fox 1 and 2.

The Staff moved to either dismiss or combine and/or incorporate Contention 3 into item 3 of Contention 16 since the pool swell in Contention 16(3)[1] is basically duplicative of the pool swell mentioned in Contention 3. Applicants opposed the motion to dismiss but did not oppose the alternative request to combine and/or incorporate. In substance, in a response dated August 11, 1978, Intervenors opposed the motion to dismiss but conditionally agreed to the proposed consolidation. We deny the motion to dismiss because it is not clear that the issues raised in the two contentions are similar. However, we consolidate the two contentions with the understanding that the Intervenors are not precluded from testifying, cross-examining, and otherwise addressing the matters specifically covered by Contention 3.

Contention 5:

Intervenors contend that the Applicant has not adequately demonstrated that the reactor pressure vessel supports and pedestal for Black Fox 1 and 2 can withstand the loads resulting from the design basis requirement of 10 CFR Part 50, Appendix A, Criterion 2, relating to earthquakes.

Staff and Applicants have moved for summary disposition of this contention. The Staff relies upon affidavits of Messrs. Harold Polk and John Kovacs. Applicants do not present affidavits, taking the position that our

[1]Contention 16, in pertinent part, reads:

Intervenors contend that the Applicant has not established the integrity of the Mark III containment in that the following items have not yet been resolved:

* * * * *

(3) pool swell

* * * * *

previous determination of the magnitude of ground acceleration of the safe shutdown earthquake is dispositive of the question of whether parts of the plant are designed to withstand that acceleration. Clearly the finding is not dispositive of this issue (see Partial Initial Decision Authorizing Limited Work Authorization, LBP-78-26, 8 NRC 102 (1978), finding 13 at p. 111). Intervenors oppose the motions relying upon portions of the MHB affidavit and its attachments. We treat the Intervenors' arguments regarding Contention 5 in numbered sequence.

1. The design has yet to be confirmed even by NRC as to combination of loads and effects (MHB, pp. 5-1, 5-2).

We note that one of the attachments to the MHB affidavit is a letter to this Board from Staff counsel Colleen Woodhead, Esq., which itself enclosed documents relating to the method used for combining earthquake loads with LOCA loads. Ms. Woodhead's letter informs us that this matter is undergoing Staff review and "[t]he matter of load combination methods will be addressed in the final supplement to the SER." That document is not yet available.

In view of the fact that so fundamental a matter as load combination methodology is apparently not yet settled between Staff and Applicants, we believe the effect of such combinations on the pressure vessel supports and pedestal should be thoroughly explored in an evidentiary hearing. We are informed by a letter of August 25, 1978, from the Staff that all parties have agreed to expand Contention 16 to encompass this point. Accordingly we will hear evidence on load combination methods and the adequacy of vessel supports and pedestal to withstand LOCA and earthquake loads as additional matters under Contention 16.

2. There is no evidence of adequacy of design to withstand expected vertical movement (Tr. 1291, 1459).

We see nothing in the Staff's or Applicants' submittals that specifically addresses this point. Accordingly, we will hear evidence addressing the question:

5-1. Is the treatment of vertical motion in an earthquake of importance to the design of pressure vessel supports and pedestals, and if so, has it been accommodated?

3. Staff's "affidavit" (Polk) is not consistent with Staff counsel's letter and attachment to the Board dated June 27, 1978.

Intervenors do not enlighten us as to the nature of the alleged inconsistency. From the letter cited, we infer that this argument merely raises again the issue in argument 1, *supra.*

4. Selection of 0.12g is inappropriate.

The matter of the appropriate acceleration was ruled upon in our Partial Initial Decision Authorizing a Limited Work Authorization, LBP-78-26, 8 NRC 102 (1978). It is no longer properly before this Board.

Accordingly, the motions with respect to Contention 5 are granted in part and denied in part. We will hear evidence on question 5-1 above, and we will hear evidence on load combination methodology in dealing with Contention 16.

Contention 6:

Intervenors contend that the Applicant has not adequately demonstrated compliance with 10 CFR Part 50, Appendix A, Criterion 2, for Black Fox 1 and 2 with respect to tornadic phenomena related to:
(a) missile penetration of the containment;

(b) rapid exterior atmospheric pressure transients or excursions on the containment;

(c) protection of new fuel; and

(d) protection of the spent fuel storage facilities.

Applicants and Staff have moved for summary disposition, with Applicants relying upon an affidavit of Mr. Robert Stippich, and with Staff relying upon an affidavit of Mr. Harold Polk.

Intervenors oppose the motion, relying on portions of the MHB affidavit.

Again we treat each of Intervenors' proffered arguments in turn, numbering them as in Intervenors' response:

1. Staff's argument may be summarily disregarded (inasmuch as Mr. Minor did not testify on tornado missiles). No one is obligated to sift through thousands of pages to find the references.

The short answer is that, regardless of the erroneous identification, Intervenors should have known or could have determined by the process of elimination (there were only four individuals whose depositions were taken) that the Staff was referring to Mr. Dale Bridenbaugh at the cited pages of the transcript.

2. Staff's motion on this contention is internally inconsistent. For example, Staff on page 6-2 uses an auto traveling at 100 *mph* and the "af-

fidavit" speaks of 100 *feet per second.* This also creates inconsistency with Applicants (Stippich, p. 6).

The Board has reviewed the cited statements and compared Staff's assertion at p. 6-2 with statements presented in the affidavit of Stippich, the affidavit of Polk, Standard Review Plan 3.5.1.4 (at p. 3.5.1.4-3), and PSAR Section 3.5.3.1.1 (at p. 3.5-2). We conclude that the Staff's statement at p. 6-2 is a typographical error.[2] No triable issue of fact lies hidden here.

3. Applicants' design does not comply with Regulatory Guide 1.117 (Rev. 1, April 1978).

No specific citation is given for this. We note, however, that the MHB affidavit, Section D at p. 6-3, asserts that the PSAR lists an outdated version (Rev. 0) of the cited regulatory guide. Neither Staff's nor Applicants' affidavits make it clear what version will be complied with, but we note that Regulatory Guide 1.117, Rev. 1, itself states that it will be used in construction permit applications docketed after May 30, 1978, and that its use in applications docketed before that date is optional. We see no triable issue here.

4. Exception of the off-gas system is not justified (MHB, p. 6-3).

The off-gas system is not one of the systems mentioned in the contention. This is not a triable issue of fact within the ambit of Contention 6. However, in the course of examining the MHB affidavit citation we have been led, through that citation, to a closer look at the PSAR, pp. 1.9-22 and 1.9-23, wherein the applicability tornado protection requirements to the off-gas system is discussed. The relevant portion of the PSAR reads as follows:

1.117 Tornado Design Classification (Rev. 0, 6/76)

> All systems, structures, and components required by this guide to be protected against the effects of tornados are protected by being housed in Category I structures. The exception to this protection requirement is the Off-Gas System which is located in the Turbine Building. For this system, PSO has adopted the GE position that the release of radioactivity as a result of damage to the system by a tornado or tornado-generated missiles will not exceed 10 CFR Part 100 guidelines. Physical separation of the UHS cooling tower cells and redundancy provided by piping interconnection between cells make it improbable that damage through the fan discharge

[2]We note that the Staff's letter of August 25, 1978, also identifies this discrepancy as a typo.

nozzles by tornado missiles would reduce cooling capacity below a safe level.

The Board requests, on its own motion, that Staff and Applicants present some clarification of the connection, if any, between the "UHS cooling tower . . . fan discharge nozzles" and the release of radioactivity resulting from damage to the off-gas system.

5. The SER does not appear to apply the criteria of the most current standard review plan.

Intervenors fail to specify what Standard Review Plan they mean. No triable issue of fact is raised here.

6. Neither Staff nor Applicants have considered proper combinations of tornado and other loads (MHB, p. 6-5, 6-6).

This argument apparently challenges the Stippich conclusion that combines tornado and LOCA loads need not be considered, and it apparently challenges it on the basis that a recent report places the probability of a LOCA at about eight times that used by Mr. Stippich. After reviewing the quantitative change which this would occasion in Mr. Stippich's figures, the Board is convinced that such a change would not raise the probability of simultaneous failure into the regime of accidents normally analyzed (cf. Standard Review Plan 2.2.3). We see no triable issue of fact.

7. Staff's motion is internally inconsistent (p. 6-4 is not supported in the "affidavit") and is contradicted by Applicants.

Intervenors fail to enlighten us as to just what material on p. 6-4 of the Staff's argument is unsupported by the affidavit or what portion or portions of the Applicants' material contradict it. Page 6-5 of the MHB affidavit says that the Staff's argument at page 6-4 alleges the equipment will withstand "combined" effects of earthquakes and tornadoes and that the supporting affidavit and that of Applicants' affiant Stippich do not say the loads are "combined." We are informed by the Staff's letter of August 25, 1978, that the word "combined" is not intended to mean "simultaneous." The discrepancy, if any, is merely one of poor choice of words. Affiants of both Staff and Applicants say that, although the fuel pools are designed to withstand both earthquakes and tornadoes, they are not designed to withstand a simultaneous earthquake and tornado. There is no triable issue of fact herein.

8. Applicants do not support with facts the conclusion that tornadoes singularly or in combination with other events) do not cause nuclear accidents.

The argument does not say where the conclusion is reached. We presume that the reference is to a sentence on p. 8 of the Stippich affidavit, a sentence which Intervenors take out of context. In context it is clear that the statement "tornadoes will not cause nuclear accidents" is meant as justification for treating tornadoes and accidents as independent events from a probabilistic standpoint. (No mention of "other events" is made.) The very next sentence gives the justification which Intervenors say is lacking. It says that the buildings are designed to take tornado loads specifically so that their contents (the equipment which would be involved in a nuclear accident) will be protected from tornado loadings. The argument raises no triable issue of fact.

Thus the Intervenors' arguments do not seem to the Board to point out triable issues of material fact. However, in the course of our review of this contention we ourselves have noted a statement made in the MHB affidavit, a statement which leads us to a concern similar to that which we noted in connection with Contention 2 above. There are apparently Task Action Plans which may bear on this matter, but which have not been mentioned in the SER. Accordingly, the motions for summary disposition are granted in part and denied in part. We will hear evidence concerning the following questions:

6-1. What relevance do Task Action Plans TAP-32 and TAP-38 have to BFS, and if they have relevance, what is their status?

6-2. What connection, if any, is implied between the UHS cooling tower discharge nozzles and the off-gas systems' potential for radioactive release by the statement at pp. 1.9-22 and 1.9-23 of the PSAR?

Contention 7:

Intervenors contend that in order for the Applicants to meet 10 CFR Part 50, Appendix A, Criterion 3, Black Fox 1 and 2 must utilize cables with fire retardant insulation.

Contention 8:

Intervenors contend that in order to meet 10 CFR Part 50, Appendix A, Criterion 3, the Applicants must separate the cable trays, including those in the cable spreading rooms so as to prevent a recurrence at Black Fox 1 and 2 of the type of fire which took place in the cable spreading room at Browns Ferry.

Contention 9:

Intervenors contend that the Applicants have not designed an in-depth fire protection system for Black Fox 1 and 2 which complies with 10 CFR Part 50, Appendix A, Criterion 3.

Since these contentions relate to fire protection, we shall treat them together. Applicants' and Staff's motion for summary disposition rely upon the following affidavits:

Staff:

A separate affidavit on each contention, each affidavit attested to by the same two affiants, Robert Giardina and James Behn.

Applicants:

An affidavit of two affiants, Messrs. William Gang and Richard Johnson, and an affidavit of Mr. Gary Engman, which address Contentions 7 and 8, and an affidavit of Mr. Edwin Cox which addresses Contention 9.

Intervenors oppose, offering portions of the MHB affidavit.

We note that the Engman affidavit (at p. 4) and the Gang/Johnson affidavit (at p. 2) assert that wiring in the plant will be protected against fire in accord with the standards IEE 383-1974 and IEE 384-1974. If, as the Board believes is the case, these IEE standard numbers indicate the standards date from 1974, it seems unlikely to the Board that they could include experience from the Brown's Ferry fire of 1975.

Intervenors' affiants allege that there is much later material available: a test of cables in 1977 by Sandia Corporation (MHB at 7-1, *et seq.*, 8-1, *et seq*); a report by "Hanover"; and one by "Gage-Babcock" (Minor deposition at p. 98).

Applicants and Staff also claim that the fire protection will meet Regulatory Guide 1.120, Rev. 1, and NRC Branch Technical Position 9.5-1 (Giardina/Behn on 7 at p. 2; Giardina/Behn on 8 at p. 3; Cox at pp. 1-2 and *passim*). These documents certainly postdate the Brown's Ferry fire. (Indeed, Regulatory Guide 1.120, Rev. 1, specifically mentions use of data obtained by a review group under Dr. Stephen Hanauer, who studied that fire (p. 120-1).) However, Intervenors' affiants raise some very complex technical questions as to whether those documents are met by Black Fox Station (MHB affidavit, Section C, pp. 8-2, 8-3; Section C, pp. 9-2, 9-3).

We are convinced that controverted issues of material fact remain to be resolved concerning the fire protection measures proposed for Black Fox Station. The motions are denied.

Contention 10:

Intervenors contend that the Regulatory Staff have not demonstrated the quality assurance program for Black Fox 1 and 2 will comply with the pertinent portions of 10 CFR Part 50, Appendix B, in the design and installation of the following equipment at Black Fox 1 and 2.
(a) Pressure vessel
(b) Control rods
(c) Reactor protection system
(d) Emergency core cooling system
(e) Rad-waste equipment (both liquid and gas)
(f) Dry well wall
(g) Weir wall
(h) Containment shell

In support of their respective motions for summary disposition, Staff relies upon the affidavit of Jack Spraul, and Applicants rely upon the affidavits of Messrs. J. Perez, William Gang, and Richard Blaisdell.

Intervenors oppose the motions, relying on portions of the MHB affidavit. As before, we treat each of Intervenors' numbered arguments in turn:

1. Staff (p. 10-2) fails to state whether the SRP being employed is the 1975 or the earlier version. There are significant differences. The failure to use the most current SRP has occurred, *e.g.*, Diablo Canyon.

The cited portions of the Staff's motion says that the initial review of the Black Fox quality assurance plant compared that plan with a checklist which was the forerunner of the present Standard Review Plan. Later, Amendment 10 to the PSAR was compared with the Standard Review Plan itself after that plan was developed and found acceptable. We see no hint of the existence of various versions of the plan and no suggestion of ambiguity in the Staff's argument or in the portion of the Spraul affidavit (p. 3) cited in the Staff's argument. What may or may not have happened at Diablo Canyon is irrelevant. There is no triable issue here.

2. Staff fails to address the impact of the new NEDO-11209-03A document (Spraul, p. 4).

Page 4 of the Spraul affidavit gives no hint of the existence of a "new"

NEDO-11209-03A. The version mentioned is specifically dated November 1976. If Intervenors believe a new version is extant, they should have so indicated. We see no triable issue here.

3. Staff (Spraul, p. 5, Item 3) contradicts Applicant (Perez, p. 9, Item 5q). The former says there is no reliance on the NRC program and the latter says there is.

We have compared the items cited. Intervenors' allegation that they contradict each other is simply a distortion. Spraul says the Black Fox Station program can stand by itself without relying on NRC inspection; Perez says PSO watches NRC inspection reports, *inter alia,* to keep informed. There is no issue of material fact here.

4. Applicant has made changes in response to Intervenors' criticisms. This demonstrates the validity of Intervenors' contention and of the balance of the issues.

No instances of such "changes" are cited, nor is any evidence offered to show that changes which may have been made resulted from Intervenors' criticisms. Further, even were such evidence adduced, it would scarcely "demonstrate the validity of the contentions and the balance of the issues." We see no triable issue here.

5. The QA program is not designed to ensure timely identification and correction of problems (see, *e.g.,* Hubbard Dep., pp. 34-37).

The argument is incorrect. At the place cited, affiant was speaking of the Diablo Canyon power plant, not Black Fox.

6. The PSAR does not contain a description of *how* the applicable requirements of Appendix B will be met. This violates 10 CFR 50.34(a)(7) and similar requirements in other documents (MHB, p. 10-3). It is important that the "how" is there so as to be able to independently verify that the Applicants can construct and operate the facilities. Thus the contention remains. There is total doubt as to "how" the QA program will be implemented (Hubbard Dep., p. 42).

We have reviewed the material in the MHB affidavit and in the Hubbard deposition, and the portions of the PSAR and certain other documents to which that material refers. It appears to the Board that the chief disagreement among the parties centers around the amount of QA documentation which must be included in the PSAR in order to discuss "how" the QA program will satisfy Appendix B to 10 CFR Part 50. It is clear that the Applicants have submitted a general discussion of their QA program (and those of their contractors) and have included a list of those procedures and manuals intended to satisfy designated requirements of Appendix B.

We see no reason to include more detail in the PSAR. It is evident from the affidavit of Mr. Spraul that the Staff has reviewed subsidiary documentation including vendors' QA plans and, after probing these thoroughly and obtaining further commitments, has satisfied itself of the completeness of the plans. There does not seem to be anything more here than a disagreement as to the semantic niceties of the word "how." We see no triable issue of fact.

7. Recent experience of failures, errors, and omissions confirm the inadequacy of the QA program (MHB, pp. 10-1, 10-2).

The MHB affidavit mentions each of the items in Contention 10 in turn except "(e) Rad-waste equipment." In items (a) and (b), MHB allege failures of equipment in service as reported in 1976 and 1977. It is implied (but not stated explicitly) that these failures stem from poor QA practices and that these poor practices will be repeated in the case of Black Fox Station. We will hear evidence responding to the following quesiton:

10-1. Did the cracking of feedwater nozzles, control rod drive return nozzles, and a collect cylinder tube mentioned in the MHB affidavit arise because of faulty QA? (Specific faults in the QA programs at the reactors at which cracking occurred should be pointed out.) Do the same faults exist at present in the BFS quality assurance proposal?

Under item (c) it is alleged that the Black Fox Station control system is of "new and unproven" design. This does not appear to the Board to be relevant to the question of whether the QA program proposed for Black Fox Station meets Appendix B.

Item (d) repeats allegations regarding errors and deficiencies in ECCS design. We have already determined to explore this question under Contention 2, *supra.*

Last of all, the MHB affidavit states that "Items (f), (g), and (h) apply to the structure of the Mark III containment." Indeed they do, but we see no hint that there is anything wrong with the QA program pertaining to them. We are at a loss to find anything triable in this allegation.

8. Applicants fail to demonstrate *how* it will comply with commitments to regulatory guides (MHB, pp. 10-3, 10-4).

This appears to be a reiteration of statement 6, above. As we noted there, we see no triable issue.

9. Applicants and Staff disagree on implementation of 10 CFR Part 21. G.E. wishes to be exempted altogether (MHB, p. 10-5).

The MHB affidavit at the page cited does not say that Applicants and

Staff disagree on this point. It says that "apparently" Applicants and G.E. do not agree on how to implement 10 CFR Part 21, and that G.E. has applied to NRC for an exemption from Part 21 requirements. (Such exemptions are provided for at 10 CFR 21.7.) We do not find the alleged "apparent" disagreement between Applicants and G.E., nor do we consider an application under 10 CFR 21.7 to be a triable issue in this case.

10. Preaward surveys of suppliers are required under Appendix B.

What Intervenors mean here is obscure. The MHB affidavit speaks of "preaward surveys of suppliers, as required by Criteria 7 [sic] of Appendix B. . . ." We do not see any language referring to "preaward surveys" in Appendix B and certainly there is no such language in Criterion VII, the criterion we presume was intended. There is no triable issue here.

11. Applicants admit (Gang, p. 2) that PGCC cables are not traceable. This does not conform to regulatory requirements and is a significant deficiency (MHB, p. 10-6.1).

Applicants do not appear to "admit" anything of the kind. The Gang affidavit simply states that Criterion VIII of Appendix B does not require such traceability back to the reel. We have read the criterion and we agree.

12. Applicants state a commitment to WASH-1309 (Perez, p. 2) yet fail to identify whether the commitment is to the most recent version (or to what provisions). This statement by Applicants also provides an additional example of the failure to tell us *how* the commitment will be implemented.

We are uncertain from the argument whether WASH-1309 is a document which undergoes continuous revision. We will hear evidence, however, as to the following question:

10-2. Is WASH-1309 undergoing revision? Are Applicants committed to conforming to the latest version?

13. Applicants state (Perez, p. 3) that the QA staff has extensive experience in the *nuclear* QA area. No facts are provided for this conclusion and Mr. Perez does not list such extensive experience for himself.

Exhibit JBP 10-1 attached to the Perez affidavit indicates Mr. Perez has worked in the QA field for 7 years, has worked for at least one nuclear supplier, and is a Registered Professional Quality Engineer in California. We will accept his experience as being "extensive." However, we will hear testimony on the following question:

10-3. What experience in the nuclear quality assurance area do the members of Applicants' QA staff have?

14. Appplicants' reliance upon Mr. Gang does not provide support for their motions on Contention 10. He has not demonstrated any QA experience and thus his "affidavit" must be disregarded. At the very least it does not supply the basis for summary disposition.

Whether or not Mr. Gang is a QA specialist seems to the Board to be beside the point. He is the Project Manager for the supply of the NSSS components for Black Fox Station. He is surely capable of describing the QA features that his affidavit presents. There is no triable issue here.

15. Applicants' Exhibit JBP 10-2 creates questions of fact. For Example:

a. Does the last sentence of paragraph 5c mean that it is false that Class I items may be excluded or that it is false that the referenced statement makes the implications.

b. Absent specific language "contractors" does not mean "installers"—paragraph 5k.

c. There is conflict between the GESSAR and PSAR and simply saying (paragraph 5j) that none exists does not change the facts.

Exhibit JBP 10-2 is a list of Applicants' responses to intervenors' interrogatories.

As to argument 15.a., paragraph 5c of Exhibit JBP 10-2 states that ". . . Article 17A.1.2.2 (of the PSAR) does not imply, as suggested, that certain Class I items may be excluded, which is simply false." The Board sees no substantive difference between the alternatives mentioned in argument 15.a. In either event, no Class I items are to be excluded from the QA program.

Argument 15.b. seems a semantic quibble. We would accept the notion that "installers" are "contractors."

We have reviewed paragraph 5j of JBP 10-2 and the PSAR sections cited therein and see no conflict.

Argument 15 raises no triable issue of fact.

16. It is impossible to say (Gang, p. 2) that a QA program is adequate when based upon testing when the testing has not been done.

Qualification testing is one of the methods of design verification specifically accepted in Criterion III of Appendix B. A program based upon such testing can be an adequate program whether or not the testing itself has

yet been completed. Intervenors do not pinpoint any specific inadequacy here. There is no issue of triable fact here.

17. There is a requirement to go into and include special processes contrary to Gang at page 3. The reason and need therefor are set forth in Mr. Hubbard's Deposition, pp. 83-87.

The Gang affidavit does not say there is no need to "go into or include" special processes. It says there is no regulatory requirement to "go into the details of how each special process is controlled" in the PSAR. The Hubbard deposition suggests that it is Mr. Hubbard's opinion that better control of certain processes, especially the plating of neutron sensors and crimping of control cables, would have been desirable when he was working for G.E. He believes that a formal listing of those processes which are "special processes" within the meaning of Criterion IX should be required. We will hear testimony on the following question:

10-4. Would there be a substantial improvement in quality assurance for the components listed in Contention 10 if the QA program required formal identification of each process which is to be treated as a "special process" within the meaning of Criterion IX of Appendix B to 10 CFR Part 50?

The motions for summary disposition of Contention 10 are granted in part and denied in part. We will hear evidence on the four questions listed above under the rubric of this contention.

Contention 12:

Intervenors contend that the Applicant has not adequately demonstrated that design and construction of Black Fox 1 and 2 spent fuel pools will comply with 10 CFR Part 50, Appendix A, Criterion 61.

In support of their respective motions for summary disposition of Contention 12, the Staff relies upon the affidavit of Mr. Robert Giardina, and Applicants rely upon the affidavit of Mr. Charles Ross. Intervenors oppose the motions, relying upon portions of the MHB affidavit. We discuss each of the Intervenors arguments in turn:

1. Inspection of the rack does not provide adequate assurance of the structural capability of the system if no inspection of the rack anchors and hold-down bolts is to be performed (MHB, p. 12-1).

Applicants' affiant Mr. Ross asserts that the spent fuel storage rack requires no periodic special testing or inspection, adding that "[t]he capability

will exist for unloading spent fuel from the racks and removing [sic] for inspection or replacement as desired" (Ross affidavit, p. 2). Intervenors' affiants assert that there will be no adequate assurance of the structural capability of the racks as no inspection of the rack anchors and hold-down bolts is to be performed. We will hear evidence on the following question:

12-1. Is inspection of rack anchors and hold-down bolts necessary to insure structural capability, and if so, have provisions been made for such inspection?

2. The spent fuel storage is unprotected from tornadoes and tornado missiles (MHB, 12-1, 6-4, 6-5).

We have already dealt with this point under Contention 6, a contention on which we granted summary disposition on all but two matters.

3. Generic issues exist (MHB, p. 12-2).

The cited portion of the MHB affidavit mentions three Task Action Plans, TAP-28, TAP-36, and TAP-38. In accord with our previous practice we shall ask clarification of the relevance of these plans. In particular we ask that the parties address the question:

12-2. What is the relevance to the Black Fox Station of TAP-28 and TAP-36 (we have already inquired about TAP-38, *supra*), and if they have relevance here, what is their status?

4. The design does not take into consideration that impacts which can be expected from vertical movements in a seismic event.

Intervenors cite no specific place where such impacts should be addressed, nor do they cite any affiant to the effect that these impacts have been overlooked. However, out of an abundance of caution, the Board has decided to look more closely at this matter. We accordingly ask the parties to address the question:

12-3. Is the treatment of vertical motion in an earthquake a matter of importance to the spent fuel pool design, and if so, has it been accommodated?

5. Staff's request for finding (12-3) has nothing to do with the issue. Thus whether Staff has made a review is not the point and Staff's motion should be denied.

The reference here appears to be to the portion of the Staff's motion entitled "Statement of Material Facts as to Which There Are No Genuine Issues." The Staff's statement is less than a model of clarity; it appears to state that Criterion 61 will be satisfied "by reason of" the Seismic Category

I design of the fuel building and the fuel pool. Clearly Criterion 61 requires more than just Seismic Category I design (matters of inspectability, for example, are mentioned). However, the Giardina affidavit asserts, *inter alia,* that the pool complies with Criterion 61 and with other documents containing additional guidelines. We note that the Intervenors have not submitted a counter-affidavit. Further, we note that, in their November 30, 1976, Answers to Staff's Interrogatories, Intervenors did not respond to the question asking for the facts in support of the spent fuel contention and that, during the May 31, 1978, deposition, Mr. Bridenbaugh stated that he had no knowledge that the spent fuel pool design presented a problem (Tr. 122). We see no triable issue here.

6. Criterion 61 requires a capability of testing. Applicants' design does not contemplate testing (Ross, p. 2).

This statement appears to be a reiteration of argument 1 above. We do not view it as raising any issues not covered in our consideration of that argument.

7. Applicant fails to identify a reliable source of water (Ross, p. 4).

The Board is uncertain as to exactly what Intervenors mean here. The cited page mentions the depth of water maintained in the pool and describes its shielding characteristic. It seems to the Board unlikely that the design of the fuel pool would fail to provide a source for the original fill or for replacement of periodic losses, but it seems that such a failure is all that Intervenors could be suggesting. Accordingly, we will hear evidence on the following question:

12-4. Does the spent fuel pool design provide for an adequate source of water to fill the pool and maintain its level during operation?

8. There is no assurance that the filtering system will operate in other than "normal" conditions (Ross, p. 5).

Intervenors have seized upon a statement in the Ross affidavit which says that the fuel pool filter and demineralizing system will maintain desired purity under "normal conditions." We will hear evidence on the following quesiton:

12-5. Are there off-normal conditions under which the design of the spent fuel pool filter and demineralizing system would permit an undue hazard to arise?

9. Removal of heat by the station service water system (Ross, p. 6) will increase the already established violation of water quality standards.

Intervenors do not tell us and the Board is unaware of any way in which the station service water system has been shown to violate water quality standards with respect to heat loads. In any event such an argument should have been raised during the environmental phase of the hearing, and is now untimely. We see no triable issue here.

10. In view of the use of the condensate system (Ross, p. 8) and the factor of this system in off-gas explosions (add. contention), it is inappropriate to use this system for makeup water.

We have already recognized as an issue the question of water supply for pool makeup (Question 12-4 above). We do not consider that mention here of additional Contention 1 adds any issue.

In sum, the motions for summary disposition of Contention 12 are granted in part and denied in part. We will hear evidence on the five questions listed above.

Contention 13:

Intervenors contend that Applicants' preliminary emergency plan does not adequately comply with 10 CFR Part 50, Appendix E, in that:

a. it does not adequately describe what contacts and arrangements have been and will be made with government agencies;

b. it does not adequately describe the matters required by Appendix E, Part II(C), (D), (E), (F), and (G);

c. it does not adequately comply with Appendix E, Part II(B), in that there are no State or local plans for coping with emergencies arising out of or connected with a radioactive related emergency.

d. it does not adequately comply with Appendix E, Part II(A), in that only one person (by job classification) will be in charge of notification. The failure to have backup or subordinate responsibility would result in the plan being unable to cope with emergencies; and

e. it does not include adequate plans to evacuate the site as the result of an explosion of a barge carrying explosives on the Verdigris River.

Both Applicants and Staff have moved for summary disposition of Contention 13. Applicants rely upon an affidavit of Mr. John West. Staff relies upon an affidavit of Mr. Richard Van Niel. Intervenors oppose the mo-

tions, relying upon portions of the MHB affidavit. We treat Intervenors' numbered arguments *seriatim* as before:

1. The emergency plan is not adequate. It fails to transport and the ability of facilities to treat large numbers of victims (MHB, p. 13-2) [sic].

The statement is unintelligible. We have examined the MHB affidavit at the page cited. The wording there mentions Appendix E requirements regarding ". . . transportation of injured or contaminated individuals . . ." and ". . . treatment of a large number of contaminated individuals. . . ." However, the requirements cited in the MHB affidavit are those of Section IV of Appendix E. Section IV is specifically identified in Section III as containing requirements for contents of *Final* Safety Analysis Reports, which are documents to be submitted as part of an *operating* license application. The present case concerns a construction permit application. We see no relevant issue here.

2. The NRC states that Regulatory Guide 1.97 applies. Applicants state that it does not (MHB, p. 13-3). There has not been an evaluation of postaccident monitoring plans.

We have reviewed the cited page of the MHB affidavit and we have read Regulatory Guide 1.97. The statement here ascribed to the Staff is, in fact an interpretation of a Staff letter by Intervenors' affiants. The guide itself specifically states (Section D at p. 1.97-4) that it is applicable to ". . . construction permit applications docketed after September 30, 1977." The letter is ambiguous. We will hear evidence on the following question:

13-1. What revision, if any, of Reg. Guide 1.97 applies to BFS? If no revision applies, what evaluation of the postaccident monitoring plan has been made and against what standard was it judged?

3. Because of the fact that this device will be a first for Oklahoma, greater consideration should be given this aspect of the application (MHB, p. 13-3).

The fact that a reactor power plant is the first in a State does not alter Appendix E requirements. There is no issue of material fact here.

4. Staff's *belief* (p. 13-2) that the Applicants' plan complies is insufficient to support summary disposition.

Intervenors take the word "believes" out of context here. The remainder of page 13-2 of Staff's argument gives adequate support to the "belief." There is no triable issue here.

5. Staff agrees that 13(C) is valid (Van Niel, p. 2). Intervenors state that 10 CFR Part 50, Appendix E, does in fact require that called for by this contention.

The affidavit of Mr. Van Niel shows no such agreement. It simply states that, while no "State or local plans" are presented, no such plans are required by the cited portion of Appendix E. We have read the regulation and we agree with the Staff. No triable issue of fact is present here.

6. State Highways 33 and 88 are grossly inadequate and this is especially true during weekend, summer lake traffic.

The adequacy of these highways to handle "weekend, summer lake traffic" seems to the Board peripheral, at best, to the present case. At any rate, we note that the PSAR states that Highway 33 is being upgraded (PSAR at p. 13.3-2). Presumably the Intervenors mean to suggest that there are special times when emergency procedures such as evacuation of certain areas must be modified to accommodate seasonal traffic patterns. If this is so, that situation is exactly the sort of emergency plan feature which the Board believes the regulations would reserve until the operating license stage. There is no triable issue here.

7. Staff's discussion (Contention 12) [sic] notably omits the fact that there are no hospital facilities or trained personnel in the Tulsa area and there are no plans to remedy this situation.

The reference is clearly to Contention 13. The Board finds it difficult to believe that there are ". . . no hospital facilties or trained personnel . . ." in the Tulsa area. Intervenors' argument is unsupported by an affidavit to this effect. At any rate, the PSAR asserts that "St. Francis Hospital and Hillcrest Medical Center, both of Tulsa, Oklahoma, have agreed to cooperate with PSO in the development of an Emergency Plan" (PSAR at p. 13.3-10). The Van Niel affidavit references this section of the PSAR. We see no triable issue here.

In sum, the motions for summary disposition of Contention 13 are granted in part and denied in part. We will hear evidence concerning question 13-1 above.

Contention 15:

Intervenors contend that the Applicants have not adequately demonstrated that Black Fox 1 and 2 will meet the requirements of 10 CFR Part 50, Appendix A, Criteria [sic] 31 with respect to utilization of materials and/or procedures which will minimize the probability of

intergranular stress corrosion cracking of stainless steel piping at Black Fox 1 and 2.

Both Staff and Applicants have moved for summary disposition of Contention 15. Staff relies upon an affidavit of Mr. William Kane. Applicants rely upon an affidavit of Messrs. Aaron Levine and Gerald Gordon, and upon an affidavit of Mr. Richard Blaisdell. Intervenors rely upon portions of the MHB affidavit.

At the outset let us note that the Board, in agreement with the Staff, sees a certain confusion of technological concepts inherent in the wording of Contention 15. We note (see *e.g.*, Kane affidavit at p. 5; Levine/Gordon affidavit at pp. 3-4) that Criterion 31 is meant to guard against a phenomenon quite different from intergranular stress corrosion cracking (IGSCC). The phenomenon is brittle fracture, and it is not even characteristic of the same material in which IGSCC occurs. Our review of the Intervenors' arguments in opposition to the motions leads us to the belief that the Intervenors actually had IGSCC in mind, and that reference to Criterion 31 is inadvertent. Regardless, Intervenors offer no argument directed at identifying triable issues of material fact as to whether Criterion 31 is violated. We find that it is not, and we grant both motions to the extent that compliance with Criterion 31 is an issue.

We now proceed to examine whether Intervenors' numbered statements establish any issues of fact concerning IGSCC. As before, we repeat each numbered argument *seriatim:*

1. Cracking and failure of BWR piping has been and continues to be a serious problem (MHB, p. 15-1). Staff admits the problem (Staff, p. 15-2) and Applicants (essentially G.E. per Levine/Gordon) in a wholly self-serving document urge that there really is no problem (Levine/Gordon, p. 3). Thus there exists total controversy.

The cited portions of the MHB affidavit simply mention that IGSCC has been a problem. All parties agree to that. MHB seem to suggest that a recognized expert, Dr. Spencer Bush, expressed great doubt that the problem can be dealt with, but we note, after having reviewed all the material presented, that there appears to be some doubts as to which of two strategies represents the most efficient way to solve the problem:

1. Replacement of austenitic stainless by materials not subject to IGSCC.

2. Protection of austenitic stainless from IGSCC by special processes and designs.

(Cf. Staff argument at pp. 15-2, 15-3; Kane affidavit at pp. 9-10; Levine/Gordon affidavit *passim.*)

Apparently Dr. Bush simply was questioning whether the more fruitful approach might not have been to abandon type 304 stainless long ago, essentially adopting alternative 1. above. The context of the remark, taken from the transcript appended to the MHB affidavit, is as follows: Dr. Giannuzi, a G.E. specialist, had described methods for protecting 304 stainless from IGSCC. The exchange proceeded:

> Dr. Bush: As a scientist I admire the approach, and as an engineer I am appalled. I keep seeing us digging deeper and deeper holes for ourselves. I really wonder why we didn't use some of the other materials 15 years ago.
>
> Dr. Giannuzzi: I told you that the objective of the program was to make 304 stainless steel work.
>
> Dr. Bush: You are right.

The Board notes that:

1. Black fox will use primarily Type 316L stainless, a material not subject to IGSCC (Levine/Gordon affidavit, p. 4).

2. Any other materials will be subject to special processing steps intended to minimize IGSCC (Kane affidavit, pp. 9-10; Levine/Gordon affidavit at p, 4).

The Intervenors have not told us why this plan will not protect against IGSCC, and we see no "total controversy." No triable issue is presented.

2. Staff views cracking as a two-phase issue with short-term and long-term solutions (Staff, p. 15-2). Applicants argue that the problem is fixed via new processes (Levine/Gordon). Apart from the fact that self-serving statements may be expected from Applicants and G.E., the facts are:

a. Controversy exists even between Staff and Applicants.

b. Applicants' belief that the problem is fixed is not supported by Staff nor by the facts because of untested and unproven processes.

Contrary to Intervenors' argument, the cited portions of Applicants' and Staff's submittals suggest agreement, rather than disagreement. Both appear to agree that the same precautions will protect materials which are

subject to IGSCC (Staff argument, p. 15-3; Kane affidavit, pp. 9-10; Levine/Gordon affidavit, p. 4); both advocate the use of materials not subject to IGSCC as a long-term solution or presently, where applicable (Levine/Gordon affidavit, pp. 3-4; Kane affidavit, pp. 10-11). We see no triable issue of fact here.

3. Neither Staff nor Applicants establish a commitment, plan, or schedule to replace affected material (MHB, pp. 15-2, 15-3).

The argument is certainly not supported by the citation. The MHB affidavit says that G.E. has committed itself to replace materials in all areas where IGSCC has occurred in the past 10-15 years. MHB's concern appears to be only that this commitment may not cover recent (or indeed, future) experience in IGSCC. We will hear evidence on the question:

15-1. Will G.E. be committed to remedial measures in parts of the Black Fox system where very recent (or future) experience indicates IGSCC may occur, as well as in parts of the system where such cracking has occurred in the past 10-15 years?

4. Neither Staff nor Applicant address new, or expanded cracking problems (MHB, p. 15-3).

This argument appears to be merely a recognition of the actual thrust of the MHB affidavit as noted in connection with argument 3., above. We see no additional issue here.

5. Neither Staff nor Applicants demonstrate, *with facts,* that the special processing steps (Kane, 15-10) will either eliminate or reduce instances of cracking.

Affidavits of both Staff and Applicants indicate (Kane affidavit at p. 9; Levine/Gordon affidavit at p. 4-5) the fact that competent metallurgical opinion, careful technical investigation, and established regulatory guides concur that these steps will reduce or eliminate IGSCC. There is no triable issue of fact here.

6. Staff alleges that corrosion cracking is "unlikely" (Kane, p. 7) to cause rapid failure. This statement leaves substantial doubt about probability and about just what the word "unlikely" means.

Read in context the cited portion of the Kane affidavit is seen as asserting that the absence of the ferritic brittle checking phenomenon in stainless steel gives "reasonable assurance" that rapidly propagating failure will not occur. We see no doubt of the meaning and no triable issue of fact.

7. For the balance of the plant (Kane, p. 7-8) it is obvious that there is no commitment to meet improved standards.

Intervenors do not make clear exactly what "improved standards" they mean. The Kane affidavit indicates that regulatory guides intended to control IGSCC will be met. We see no triable issue here.

8. Everyone is left in doubt as to just what is occurring with respect to containment spray and ECCS materials (Kane, p. 8). It seems that design measures are to be taken but no commitment exists.

We see no such language at the cited page. The cited page of the Kane affidavit states that Applicants are committed to applying the GESSAR 238 nuclear island resolution of containment spray acidity controls. It also notes that, should later review indicate some incompatibility between materials in the GESSAR 238 design, alternative measures are available. There is no triable issue of fact here.

9. Staff speaks of a "promising solution" (Kane, p. 9), *i.e.,* replacement. Yet there is no commitment to do so in this case (MHB, p. 15-2).

In context, the cited passage in the Kane affidavit states there is a commitment. The MHB affidavit questions the schedule, and that question forms the basis for question 15-1, above. No additional triable issue exists here.

10. Statements (Kane, p. 14) such as "a special process is being developed" and "(G.E.) intends to implement . . ." are worthless to support a summary disposition.

There is no p. 14 in the Kane affidavit. Language similar to that quoted occurs at p. 10. In context, it is obvious that the processes referred to are simply two of many that are being used to combat IGSCC. We see no triable issue here.

11. Staff speaks of short and long-term programs to be a part of the final stage of review (Kane, p. 17), yet no schedule is given and no assurances are proffered that Black Fox will have anything to receive from these programs. This is another instance of "forget about it." Both Staff and Applicants refuse to acknowledge the fact that this problem has existed for years and nothing has been done to obtain a solution. The bandaid approach is hardly consistent with concerns about public health and safety.

There is no page 17 in the Kane affidavit. Staff uses the term "short-term" and "long-range" at pp. 15-2 and 15-3 of its motion, referencing the Kane affidavit at pp. 9 and 10. We dealt with this matter in treating argument 2., above. We see no triable issue here.

12. Staff admits that review is ongoing (Kane, p. 12) and, of equal

importance, that the Staff has (without authority in law) exempted items from those things which *may* mitigate cracking (Kane, p. 12).

The mention of ongoing review seems to the Board to be exactly the sort of description of status of a generic item which we feel is called for by *Gulf States Utilities Company* (River Bend Station, Units 1 and 2), ALAB-444, 6 NRC 760 (1977). We note also the so-called "exempted items" are matters which affiant states present readily adoptable alternatives within the state of the art. Intervenors do not suggest that any of Mr. Kane's assertions are untrue. We see no triable issue here.

13. Detecting a crack through leakage (Levine/Gordon, p. 4) is first an admission of the issue and second a wholly inappropriate way to deal with the problem.

It is merely asserted at the place cited that previous cracks have been detected "through leakage or by nondestructive test techniques." In context, this statement was made simply to bolster the point that IGSCC does not lead to rapid failure. We see no intent to rely on leak detection to deal with IGSCC. There is no triable issue here.

14. The G.E. program (as reflected by Levine/Gordon, p. 4) is unproven, and no facts are presented to demonstrate that it is subject to an adequate QA program.

The page cited simply describes the G.E. program to combat IGSCC. The Board feels that, had Intervenors reason to believe QA for this program is inadequate they should have timely proposed a contention to this effect. Absent such a contention, the argument is without foundation and is rejected.

15. Applicants' final statement is internally inconsistent (Blaisdell, p. 3). In one breath there is a reference to a leak *protection* system. Yet an altogether indifferent animal (a *detection* system) is then described.

We see no inconsistency in the affidavit. It is clear from the context that the means of "protection" mentioned is detection. There is no triable issue here.

16. It is not clear that Applicants agree to a resolution of the issue, at least as may be resolved by G.E. (Bridenbaugh, Dep., pp. 72, 74).

At the pages cited affiant, with many disclaimers such as "I haven't reviewed it that thoroughly," alleges that he is uncertain of the extent of PSO's commitment to replacement of austentic stainless as a measure to control IGSCC. It has been made abundantly clear that this approach is one

of two alternatives, both of which will be pursued. We see no hint of disagreement between Applicants and vendor and we see no triable issue here.

In sum, the motions with respect to Contention 15 are granted in part and denied in part. We will hear evidence respecting question 15-1 above.

Contention 18:

Intervenors contend that the Applicants have not demonstrated that they are financially qualified to build Black Fox 1 and 2.

Both Staff and Applicants have moved for summary disposition. Staff relies upon an affidavit of Michael Karlowicz. Applicants rely upon an affidavit of Dwane Glancy. Intervenors oppose the motion, but did not submit a supporting affidavit. We treat the Intervenors' numbered arguments in order.[3]

1. The Cooperatives have not received Federal funding. Intervenors will litigate this with the REA."

Intervenors' argument is scarcely a model of clarity. We presume by "Federal funding" the Intervenors refer to the Federally guaranteed borrowings mentioned at p. 6 of the Glancy affidavit and p. 7 of the Karlowicz affidavit. If so, we note that Karlowicz states:

> . . . Staff requires copies of the executed loan commitment notices and the executed joint ownership agreement as conditions to the construction permit.

This seems to the Board dispositive. If no guaranteed loans are available, no construction permit will issue. There is no triable issue of fact here.

2. Intervenors believe that Western Farmers will become subject to State regulations.

We are unable to conclude wherein this speculative argument is relevant to the contention at hand.

3. On page 18-2, Staff finds assurance in PSO being able to raise 61% of *two million dollars.* No doubt PSO could borrow 1.6 million—but here the issue is the ability to finance a project approximately four times bigger than PSO.

[3]In Intervenors' submittal the statements are numbered "1, 2, 3, 4, 5, 6, 7, 5, 6." We have taken the liberty of numbering the second 5-6 sequence 5.a. and 6.a. for clarity.

The Staff's reference to $2,042,300 at page 18-2 of its motion was a typographical error and, as explained in the Staff's letter of August 25, 1978, should not have appeared therein. We see no triable issue here.

4. Staff and Applicants fail to account for other large capital requirements of Applicants, especially coal plants.

It seems to the Board that the statement at pp. 5-6 of the Glancy affidavit to the effect that Black Fox Station represents only 35% of PSO's forecasted construction funds deals adequately with this point. There is no triable issue here.

5. The Central and Southwest return on equity, as it applies to financing this project, fails to account for the capital financing required for the three other utilities owned by it.

This argument is a barren one, unsupported by an affidavit or cited documentation. By contrast the Karlowicz affidavit, at pp. 2-4, indicates a satisfactory return on equity for both PSO and its parent. There is no triable issue of material fact.

6. Applicants' statements concerning such things as coverage ratios conflict with its position before the Oklahoma Corporation Commission.

The only mention of coverage ratio we see is at p. 6 of the Karlowicz affidavit. The loose terminology "such things as," used in the statement leaves us at a loss to determine exactly what is alleged. However, Intervenors appear to be levelling a rather serious charge, *viz*, that the Applicants have in some way provided contradictory figures on an important aspect of their financial condition to NRC and to the Oklahoma Corporation Commission. We will hear evidence on the following very narrow question:

18-1. Has PSO provided different data on coverage ratios for bonded debt to NRC and OCC, and if so, what is the reason for the difference?

7. Applicants' statement (p. J) that it exists in a "healthy regulatory climate" is another way of saying that all it had to do was ask. This situation is now changed. Even so, PSO left 10 million at its last rate case through "oversight."

The argument is unclear, not clarified by or supported by an affidavit, and has no apparent relevancy to the contention.

5.a. PSO has consistently been refused "construction work in progress" treatment of Black Fox. A copy of the most recent order is attached (see p. 3) and thus, Applicants' inference (Glancy, p. 5) in this regard is in error.

The document attached to Intervenors' response, an order of the Oklahoma Corporation Commission, far from "refusing" CWIP, says:

> [W]e see no reason to change or deviate from our standard policy in regard to CWIP; that is, an appropriate amount of CWIP to be included in the rate base . . . is that portion to be completed and in service during the 12-month period immediately succeeding the end of the test period. . . .

The Board sees no conflict between this and the assertion appearing at page 5 of the Glancy affidavit. There is no triable issue here.

6.a. A rate increase does *not* provide a rate of return contrary to Glancy page 5. At most a rate gives *only* an *opportunity* to earn a return.

Intervenors' argument is true (said truism is mentioned in the Karlowicz affidavit at p. 2-3), but we fail to see its relevance. While not guaranteeing any specific return, the fact that rate increases have been granted is reassuring for future financial stability. We see no triable issue here.

The motions with respect to Contention 18 are granted in part and denied in part. We will hear evidence bearing on question 18-1 above.

Contention 19:

> Intervenors contend that the Applicants have not adequately demonstrated that Black Fox 1 and 2 will comply with 10 CFR Part 50, Appendix A, Criteria A, Criteria 4, in that the potential dynamic effects on the containment associated with internally generated turbine missiles have not been adequately considered.

Both Staff and Applicants have moved for summary disposition. Staff relies upon an affidavit of Mr. Kazimieras Compe. Applicants rely upon an affidavit of Mr. R. Stippich. Intervenors oppose the motions, relying upon portions of the MHB affidavit.

We have reviewed all the submissions and we are convinced that material issues of fact remain unresolved. We will not, in this case, treat each of Intervenors' arguments in detail since we believe their sum is of sufficient validity to justify denying the motions. We will, however, specify the following questions as being matters which should be specifically addressed by the parties.

19-1. What bearing, if any, do TAP-32 and TAP-37 have upon the review of BFS, and, if they do bear upon that review, what is their status?

19-2. Are the probabilities of failure per turbine-year mentioned in

the Staff's motion at p. 19-2 and in Reg. Guide 1.115, Rev. 1, in agreement with each other (cf. MHB affidavit Section C at p. 19-2)?

19-3. Which version of Reg. Guide 1.115 is applicable to BFS? Are there significant differences between Rev. 0 and Rev. 1?

Contention 66:

The Applicants' present design does not adequately protect the public from the potential consequences of sabotage at the Black Fox plant in that the plant does not require sufficient structural integrity and safety redundancy to thwart a saboteur.

We understand from the affidavit of a Staff employee (William Ross) that on May 14, 1976, Applicants submitted a physical security plan of a preliminary nature in Amendment 3 to the Preliminary Safety Analysis Report. Asserting that security is a function of design, the Intervenors contend that contrary to the new regulations, 10 CFR 73.55, published on February 24, 1977 (42 Fed. Reg. 10838), Applicants have not issued an updated security plan and thus the present plant design does not meet regulatory requirements. Applicants assert that the plant is being designed to comply with 10 CFR 73.55 requirements, and that, while its security plan was submitted prior to the adoption of Section 73.55, it has committed to comply with those requirements (E.L. Cox's affidavit). The Staff asserts that Applicants submitted the preliminary physical security plan in compliance with 10 CFR 50.34(c) and affirms that Applicants have committed to comply with Section 73.55 (Ross affidavit).

We are unaware of any applicable regulation, and none has been cited by the parties, that requires an Applicant for a construction permit to submit at that stage even a preliminary physical security plan, let alone an updated security plan.[4] Recognizing that a security plan need not be submitted until the operating stage, the Staff states that it believes by maintaining close contact with Applicants during the design and early construction stages, that the physical components of a security plan can be implemented in a timely manner and any changes in regulations can be factored into the evaluation of the overall plan (Ross affidavit, p. 4). Since Applicants and the Staff are proceeding in this manner to implement the physical components of the security plan and since the security plan will be submitted in conjunction with the Final Safety Analysis Report at the operating phase of

[4]10 CFR 50.34(c) and 73.55 require that every *licensee* who is authorized *to operate* a nuclear power reactor must submit a very detailed physical security plan.

the licensing process (Ross affidavit, p. 4), there is obviously no need for an updated security plan and the regulations do not require one at this time. However, the MHB affidavit (p. 66-2) suggests that there is a need for consideration of security measures at the early design stage of a nuclear plant, and further suggests, citing TAP A-29, that requirements at the early stage may be increased in the future.

We will hear evidence on the question:

66-1. What relevance does TAP A-29 have to the construction permit proceeding for BFS? If it has relevance, what is its status?

Accordingly, the motions are granted in part and denied in part. We will, as noted above, hear evidence on quesiton 66-1.

Additional Contention No. 1 (A-1):

Intervenors contend that Applicants and Staff have not adequately analyzed the cause and means of prevention of explosions resulting from hydrogen escaping from the off-gas system. Such explosions are apparently limited to BWR reactors and have associated secondary explosions, *e.g.*, ignition of hydrogen in the base of the effluent release stack.

The Staff moved for summary disposition of this contention as part of its motion on other contentions. Applicants in a separate filing dated July 14, 1978, moved for summary disposition. Staff relies upon an affidavit of Mr. Jacques Boegli. Applicants rely upon an affidavit of Mr. Aaron Levine. Intervenors oppose the motion, relying upon parts of the MHB affidavit.

We have read the submittals and are gratified to note many changes have been effected such as steam-dilution and redesigned seals, which are intended to mitigate the conditions that have caused explosions in the past.

We note that, with respect to this matter, Applicants assert that we misconstrue Chairman Hendrie's remarks in his letter of February 9, 1978, to the Honorable John Dingell, Chairman of the Subcommittee on Energy and Power, Committee on Interstate and Foreign Commerce, U.S. House of Representatives. Applicants imply that all necessary requirements aimed at prevention of explosions have already been imposed on reactors such as Black Fox, and suggest we erred in asking what additional measures were proposed here (Applicants' Motion for Summary Disposition Off-Gass Explosion Contention (Motion) at pp. 5-6). But, in virtually the same breath, Applicants admit that the sealing system described in the Levine affidavit is the subject of an as yet unpublished PSAR revision. The seal system, we

note, was a prime factor in making the Millstone explosion more damaging than others. The Levine affidavit is, in our estimation, quite inexplicit on the details of the proposed redesign.

We feel that granting summary disposition before this new design is fully explored in our record would be premature. Further, we note (MHB affidavit, pp. A-1-2 and A-1-3) and alleged connection between natural phenomena and gas explosions that is nowhere addressed by Applicants and Staff.

We feel that such matters as design changes in the seal values, relative effectiveness of steam dilution, performance records of recombiners, protection from natural phenomena, and other details of the hydrogen explosion protection system are precisely the sort of matters that should be thoroughly aired in the record and subjected to the test of cross-examination. Accordingly, the motions for summary disposition of Contention A-1 are denied.

IT IS SO ORDERED.

THE ATOMIC SAFETY AND
LICENSING BOARD

Dr. Paul W. Purdom, Member

Frederick J. Shon, Member

Sheldon J. Wolfe, Esquire
Chairman

Dated at Bethesda, Maryland,
this 8th day of September 1978.

Cite as 8 NRC 366 (1978) LBP-78-31

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

John F. Wolf, Chairman
Hugh K. Clark
Joseph F. Tubridy

In the Matter of Docket Nos. 50-483
50-486

UNION ELECTRIC COMPANY

(Callaway Plant, Units 1 and 2) September 28, 1978

In order to permit the Nuclear Regulatory Commission to carry out its principal task in regulating the commercial use of nuclear power to assure the public health and safety, the Licensing Board holds that suspension of construction permits is required in light of licensee's and contractor's refusal to permit a necessary NRC investigation which was prompted by the firing of an employee who reported construction problems. The Board also holds that the investigation should not be delayed pending the outcome of the ongoing grievance proceeding, since the results of that investigation will not be controlling in this show cause matter. Finally, it finds "implied issues" raised by intervenor (former employee) concerning the NRC's authority to protect a construction worker fired for making safety complaints to the NRC to be beyond its jurisdiction.

NRC: AUTHORITY TO INVESTIGATE

The Commission has ultimate responsibility and authority for such investigations and inspections as it deems necessary to protect public health and safety, and it may not be impeded by a licensee or contractor.

NRC: AUTHORITY TO INVESTIGATE

Proposed investigation of discharge of employee who reported construction problems was within Commission's statutory and regulatory authority to protect public safety.

NRC: AUTHORITY TO INVESTIGATE

Nuclear Regulatory Commission licensees voluntarily subject themselves "to a full arsenal of governmental regulations."

NRC: AUTHORITY TO INVESTIGATE

Because the atomic energy industry is pervasively regulated, lawful inspections of licensees' activities fall within the "warrantless search" exception set forth in *Marshall* v. *Barlow's, Inc.*,_____U.S._____, 56 L.Ed. 2d 305 (May 23, 1978).

RULES OF PRACTICE: SUSPENSION OF PERMITS

Refusal by licensee and contractor to permit staff investigation deemed necessary to protection of public health and safety is serious enough to warrant drastic remedy of permit suspension, since it interferes with the Commission's duty and responsibility to assure the public safety.

INITIAL DECISION ON ORDER TO SHOW CAUSE

Appearances

Gerald Charnoff, Esq., William Bradford Reynolds, Esq., and John L. Carr, Esq., Shaw, Pittman, Potts & Trowbridge, 1800 M Street, N.W., Washington, D.C. 20036; on behalf of Union Electric Company, Licensee

Michael Bancroft, Esq., and Diane Cohn, Esq., Public Citizen Litigation Group, 2000 P Street, N.W., Washington, D.C. 20036; on behalf of William Smart, Intervenor

James P. Murray, Esq., and James Lieberman, Esq., Office of the Executive Legal Director, Nuclear Regulatory Commission, Washington, D.C. 20555; on behalf of the Regulatory Staff.

I. INTRODUCTION

The Union Electric Company, St. Louis, Missouri (Licensee), is the holder of construction permits numbered CPPR-139 and CPPR-140 (the

license) issued on April 6, 1976, by the U.S. Nuclear Regulatory Commission (NRC or Commission). The license authorizes the construction of the Callaway Plant, Units 1 and 2. The Daniel Construction Company (construction contractor), a division of Daniel International Corporation, is engaged in construction activities authorized by the license pursuant to a contract with the Licensee.

Mr. William Smart, while an employee of the construction contractor working at the Callaway Plant site, made allegations to the Commission's safety inspector concerning construction problems which if uncorrected could lead to unsafe conditions in a licensed activity. Thereafter, on March 21, 1978, Mr. Smart was discharged by the construction contractor. A grievance proceeding was instituted in accordance with Article VII of the Callaway Project Agreement beteween the construction contractor and the unions involved.[1] This grievance procedure is still underway.

On March 30, 1978, duly authorized NRC inspectors sought to examine records pertaining to the firing of Mr. Smart, and to question personnel who might have knowledge concerning the circumstances of his firing. The construction contractor refused to permit the inspectors to have access to information concerning the termination of Mr. Smart's employment.

On April 3, 1978, pursuant to 10 CFR 2.202, the Director of NRC's Office of Inspection and Enforcement issued an order addressed to the Union Electric Company to show cause why the construction license for the Callaway Plant (Units 1 and 2) should not be suspended until such time as the Licensee, including its employees, agents, and contractors engaged in activities under the license, submits to an investigation of pertinent records and personnel.

The Licensee's answer dated April 21, 1978, demanded a hearing, if adequate cause were not deemed shown by its answer. The Director, after considering the answer, determined that adequate cause had not been shown. Subsequently, on May 11, 1978, the Nuclear Regulatory Commission issued a notice of hearing, appointed the members of this Board to hear the matter, and stated two issues which it instructed the Board to consider and decide.

On June 15, 1978, Mr. Smart filed a petition to intervene in these proceedings. His petition was granted by the Board.

A prehearing conference was held on June 16, 1978. Attorneys for the Licensee, Intervenor Smart, and the NRC Staff were present. A stipulation of fact by counsel for the NRC Staff and counsel for the Licensee was filed.[2] Subsequently, on June 27, 1978, William Smart filed an agreement to

[1] P. 11 of Licensee's Brief dated April 21, 1978.

[2] **Stipulation:** "For the purposes of the hearing on the Show Cause Order issued in the above matter by the Director, Office of Inspection and Enforcement, on April 3, 1978, the under-

(Continued on next page.)

the stipulation.

The stipulation of June 15, 1978, stated, *inter alia,* that the fact stipulated in paragraphs 1 through 8 disposed of the first issue which the Nuclear Regulatory Commission had directed this Board to consider and decide. The second issue established by the Commission is primarily a question of law. For these reasons, the parties have stipulated that there was no need for an evidentiary hearing to resolve the issues in this case. However, oral arguments were made by the parties to the Board on August 23, 1978. At that hearing, Board's Exhibit 1 was received.

(Continued from previous page.)
signed counsel hereby stipulate and agree to the following factual matters relevant to the Licensing Board's inquiry:

"1. The Daniel Construction Company, a Division of Daniel International Corporation, is a contractor engaged in construction activities which are authorized under Construction Permit Nos. CPPR-139 and CPPR-140 issued to the Union Electric Company to construct the Callaway Plant, Units 1 and 2.

"2. William Smart, an employee of Daniel Construction Company (Daniel) assigned to work at the Callaway construction site, was fired by Daniel on March 21, 1978.

"3. Prior to Mr. Smart's firing, he had made allegations to the Commission concerning safety problems at the Callaway Plant, which allegations have been investigated by the Nuclear Regulatory Commission (NRC).

"4. Union Electric and Daniel have not obstructed any NRC investigation of allegations by William Smart pertaining to the quality of construction and design at the Callaway site; those investigations did not disclose any circumstances warranting suspension of the construction permits.

"5. Grievance procedures have been invoked by William Smart in connection with his firing and pursuant to those procedures the matter has now been submitted to arbitration; it is not now known when the grievance procedures will be completed.

"6. On March 30, 1978, duly authorized NRC inspectors attempted to examine records pertaining to the firing of Mr. Smart and personnel who might have knowledge concerning the circumstances of his firing.

"7. The Order to Show Cause of April 3, 1978, issued by the Director, Office of Inspection and Enforcement, states that the purpose of the investigation was to determine (a) whether a construction worker engaged in activities under the license was discharged because the worker made allegations to the Commission concerning alleged construction problems which, if uncorrected, could lead to unsafe conditions at the Callaway facility jeopardizing the public health and safety, (b) whether the Commission's regulations should be amended to provide expressly that all workers involved in licensed activities under the construction permit are encouraged to communicate with the Commission concerning matters which could jeopardize the public health and safety and to expressly prohibit any retaliation by employers against workers who do so, and (c) whether there may now exist at the Callaway facility potentially unsafe conditions, the existence of which has not been communicated to the Commission because of the chilling effect on workers at the site of any perception on such workers' part that a worker was discharged because he alleged potentially unsafe conditions to the Commission.

"8. Daniel did not permit the NRC investigators to inspect its records or interview Daniel personnel regarding the cause of William Smart's dismissal, and Union Electric Company (Union Electric) did not compel Daniel to make its records relating to the firing of its per-

(Continued on next page.)

II. IMPLIED ISSUES RAISED BY MR. SMART

In agreeing to the stipulation, Mr. Smart contended that there were implied issues in those stated in the Commission's notice of hearing (May 11, 1978).

His contention reads as follows:

> As to the issues before the Board, Mr. Smart maintains that implicit in the Commission's notice of hearing (May 11, 1978) are the issues of (1) the NRC's authority to protect a construction worker fired for making safety complaints to the NRC and (2) the proper mechanism for asserting that authority. These issues are raised by the Commission's concern with the "chilling effect" (Notice of Hearing, p. 2) of a retaliatory firing on the willingness of construction workers at Callaway to communicate safety concerns to the NRC. This chilling effect will not be dispelled by establishment merely of the NRC's authority to investigate charges of retaliatory job discrimination. Rather, a construction worker contemplating communication with the NRC, knowing that his identity may be revealed by the content and circumstances of his charges, needs to know whether the NRC can protect him from retaliatory job discrimination.

Counsel for the NRC Staff and for the Licensee both argue that the implied issues raised by Mr. Smart should be decided after an investigation has established the facts, since to do otherwise would be to make decisions based on pure speculation. Additionally they argue that Mr. Smart's implied issues are not fairly within the scope of the issues posed to this Board by the Commission, and hence, their decision is beyond the jurisdiction of the Board.[3]

(Continued from previous page.)

sonnel available to the NRC for such an investigation.

"The undersigned counsel agree that the foregoing stipulated factual matters dispose of the first of the two issues set out in the notice of hearing issued by the Commission on May 11, 1978.

"As to the second issue in the notice of hearing, the parties agree that the remaining matters to be considered are (a) the legal authority of the Nuclear Regulatory Commission to conduct an investigation into the cause of the dismissal of Mr. Smart; (b) assuming that the Commission has such authority, the manner in which and circumstances under which such authority may be exercised; (c) whether the NRC should defer its investigation to the ongoing grievance proceeding invoked by Mr. Smart; and (d) the appropriate remedy, if any, if it is determined that the requested investigation should have been permitted.

"In view of the foregoing and the absence of any factual dispute, the undersigned counsel agree that the remaining matters as set out in the preceding paragraph can and should be handled by briefs and oral argument as necessary . . . ."

[3]Staff Brief of July 5, 1978, pp. 2 and 3; Licensee's Brief of August 16, 1978, pp. 11 and 12.

After careful consideration, the Board finds that the arguments of the NRC and the Licensee are persuasive. The Board further finds that the issues proposed by Mr. Smart are beyond its jurisdiction. Accordingly, no decision as to those "implied" issues will be included in this Initial Decision.

III. THE FIRST ISSUE

The first issue established by the Commission to be resolved by this Board reads as follows:

> (1) Whether the Commission in its investigation was denied access to records and personnel relating to the termination of a worker who had alleged construction problems which if uncorrected could lead to unsafe conditions in an activity licensed by the Commission.

All of the parties to this proceeding have agreed that the issue numbered (1) contains a true statement of the facts referred to therein (Tr. 75-76). The Board, relying on the evidence in the record, finds that the answer to the question posed by the first issue is yes (Stipulation of June 15, 1978; Tr. 75-76; Board's Ex. 1; Smart's Agreement to Stipulation).

Therefore, the Board finds, as a fact, that "the Commission in its investigation was denied access to records and personnel relating to the termination of a worker who had alleged construction problems which if uncorrected could lead to unsafe conditions in an activity licensed by the Commission."

IV. THE SECOND ISSUE

The second issue established by the Commission to be resolved by this Board follows:

> (2) Whether Construction Permits No. CPPR-139 and No. CPPR-140 should be suspended until such time as the Licensee, including its employees, agents, and contractors engaged in activities under the license, submits to investigation and inspections as the Commission deems necessary and as authorized by the Atomic Energy Act of 1954, as amended, [and] in the Commission's regulations.

1. The Nuclear Regulatory Commission's Duty and Authority

(a) The Commission's Duty to Protect the Public Health and Safety

The Congress of the United States in Chapter 1, Section 2d, of the Atomic Energy Act of 1954, as amended (hereinafter, the Atomic Energy

Act or the Act),[4] made the following findings relating to regulating to protect public health and safety.

> d. The processing and utilization of source, byproduct, and special nuclear material must be regulated in the national interest and in order to provide for the common defense and security and *to protect the health and safety of the public.* [Emphasis added.]

The courts have interpreted the Act to mean that the Nuclear Regulatory Commission's principal task in regulating the commercial use of nuclear power is to assure the public health and safety.

In its opinion on reconsideration in *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-315, 3 NRC 101, 103-104 (1976), the Atomic Safety and Licensing Appeal Board noted the broad extent of the Commission's regulatory control in connection with the granting of both construction and operating permits. It stated:

> . . . Under [the Atomic Energy] Act, a utility seeking permission to build a nuclear power plant must satisfy the Commission at a public hearing that its application meets the prerequisites for that privilege. It is equally true that the Commission's award of a construction permit carries with it no concomitant right to operate the completed facility. Rather, to obtain an operating license, the Act requires the utility to shoulder once again the burden of proving to the Commission (at a public hearing if need be) that it has, *inter alia,* constructed the plant in conformity with its application, the Act, and the Commission's rules and regulations. And even at this late stage the Act permits the Commission to withhold the license for good cause. It was not happenstance that Congress structured Atomic Energy Act procedures in this manner. Rather, it was intentionally done to make certain that public safety was a paramount issue at every stage in processing applications for commercial use of nuclear power. As the Supreme Court has noted with approval, the Commission has interpreted the Atomic Energy Act to mandate "that the public safety is the first, last, and a permanent consideration in any decision on the issuance of a construction permit or a license to operate a nuclear facility." *Power Reactor Company* v. *Electricians,* 367 U.S. 396, 402 (1961) . . . .

(b) The Commission Regulatory Authority

The Atomic Energy Commission had broad authority under Section 103a of the Atomic Energy Act[5] to regulate the commercial use of nuclear

[4] 42 U.S.C. 2042, Section 2(d).
[5] 42 U.S.C. 2133.

energy. This section reads:

> a. The Commission is authorized to issue licenses to persons applying therefore to transfer or receive in interstate commerce, manufacture, produce, transfer, acquire, possess, use, import, or export under the terms of an agreement for cooperation arranged pursuant to Section 123, utilizaiton or production facilities for industrial or commercial purposes. Such licenses shall be issued in accordance with the provisions of Chapter 16 and subject to such conditions as the Commission may by rule or regulation establish to effectuate the purposes and provisions of this Act.

This authority of the Atomic Energy Commission was transferred to the Nuclear Regulatory Commission by Section 201(f) of the Energy Reorganization Act.[6] This section reads, in part, as follows:

> (f) There are hereby transferred to the Commission all the licensing and related regulatory functions of the Atomic Energy Commission, the Chairman, and members of the Commission . . . .

In *Siegel* v. *Atomic Energy Commission,* 400 F.2d 778, 783 (D.C. Cir. 1968), the court pointed out that:

> . . . Congress agreed [as to the desirability of flexibility] by enacting a regulatory scheme which is virtually unique in the degree to which broad responsibility is reposed in the administering agency, free of close prescription in its charter as to how it shall proceed in achieving the statutory objectives.

Under the Atomic Energy Act of 1954, as amended, the Federal Government gave up its monopoly of nuclear energy and a civilian nuclear industry was created. However, the Federal Government retained important regulatory power over private nuclear activities.[7] In *Train* v. *Colorado Public Interest Research Group,* 426 U.S. 1, 24 (1976), the Supreme Court found no subsequent Congressional intention to alter "the pervasive regulatory scheme embodied in [the Atomic Energy Act]."

To achieve the goal of assuring public safety, the Commission's inspectors monitor the construction of nuclear plants to ascertain whether or not they conform with designs and specifications and the Nuclear Regulatory Commission's safety standards. Monitoring is done by sampling, based on inspection of construction records and physical inspection of a small

[6] 42 U.S.C. 5801.

[7] *Northern States Power Company* v. *State of Minnesota,* 447 F.2d 1143, 1148 (CA8, 1971, aff'd 405 U.S. 1035 (1972)).

percentage of the work. The primary goal of monitoring is to make certain that the Licensee's quality assurance (QA) program is working effectively.[8]

If there are inadequacies in the QA programs, workers on the site can be of great assistance to the Commission by bringing construction flaws to the attention of NRC inspectors. It is the reporting to the Commission's inspectors of such information relating to safety, by a worker who was subsequently discharged by the construction contractor, that preceded the impass that has arisen between the Licensee and Commission over the Commission's demand that it be permitted to make investigations and inspections which it deems necessary and as authorized by the Act, and the Commission's regulations.

(c) The Commission's Authority to Investigate

Under §§161(c) and (o) of the Atomic Energy Act, the Commission is given broad authority to investigate and inspect as it deems necessary to assist it in exercising its authority to effectuate the purpose of the Act. These sections read, in part, as follows:

> . . . make such . . . investigations, obtain such information . . . as the Commission may deem necessary or proper to assist it in exercising any authority provided in this Act . . . [§161(c)],

and to

> . . . provide for such inspections of . . . activities under licenses issued pursuant to section . . . 103 . . . as may be necessary to effectuate the purpose of this Act . . . [§161(o)].

The Commission has both the duty and the authority to make such investigations and inspections as it deems necessary to protect the public health and safety. While the QA programs are designed to give the Licensee and its contractor a major role in making inspections and investigations, the Commission has by statute the ultimate duty and responsibility for safety inspections and investigations. In the instant situation, the NRC inspectors were attempting to carry out that ultimate responsibility and the refusal of the construction contractor to permit the NRC inspectors to perform their duty is indefensible.

2. Views of the Licensee and NRC Staff Concerning the Issues

The first point stated as one agreed to by the parties is that the issue raised is one of first impression (on p. 2 of its reply brief of August 16,

[8]NRC's Inspection Program, see NUREG-0397, March 1978, p. 6; footnote 8 on page 14 of NRC Staff's Brief, dated August 4, 1978; Tr. 80-81.

1978, Union cites its brief of July 24, 1978, at p. 7; NRC Brief of August 4, 1978, at p. 17). The said reply brief of Union Electric Company on page 3 then states:

> . . . the parties are in agreement that the proper reference point for decision is the language contained in Sections 161(c) and 161(o) of the Atomic Energy Act, 42 U.S.C. 2201(c) and 2201(o). No one denies that these sections are broadly framed; but neither is it suggested by anyone that their reach is unlimited (see Opening Br. at pp. 8-10; NRC Br. at pp. 13, 19; Smart Br. at pp. 13-15). What they authorize, as recognized by all parties, are such inspections or investigations as may be necessary to effectuate the purposes of [the] Act (Section 161(o)), or as may be necessary or proper to assist [the Commission] in exercising any authority provided in [the] Act . . . (Section 161(c)).
>
> It is on the basis of this common understanding that the present inquiry has, quite correctly, been narrowed to the "public health and safety" concerns that undergird the Atomic Energy Act. As the several briefs have argued in differing terms, *the crux of the issue presented by the show cause order is whether an inspection into the causes of an employee's discharge is properly perceived as a "safety investigation."* [Emphasis added.]

The Licensee argues, of course, that such investigation into the cause of a worker's discharge must be perceived as an investigation of a labor dispute. It has summarized its argument as follows:

> Our sole opposition in this case relates to the efforts by NRC to conduct its own investigation of the discharge decision. Such agency involvement in labor relations matters is, we submit, *not* authorized by statute, *not* contemplated by the Commission's own regulations, *not* accepted by the Supreme Court in the absence (as here) of fundamental procedural safeguards against governmental intrusion on privacy rights, and, finally, *not* recommended as a matter of sound policy where there exist parallel grievance proceedings already examining the same disciplinary action. Accordingly, Daniel Construction's refusal of access was in the present circumstances appropriate and should be upheld, not condemned. [P. 27 Licensee's Brief dated July 24, 1978.]

The Staff's position is that the investigation and interrogation are necessary in the interests of public health and safety, and they cannot be properly carried out so long as investigators are denied access to employees and records pertinent to the investigation. In answer to the Licensee's assertion that the matter is a labor dispute and outside of the Commission's

jurisdiction, the Staff maintains that it is a matter governed by the Atomic Energy Act, subject to adjudication by the NRC and that they are not mutually exclusive.

3. The Nature of the Investigation Contemplated by the Commission

The Commission, asserting authority under the Act, acting through its Office of Inspection and Enforcement, sought and was denied access to records and personnel necessary to conduct an investigation to determine:

> (1) whether a construction worker engaged in activity under the license was discharged because the worker made allegations to the Commission concerning alleged construction problems, which, if uncorrected, could lead to unsafe conditions at the Callaway facility jeopardizing the public health and safety;
>
> (2) whether the Commission's regulations should be amended to provide expressly that all workers involved in license activities under a construction permit are encouraged to communicate with the Commission concerning matters which could jeopardize the public health and safety and to expressly prohibit any retaliation by employers against workers who do so; and
>
> (3) whether there may now exist at the Callaway facility potentially unsafe conditions, the existence of which has not been communicated to the Commission because of the chilling effect on workers at the site of any perception on such worker's part that a worker was discharged because he alleged potentially unsafe conditions to the Commission. [Notice of Hearing, pp. 1 and 2.]

The Board finds that the investigations which the Commission has sought and continues to seek to carry out at Union Electric Company's plant are directed toward assuring that the plant is constructed according to the approved design. They are clearly for the purpose of carrying out a statutory purpose, *i.e.*, public safety for which the Commission has responsibility.[9] The Board further finds that the proposed investigations and inspections are within the statutory authority of the Commission[10] and its regulations.[11]

The Board concludes that the Commission is authorized by the Atomic

[9] 42 U.S.C.A. 2012.
[10] 42 U.S.C.A. 2201(c) and 2201(o).
[11] 10 CFR 50.70.

Energy Act of 1954, as amended, and its regulations to make the investigations and inspections as outlined above in the three paragraphs quoted from the notice of hearing to assure the public health and safety.

4. A Warrant is Not Required for NRC Inspections

The atomic energy industry is an example of a pervasively regulated industry, and accordingly, lawful inspections of licensees' activities are within the warrantless search exception for a "closely regulated industry" delineated by the United States Supreme Court in *Marshall* v. *Barlow's, Inc.*,_____U.S._____, 56 L.Ed.2d 305, 46 U.S.L.W. 4483 (May 23, 1978).

Nuclear Regulatory Commission licensees voluntarily subject themselves "to a full arsenal of governmental regulation" including 10 CFR 50.70, which provides;

> Each licensee and each holder of a construction permit shall permit inspection, by duly authorized representatives of the Commission, of his records, premises, activities, and of licensed materials in possession or use, related ot the license or construction permit as may be necessary to effectuate the purpose of the Act, including Section 105 of the Act.

Licensee's submission to all applicable NRC regulations constitutes advance consent to lawful inspections, and therefore no warrant is required for such inspections.

5. NRC Should Not Defer Its Investigation to the Ongoing Grievance Proceeding Between the Worker and Contractor Here Involved

In addition to the two issues which the Commision placed before this Board to consider and decide, it "authorized [the Board] to resolve the Licensee's contention that NRC should defer its investigation to the ongoing grievance proceeding between the worker and contractor here involved."

All of the parties to this proceeding have stipulated that paragraphs 1 through 8 of the stipulation of June 15, 1978, disposes of the first issue (p. 3, Stipulation of June 15, 1978). The Board finds that, on the basis of the record in this matter, the first issue established by the Commission has been resolved (Stipulation of June 15, 1978; Board's Ex. 1; Tr. 75-76).

The second issue established by the Commission in this matter involves an evaluation of the propriety of imposing a sanction of suspension on the construction of the Callaway Plant until such time as the barriers to the in-

vestigations and inspections are removed by the Licensee. It also presents the question of the Commission's authority under the Act and its regulations to carry out the inspections and investigations it deems necessary.

The Licensee has expressed a fear that the investigation by representatives of NRC might adversly affect the grievance procedure currently underway. The Board believes this fear to be groundless. However, the safety matter is paramount and the risk perceived by the Licensee is not deemed a good reason for delay. The Board finds that the NRC investigation should not be delayed pending the outcome of the grievance proceeding.

6. Whether Construction Permits Should Be Suspended Until the Investigation Barrier Is Removed

It is, of course, recognized that the drastic sanction of suspension of a license should not be applied by the NRC in administering the Atomic Energy Act without ample justification. A sense of fairness, as well as the statutory authority and the regulations[12] support that conclusion, as does case law on the point.[13]

In the instant matter, the Licensee and contractor have refused to permit duly authorized representatives of the Commission to conduct an investigation which was projected when an employee of the contractor was fired after he had reported construction problems to Commission personnel.

The barrier to the investigation which the Licensee and contractor have set up is clearly contrary to the statutory and regulatory authority of the Commission.[14]

Is the refusal to the Licensee and the contractor to permit the investigation of such serious import as to warrant suspension of the construction license?

Public health and safety is an overriding consideration in any decision related to the construction and operation of a nuclear facility.[15] Accordingly, the Board finds that the Licensee and contractor's refusal to permit the investigation is intolerable since it interferes with the Commission's duty and responsibility to assure the public safety.

For the reasons set forth above, the Board finds that the drastic remedy of suspension of the construction license is required.

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[12] 42 U.S.C. 2236(a); 10 CFR 50.100.

[13] *Virginia Electric and Power Company,* ALAB-324, 3 NRC 347, 389 (1976).

[14] 42 U.S.C. 2201(c) and 2201(o); 10 CFR 50.70.

[15] *Power Reactor Co.* v. *Electricians,* 367 U.S. 396, 402 (1961).

Addenda

All requests for transcript corrections are hereby granted. Mr. Murray's letter of September 20, 1978, correcting an error in the statement of counsel found on pages 86-87 of the transcript in response to a question by a Board member on page 85 of the transcript, is accepted. Mr. Murray's earlier letter of September 15, 1978, on the same topic, and attachments thereto, are rejected as unduly prolix and cumulative.

Mr. Charnoff, Counsel for Licensee, during a telephone conference between the Board and counsel for the parties, made a motion for permission to insert certain documents into the record, which relate primarily to remedies to be employed when situations are found to exist involving retaliatory discharges. They are beyond the scope of this opinion, and hence the motion is denied. These documents were identified by Counsel for the Licensee as follows:

1. Senate Bill S. 2584, to authorize appropriations to the Nuclear Regulatory Commission in accordance with Section 261 of the Atomic Energy Act of 1954, as amended, and Section 305 of the Energy Reorganization Act of 1975, as amended, and for other purposes. This bill is currently before the Senate Committee on Environmental and Public Works.

2. Report SECY-78-308 to the Nuclear Regulatory Commission, dated June 9, 1978, from Robert B. Minogue, Director, Office of Standards Development, to the Executive Director of Operations, captioned "Individuals Who Provide Information to NRC; Remedies in the Event of Discrimination and Penalties for a Person That Discriminates," and the attachments thereto.

V. ORDER

On the basis of the Board's findings and conclusions in this Initial Decision, and pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's rules and regulations, IT IS ORDERED that the Director, Office of Inspection and Enforcement, is authorized to suspend construction permits No. CPPR-139 and No. CPPR-140 until such time as the Licensee, including its employees, agents, and contractors engaged in activities under the license, submit to such investigations as the Commission deems necessary and as authorized by the Atomic Energy Act of 1954, as amended, [and] the Commission's regulations.

IT IS FURTHER ORDERED, in accordance with 10 CFR 2.760, 2.762, 2.764, 2.785, and 2.786, that this Initial Decision shall become effective

within thirty (30) days after the date of issuance, and shall constitute, with respect to the matters covered therein, the final action of the Commission thirty (30) days after the date of issuance hereof, subject to any review pursuant to the Commission's Rules of Practice. Exceptions to this Initial Decision may be filed by any party within ten (10) days after service of this Initial Decision. Within thity (30) days thereafter (forty (40) days in the case of the Staff), any party filing such exceptions shall file a brief in support thereof. Within thirty (30) days of the filing of the brief of the Appellant (forty (40) days in the case of the Staff), any other party may file a brief in support of, or in opposition to, the exceptions.

ATOMIC SAFETY AND
LICENSING BOARD

Joseph F. Tubridy

Hugh K. Clark

John F. Wolf, Chairman

Dated at Bethesda, Maryland,
this 28th day of September 1978.

[Appendix A has been omitted from this publication but is available for inspection at the NRC Public Document Room, 1717 H Street, N.W., Washington, D.C.]

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Jerome E. Sharfman, Chairman
Richard S. Salzman
Dr. W. Reed Johnson

In the Matter of

Docket Nos. STN 50-508
STN 50-509

WASHINGTON PUBLIC POWER SUPPLY SYSTEM, et al.

(WPPSS Nuclear Project Nos. 3 and 5)

October 2, 1978

Intervenor's motion to have the Appeal Board consider four questions is dismissed for want of jurisdiction.

RULES OF PRACTICE: JURISDICTION OF APPEAL BOARD

The Appeal Board's jurisdiction over a cause not otherwise before it expires when the time for Commission review of the Board's decision has run. 10 CFR 2.717(a).

Mr. Joseph B. Knotts, Jr., Washington, D.C., for applicant Washington Public Power Supply System.

Mr. James E. Duree, Westport, Washington, for Citizens for a Safe Environment.

Mr. Daniel T. Swanson for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

On August 17, 1978, Citizens for a Safe Environment ("CASE") filed a document asking this Board, "in its review," to consider four questions.[1]

[1]Apparently CASE's document was not served on all the parties until September 11th.

The applicant and staff have pointed out in reply that there is no review pending before us and the staff adds that we no longer have jurisdiction of the proceeding. They are correct.

This was an uncontested proceeding. CASE had petitioned to intervene before the Licensing Board, but its petition was denied. See LBP-77-25, 5 NRC 964, 969 (1977). CASE did not appeal that denial under 10 CFR 2.714a. The Licensing Board thereafter rendered its final decision on April 10, 1978, which we reviewed on our own motion and affirmed on June 7, 1978. ALAB-485, 7 NRC 986. The time in which the Commission might have elected to review our June 7th decision expired 30 days later. 10 CFR 2.786(a). At that time, any residual jurisdiction that we retained also expired 10 CFR 2.717(a). Consequently, CASE's August 17th request is *dismissed* for want of jurisdiction.

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Richard S. Salzman

In the Matter of Docket No. STN 50-485

ROCHESTER GAS AND ELECTRIC CORPORATION, et al.

(Sterling Power Project, Nuclear Unit No. 1) October 19, 1978

The Appeal Board retains jurisdiction over the environmental impact of radon releases arising from the mining and milling of uranium and over the need for power from the facility. LBP-77-53, 6 NRC 350 (1978), is *affirmed* on all other issues.

NEPA: NEED FOR POWER

There is little doubt that under the Atomic Energy Act of 1954 State public utility commissions or similar bodies are empowered to make the initial decision regarding the need for power. *Vermont Yankee Nuclear Power Corp.* v. *NRDC,* 435 U.S.____, ____(1978). However, the Commission's responsibility for analyzing the need for power from a nuclear plant arises primarily from the National Environmental Policy Act rather than the Atomic Energy Act.

NEPA: INDEPENDENT INQUIRY BY FEDERAL AGENCY

The National Environmental Policy Act does not prevent the Commission from placing heavy reliance on the judgment of local regulatory bodies on the issue of need for power. *Carolina Power & Light Company* (Shearon Harris Nuclear Power Plant, Units 1, 2, 3, 4), ALAB-490, 8 NRC 234, 241 (August 23, 1978).

NEPA: COST-BENEFIT BALANCE

" 'Need for power' is a shorthand expression for the 'benefit' side of the cost-benefit balance which NEPA mandates for a proceeding considering the licensing of a nuclear power plant." *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-422, 6 NRC 33, 90 (1977).

NEPA: NEED FOR POWER

The need for power findings and conclusions of the New York State Board on Electric Generation Siting and the Environment will be given great weight unless shown to rest upon a fatally flawed foundation.

NEPA: CONSIDERATION OF ALTERNATIVES

The evaluation of alternatives to a proposed nuclear facility mandated by Section 102(2)(C)(iii) of the National Environmental Policy Act, 42 U.S.C. 4332(2)(C)(iii), has been characterized as "the 'linchpin' of environmental analysis."

NEPA: CONSIDERATION OF ALTERNATIVES

An important element of the evaluation of alternatives to a proposed nuclear facility under the National Environmental Policy Act is the obligation to consider possible alternative sites for the proposed reactor. *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), 5 NRC at 522.

RULES OF PRACTICE: STANDING TO APPEAL

Exceptions may not be filed unless a party is aggrieved by the result reached below. *Toledo Edison Company* (Davis-Besse Nuclear Power Station), ALAB-157, 6 AEC 858 (1973); *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-282, 2 NRC 9 (1975).

NEPA: CONSIDERATION OF ALTERNATIVES

The standard to be used by a licensing board in evaluating alternate sites derives from the Commission's *Seabrook* decision, CLI-77-8, 5 NRC at 522-36 (1978). A proposed site may be rejected in favor of an alternative not when the alternative is marginally "better" but, rather, only when it is "ob-

viously superior." *Id.* at 530. Moreover, in determining whether a particular alternate site is obviously superior, actual costs of completing a facility at that site may be considered. *Id.* at 530-36.

NEPA: CONSIDERATION OF ALTERNATIVES

NEPA does not require that a plant be built on the single best site for environmental purposes. All that NEPA requires is that alternative sites be considered and that the effects on the environment of building the plant at the alternative sites be carefully studied and factored into the ultimate decision. *New England Coalition on Nuclear Pollution* v. *NRC, supra,* 582 F.2d at 95.

NEPA: CONSIDERATION OF ALTERNATIVES

In evaluating alternate sites a licensing board may properly take into account the costs of any replacement power which might be required by reason of the substitution at a late date of an alternate site for the proposed site. Such costs appear to be as much a "cost of completion" as those associated with pouring concrete or purchasing land.

NEPA: CONSIDERATION OF ALTERNATIVES

In determing whether a particular alternate site is "obviously superior," the presence of an existing reactor at an alternate site is significant but not dispositive. *Boston Edison Company* (Pilgrim Nuclear Generating Station, Unit 2), ALAB-479, 7 NRC 774 (1978). The various environmental attributes of the two sites control whether the alternate site is "obviously superior" to the proposed site.

NEPA: CONSIDERATION OF ALTERNATIVES

Unless environmental preferability of an alternative is demonstrated, the cost comparison becomes irrelevant. *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-458, 7 NRC 155, 161-62 (1978).

NEPA: LAND-USE INQUIRY

In assessing the environmental harm associated with land clearance, one must look at what is being removed from the site and not just at how many acres are involved. "It does not follow as night the day that every inch of ground spared from a power plant or transmission facilities is so much parkland preserved." *Pilgrim,* ALAB-479, 7 NRC 774, 787 (1978).

In evaluating the two sites in issue, all that must be decided is whether the alternate site is "obviously"—in other words clearly and substantially—superior to the proposed site.

Mr. Lex K. Larson, Washington, D.C. (with whom **Messrs. Edward L. Cohen** and **Arthur M. Schwartzstein** were on the brief) for the applicants, Rochester Gas and Electric Corporation, *et al.*

Ms. Sue Reinert and **Dr. Helen Daly**, Oswego, New York (with whom **Ms. Ruth Caplan** was on the brief) for the intervenor, Ecology Action of Oswego.

Mr. Stephen M. Sohinki (with whom **Messrs. Edwin J. Reis** and **Auburn L. Mitchell** were on the brief) for the Nuclear Regulatory Commission staff.

DECISION

On August 26, 1977, the Licensing Board rendered an initial decision authorizing issuance of a construction permit for the Sterling Power Project, Nuclear Unit No. 1.[1] LBP-77-53, 6 NRC 350. The facility is to be located on the south shore of Lake Ontario, in the town of Sterling in Cayuga County, New York, approximately 8 miles southwest of Oswego and 30 miles northwest of Syracuse (FES, §2.1).

Exceptions to the decision were filed by intervenor Ecology Action of Oswego[2] and by the applicants. Additionally, at various times during the pendency of the appellate proceedings, Ecology Action filed with us motions to reopen the record on such discrete issues as (1) the need for the power to be generated by the Sterling facility;[3] (2) the environmental costs

[1]The Sterling facility is to be owned by Rochester Gas and Electric Corporation (28%), Central Hudson Gas & Electric Corporation (17%), Orange and Rockland Utilities, Inc. (33%), and Niagara-Mohawk Power Corporation (22%) (Safety Evaluation Report, Supp. No. 1, §20.1). Rochester has full responsibility for the construction, operation, and licensing of the facility (*id.*, §1.1).

[2]Ecology Action participated below as a joint intervenor with Sharon Morey, an individual. Ms. Morey has not joined in the appeal. As used in this opinion with reference to the proceedings before the Licensing Board, the term "Ecology Action" embraces both that intervenor and Ms. Morey.

[3]Motions dated October 24, 1977, and April 28, 1978.

associated with releases of radon (Rn-222) in the mining and milling of uranium;[4] (3) whether the facility should be located at some other site;[5] and (4) the availability and cost of the uranium necessary to fuel the reactor over its projected lifetime.[6] With respect to the second and third of these subjects, on April 28, 1978, Ecology Action moved to suspend the effectiveness of the construction permit[7] to await the outcome of its appeal. In an unpublished order entered on May 5, 1978, we declined to grant that relief, noting (*inter alia*) that the applicants had represented to us that, in any event, they did not intend to commence construction prior to the fall of 1978. We directed, however, that pending our final decision on the various exceptions, the applicants provide us with at least 10 days' written notice prior to the commencement of any construction activities.[8] By letter dated July 21, 1978, the applicants advised us that commencement of construction had been deferred until the fall of 1980, with the scheduled date of commercial service deferred until the spring of 1988.

In this opinion, we reach and decide all matters before us except for need for power and radon releases. For the following reasons, decision on those two issues is being deferred:

1. In its motions seeking a reopening of the record on the need for Sterling-generated electricity, as well as in its exceptions addressed to that question, Ecology Action placed heavy reliance on various reports which purportedly counter the Licensing Board's findings respecting when that need will arise. More particularly, in its April 28, 1978, filing (see fn. 3, *supra*), Ecology Action brought to our attention the report submitted earlier that month by the New York Power Pool pursuant to the requirements of the New York Public Service Law (commonly referred to as a "Section 149-b" report). According to Ecology Action, that report reflected a reduced projected demand growth in the applicants' service areas, as well as the likelihood that, even in the absence of Sterling, excess generating capacity would be available in 1984.[9]

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[4]Motion dated March 15, 1978. On April 28, 1978, Ecology Action filed a "Renewal and Supplement" to this motion. Subsequently it filed several other requests respecting the "radon" question.

[5]Motion dated March 22, 1978. On August 3, 1978, Ecology Action filed a supplement to this motion.

[6]Motion dated April 28, 1978.

[7]The permit (No. CPPR-156) issued on September 1, 1977. See 42 Fed. Reg. 45722 (September 12, 1977).

[8]Ecology Action unsuccessfully sought Commission review of our May 5 order. Thereafter, it sought judicial review of that order; that action is still pending. *Ecology Action of Oswego, New York* v. *NRC*, D.C. Cir. No. 78-1855.

[9]The Licensing Board found that Sterling power would be needed in that year. See 6 NRC at 379.

In granting in January 1978 the requisite State certificate of environmental compatibility and public need for the Sterling facility, the New York State Board on Electric Generation Siting and the Environment (siting board) had concluded that, without the addition of Sterling or a fossil-fuel alternative to it, a deficiency in generating capacity was likely in 1986. In the wake of the Section 149-b report rendered in April, and alluding specifically to it, the siting board entered an order on May 4 which directed a "limited reopening on the issue of public need for the" Sterling facility (order, p. 10). To date, insofar as we have been informed, the siting board has not rendered its determination on this reopened issue.

We are, of course, under no legal compulsion to withhold our own decision on the need for power question to await the siting board's ruling. But it appears to us that little useful purpose would be served were we now to undertake a duplication of the inquiry being made by the State body into the significance of the disclosures in the Section 149-b report. We have been given no cause to believe that the siting board—which has among its members a representative of the New York Public Service Commission—lacks either the capability or the willingness to explore the matter thoroughly and to make an informed judgment on it. Beyond that, our understanding is that Ecology Action is a party to the State proceeding; thus it is in a position to put forth in that proceeding the same considerations it has pressed upon us in support of its challenge to the applicants' claims respecting when Sterling power will be needed.

In its *Vermont Yankee* decision[10] last April, the Supreme Court noted that "[t]here is little doubt that under the Atomic Energy Act of 1954, State public utility commissions or similar bodies are empowered to make the initial decision regarding the need for power." 435 U.S. at_____, 55 L.Ed 2d at 483. Although, to be sure, this Commission's responsibilities in this sphere have their primary roots in the National Environmental Policy Act rather than the Atomic Energy Act,[11] we even more recently expressed the view that NEPA does not foreclose "the placement of heavy reliance upon the judgment of local regulatory bodies which are charged with the duty of insuring that the utilities within their jurisdiction fulfill the legal obligation to meet customer demands." *Carolina Power & Light Company* (Shearon Harris Nuclear Power Plant, Units 1, 2, 3, 4), ALAB-490, 8 NRC 234, 241

[10] *Vermont Yankee Nuclear Power Corp.* v. *Natural Resources Defense Council*, 435 U.S.____, ____, 55 L.Ed 2d 460, 483 (1978).

[11] " 'Need for power' is a shorthand expression for the 'benefit' side of the cost-benefit balance which NEPA mandates for a proceeding considering the licensing of a nuclear power plant." *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-422, 6 NRC 33, 90 (1977).

(August 23, 1978). Granted—unlike State utilities commissions such as the one involved in *Shearon Harris*—the siting board as such may not have that duty. But, especially in light of the New York Public Service Commission presence on it, no less than a public utilities commission the siting board can "be expected to possess considerable familiarity with the primary factors bearing upon present and future [electricity] demand. . . ." *Ibid.* This being so, we have little hesitancy in carrying over to this case the conclusions reached in *Shearon Harris* with regard to the deference which appropriately may be given to need for power determinations by State agencies.

In this connection, in the particular circumstances confronting us, it is of no moment that in *Shearon Harris,* unlike here, the ultimate State determination had already been made by the time that the NRC licensing proceeding had reached the adjudicatory stage. Apart from all other considerations, as previously noted the applicants do not propose to start building for another 2 years. By that time, both the siting board ruling and our own need for power decision in the wake of it should be in place. Stated otherwise, although in many situations a deferral of one licensing body's decision to await that of another might cause prejudicial delay, we perceive no significant risk of that happening in this instance.

Once the siting board has ruled, we will expect the appplicants promptly to bring its decision to our attention. Should the decision be adverse to the applicants (and not overturned on any subsequent judicial review which might be available), that most likely would be the end of the matter. For, according to our understanding of New York law, the grant by the siting board of a certificate of environmental compatibility and public need is a condition precedent to plant construction no matter what this Commission might conclude regarding the need for the plant.[12] On the other hand, if the applicants prevail before the siting board, the *Shearon Harris* principles will come into play. That is to say, the need for power findings and conclusions of that board will be given great weight by us unless shown to "rest upon a fatally flawed foundation." ALAB-490, *supra,* 8 NRC at 241. *Cf. Seabrook,* ALAB-422, *supra,* fn. 11, 6 NRC at 69-71, *affirmed on this point,* CLI-78-1, 7 NRC 1, 23-28 (1978), *affirmed sub nom. New England Coalition on Nuclear Pollution* v. *NRC,*_____F.2d_____(Nos. 77-1219, etc., 1st Cir., decided August 22, 1978) (slip opinion at 16-19).[13]

2. For its part, the issue relating to the environmental effects of radon

[12]There has, of course, been no Federal preemption insofar as determinations respecting need for the nuclear facility are concerned.

[13]We assume that the siting board's decision will develop in some detail the basis for whatever conclusions the board may reach. Such development is a condition precedent to our giving deference to those conclusions.

releases in the mining and milling of uranium is "generic" in character in the sense that it applies generally to all reactors. Nonetheless, it is under current consideration in a large number of individual licensing proceedings as a result of the Commission's amendment of Table S-3 of 10 CFR Part 51 to delete the value assigned in the table to radon releases. 43 Fed. Reg. 15613 (April 14, 1978). This action was taken because that value had been found to be incorrect. In ordering the deletion, the Commission further directed that the radon issue be examined or reexamined in all pending proceedings without reference to the discredited value.

In implementation of the Commission's instructions, we established procedures for dealing with the radon issue in cases such as this one. See *Philadelphia Electric Company* (Peach Bottom Atomic Power Station, Units 2 and 3), *et al.*, ALAB-480, 7 NRC 796 (May 30, 1978). Those procedures are being followed but as yet have not reached the culmination point; hence we put the radon issue to one side in this case until that time.

We now turn to the issues which are ripe for decision at this time.

I

The evaluation of alternatives to a proposed nuclear facility mandated by Section 102(2)(C)(iii) of the National Environmental Policy Act, 42 U.S.C. 4332(2)(C)(iii), has been characterized as "the 'linchpin' of environmental analysis."[14] One important ingredient of this evaluation is the "obligation to consider possible alternative sites" for the proposed reactor. *Seabrook,* CLI-77-8, *supra,* fn. 14, 5 NRC at 522. The alternate site issue was sharply contested in this case, and aspects of the Licensing Board's decision are challenged on appeal by both Ecology Action and the applicants.

A. Information concerning alternate sites was provided by the applicants, both in their environmental report[15] and at the hearing.[16] The staff

[14]*Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-77-8, 5 NRC 503, 522 (1977), citing *Monroe County Conservation Society, Inc.* v. *Volpe,* 472 F. 2d 693, 697-98 (2d Cir. 1972). See also *Boston Edison Company* (Pilgrim Nuclear Generating Station, Unit 2), ALAB-479, 7 NRC 774, 778-79 (1978); *Kansas Gas and Electric Company* (Wolf Creek Generating Station, Unit No. 1), ALAB-462, 7 NRC 320, 338 (1978).

[15]ER, §9.2.2.

[16]Testimony of Robert J. DeSeyn on Contentions 11, 12B, fol. Tr. 868; testimony of Michael J. Hess on Contention 12D, fol. Tr. 935.

analyzed this information as well as site data of its own.[17] Although several claims relating to the alternate site inquiry were presented to the Licensing Board, what the appeals call upon us to consider is that Board's treatment of the applicants' choice of Sterling over one specific site—identified as "Ginna"—of the several possibilities examined.

As earlier noted, the Sterling site is on the south shore of Lake Ontario, approximately 8 miles southwest of Oswego (FES, §2.1). Although also on Lake Ontario (FES, §9.1.2.2), the Ginna site is 35 miles to the west of Sterling, near Rochester (ER, Fig. 2.9-2). It now houses a 490 MWe nuclear reactor which is operated by Rochester Gas and Electric Company, one of the Sterling applicants (FES, p. 9-10). Primarily for this reason, Ecology Action asserted below that the Ginna site should have been selected for this reactor rather than Sterling.

The Licensing Board carefully analyzed the various attributes of the two sites, with particular reference to those factors stressed by Ecology Action—namely, transmission lines, aesthetics, and land-clearing requirements. 6 NRC at 414-16.[18] Although the applicants and staff regarded the Sterling site's proximity to a proposed 765 kV transmission line as favoring use of that site, the Board agreed with Ecology Action that it should be given no weight in view of the then lack of local approval of the proposed line. *Id.* at 414.[19] On the score of aesthetic effects, the Board found the differences between the two sites to be "slight." Although taking account of the intervenor's thesis that a "second unit at Ginna would blend with the first and thus provide less visual impact," the Board balanced against it the consideration "that the Ginna site is smaller and flatter, with less natural cover and that the rolling hills and vegetation around Sterling would reduce the visual impact of the plant from a landward direction."[20] *Id.* at 415. As for the impact upon the terrestrial environment, the Board

[17]FES, §9.1.2.2; supplemental testimony of Martha S. Salk on Contention 12D, of Dino C. Scaletti on Contention 12C, of Arvin S. Quist on Contentions 12A and 12B, of Mr. Scaletti on Contention 11B.2, and of Messrs. Quist and Scaletti on Contention 11A, all fol. Tr. 1296. The applicants and staff also presented testimony comparing the Sterling and Ginna sites assuming closed-cycle cooling were used at each. Appl. Exh. 8, as revised May 16, 1977; NRC Staff Supplemental Testimony—Alternate Sites, by Dino C. Scaletti, fol. Tr. 4048. See fn. 27, *infra.*

[18]The Board also examined Ecology Action's claim that the applicants had rejected "some sites" (not further identified) because they could not accommodate two coal-fired plants which the applicants had once planned for the Sterling site (in addition to the nuclear unit) but had since postponed indefinitely. 6 NRC at 413. The Board found other reasons why each site had been rejected. *Id.* at 414-15. Ecology Action has not reasserted this claim before us.

[19]We have not been apprised by the parties of any further developments with regard to the approval of the line; presumably, it is still under review.

[20]Our own visit to the two sites bore out the accuracy of the Board's summary of the terrain of each.

determined that there was some advantage to the Ginna site. *Id.* at 416. This stemmed from the fact that fewer acres would have to be cleared (150 as opposed to 201 in the case of Sterling). The Board noted, however, that the trees which would be removed at Sterling "are not unique to the region since mature hardwoods are relatively common in the area along the southern shore of Lake Ontario." *Ibid.* It also found that the wooded swamp on that site would be only "minimally affected" by the project. *Ibid.*

Going beyond these environmental comparisons, the Board undertook an economic analysis which produced the conclusion that it would cost roughly the same amount to build, operate, and decommission the reactor whether located at Ginna or Sterling—assuming that no weight were given the substantial transmission line cost differential in Sterling's favor should the proposed line in the vicinity of that site be approved. 6 NRC at 417-18. This equivalence—taken in conjunction with the slight environmental advantage which it thought that Ginna possessed—led the Board to join in Ecology Action's concern respecting the commitment of a "virgin" site such as Sterling to power generation when another site already so committed was available. *Id.* at 418. But the Board then went on to find that a change in site from Sterling to Ginna would result in a 2 ½-year delay in the completion of the plant, that the power provided by Sterling would be needed in 1984, and that beginning in that year an additional amount in excess of $100 million annually would have to be expended to obtain replacement power from some other source. *Ibid.* Because of these factors, the Board concluded that "Sterling is the preferred site for economic reasons." *Id.* at 419. It added:

> If, however, a delay of 2 or more years were to occur in the beginning of construction of Sterling, then a reevaluation of site selection must be given serious consideration.

Ibid.

B. Ecology Action and the applicants each take issue with the Board's resolution of the Ginna-Sterling alternate site question—although, not surprisingly, on different grounds. The intervenor claims that the Licensing Board's finding of environmental preferability of the Ginna site must perforce control the resolution of the site issue and that it was impermissible for the Board to have founded its ultimate conclusion on the "cost of delay." We are told that this is at least so where, as assertedly is true here, there is available "sufficient power to absorb the delay without jeopardizing the public interest in having sufficient electricity." On the other hand, the applicants maintain that the record demonstrates the environmental preferability (or at least equivalence) of the Sterling site and that the choice

of that site should have been ratified for that reason. Further, they urge that the Licensing Board relied on an incorrect legal standard in conducting its site evaluation. For these reasons, they would have us countermand that Board's suggestion that there be undertaken a reevaluation of the sites should there be a delay of 2 or more years in the commencement of construction—an eventuality which, we have seen, has indeed materialized.[21]

Our consideration of these competing claims persuades us that the Board below used the wrong standard in making its site comparison but that, under the correct one, the approval of the Sterling site was called for and there is no warrant for a further comparison of the Sterling and Ginna (or any other) sites.

1. The standard to be used by a licensing board in evaluating alternate sites derives from the Commission's *Seabrook* decision, CLI-77-8, *supra,* 5 NRC at 522-536. There, the Commission described the lengthy and thorough review given proposed sites for nuclear power plants, commencing long prior to the adjudicatory consideration of site-related issues and involving not only the NRC staff but, as well, other interested governmental agencies and the general public. It contrasted this extensive review with the necessarily more limited analysis which reasonably can be accorded to possible alternative locations for the reactor—noting that "[c]ommon sense teaches that the more closely a site is analyzed, the more adverse environmental impacts are likely to be discovered." 5 NRC at 529 (fn. omitted). It also pointed to the inherent imprecision of cost-benefit analysis and the "wide margin of uncertainty" attendant upon any evaluation of a particular site. *Id.* at 528. Because of these two "realities of the NEPA process" (*ibid.*), a proposed site may be rejected in favor of an alternative not when the alternative is marginally "better" but, rather, only when it is "obviously superior." *Id.* at 530. Moreover, in determining whether a particular alternate site is obviously superior, actual costs of completing a facility at that site may be considered. *Id.* at 530-36.

[21]Although the applicants have filed exceptions with respect to the Licensing Board's alternate site conclusions, we have serious doubt regarding their right to do so. Exceptions may not be filed unless a party is aggrieved by the result reached below. *Toledo Edison Company* (Davis-Besse Nuclear Power Station), ALAB-157, 6 AEC 858 (1973); *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-282, 2 NRC 9 (1975). Here, the applicants do not challenge the site choice endorsed by the Licensing Board but, rather, the route chosen by the Board to reach its result. Although they do seek to abrogate the site reevaluation suggestions of that Board, those suggestions appear to be hortatory rather than mandatory and, indeed, gave rise to no construction permit condition. For that reason, we dismiss the applicants' exceptions. Their brief in support of those exceptions has, however, been considered by us in connection with our assessment of Ecology Action's site comparison exceptions. See *Midland,* ALAB-282, *supra,* 2 NRC at 10, fn. 1.

The Commission's "obviously superior" standard for evaluating alternate sites has now been expressly upheld by the Court of Appeals for the First Circuit. *New England Coalition on Nuclear Pollution* v. *NRC, supra,* _____F.2d at_____ (slip opinion at 13). In doing so, the court of appeals stressed that ". . .NEPA does not require that a plant be built on the single best site for environmental purposes. All that NEPA requires is that alternative sites be considered and that the effects on the environment of building the plant at the alternative sites be carefully studied and factored into the ultimate decision." *Id.,*_____F.2d at_____(slip opinion at 13-14). The court also approved the Commission's determination to take actual facility completion costs into account in evaluating alternatives, terming it a "realistic way of dealing with existing circumstances."[22] *Id.,*_____ F.2d at____(slip opinion at 14).

2. Application of this standard mandates rejection of Ecology Action's assertion that the Licensing Board was required to disapprove use of the Sterling site given its findings that the Ginna site is marginally preferable. Equally unavailing is the claim that a licensing board may not properly take into account the costs of any replacement power which might be required by reason of the substitution at a late date of an alternate site for the proposed site. Such costs appear to be as much a "cost of completion" as those associated with pouring concrete or purchasing land.[23] The only substantial question now before us is one which the Licensing Board did not answer—*i.e.,* whether, on the basis of the record, Ginna is sufficiently better than Sterling to be adjudged "obviously superior." We conclude not.

The principal advantage of Ginna obviously is the presence there of an existing reactor. That factor is significant but not dispositive. *Boston*

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[22]The court did express some concern that this practice might weight the Commission's determination in favor of an applicant's chosen site, particularly where construction commences prior to the agency's final decision on the alternate site question. Because the start of Sterling construction is deferred for at least another 2 years, that eventuality is not likely to materialize in this proceeding.

[23]We do not now consider whether, in point of fact, replacement power would be required were the Ginna site now to be substituted for Sterling. As seen, the Licensing Board's findings respecting such power were founded on its conclusion that the nuclear facility would be needed in 1984 to meet power demands existing at that time. It is now clear that the facility will not be on-line by 1984 even if built at the Sterling site. Beyond that, we have deferred decision on the correctness of the need for power findings below. All that we hold here is that, assuming that there is a sufficient factual basis for concluding that the delay attendant upon a switch in sites will necessitate the acquisition of replacement power, the cost differential between that power and the power which would have been generated by the proposed facility may be factored into the alternate site comparison. Whether in the particular case there will be occasion to do so, however, will depend upon the outcome of the environmental analysis. See p. 398, *infra.*

Edison Company (Pilgrim Nuclear Generating Station, Unit 2), ALAB-479, 7 NRC 774 (1978); *Florida Power and Light Company* (St. Lucie Nuclear Power Plant, Unit No. 2),ALAB-355, 3 NRC 830 (1976). "[B]uilding a second nuclear plant next to an existing one is not always the most favorable solution." *Pilgrim, supra,* 7 NRC at 789. And the possibility that it will not be is enhanced where, as here, the existing plant was built in the 1960's and is vastly different from the proposed unit, with the consequence that there is little potential for the two units to share common facilities or equipment.[24]

The various environmental attributes of the two sites control whether Ginna is "obviously superior" to Sterling.[25] As earlier noted, the Licensing Board thought the two sites to be essentially equivalent except that use of Ginna would involve the clearing of only 150 additional acres (in contrast to the 201 acres which would have to be cleared at Sterling).

In assessing the environmental harm associated with land clearance, one must look at what is being removed from the site and not just at how many acres are involved. "It does not follow as night the day that every inch of ground spared from a power plant or transmission facilities is so much parkland preserved." *Pilgrim,* ALAB-479, *supra,* 7 NRC at 787. In this regard, the Licensing Board found:[26]

> Thirty-three acres of mature beech maple forests will be cleared at Sterling, which amounts to a loss of 64% of the remaining mature beech maple forests on the site. At Ginna, 8 to 15 acres of intermediate-to-mature hardwoods would be cleared. *Ibid.;* Tr. 937-38. Therefore, in terms of the number of acres of natural communities to be cleared, the impact would be less at Ginna than at Sterling. However, the habitats which will be cleared at Sterling are not unique to the region since mature hardwoods are relatively common in the area along the southern shore of Lake Ontario. Salk Contention 12D Testimony at p. 1; Tr. 1352-1353.

We were told at oral argument by Ecology Action that one of the prime disadvantages of the Sterling location is that its use would mean the destruction of a large hardwood forest along Lake Ontario (App. Bd. Tr. 28-32). That is somewhat of an overstatement. As earlier noted, the Licensing Board found the trees to be removed not to be "unique" and mature hard-

[24]See, *e.g.,* "Applicant's Response to Board Inquiry on Cost Review of the Proposed Nuclear Unit at Sterling and as a Second Nuclear Unit at Ginna," fol. Tr. 2445.

[25]Unless environmental preferability of an alternative is demonstrated, the cost comparison becomes irrelevant. *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-458, 7 NRC 155, 161-62 (1978).

[26]6 NRC at 416.

woods to be "relatively common" in the area. The witnesses cited by the Licensing Board as advancing this proposition clearly did so, and Ecology Action has presented no contrary claim to us (App. Bd. Tr. 29). Moreover, our own inspection of the site left us with the firm impression that it is populated essentially with second or third growth trees—not unattractive but scarcely differentiable from the substantial number of other trees in the general area.

It is undoubtedly true that, as was stressed by Ecology Action during the oral argument (App. Bd. Tr. 29-30), once construction were to be commenced on the Sterling site members of the public no longer would have access to it—as they apparently do now—for such recreational purposes as strolling along the edge of the lake among the trees. But that consideration hardly serves to defeat the applicants' proposal to use the site for a nuclear plant. Ecology Action attaches insufficient significance to the fact that the site is owned by the lead applicant, Rochester Gas and Electric, which acquired it for the purpose of building some type of power plant on it. The public now enjoys its use not as of right but, rather, because that company has chosen to allow such use. At any time, the company presumably could foreclose further public use—irrespective of whether either a nuclear plant were built on the site or (as seems likely should the Sterling proposal fail) the site were dedicated to some other project. In these circumstances, the public use factor cannot be weighed heavily against the Sterling site on the NEPA scales. Indeed, if a landowner's voluntary choice to permit public access to its property were deemed to provide a possible obstacle to its own future use of that property for some other purpose, the almost certain consequence would be that such permission would never be forthcoming. This assuredly would further no one's interests.

Ecology Action also has renewed before us its argument below that aesthetic considerations dictate the selection of Ginna over Sterling. We see no reason, however, to disturb the Licensing Board's finding to the contrary. More specifically, our own inspection of the two sites confirmed what the Board found the record to establish (see p.391, *supra*): that each site has certain advantages and disadvantages from the standpoint of minimizing aesthetic effects and that, on balance, the difference between them is slight.

Finally, Ecology Action asserts the possibility that an existing swamp on the Sterling site might be seriously disturbed by construction and operation of the plant. It does not take issue with the finding below that only 1 acre of the 179-acre wooded swamp would unavoidably be altered due to construction (6 NRC at 416); instead, its challenge goes to the further finding that the applicants will take steps to protect the remainder of the swamp area and thus that area will be but minimally affected by plant construction and operation (*ibid.*). Specifically, Ecology Action points to the potential effect

of oil, salt, and dust on the swamp and expresses doubt that the proposed mitigative measures will be successful.

When closely questioned at oral argument, however, Ecology Action was unable to point to any evidence establishing that permanent damage to the swamp likely would eventuate or that the applicants' mitigative measures would not succeed (App. Bd. Tr. 27-28). And our independent review of the record has turned up no evidence which would undercut the Licensing Board's conclusions on the matter. In that connection, it is worthy of note that the undertaking of mitigative measures, as spelled out in §4.5 of the Final Environmental Statement, is expressly made a construction permit condition and that the Licensing Board also imposed the following further condition:

> If unexpected harmful effects or evidence of serious damage are detected during plant construction, the Applicants shall provide to the Staff an acceptable analysis of the problem and a plan of action to eliminate or significantly reduce the harmful effects or damage.

6 NRC at 434. Given the absence of anything to suggest that this condition might not be capable of fulfillment, we think it to provide a sufficient measure of additional protection for the swamp area.

3. We earlier referred to the Commission's recognition of the "imprecision of cost-benefit analysis" and the "wide margin of uncertainty" inherent in any site evaluation (see p. 393, *supra*). As the Commission has explained:

> . . .in the nuclear licensing context the factors to be compared range from broad concerns of system planning, safety, engineering, economic, and institutional factors to environmental concerns, including ecological, biological, aesthetic, sociological, recreational, and so forth. Much of the underlying cost-benefit data is difficult of articulation, much less quantification.

Seabrook, CLI-77-8, *supra,* 5 NRC at 528.

These observations ring true as applied to the evaluation of the two sites in issue here. Indeed, were we called upon to determine on the record brought to us which site was on balance the best choice from an environmental standpoint, our task would be a most difficult one. Fortunately, however, we need not make that determination. All that we must decide is whether Ginna is "obviously"—in other words, clearly and substantially—superior to Sterling. In our judgment, in light of the record evidence discussed above (taken in conjunction with the fruits of our own examina-

tion of the sites), that question requires a negative answer.[27]

This being so there will be no need for the staff to pursue the Licensing Board's suggestion—and it was no more than that (see fn. 21, *supra*)—that the selection of the Sterling site be reevaluated if the commencement of construction were delayed for 2 years or more. As we have seen (see p. 392, *supra*), that suggestion flowed from the Licensing Board's approval of the Sterling selection solely on the basis of the costs of delay entailed in transferring the plant to the Ginna site. Our holding that the Sterling site should have been approved on the quite different basis that Ginna is not "obviously superior" from an environmental standpoint eliminates, however, any occasion to consider further, now or in the future, the delay cost factor. See *Seabrook*, CLI-77-8, *supra*, 5 NRC at 533-36.

II

Ecology Action has advanced several other claims on its appeal. Upon careful examination, we have found them sufficiently insubstantial to be unworthy of discussion.[28] Suffice it to say that most of the claims go to factual matters and the record manifestly provides adequate support for the Licensing Board's findings on the particular point in issue.[29]

What that leaves is the staff's unopposed request that the second paragraph 209 of the initial decision, 6 NRC at 423, be amended. In that paragraph, the Board set forth the calculations made by the staff with regard to the potential radiation consequences should truck shipments of spent reactor fuel be subject to acts of sabotage. It concluded the paragraph with the following findings:

> These calculations do not take into account any protection likely to be afforded by buildings or evacuation of the endangered area. It is

[27]The preceding discussion presupposed that, whether located at Sterling or Ginna, the facility would employ a once-through cooling system (as proposed by the applicants). As its decision reflects, however, the Licensing Board also compared the two sites on the assumption that a closed-cycle cooling system ultimately will be required by the Environmental Protection Agency at both locations. 6 NRC at 352, 428-29. The Board found that that assumption did not call for an alteration of the conclusions it had reached on the basis of the once-through cooling system premise. *Id.* at 429. Ecology Action does not challenge this finding and our independent examination of the record convinces us as well that the choice of cooling systems is an essentially neutral factor insofar as the comparison of these sites is concerned. Accordingly, our conclusion on the alternate site issue should be taken to apply without regard to which type of cooling system were to be employed as a result of EPA action.

[28]The same is true of the motion to reopen the record on the cost and availability of uranium, which we hereby deny.

[29]Review on our own initiative of the portions of the Licensing Board's decision not brought to us by way of appeal has likewise disclosed no error below requiring corrective action.

believed, however, that these factors would have a mitigating effect, reducing expected consequences substantially.

These findings were an accurate reflection of the prepared testimony of staff witnesses Kasun and Hodge (following Tr. 3646 at p. 7). The staff now tells us, however, that the testimony was partially in error. In point of fact, the calculations took into account the shielding effects of buildings (albeit not the evacuation factor).

Although the staff acted responsibly in calling to our attention the error, we find no need to go beyond noting it for the record. The calculated releases as set forth in the second paragraph 209 are indeed small. And the record establishes that evacuation procedures (not factored into the calculations) would reduce those releases by an order of magnitude. Kasun-Hodge Testimony, *supra,* at p. 7. In these circumstances, there is continuing validity to the ultimate finding of the Licensing Board that, if an act of sabotage should occur, the radiation releases would be small and would not constitute a major threat to the public health and safety.[30]

On the basis of the foregoing:

The Licensing Board's August 26, 1977, decision is *affirmed* on all issues except need for power and the environmental impact of radon releases arising from the mining and milling of uranium;[31] jurisdiction is *retained* over those issues.

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

[30]Para. 211, 6 NRC at 423.

[31]As seen, however, the affirmance of the result reached on the alternate site issue is on grounds other than those assigned by the Board below.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Michael C. Farrar
Richard S. Salzman

In the Matter of **Docket Nos. 50-483**
50-486

UNION ELECTRIC COMPANY

(Callaway Plant, Units 1 and 2) **October 20, 1978**

The Appeal Board approves an agreement among the parties governing access by NRC's Office of Inspection and Enforcement to certain records and personnel; and dismisses as moot applicant's motion to stay the Licensing Board's decision in LBP-78-31, 8 NRC 366 (1978), authorizing the suspension of construction permits until applicant granted such access.

Messrs. Wm. Bradford Reynolds and **Gerald Charnoff,** Washington, D. C., for the licensee Union Electric Company.

Mr. Michael H. Bancroft, Washington, D. C., for the intervenor William Smart.

Mr. James P. Murray, Jr., for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

On April 3, 1978, the Director of the Office of Inspection and Enforcement (I & E) of this Commission entered an order directing the Union Electric Company to show cause why the construction permits for Units 1 and 2 of its Callaway facility should not be suspended. The order recited that it was based upon the refusal of the Daniel Construction Company, a contractor of Union Electric engaged in the construction of the facility, to provide I & E investigators access to certain Daniel records and personnel. Such ac-

cess was sought in connection with an investigation initiated by I & E for the purpose of determing, *inter alia*, whether William Smart, a Daniel employee working at the Callaway site, had been dismissed by the company because he had "made allegations to the Commission concerning alleged construction problems which, if uncorrected, could lead to unsafe conditions at the Callaway facility jeopardizing the public health and safety." Order, p. 1.

On April 21, 1978, Union Electric filed a response to the show cause order, in which it requested a hearing. On May 11, 1978, the Commission issued a notice of hearing. The notice established a licensing board to consider the matter and delegated review authority to an appeal board. 43 Fed. Reg. 21389 (May 17, 1978). It went on to set forth the issues which were to be considered and decided in the proceeding.

The parties before the Licensing Board were Union Electric, the NRC staff, and Mr. Smart, who had been granted leave to intervene by the Board. At a prehearing conference, a stipulation of fact was filed by counsel for Union Electric and the staff. Subsequently, through his counsel, Mr. Smart apprised the Board of his acceptance of the stipulation.

Following oral argument based upon the stipulated facts, the Licensing Board rendered an initial decision on September 28, 1978.[1] The Board concluded that, as a matter of law, I & E was entitled to access to the Daniel records and personnel in question. It further determined that the appropriate remedy was the suspension of the construction permits for as long as Daniel persisted in precluding access. On the strength of these conclusions, the Board authorized the Director of I & E to suspend the Callaway permits until access was permitted. That authorization was to become effective "within thirty (30) days after the date of issuance" of the decision.

Exceptions to the initial decision were timely filed by both Union Electric and Mr. Smart.[2] Accompanying Union Electric's exceptions was a motion seeking a stay of the effectiveness of the initial decision pending the outcome of our review.[3]

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[1]LBP-78-31, 8 NRC 366.

[2]Mr. Smart's exception addressed the ruling of the Licensing Board that certain issues which he had attempted to raise were not within the ambit of the Commission's May 11, 1978, notice of hearing.

[3]In his letter transmitting this motion, the licensee's counsel indicated that it was being filed solely "out of an abundance of caution." According to the licensee, if exceptions are timely filed from an initial decision in a show cause proceeding, that decision does not become effective until after those exceptions have been determined. This is said to follow from the fact that 10 CFR 2.764 provides for the immediate effectiveness only of initial decisions which direct the issuance or amendment of a construction permit, construction authorization, or operating license.

(Continued on next page.)

Upon its receipt of the motion, this Board scheduled an immediate, off-the-record conference with counsel for the respective parties. The objective of the conference was to explore whether there might be an available means for protecting the divergent interests of all concerned during the period which would be required for the full briefing, consideration, and disposition of the several seemingly difficult issues of first impression presented in this proceeding. Following extended discussion at the conference, and consultation by telephone with their clients during a recess called for the purpose, counsel reached an agreement in this regard. At our request, that agreement was subsequently reduced to writing, signed by counsel, and submitted for formal approval.

A copy of the agreement is appended to this order. In essence, it provides that the records sought by I & E will be now made available to its investigators, who also will be permitted to interview employees of Union Electric and Daniel concerning the circumstances of Mr. Smart's discharge from Daniel's employ. All information obtained from those records and interviews shall however, be held in confidence by I & E until 15 days after our decision on the merits of the pending appeal, unless we should direct otherwise on the basis of a written motion and after providing all parties with an opportunity to be heard. The requirement of confidentiality shall preclude disclosure of the information to any person not on the staff of I & E—whether or not in the employ of the Commission—other than counsel for the NRC staff who signed the agreement on I & E's behalf. Additionally, the information shall not be utilized, directly or indirectly, in connection with the pending appeals or any further proceedings respecting those appeals which might be conducted before either the Commission or a court.[4]

The agreement goes on to stipulate that the Director of I & E will not exercise the permit suspension authority conferred upon him by the Licensing Board's initial decision during the pendency of the appeals (and for 15 days thereafter). Finally, the parties set forth their understanding that the agreement will not be construed as a waiver of any legal arguments they may wish to advance on the appeals, and also that (as we had proposed) implementation of the agreement will not have the effect of mooting any of the issues raised by the filed exceptions.

We find the agreement totally satisfactory and hereby incorporate by reference each and every term of it in this order. In doing so, we wish to

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(Continued from previous page.)

For reasons that will later appear in this order, it is unnecessary for us to decide here whether the licensee is correct in that interpretation of the Rules of Practice.

[4]In this regard, it should be noted that this proceeding involves only the right of I & E to obtain access to the records and personnel in question. It does not involve the merits of Mr. Smart's claim that he was improperly discharged.

commend all three parties, and their counsel, for their ready willingness first to seek and then to implement this happy interim resolution of the matter in controversy. But for that willingness, we would have been required to act promptly upon the stay motion which, in turn, would have necessitated a hasty (if tentative) appraisal of the merits of at least the licensee's exceptions. This we were most anxious to avoid if at all possible. Given the nature of the issues which have been taken to us, it seemed far preferable from everyone's standpoint that we not be compelled to make even a preliminary assessment of where the right might lie until after the parties had an opportunity to develop fully their positions in briefs and argument and we then had a like opportunity to give mature consideration to those positions. By not allowing legitimate differences of opinion on the issues to stand as insuperable obstacles to arriving at an interim arrangement that would reasonably accommodate their conflicting interests (as we are convinced the agreement at hand does), the parties and their counsel have furthered the public interest as well as their own.

In light of the foregoing, the motion for a stay is *dismissed* as moot. The briefing of the appeals shall proceed on the time schedule provided in the Rules of Practice. As the parties were advised at the conference, once briefing has been concluded we will hear and decide the merits of the appeals as expeditiously as possible.

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

AGREEMENT

At an informal conference among counsel for all parties and members of the designated Atomic Safety and Licensing Appeal Board (the "Appeal Board") in the show cause proceeding in *Union Electric Company* (Callaway Plant, Units 1 and 2), Construction Permit Nos. CPPR-139 and CPPR-140, the parties hereto, by, and through their undersigned counsel, entered into the following agreement with respect to a requested investigation by the Nuclear Regulatory Commission Office of Inspection and Enforcement ("I & E") into the circumstances of the firing of employee William Smart by Daniel Construction Company (the "Contractor"), a division of Daniel Interna-

tional Corporation and one of the contractors of Union Electric Company (the "Licensee") at the Callaway construction site:

1. Licensee and Contractor agree that they shall provide to I & E inspectors copies of the personnel records of William Smart and shall permit I & E inspectors to examine and copy all documents relating to William Smart's employment and discharge by Contractor and to interview employees of Licensee and Contractor (privately if so desired by the employee or the inspector) concerning the circumstances of said discharge.

2. I & E agrees that, unless otherwise directed by the Appeal Board pursuant to paragraph 6 below, any and all documents and information obtained by I & E inspectors as a result of the aforesaid investigation agreed to by Licensee and Contractor shall be retained by I & E on a confidential basis and shall be protected against disclosure to any persons (other than the undersigned counsel for the NRC Staff) pending consideration and decision by the Atomic Safety and Licensing Appeal Board of the filed exceptions in the above referenced show cause proceeding, and for fifteen (15) days thereafter, all in accordance with the order on Licensee's stay motion issued by the Appeal Board.

3. This agreement as to confidentiality and protection against disclosure shall remain in full force and effect throughout the pendency of the review being undertaken by the Appeal Board of the Initial Decision on Order to Show Cause, issued by an Atomic Safety and Licensing Board in the above referenced show cause proceeding on September 28, 1978, and, unless otherwise ordered by the Appeal Board, for fifteen (15) days following issuance of the Appeal Board's decision in said matter.

4. The undersigned counsel for the parties hereby agree that the information and material covered by the agreement of confidentiality and nondisclosure set forth in paragraph 2 above shall not be cited, nor shall its actual contents or any report or opinion based upon its contents be referred to, in the pending appeal before the Appeal Board or in any subsequent appeal to the Commission or to the courts.

5. I & E agrees that, for the period specified in paragraphs 2 and 3 above, the Director of I & E will not suspend Construction Permit Nos. CPPR-139 and CPPR-140 pursuant to the authorization granted in the Initial Decision on Order to Show Cause, dated September 28, 1978.

6. Except as to paragraph 4 above which shall not be subject to modification, this agreement may be modified by order of the Appeal Board only, pursuant to a filed motion for modification on which all parties hereto have had an opportunity to be heard.

It is understood and agreed by all parties hereto that this Agreement is neither intended nor will be construed to constitute a waiver by any of the parties of the legal arguments they intend to make to the Appeal Board; nor

will the agreed I & E investigation pursuant to this Agreement be deemed to have mooted any of the issues raised by the filed exceptions.

Dated: October 18, 1978.

James P. Murray, Jr.
Counsel for NRC Staff

Wm. Bradford Reynolds
Counsel for Union Electric Company
and Daniel Construction Company

Michael H. Bancroft
Counsel for William Smart

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Richard S. Salzman, Chairman
Alan S. Rosenthal
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) **October 27, 1978**

The Appeal Board grants intervenor's motion for directed certification. The Licensing Board's order denying intervenor's "petition to establish the qualifications of its security expert for discovery" is vacated and the cause is remanded for prompt reconsideration.

RULES OF PRACTICE: CERTIFICATION

The Appeal Board exercises its directed certification authority most sparingly; but the Licensing Board's failure to give a reasoned basis for a ruling of obvious crucial importance calls for remand by the Appeal Board.

LICENSING BOARD: DETERMINATION AND RULING

Licensing boards have an obligation "to articulate in reasonable detail the basis for [their] determinations" on the questions coming before them for decision. *Northern States Power Company* (Prairie Island Nuclear Generating Plant, Units 1 and 2), ALAB-104, 6 AEC 179 (1973). This obligation is not met by the board's mere conclusionary statement of agreement with the analysis of the staff and applicant. The intervenor and the tribunals in the decisional review chain are entitled to an explanation of why the licensing board found such analysis to be persuasive.

RULES OF PRACTICE: PROTECTIVE ORDER

The law knows no presumption that anyone will disregard a protective order.

Messrs. John C. Morrissey, Malcolm H. Furbush, and **Philip A. Crane, Jr.,** San Francisco, California, and **Arthur C. Gehr** and **Bruce Norton,** Phoenix, Arizona, for the applicant Pacific Gas and Electric Company.

Messrs. Paul C. Valentine, Palo Alto, California, and **Yale I. Jones,** San Francisco, California, for the intervenor San Luis Obispo Mothers for Peace.

Mr. Marc R. Staenberg for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

This is an operating license proceeding involving the Diablo Canyon facility. Over a year ago, we were called upon to decide whether the applicant's security plan for the facility should be made available to the expert witness or witnesses of the intervenor (San Luis Obispo Mothers for Peace). Our conclusion was that those portions of the security plan relevant to the issues raised by the intervenor were subject to discovery under an appropriate protective order if, *inter alia,* the intervenor established that its proposed witness[es] possessed the technical competence necessary to evaluate them. ALAB-410, 5 NRC 1398, 1404-05, *Commission review declined,* CLI-77-23, 6 NRC 455 (1977). In other words:

> The plan, or any portion thereof, is to be released solely to individuals qualified to review it. It is to be made available to the intervenor's attorney plus any experts it selected who are so qualified.

Id. at 1406.

The cause was remanded to the Licensing Board for further proceedings consistent with that guideline and others established in ALAB-410. Thereafter, the intervenor unsuccessfully endeavored at various times to obtain Licensing Board determinations that certain individuals it proposed to use as witnesses were qualified to review the security plan. Intervenor now has returned to us asking that we review by directed certification[1] the Board's

[1]See 10 CFR 2.718 (i); *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-271, 1 NRC 478 (1975).

ruling with respect to one of those individuals—David Dinsmore Comey.[2] The request is opposed by both the applicant and the NRC staff.

I

Intervenor's "petition to establish qualifications of David Comey as security expert for discovery" was filed on May 23, 1978. The petition averred that Mr. Comey "is an expert with respect to security plans and security installations of nuclear power plants" and that, in 1974, he had "reviewed the security plans, under the terms of a protective order, and inspected the facilities at the plant and participated in a negotiation of an *in camera* settlement agreement with respect to the security system of Donald C. Cook 1 and 2 nuclear plants."[3] It was further asserted in the petition that, in 1973, Mr. Comey had reviewed under protective order the security plan for the Zion facility and had conducted cross-examination on the plan during the operating license proceeding concerning that facility.[4] Appended to the petition was a "statement of personal qualifications" which represented, *inter alia,* that Mr. Comey:

> . . . has conducted detailed, and sometimes repetitive onsite inspections of the nuclear steam supply systems, control systems, and auxiliary power systems at four boiling water reactor units and six pressurized water reactor units, including five Westinghouse reactors. In the case of four of those Westinghouse reactors, he has reviewed the plant security plans as well.
>
> He is familiar, on a first-hand basis, with the physical layout and operation of the above-mentioned systems at these plants, including control rooms and plant security control centers.
>
> He has testified on nuclear plant security matters in in camera sessions before the Advisory Committee on Reactor Safeguards, and has had numerous consultations on the subject of reactor sabotage with members of the staff of the U.S. Atomic Energy Commission and the U.S. Nuclear Regulatory Commission (NRC), both at the regional office level and also at headquarters in Bethesda, Maryland.
>
> For the past year he has served as a member of the Nuclear Safeguards and Proliferation Panel of the Office of Technology Assessment of the

[2]Mr. Comey is currently the President of Citizens for a Better Environment, said to be an Illinois not-for-profit corporation specializing in environmental research. He previously was affiliated with Businessmen for the Public Interest (BPI).

[3]Petition, pp. 1-2.

[4]*Id.* at p. 2.

U.S. Congress. This panel, which consisted of Mr. Comey, Chester Cooper, William Higinbotham, George Kistiakowsky, Herbert Scoville, Henry DeWolf Smyth, George Stathakis, Theodore Taylor, Cyrus Vance, Alvin Weinberg, Mason Willrich, and others, has reviewed U.S. nuclear policy with respect to preventing nuclear proliferation, particularly to "non-State adversaries."

In addition, he has served, together with Willy Higinbotham and a staff of outside consultants from Brookhaven National Laboratory, the Defense Nuclear Agency, and the Rand Corporation, on a special review group on physical security and safeguards against terrorist attack on nuclear facilities.[5]

In its response, the applicant urged that the petition be denied as untimely. Alternatively, it sought leave to take Mr. Comey's deposition "to determine what qualifications he possesses, if any, which would render him qualified to participate in discovery relating to the security plan of Diablo Canyon." Although not joining in the applicant's assertion of untimeliness, the staff also suggested the appropriateness of a further exploration of Mr. Comey's qualifications by way of deposition.

On June 13, 1978, the Licensing Board entered an order deferring a ruling on the petition until after Mr. Comey had been deposed. On July 5, his deposition was taken. Thereafter, both the applicant and the staff urged the Licensing Board to deny the petition on the ground that the intervenor had failed to establish that Mr. Comey possessed the requisite qualifications to evaluate the security plan. This was said to follow not only from the petition itself, but as well from Mr. Comey's deposition (and, in the case of the staff, an independent inquiry into his qualifications).[6] The intervenor countered those submissions with a second filing of its own, in which it insisted that Mr. Comey's deposition "conclusively" established his expert qualifications regarding security matters.

On September 5, 1978, the Licensing Board entered an order denying the petition. After a brief summary of the positions of the respective parties, the order stated:

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[5]The petition was also accompanied by the affidavit of intervenors's counsel to the effect that Mr. Comey had several months earlier declined, because of schedule conflicts, a request to serve as an expert witness. The affidavit went on to state that counsel had learned on May 23 (the date the petition was filed) that Mr. Comey "now would be able to serve as an expert."

[6]That inquiry was said to have disclosed, *inter alia*, that Mr. Comey had not in fact conducted the cross-examination on the Zion security plan, although Mr. Comey claimed (deposition at pp. 10-12, 14) both that the Board had given him permission to do so under 10 CFR 2.733 and that the questions asked by the counsel for the intervenors in that case had been formulated by him.

The Board has considered the filings of the parties and the transcript of the deposition. The Board perceives Mr. Comey a layman who is familiar with some of the available literature. The Board also recognizes that there exists today not only a different climate from the days of the Zion and Cook proceedings but there now exists 10 CFR 73.55 and ALAB-410 plus peripheral ACRS concerns and the general rise in civil disobedience—all of which cause this Board to approach this matter with extreme care.

The Staff and [applicant] have both made two points: (1) that expertise had not been established, and (2) there is no claim of expertise relative to specific portions of the security plan identified by the Appeal Board in ALAB-410. The Board agrees with the analysis of the Staff and [applicant] and the Intervenors' petition to qualify David Comey for discovery of the security plan is denied.

II

We have emphasized on many prior occasions that our directed certification authority will be exercised most sparingly. See *e.g.*, *Public Service Company of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-393, 5 NRC 767, 768 (1977), and cases there cited. "[D]uring the course of lengthy proceedings licensing boards must make numerous interlocutory rulings, many of which deal with the reception of evidence and the procedural framework under which it will be admitted. It simply is not our role to monitor these matters on a day-to-day basis; were we to do so, 'we would have little time for anything else.'" *Ibid.*, quoting *Toledo Edison Company* (Davis-Besse Nuclear Power Station, Unit 1), ALAB-314, 3 NRC 98, 99 (1976).

As we have seen, what is involved here is essentially the application by the Licensing Board of the guidelines laid down in ALAB-410 to the specific facts of record in this case as they pertain to the qualifications of Mr. Comey as a security expert. This being so, there is a ready temptation to deny the petition for certification summarily, leaving it to the intervenor to renew its challenge to the September 5 order on any appeal which might later be taken from the final decision below on the operating license application. For the reasons which follow, however, we are unable to give effect to that temptation.

A long time ago, we reminded the licensing boards of their obligation "to articulate in reasonable detail the basis for [their] determinations" on the questions coming before them for decision. *Northern States Power Company* (Prairie Island Nuclear Generating Plant, Units 1 and 2), ALAB-

104, 6 AEC 179 (1973), citing *Greater Boston Television Corp.* v. *Federal Communications Commission*, 444 F.2d 841, 851-53 (D.C. Cir. 1970), *certiorari denied,* 403 U.S. 923 (1971). By way of elaboration, we referred to

> . . . the general duty of licensing boards to insure that initial decisions and miscellaneous memoranda and orders contain a sufficient exposition of any ruling on a contested issue of law or fact to enable the parties, and this Board on its own review, readily to apprehend the foundation for the ruling. Compliance with this general duty is not a mere procedural nicety but is a necessity if we are to carry out efficiently our appellate review responsibilities.

ALAB-104, *supra*, at fn. 2.

On this occasion, an examination of the Licensing Board's ruling on intervenor's petition respecting Mr. Comey (quoted in full above) reveals that manifestly inadequate regard was given to that admonition. Without now passing judgment on the ultimate question whether Mr. Comey meets the qualifications test laid down in ALAB-410, this much can be said: given his prior involvement in the scrutiny and consideration of security plans for nuclear power plants, the Board's characterization of Mr. Comey simply as "a layman who is familiar with some of the available literature" cannot conceivably carry the day. And no more compelling are the Licensing Board's elliptical references to the existence today of "a different climate from the days of the Zion and Cook proceedings," as well as to "10 CFR 73.55 and ALAB-410 plus peripheral ACRS concerns and the general rise in civil disobedience." We have not been told what relevance the Board thought those references had on the question of Mr. Comey's expert qualifications. It may be, of course, that the Board was implicitly suggesting either that he was a past or a potential future contributor to instances of civil disobedience or that he could not be relied upon to comply with the terms of any protective order which might accompany disclosure of portions of the plan to him.[7] If that in fact is what the Board had in mind, it should have said so expressly and identified the portions of the record which lent support to those concerns—especially since, insofar as we are aware, none of the parties made a claim along such lines.[8] On the other hand, if a

[7]In ALAB-410, *supra*, 5 NRC at 1404, we indicated that a licensing board might be justified in refusing to grant security plan access to a person who demonstrably was unlikely to comply with the protective order covering that access.

[8]A party making such an assertion would have the burden of proving it, ALAB-410, 5 NRC at 1406, the point being (as it should hardly be necessary to remind the Board) that the law knows no *presumption* that anyone will disregard a protective order.

different point was intended by the references in question, it should have been spelled out in enough detail to be understood by the reader.

What that leaves is the Board's conclusionary notation that it "agree[d]" with the analysis of the staff and applicant. This likewise will not do. Again without prejudging the merits of the controversy, we are satisfied that the intervenor's position regarding Mr. Comey's qualifications could not properly be dismissed as frivolous. Accordingly, the intervenor (as well as this Board and other tribunals further along in the review chain) were entitled to an explanation of *why* the Licensing Board found the analysis of the staff, and applicant to be persuasive—*i.e.*, why Mr. Comey's prior activities in the realm of security and security plans are, individually or collectively, insufficient to qualify him as an expert for present purposes.

In these circumstances, we are constrained to remand the cause to the Licensing Board for *prompt* reconsideration and a full explication of the reasons underlying whatever result that Board might reach upon such reconsideration. It is one thing to defer appellate review of an adequately developed interlocutory ruling until the initial decision is rendered—irrespective of whether on a preliminary look the ruling appears to be right or wrong in result. But it is another matter to let pass until the end of the case a ruling of obvious crucial importance which has no reasoned basis assigned for it. Indeed, as we see it, our failure to intercede in the situation at bar would constitute an abdication of the oversight responsibilities vested in us by the Commission.

The petition for directed certification is *granted*; the September 5, 1978, order of the Licensing Board is *vacated*; and the cause is *remanded* for immediate further consideration consistent with this opinion.[9]

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

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[9]We stress once more that this action should not be taken as implying any views regarding the ultimate merits of the controversy beyond our belief that the issue is an important one and warrants reasoned analysis by the Licensing Board.

Although the petition for directed certification also addressed Licensing Board action pertaining to other potential security plan witnesses, in a supplemental memorandum the intervenor advised us that it had decided to confine its request for relief to Mr. Comey. Thus, the directed certification relates only to the September 5 order.

Cite as 8 NRC 413 (1978) LBP-78-32

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

THE ATOMIC SAFETY AND LICENSING BOARD

Sheldon J. Wolfe, Esq., Chairman
Dr. Frederick P. Cowan
Frederick J. Shon

In the Matter of	Docket No. 50-344 (Proposed Amendment for Fuel Storage Pool Modification)
PORTLAND GENERAL ELECTRIC COMPANY, et al.	
(Trojan Nuclear Plant)	October 5, 1978

Upon consideration of the evidence and briefs, the Licensing Board authorizes the Director of Nuclear Reactor Regulation to issue amendments to the facility operating license permitting Applicant to increase the capacity of the facility spent fuel storage pool, subject to specified license conditions.

RULES OF PRACTICE: FINDINGS OF FACT

Questions posed by the Licensing Board do not create an inviolate duty to make findings specifically addressed to the subject matter of the questions. *Southern California Edison, et al.* (San Onofre, Units 2 and 3), ALAB-248, 8 AEC 957, 975 (1974).

TECHNICAL ISSUES DISCUSSED: Quality assurance program; corrosion; seismic and structural design; spent fuel pool structural integrity; repairs and maintenance; stored spent fuel accidents; criticality analysis of spent fuel configuration; radiological impacts; thermal impacts; spent fuel pool cooling systems; need for environmental impact statement; volcanism and landslides; plutonium buildup.

INITIAL DECISION

(Amendment to Operating License)

Appearances

Warren Hastings, Esq., Counsel for Licensees Portland General Electric Company, the Eugene Water and Electric Board, and Pacific Power and Light Company

Sharon S. McKeel, appearing *pro se*

David B. McCoy, appearing *pro se*

Susan M. Garrett, appearing *pro se* and for the Coalition for Safe Power

Richard M. Sandvik, Esq., Counsel for the State of Oregon's Energy Facility Siting Council and Department of Energy

Joseph R. Gray, Esq., and **Vicki R. Harding, Esq.,** for the U. S. Nuclear Regulatory Commission

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I. PRELIMINARY STATEMENT

This initial decision involves the application filed under date of January 6, 1977, with the Nuclear Regulatory Commission (NRC), by the Portland General Electric Company acting on behalf of itself, the Eugene Water and Electric Board, and Pacific Power and Light Company (hereinafter referred to as the Licensees or PGE). Therein, the Licensees requested an amendment of Operating License NPF-1 for the Trojan Nuclear Plant (the facility or plant) to allow more spent fuel to be stored in the facility's spent fuel pool (SFP) by a modification of the SFP which would substitute new spent fuel storage racks with spaces for 651 fuel assemblies in lieu of the existing approved racks which can hold 280 fuel assemblies (PGE Ex. 2, known as PGE-1013, which was supplemented and amended by PGE Exs. 4-11).

On February 14, 1977, the NRC issued a "Notice of Proposed Issuance of Amendment to Facility Operating License" which, in part, provided that those whose interest might be affected by the Licensees' request could file a petition to intervene and request a hearing (42 Fed. Reg. 9068). Petitions to intervene were filed and ultimately the Board admitted the following as intervening parties pursuant to 10 CFR 2.714: David B. McCoy; the State of Oregon, acting by and through its Department of Energy and its Energy Facility Siting Council; Susan M. Garrett, acting on her own behalf and as the representative of the Coalition for Safe Power; and Sharon S. McKeel.

After the Board had admitted various contentions of the intervening parties as issues in controversy and after discovery had been concluded, the hearing commenced in Portland, Oregon, on January 4, 1978. Numerous limited appearance statements by members of the public were received through Janaury 6, 1978. The evidentiary phase of the hearing began on January 9th[1] and continued through January 20, 1978. Thereafter the

[1]On January 9, 1978, at the beginning of the evidentiary portion of the hearing, the State of Oregon withdrew Contentions A3(b) and (c), A5(b), (c), and (d), A8(b), B3(a)(2), (3), and (4),

(Continued on next page.)

evidentiary hearing was held between January 30 and February 10,[2] and between April 17 and April 26, 1978. On the latter date the evidentiary record was closed. There were 6,493 pages of transcript. All parties, except Ms. McKeel and Mr. McCoy, called witnesses. (Appendix A hereto lists the exhibits admitted into evidence.)

Parenthetically we note that, prior to the hearing, on August 30, 1977, PGE forwarded to us Revision 2 to PGE-1013 (PGE Ex. 2) which stated that, although no spent fuel had been stored in the SFP, the SFP had been used to temporarily store liquid rad-waste in July 1976. Further, we note that in a letter dated September 20, 1977, PGE advised that certain preparatory work was being performed to facilitate the installation of the new SFP storage racks after the license amendment was received. Consequently, in our order of October 31, 1977, we directed Staff and the Licensees to present evidence regarding the exact nature of the preparatory work being performed and the exact contamination level in the pool at the time the preliminary work commenced as well as the present time. We do not make specific findings herein on these two matters since the Board's posing of questions does not create an inviolate duty to make findings specifically addressing the subject matter of the questions. *Southern California Edison Company, et al.* (San Onofre Nuclear Generating Station, Units 2 and 3), ALAB-248, 8 AEC 957, 975 (1974). Based upon the evidence adduced by the Staff and Licensees and subjected to cross-examination, we conclude (1) that the preparatory work did not reduce the structural integrity of the existing racks (Aldersabaes, Tr. 1216-17; Morril, Tr. 1870-72) or liner (Aldersabaes/Bushnell, Tr. 1230, 1341; Pate, Tr. 1707-08), and (2) that the total exposure experienced by the Licensees' personnel working in the contaminated SFP was insignificant (Withers written

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(Continued from previous page.)
B3(b) and (c), B4(a)(2), and B7(b)(4), because, as a result of the discovery process, it concluded that these contentions were not well-founded (Tr. 932-36). Further, on February 10th, the State withdrew Contention B6 because the Licensees had agreed to and had conducted additional dye penetrant testing of the SFP liner plate (Tr. 3868, Tr. 4884-4892).

Further, on January 9, 1978, Mr. McCoy filed a Motion for Admission of a New Contention which, in substance, asserted that there existed an enhanced probability that an earthquake would occur which could damage the SFP (Tr. 981). The Board denied the motion in that it was untimely and in that it challenged the safe shutdown earthquake for the entire facility, a matter which was beyond our jurisdiction to determine (Tr. 2488-91; see our order of February 15, 1978). We rejected a similar Motion by Ms. Garrett (Tr. 2491-93) with regard to Mr. McCoy's seismic contention because the National Environmental Policy Act does not confer on the Board jurisdiction that it would not otherwise possess—*i.e.*, the Commission had delegated to us only the authority to decide whether to permit the modification to the operating license which would change the capacity of the SFP racks (Tr. 3008-14).

[2]On February 6, 1978, the Board visited the Trojan Plant to view the SFP.

testimony, pp. 1-2, fol. Tr. 1881; Fish written testimony, pp. 1-4, fol. Tr. 1935; Fish, Tr. 1969-70).

II. FINDINGS OF FACT RE MATTERS IN CONTROVERSY[3]

A. Quality Assurance

Garrett Contention A-5:

The Licensees have not demonstrated the existence of a detailed quality assurance program which would effectively detect and prevent defective work by contractors and manufacturers of the Licensees' proposed spent fuel storage system.

1. The quality assurance program for the new storage racks is governed by 10 CFR Part 50, Appendix B, which is captioned "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." To satisfy these requirements, PGE required that its contractor-vendor, Programmed and Remote Systems, Inc. (PaR),[4] as well as subvendors, adopt ANSI N45.2-1971 which implements Appendix B (Frewing written testimony, pp. 9-10 fol. Tr. 2249; Pate, Tr. 2609; Sturm, Tr. 3985; PGE Ex. 2, p. 7-1). The ANSI Standard N45.2-1971 includes the following quality assurance program elements: (1) program; (2) organization; (3) design control; (4) procurement document control; (5) instructions, procedures, and drawings; (6) document control; (7) control of purchased material, equipment, and services; (8) identification of materials, parts, and components; (9) control of special processes; (10) inspection; (11) test control; (12) control of measuring and testing equipment; (13) handling, storage, and shipping; (14) inspection, test, and operating status; (15) nonconforming items; (16) corrective actions; (17) quality assurance records; and (18) audits (Frewing written

[3]At the time of its filing of proposed findings of fact and conclusions of law, the State of Oregon withdrew several of its contentions—A 1 (a), B2, A3 (a), B3 (a)(1), B4(a)(1), B4(b)(1) and (2), A5(a), A5(e)(1) and (2), B5(a), (b), and (c), A7(a) and (b), B7(a)(1) and (2), and B7(b)(3). After reviewing the record and the proposed findings submitted by Staff and Licensees, we conclude that Oregon's withdrawal of these contentions was well-taken in that said contentions are not supported by the evidence, and we do not discuss them further.

Mr. McCoy did not file proposed findings of fact and conclusions of law. Ms. McKeel submitted remarks in the form of a prayer. Ms. Garrett limited her proposed findings and conclusions of law to two of her contentions (A-1 and A-2), which we discuss under heading II.K., *infra*. Since these intervening parties have not formally withdrawn their contentions, we proceed with our adjudication thereof.

[4]PaR is responsible for the new rack design, fabrication, and installation (Frewing written testimony, p. 12, fol. Tr. 2249).

testimony, p. 10, fol. Tr. 2249). The Staff reviewed the Licensees' quality assurance program for the design, fabrication, and installation of the new spent fuel racks and found that it conformed to the requirements of Appendix B (George written testimony, p. 7, fol. Tr. 2516; Staff Ex. 1A, p. 14).

2. PGE performed two audits to verify that PaR's quality assurance program satisfied Appendix B requirements and made subsequent visits to the vendor's plant to verify that action had been taken to correct certain deficiences (attach. to Frewing written testimony, fol. Tr. 2249; Greenwood, Tr. 2280). Further, with regard to the actual fabrication, inspectors of the Bechtel Corporation, as agent for the Licensees, made 12 inspections at PaR's plant (Greenwood, Tr. 2279, 2484-85). In addition, PaR conducted quality assurance audits of work being performed by its subcontractors (Sturm, Tr. 3745-46). Finally, an inspector in the NRC Office of Inspection and Enforcement (OIE) examined welds on one of the new SFP racks and found them to meet the ASME visual inspection requirements (Pate testimony, p. 4, fol. Tr. 1644). This inspector, after requesting additional liquid penetration testing, did find that there were some liquid penetrant indications in welds on a module locating frame. However, at the time of the hearing, all but two of these indications had been corrected by surface grinding, and we understand that, with respect to these two indications, PGE will take corrective action which will be verified by the OIE (Pate, Tr. 2503-04).

3. From our review of the record, we are satisfied that the Licensees' quality assurance program meets the requirements of Appendix B to Part 50. There is no evidence that the QA program has not effectively detected and prevented defective work. Indeed, there is no evidence that there has been faulty workmanship—the liquid penetrant indications result from pits or scratches incurred in normal welding, and do not indicate faulty workmanship (George, Tr. 2583).

B. Corrosion

Oregon Contention A 2:

Long-term Storage: The Licensees have failed to demonstrate that utilization of the spent fuel pool, associated systems, and storage racks, as proposed pursuant to the requested amendment, is adequate to accommodate storage of spent fuel elements safely either for the length of time contemplated by its analysis or for what is reasonably likely to be a substantially longer period of time. This failure precludes a conclusion that issuance of the proposed amendment is not inimical to the public health and safety. Specifically, the Licensee did not assess:

(a) the potential effects of increased corrosion on pool liners, storage racks, or spent fuel;

(b) the increased need for water chemistry or detrimental materials controls;

(c) the need for, and adequacy of, in-service inspections and surveillance of the pool liner, storage racks, spent fuel, and the support systems associated with the spent fuel pool.

4. Although Oregon, in its proposed findings, asserts that it still advances this contention, it is evident to the Board that the State's present position is very different from that suggested by the contention as worded above. In particular, the State now levels a criticism at the Licensees' plan which is much narrower in scope than that set forth above (Oregon's Proposed Findings, nos. 17-24, pp. 2-4). Far from holding that the Licensees have "not assessed" the effect of increased corrosion, the need for chemistry and material controls, and the need for surveillance of equipment, Oregon now limits itself to implying that we should require as conditions for the proposed amendment (a) a Technical Specification fixing water chemistry in the pool (rather than a less formal commitment on the Licensees' part), and (b) the instituting of a corrosion program (Oregon Proposed Findings 17-24).

5. We turn first to the notions advanced in Oregon's proposed findings. We shall deal with the corrosion itself in those findings wherein we address similar corrosion contentions advanced by other Intervenors.

6. We note that the Staff witnesses did not believe that imposing SFP water chemistry Technical Specifications would be necessary (Herring, Tr. 4593; Trammell, Tr. 4598); that an effective means of policing the Licensees' adherence to appropriate water chemistry limits exists without a Technical Specification (Trammell, Tr. 4597); and that the halide concentrations to which the Licensees were being held were, if anything, more restrictive than necessary (Weeks, Tr. 4590; Trammell, Tr. 4598). The Staff witnesses also mentioned that there is an ongoing generic study of water chemistry requirements for SFP's, and they expressed reluctance to set Technical Specifications before the results of that study were known (Trammell, Tr. 4600).

7. This testimony was uncontroverted, and Oregon's witness, Mr. Godard, did not give any reasons why Technical Specifications should be imposed (Oregon Ex. 1). Indeed, Oregon's witness alleged that he himself would also be independently checking records of the SFP water chemistry to

give further assurance that it would be kept within the limits to which the Licensees have committed (Godard, Tr. 3463).

8. We see no particular advantage in imposing Technical Specifications on SFP water chemistry. The combination of regulatory control operating through 10 CFR 50.59 mentioned by the Staff's witness (Trammell, Tr. 4597) and State surveillance of records (Godard, Tr. 3463) seems adequate.

9. The evidence does not indicate the necessity for requiring a corrosion coupon program, which would entail the examination of samples of pool materials exposed to the environment. Staff witness, Dr. John Weeks, testified that, in his opinion, such a program was not necessary, although he felt it might be "possibly" desirable (Tr. 4580, 4583) as a long range study. Licensees' witness, Dr. A. B. Johnson, testified that there might be merit to a coordinated program, but that "great confusion" could come from a program where individual reactors were required to conduct such tests (Tr. 2851-52). Licensees' witness, John Frewing, asserted that no useful information could be gained by such a program because the very low corrosion rate in the SFP would make measurements difficult (Frewing written testimony, p. 21, fol. Tr. 3047; Tr. 3218).

10. The State's witness, Mr. Donald Godard, felt that a corrosion coupon program would be of value as a check to assure that violations of water chemistry conditions had not occurred (Oregon Ex. 1, pp. 10-11). But even he agreed the coupons would have little "predictive value" (Tr. 3442). He also conceded that his own experience, where a coupon program had proved useful, involved much more corrosive environments, wherein corrosion rates would be higher, and that at the low rates expected in the SFP, corrosion coupons would not be so effective (Tr. 3477). Moreover, Mr. Godard did not feel that the corrosion coupons would affect a "go no-go decision" on fuel pool expansion (Tr. 3448). We see no reason to require such a program.

Garrett Contention A-4:

The Licensees have not adequately analyzed corrosion and radiation damage to the fuel assembly racks, the assemblies, the steel pool liner, and the concrete walls and flooring of the spent fuel pool due to:

(a) increased radioactivity in the pool:

(b) increased and uninterrupted spent fuel assembly residence time including possible residence beyond 1988; and

(c) increased temperatures resulting from the proposed modification.

An adequate analysis of potential corrosion and radiation damage is especially important in view of the fact that the opportunities for pool and rack maintenance will be reduced due to the constant, uninterrupted spent fuel residence in the pool under the proposed modification.

McKeel Contention A1(b):

The Licensees have failed to adequately demonstrate that the storage of greater amounts of irradiated fuel for longer periods of time than originally anticipated and the attendant increased fission product inventory, heat load, and displacement of SFP cooling water will not:

(b) result in unacceptable radioactivity and heat-induced acceleration of corrosion of the SFP racks, the seismic restraint system, the stainless steel SFP liner, and the Zircaloy cladding on the stored fuel elements.

McCoy Contention A5(a):

The Licensees have failed to adequately demonstrate that the proposed expansion of spent fuel storage will not increase to unacceptable levels the corrosion of the fuel storage racks, the spent fuel elements therein, and the fuel pool itself as a result of the increased amount of spent fuel and the increased number of racks under the proposed modification, and the potential increased length of time for storage of spent fuel that would be made possible for the proposed amendment.

McCoy Contention B5(b):

The proposed seismic design for the modified SFP is inadequate to withstand the proposed safe shutdown earthquake in that. . . (b) the weakening of SFP structures because of increased radiation fields and temperatures has not been addressed in the analysis. The structures involved include racks, liner, fastenings, and cooling system components.

11. These contentions, and Oregon Contention A2(a) above, allege that corrosion will be increased and pool components or fuel assemblies will be weakened because the proposed change will affect parameters such as temperature, radiation level, and the length of time fuel is stored. The materials present in the modified SFP will be type 304 stainless steel in the racks, the pool liner, and the discharge header and piping; 17-4 pH stainless steel in the racks; and Zircaloy-4 and Inconel-318 in the spent fuel

assemblies (PGE Ex. 2, Ch. 3). The SFP water is to be maintained during normal operation at a quality comparable to that of the reactor coolant (Frewing, Tr. 3075) and at temperatures less than or equal to 140°F (PGE Ex. 2, p. 3-17). The racks and the liner will likely remain in the SFP until the expiration of the facility operating license in the year 2011, and there is presently nothing in the operating license that would prohibit the storage of a particular fuel assembly in the Trojan SFP until that date. Thus, the period of exposure of materials in the SFP would be on the order of 33 years from a corrosion standpoint.

12. Extensive testimony by PGE witness Dr. A. Johnson indicates that similar fuel has been stored up to a maximum of 18 years, and many assemblies have been stored up to 14 years without significant degradation (Johnson written testimony, pp. 2, 4, Table 3, fol. Tr. 2692; Tr. 2752, 2763).

13. Testimony by Licensees' witness, Mr. R. Frey, and by Staff's witness, Dr. John Weeks, confirms the notion that fuel elements of the type used at Trojan suffer very little corrosion in water near the temperature produced by the proposed modification (Frey written testimony, p. 1, fol. Tr. 3049; Weeks written testimony, p. 1, response to McCoy Contention A5(a), fol. Tr. 4567).

14. We find that general corrosion of the fuel is not expected to be a problem. Local corrosion conditions of Zircaloy-clad fuel, including stress corrosion cracking, galvanic corrosion, and helium embrittlement, were also examined in detail by Dr. Johnson (Tr. 2727-29). The evidence establishes that Zircaloy is generally immune to stress corrosion cracking in aqueous media (Johnson written testimony, p. 68, fol. Tr. 2692; Tr. 2784) and that Inconel is similarly resistant to this phenomenon (Frey written testimony, p. 4, fol. Tr. 3049; Tr. 3386). Similarly, Zircaloy and Inconel are highly resistant to crevice corrosion (Johnson written testimony, p. 69; Tr. 2858), and there is no galvanic corrosion between Zircaloy and Inconel (Staff Ex. 2, p. 7; Johnson, Tr. 2790-92). While the type of fuel used at Trojan is internally pressurized with helium, the form of helium used is such as to preclude substantial migration into clad and helium embrittlement (Johnson, Tr. 2856-57). Thus, we find that local corrosion phenomena will not significantly affect spent fuel integrity under the storage conditions and time period contemplated by the proposed amendment. General corrosion rates for materials other than fuel will also be low under the conditions proposed for the expanded facility (Johnson, Tr. 2878; Staff Ex. 2, pp. 2, 5, 10).

15. Local corrosion rates of components other than fuel were also addressed. It appears that stress corrosion cracking of stainless steel could be of concern because of the possible existence of sensitized areas generated by

welding (Bushnell, Tr. 1231; Carter, Tr. 1305-07, 3196, 3260-61; Frey, Tr. 3091). However, this phenomenon occurs only at levels of halide concentration considerably above those at which the SFP water purity will be controlled (Johnson, Tr. 2787; Johnson written testimony, p. 67, fol. Tr. 2692; PGE Ex. 2, Table 3.6; Frey written testimony, p. 3, fol. Tr. 3049). The evidence indicates that gamma radiation will have no effect on corrosion rates of materials in the SFP other than possibly to increase oxygen levels in the SFP which would tend to inhibit corrosion (Weeks written testimony, response to Garrett Contention A-4, pp. 1-2, response to McKeel Contention A1(b), p. 2, fol. Tr. 4567). Neutron radiation levels are orders of magnitude below those known to cause damage to the materials present in the SFP and will not affect corrosion rates significantly (Weeks written testimony, response to Garrett Contention A-4, pp. 1-2, fol. Tr. 4567, response to McKeel Contention A1(b), p. 2, fol. Tr. 4825; Frey written testimony, p. 2, fol. Tr. 3049). There is no evidence that the radiation generated by the fuel once it is removed from the reactor (Johnson, Tr. 2845) or the amount of fuel stored (Weeks written testimony, response to McCoy Contention A5(a), p. 1, fol. Tr. 4567) has any effect on corrosion rates of materials in the SFP. Similarly, radioactive material present in the pool due to fuel defects will have no effect on corrosion (Johnson, Tr. 2756, 2962).

16. We see no reason to believe that the components of the modified SFP or the fuel assemblies stored therein will be subject to corrosion of a sort which would threaten their integrity or interfere with their intended functions.

McKeel Contention A2(a):

> In view of the longer period of storage of spent fuel contemplated under the proposed amendment and the increased amount of fission products and heat the stainless steel SFP liner will be exposed to, the maintenance of adequate safety margins requires the installation of a thicker pool liner which will be more resistant to minor imperfections in the plate and the liner's welded joints in order to reduce the likelihood of leaks to acceptable levels.

17. Stainless steel has been stored under water to periods up to 20 years without degradation (Carter, Tr. 3257). It is deemed satisfactory for storage up to 40 years (Staff Ex. 2, pp. 5, 10). The anticipated level of radiation will not affect the corrosion rate (Frey written testimony, p. 2, fol. Tr. 3049). As with the other stainless steel components of the SFP, the liner, having been welded, could be subject to stress corrosion cracking in weld heat affected

zones, but this can be precluded by proper water chemistry control (see the discussion of other corrosion contentions, *supra*).

18. Dr. Weeks testified that fuel pools having liners the same thickness as the Trojan fuel pool liner, one-quarter inch, have not experienced leakage, and that he saw no need for an increased lining thickness (Weeks written testimony responding to McKeel Contention A2(a), p. 1, fol. Tr. 4567). Both Dr. Weeks and Mr. Kenneth Herring (Herring written testimony responding to Oregon Contention B7, p. 2, fol. Tr. 4473) testified that leaks, should any develop, can be repaired.

19. We see no need to increase pool liner thickness in connection with the proposed increase in storage capacity.

C. Structural Matters

20. As noted above, at the time it filed its proposed findings of fact and conclusions of law, Oregon withdrew its Contentions B4(a) (1) and B4(b)(1) and (2). Oregon also withdrew the last sentence of its Contention A4, leaving that contention to read:

> **Oregon Contention A4:**
>
> The Licensees have not demonstrated that the design of the new spent fuel storage racks provide a structural integrity sufficient to store spent fuel onsite safely in the manner and for the period contemplated by its application. This failure precludes the conclusion that issuance of the proposed amendment is not inimical to the public health and safety. Specifically, the drop test described at page 3-7 of PGE-1013 does not accurately reflect the reasonably likely impacts upon the storage racks in that, while the tests simulated the dropping of a 2,000-lb object onto a test rack section from a height of 18 in, the current Trojan Technical Specifications would permit loads of up to 2,500 lb to be transported over the spent fuel pool at heights greater than 18 in.

21. We note that the test mentioned in the contention was not intended as a proof test for rack integrity under very severe circumstances (Herring, Tr. 4034-4035). It was used only to determine local damage under conditions simulating the dropping of a fuel element (PGE Ex. 2, p. 3-7) and to determine rack response in order to permit other calculations to be made (Herring, Tr. 4035).

22. The test did not represent an accident severe enough to cause the racks to yield (Bushnell, Tr. 3544). The test subjected the racks to only 20,000 in-lb of impact energy (PGE Ex. 2, p. 3-8) but allowable stresses in

the most critical structural member of the racks would be reached only for impact energies around 240,000 in-lb (Bushnell, Tr. 3545).

23. Technical Specifications prohibit the carrying of loads greater than 2,500 pounds over stored spent fuel, but there is no limit on the height at which lighter loads may be carried (Bushnell, Tr. 3573). There is a Technical Specification requiring demonstration that crane stops be in place to prevent the high capacity fuel building crane from traversing the fuel assemblies (Tr. 3951). We note that there are many objects that can be carried over spent fuel: an 800-pound burnable, poison-handling tool, a 356-pound handling tool, and a 292-pound thimble plug-handling tool are some examples (Trammell, Tr. 4023). Analysis indicates that the worst-case drop (an 800-pound tool from a height of 12 feet) yields an impact energy of 118,400 in-lb (Bushnell, Tr. 3614, 3755-56). This is far less than the 240,000 in-lb of energy required to overstress the racks.

24. We find that data from the drop tests have been appropriately used, and that the design of the racks is adequate to resist the type of dropped objects which will be routinely handled over the pool. Oregon, however, in its proposed findings, raises a new issue distantly related to this contention, an issue which we believe merits further attention—*i.e.*, Oregon believes that we should require a Technical Specification which would limit loads and the heights at which they are carried over spent fuel so as to preclude impact energies in excess of 240,000 in-lb (Oregon's Proposed Findings, p. 7, paragraph 31). Oregon points out that, although it is not a routine matter, a situation could be visualized in which a weight of 700 pounds could pass over fuel at a height of 48 feet (Oregon Proposed Findings, p. 7, paragraph 29; Trammell, Tr. 4021) and that damage to the racks could cause damage to the stored fuel elements (Oregon's Proposed Findings, p. 7, paragraph 30).

25. We believe that this condition would be a sensible one to impose. It would impose no burden on routine operations, and testimony indicates that even nonroutine operations could be carried out in accord with it (Trammell, Tr. 4021). We therefore impose in our order, *infra*, the condition Oregon requests.

Garrett Contention A-3:

The Licensees' description of possible accidents has provided no analysis of possible loss of seismic restraint capability of the spent fuel pool which might result from accidental dropping, or repeated droppings over a period of time of fuel assemblies or other similar large objects into or upon the expanded storage area.

26. The ability of the SFP itself to withstand seismic events is not changed by the proposed modification and is not an issue in this proceeding. The seismic restraints for the racks result from rack-to-rack connections to prevent overturning (Bushnell/Sturm, Tr. 3624-26). Shear forces present no problem (Bushnell, Tr. 3626). The only portion of the racks that could be damaged by dropped objects is the set of funnels at the tops of the racks. The overall rack integrity would not be impaired and such damage would not affect the ability of the racks to withstand a seismic event. Cumulative effects of repeated dropping of objects need not be considered since the Licensees intend to examine the structural elements and take corrective action whenever a drop incident occurs (Herring written testimony on Garrett A-3, pp. 1-2, fol. Tr. 4001).

27. We conclude that the seismic restraint capability of the SFP racks will not be significantly degraded by accidental dropping or repeated droppings of fuel assemblies or similar large objects. Garrett Contention A-3 is without merit.

McCoy Contention B5(a):

The proposed seismic design for the modified SFP is inadequate to withstand the proposed safe shutdown earthquake in that (a) the increased stresses on pool structure, pool liner, and other building structural components, due to the greater weight of fuel and racks, have not been evaluated.

28. Licensees' witness established that seismic loads have been considered in the design of the racks (Bushnell, Tr. 3636), and that the structural systems affected by the modification have been evaluated in accord with all regulatory acceptance criteria (Bushnell written testimony, p. 5, fol. Tr. 3538). Maximum weights and masses were used in the design (Bushnell, Tr. 3645, 3649).

29. The Staff witness, Dr. Herring, also assures us that design of the modified installation conforms to all regulatory requirements, including seismic ones (written testimony on McCoy B5(a), p. 1, fol. Tr. 4001).

30. We see no reason to believe that the seismic design has failed to account for any change in rack weight or fuel weight. McCoy Contention B5(a) is without merit.

McKeel Contention A2(b):

In view of the longer period of storage of spent fuel than that contemplated in the original operating license and the increased fission

product inventory to be stored under the proposed amendment, the associated increase in the likelihood and consequences of a leak from the SFP requires that the reinforced concrete structure be designed to be leaktight in addition to providing structural support for the SFP.

31. It is not the concrete structure, but the pool liner which is designed to assure leaktightness (Frewing, Tr. 3831). The liner has been analyzed for load combinations including dead, live, thermal, and seismic loads and thus its structural integrity will be maintained (Herring written testimony on McKeel A2(b), p. 1, fol. Tr. 4001). No degradation of the liner due to corrosion is expected (see discussion of corrosion, *supra*). The concrete will not be degraded by radiation or thermal effects (Frewing testimony, pp. 23-24, fol. Tr. 3533; Frewing testimony, p. 36, fol. Tr. 4181). Any leakage through the liner will be readily detectable through the leak-chase channel system and the concrete itself acts as a secondary barrier (Frewing testimony, p. 36, fol. Tr. 4181).

32. We find that the modification engenders no need for the reinforced concrete pool structure to be made more leaktight than it already is, and McKeel Contention A2(b) is without merit.

D. Repairs and Maintenance[5]

Oregon Contentions B7(b)(1) and (2):

The Licensees' analysis of potential accidents after the proposed modifications have been made is deficient, and therefore cannot be used to support a conclusion that issuance of the proposed amendment would not be inimical to the public health and safety. Specifically . . . (b) the Licensees did not discuss what provisions have been made to recover from accidents described in paragraph (a) above or from the longer term effects of spent fuel storage such as degradation of the pool liner, the fuel cooling systems, or storage racks. Specifically, the Licensees have failed to demonstrate that (1) pool liner leakage can be repaired, and (2) sufficient numbers of casks are available for or can be obtained to allow removal of fuel from the pool if such removal is necessary for the performance of repairs.

33. If under abnormal circumstances a fuel assembly is dropped and its

[5]Oregon did not submit proposed findings on Contentions B7(b)(1) and (2). However, the Board finds no indication in the record of withdrawal of these contentions and therefore will make findings on them as part of this initial decision.

corner directly strikes the pool liner over a leak detection channel, there is a possibility of liner rupture (Bushnell, Tr. 3544). In such a situation, the concrete walls and floor of the SFP will provide an essentially leaktight barrier (Frewing written testimony, pp. 36-37, fol. Tr. 4181), the location of the liner leak could be determined visually or by means of the monitoring system built into the pool (Bushnell, Tr. 4189-93; Bushnell written testimony, p. 2, fol. Tr. 3538; Lantz, Tr. 4494-5), and repairs could be accomplished by divers using welding or other techniques that have been used elsewhere (Herring written testimony on Oregon Contention B7(b)(1), p. 1, fol. Tr. 4001; Frewing written testimony, p. 37, fol. Tr. 4181; Bushnell, Tr. 4324-5).

34. The only situation in which liner leakage from a dropped object might result is where the object directly impacts the liner and this would only occur in the spaces at the edge of the pool between the racks and the SFP where no racks or fuel are located. Nevertheless, even assuming that a leak could occur under storage racks, the necessity to move fuel to effect repairs is not appreciably altered by the proposed modification (Frewing, Tr. 4334-35). Because of the design of the locating frames for the modified SFP, a leak beneath particular locating frames could require the removal of, at worst, four racks to get to the leak. This could be done without removing fuel from the SFP after as many as seven prior refuelings or until about 1985 assuming that the proposed amendment is authorized in 1978 (Frewing written testimony, p. 38, fol. Tr. 4181; Bushnell, Tr. 4199-4200). Such fuel shifting would provide ample space and radiation protection to allow divers to repair the liner and does not differ markedly from the situation as it would exist in the event of a leak in the unmodified SFP (Lantz written testimony, p. 2, fol. Tr. 4473). In fact, from the standpoint of the availability of onsite storage space for the shuffling of fuel to allow liner repairs, the proposed modification will provide substantially more space than the existing pool since full-core storage capability will not be lost until after the eighth refueling as compared with loss after the second refueling for the unmodified SFP.

35. The proposed modification itself does not affect the availability of casks to ship fuel off the Trojan site so that repairs may be made to the SFP (Lantz written testimony, p. 3, fol. Tr. 4473). The need for shipping casks in the liner repair context could arise in 1982 or earlier with the existing SFP. For the modified SFP, we have previously found that the need to ship fuel offsite so that liner repairs can be performed would not arise until 1985 at the earliest. Casks are available for rental from vendors within time periods of one year, which is the time it would take the Licensees to purchase a cask of their own (Lentsch, Tr. 4225; Owens, Tr. 4226), and there is no evidence that would indicate that this situation with regard to cask

availability will be different in 1985 with a modified SFP than it is now with the existing SFP.

36. Since the record establishes that modification of the spent fuel pool results in no appreciable change in repairability of the pool liner, that there is no change in the availability of fuel casks as a result of the pool modification, and that there is a reasonable likelihood of casks being available when possibly needed after 1985, Oregon Contentions B7(b)(1) and (2) are without merit.

E. Accidents

Oregon Contentions A8(a)(1) and (2):

The Licensees' analysis of potential accidents after the proposed modification have been made is deficient, and therefore cannot be used to support a conclusion that issuance of the proposed amendment would not be inimical to the public health and safety. Specifically (a) the Licensees did not accurately address either the increased risks of or consequences from releases of radioactivity from or criticality occurring in the modified spent fuel pool due to an accident resulting from (1) the transport of spent fuel casks and other heavy objects alongside, over, and near the spent fuel pool; (2) projectiles generated by natural events, such as earthquakes or tornados, or by mechanical failure, such as turbine failure.

37. The likelihood of a cask drop or tip accident in the vicinity of the SFP is not changed by the proposed modification. It is extremely low because it would require not only the violation of the Licensees' administrative procedures for heavy load handling but also the simultaneous failure of the mechanical stops on the fuel building crane, a mechanical device, such as the crane hook, on the crane itself and the safety sling (PGE Ex. 2, p. 4-3; Frewing, Tr. 4946-47). If a cask drop did occur in the cask-loading pit, there would be no water loss from the SFP and no effects on safety-related equipment (Staff Ex. 1A, p. 7).

38. The Staff currently has underway a generic load-handling study in which cask drop and tip accidents in the vicinity of spent fuel pools are being assessed to determine what further actions may be necessary (Staff Ex. 1A, pp. 7-8). This study is scheduled for completion in January of 1979 (Oregon Ex. 2, pp. 6-7; Trammell, Tr. 4030). The Staff has evaluated the likelihood of a cask drop or tip accident in the vicinity of the Trojan SFP prior to the completion of the generic study and has determined that such probability is essentially zero since no casks will be present at Trojan until

1984 (Trammell, Tr. 4023). Because of this, the Staff has taken the position that no restrictions on cask handling are required until completion of the generic study and the Board agrees (Staff Ex. 1A, pp. 7-8; Donohew written testimony, pp. 1-2, fol. Tr. 5030). However, the present Technical Specification limiting loads carried over stored fuel to 2,500 lb doesn't preclude carrying loads of lesser weight at substantially greater heights. Therefore in finding 25, *supra,* we have specified the imposition of a condition limiting the impact energy of any potentially dropped object to 240,000 in-lb.

39. The evidence demonstrates that objects that could normally be carried over spent fuel under the existing Technical Specifications would, if dropped, initially impact only one spent fuel assembly. Although such a dropped object could bounce after the initial impact, it would not hit other stored fuel assemblies because stored fuel is 9 inches below the top of the modified racks. As a result, it is physically impossible for a dropped fuel assembly or tool to damage more than one stored fuel assembly (Donohew written testimony, pp. 2-3, fol. Tr. 5030; Donohew, Tr. 5056-57). Such damage would, at worst, result in the rupture of all fuel rods in a single fuel assembly.[6] That particular accident was previously analyzed as the design basis accident for the Trojan SFP and the consequences found to be acceptable. The accident and its analysis are still applicable to the modified SFP (Frewing written testimony, p. 43, fol. Tr. 4936; Lentsch, Tr. 4944-46; Frewing, Tr. 4948).

40. In the event that an object impacts and ruptures fuel in the SFP, radioactivity will be released from the fuel. The consequences of such an accident will depend on the amount and age of the fuel which is damaged. The Staff calculated, as a function of decay time, the number of fuel assemblies which could suffer the rupture of all fuel rods with the consequences within the guidelines of 10 CFR Part 100. Those calculations demonstrate that at 96 hours after reactor shutdown (minimum decay time before fuel may be moved from the reactor to the SFP) at least ten fuel assemblies could be damaged without exceeding the guidelines of Part 100. In about three and a half weeks after reactor shutdown, an entire third of a core can be damaged without unacceptable consequences[7] (Donohew written testimony, table 1 and p. 4, fol. Tr. 5030).

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[6]This is an extremely conservative assumption since, in eight of the ten fuel assembly drop accidents experienced to date, there was no measurable release of radioactivity (Donohew, Tr. 5071), which indicates that few, if any, fuel rods were ruptured. In fact, the evidence indicates that only a dropped cask could cause the rupture of all fuel rods in a single assembly (Frewing, Tr. 4947).

[7]The Staff's calculations in this regard are extremely conservative in that a peaking factor of

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41. In the event that the proposed amendment is authorized and reracking of the SFP occurs while some spent fuel is stored in the pool, the potential exists for dropping an empty fuel rack on stored fuel while the empty rack is being removed from or installed in the pool. The Licensees have stated that if the SFP modification is made with fuel stored in the pool, the reracking procedure would be to lift an empty rack a few inches off the pool floor, move it at that height to the end of the pool opposite where the spent fuel is located and then lift the empty rack from the pool. The installation of new racks would involve the same procedure in reverse (Bushnell, Tr. 4953-57). Such a procedure would clearly minimize the chances of damaging stored fuel from dropping an empty rack. In addition, the Staff proposed, and the Board agrees (see findings 53 and 81, *infra*), that conditions on boron concentration in the SFP and minimum decay times for stored fuel be imposed if the pool reracking is performed while fuel is stored in the SFP. Such conditions will preclude criticality and the occurrence of unacceptable radiological consequences from a dropped storage accident.

42. The probability of generating a turbine missile that would hit the SFP is so low as to be considered incredible and the probability of damage to freshly discharged fuel is even lower (Bushnell, Tr. 4985-86; Donohew written testimony, p. 4, fol. Tr. 5030; Herring, Tr. 4050; Walt, Tr. 4056).

43. The probability of a tornado occurring in the vicinity of the plant is about 7×10^{-5} per year. This probability, combined with the fraction of a year during which refueling takes place and the critical period for fuel damage occurs, results in a probability that a tornado would occur in the site vicinity during the critical period of about 6×10^{-6} per year (Donohew written testimony, p. 4, fol. Tr. 5030). The evidence shows that the siding on the fuel building is designed to wrap around structural girders in the event of a tornado; consequently such siding could not become missiles that could damage stored fuel (Bushnell, Tr. 4938). The concrete walls of the SFP will resist any postulated, low trajectory tornado missiles so that such missiles will not damage stored fuel (Frewing, Tr. 4939; Bushnell, Tr. 4941-42). In view of this, the probability that a tornado would generate a missile that could damage more than ten freshly discharged fuel assemblies during the critical period for fuel damage is clearly lower than 6×10^{-6} and is so low as to be incredible. This is confirmed by the Licensees' analysis for the modified SFP which shows that tornado missiles will not cause damage beyond the design basis fuel-handling accident (Bushnell, Tr. 4950).

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1.65 was assumed for every fuel element. An analysis of the more realistic, expected consequences shows that all fuel elements in one-third of a core could be ruptured before 96 hours after shutdown without exceeding Part 100 guidelines (Donohew written testimony, p. 6, fol. Tr. 5030).

44. The evidence also shows that the likelihood of the occurrence of a seismic event which generates a missile large enough to damage more than ten fuel assemblies during the critical period is similarly low (Donohew written testimony, p. 5, fol. Tr. 5030). The only missiles that might be generated by a seismic event are those carried by the cranes in the fuel building (Godard, Tr. 4149-50). The Technical Specifications preclude the large fuel building crane from carrying objects greater than 2,500 pounds near the SFP, we have previously found that small objects which may normally be carried over the SFP would not damage more than one fuel assembly, and we have imposed a limit of 240,000 in-lb on potential impact energy to preclude remotely conceivable situations involving objects weighing less than 2,500 pounds. Thus, a seismic event will not generate missiles that will result in consequences from fuel damage in the modified SFP exceeding the guidelines of Part 100 or consequences that exceed the previously analyzed and acceptable design basis fuel-handling accident.

45. Based on the foregoing, we find that radiological consequences from fuel damaged by projectiles generated by natural events or mechanical failures will be within the guidelines of 10 CFR Part 100. In addition, there is no evidence that those consequences will be significantly different for the modified SFP than what they would be for the existing pool (Godard, Tr. 5088), and in fact, if freshly discharged fuel is stored on 26.6-inch centers as the Licensees have committed, the consequences could be lower for the modified pool since such a storage arrangement is not used in the existing pool (Lentsch, Tr. 4986-91).

46. The likelihood that a projectile will cause criticality in the modified SFP will not change substantially from the likelihood of its causing criticality in the existing SFP. The spacing between assemblies is the primary difference between the existing and the modified SFP from a criticality standpoint. This spacing prior to projectile impact will do little to prevent criticality where the projectile is very large (Lantz written testimony, pp. 1-2, fol. Tr. 5026). The probability that a small projectile will push assemblies into a critical configuration increases as the spacing between assemblies prior to impact decreases (Lantz, Tr. 5047-48). At the same time, the probability that a small missile will be generated that will cause criticality by wedging between assemblies and pushing them into close contact with other assemblies decreases as initial spacing decreases because there are fewer missiles of the proper size and shape (Lantz written testimony, p. 2, fol. Tr. 5026). In view of this, we find that the likelihood of criticality due to impacts of projectiles does not change substantially for the modified SFP. Under actual conditions of spent fuel storage, circumstances are such that a substantial portion of the refueling concentration of boron will remain in the SFP. In addition, in the expected circumstances, all stored fuel

will have been irradiated in the reactor for at least 1 year and probably more. In these circumstances, the evidence shows that criticality in the spent fuel pool is very unlikely and that it is precluded for Trojan low-load fuel, regardless of the nature of the accident involving missile impact (Lantz, Tr. 5054, Tr. 5072-73; Perry, Tr. 5168-70; Lantz, Tr. 5174-75).[8]

47. Based on the foregoing, we find that the potential consequences of heavy load drops and of projectiles damaging spent fuel in the modified SFP have been adequately analyzed and shown to be within the requirements of the regulations and acceptable from the standpoint of public health and safety. We, therefore, find Oregon Contentions A8(a)(1) and (2) to be unfounded.[9]

F. Criticality

Oregon Contention A6:

The Licensees' analysis of the effect of the revised spent fuel configuration upon criticality, although it conservatively assumed zero boron for purposes of analysis, is deficicient in that it fails to identify the need to maintain 2,000 ppm of boron in the spent fuel pool water at all times. This deficiency precludes a conclusion that issuance of the proposed amendment is not inimical to the public health and safety.

48. The criticality analysis for the modified SFP assumed that no boron was present in the water (Frewing, Tr. 5160). Analyses were made for normal storage conditions and for a wide range of off-normal conditions including boiling of the water (Fisher, Tr. 5139-40), safe shutdown earthquake (SSE), a fuel assembly dropped upon the racks, an assembly dropped

[8]In its proposed findings, Oregon urged us to impose a Technical Specification requiring spacing of freshly discharged fuel no closer than every other cell in the new racks. Although the Board recommends that this procedure be carried out as planned, the record does not justify the imposition of such a rigid additional requirement. The Board reaches the same conclusion in regard to a demand by Oregon in its proposed findings that a Technical Specification be imposed requiring drastic action, including reactor shutdown, should pool temperature exceed 140°. The record doesn't reveal any serious consequences should 140° be exceeded during an accident situation, nor does it address the possible adverse consequences of such rigidity imposed on PGE's management of an accident.

[9]In its direct testimony (Godard, Tr. 5087) the State of Oregon asserted that a pool cover is part of the design for the Pebble Springs facility and that installation of a pool cover should be considered for the Trojan SFP. The evidence presented by Oregon does not establish a rationale for installation of a pool cover at Trojan and the expert witness testifying on behalf of the State indicated that, in his view, the proposed SFP modification, of itself, does not increase the consequences of SFP accidents or bring about the need for a pool cover (Godard, Tr.

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between loaded racks, and an assembly dropped between rack and wall. For each of these conditions K_{eff} was less than 0.94.

49. Thus the NRC acceptance criterion, K_{eff} 0.95 would be met for all cases with no boron present (Lantz written testimony on McCoy A7, pp. 1-2, fol. Tr. 5173), and it is clear that boron is not needed to preclude criticality for any of the possible off-normal conditions noted above (Frewing written testimony, p. 52, fol. Tr. 5123; Tr. 5128-29).

50. However, the boron concentration is generally kept at 2,000 ppm in the pool, not to guard against criticality in the pool, but to facilitate meeting a Technical Specification which requires such a concentration in the reactor cooling system and refueling cavity during refueling, since pool water mixes with the water in those systems at that time (Frewing written testimony, p. 52, fol. Tr. 5123, as amended; Tr. 5118).

51. Oregon, in its proposed findings (Proposed Findings 37-39, pp. 10-11) urges that we require a Technical Specification which would require maintenance of 2,000 ppm at all times, saying that "certain scenarios" set forth at pp. 5168-70 of the transcript indicate "rearrangements of spent fuel" would result in criticality, absent this concentration of boron. We have reviewed the portion of the transcript cited in context, and we note that any rearrangement that has that characteristic would be one in which all spacing between the fuel assemblies had completely collapsed, but the assemblies themselves had not. We deem the spontaneous occurrence of this condition, even as a result of some external missile, to be extremely improbable. Oregon has not pointed out any mechanism by which it could occur. We conclude that such a requirement for continuous maintenance of 2,000 ppm is unnecessary.

52. The Staff also urges a condition with regard to boron concentration. The Staff's proposal, however, is quite a different matter from that of Oregon. Staff urges that we require 2,000 ppm "in the event the proposed amendment is authorized and the modified racks are installed while fuel is stored in the SFP," said requirement to be effective during the installation of the racks. The Staff urges this to preclude criticality due to overturned racks and consequent spilled fuel elements, or due to the dropping of racks one on the other (Staff Proposed Findings, finding 110, p. 67).

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5087-89). The evidence shows that use of a pool cover at Trojan would require substantial design changes to the fuel building (Oregon Ex. 1, p. 29) and that there is no reasonable or practical way for a pool cover to be installed or used (Frewing, Tr. 4964-66). In view of this and of our findings with regard to the consequences of accidents without a pool cover, there is no need for a pool cover at the Trojan facility due to the proposed amendment.

53. We note that the mechanisms hypothesized by the Staff, in particular the one in which an overturned rack spills its burden of fuel, could result in just the sort of configuration which the Licensees' witnesses suggested might require boron (Frewing, Tr. 5167-70). Further, since the concentration is normally near 2,000 ppm, it seems no great burden to require that it be at least that high during reracking, should reracking occur while fuel is being stored (as it is now evident it will). We shall therefore impose that condition.

54. We also agree with Staff's proposal that an upper limit of 44.3 grams per axial centimeter of ^{235}U should be placed on the fuel stored in the modified racks (Staff's Proposed Findings, finding 111, p. 68) since the criticality analyses assumed this value (Lantz written testimony on McCoy Contention A7, p. 2, fol. Tr. 5173; Staff Ex. 1A, pp. 2, 4). We therefore impose this condition.

McCoy Contention A7:

The Licensees have failed to demonstrate that the increased amount of spent fuel proposed to be stored will not become critical some time during the period of storage permitted under the proposed amendment.

55. As we noted above with regard to Oregon Contention A6, it has been clearly demonstrated that criticality will not occur for any normal condition in the fuel pool, nor for a wide range of credible but unlikely off-normal conditions. It cannot be flatly stated that criticality can be absolutely ruled out; however, no party suggested a reasonably probable mechanism leading to criticality, other than the mechanisms mentioned by the Staff (and noted above), mechanisms which could occur only briefly under certain conditions of reracking. We have already determined that certain additional precautions are warranted for that period.

56. Intervenor McCoy did not submit proposed findings and has propounded no credible mechanism which would require additional demonstration of subcriticality.

57. Oregon did not propose findings on this contention. It did, however, submit proposed findings on its Contentions A8(a)(1) and (2) which mention criticality as a result of accidents. Significantly, those proposed findings (Oregon Proposed Findings, findings 32-36, pp. 8, 9) did not suggest any accident which could result in criticality but dealt only with the potential for damage to fuel and boiling of the pool.

58. After careful consideration of the record we conclude that it has been demonstrated that the fuel stored in the pool after the proposed

modification will remain subcritical in all circumstances likely to be encountered, and McCoy Contention A7 is without merit.

G. Cooling Systems[10]

McKeel Contention A1(a):

The Licensees have failed to adequately demonstrate that the storage of greater amounts of irradiated fuel for longer periods of time than originally anticipated and the attendant increased fission product inventory, heat load, and displacement of SFP cooling water will not (a) impose an excessive burden on the two SFP cooling pumps, the two heat exchangers, and other interrelated components of the spent fuel pool cooling and demineralizer system (SFPCDS).

59. The Licensees' evaluations demonstrate that no equipment modifications are required for the spent fuel pool cooling and demineralizer system. The residual heat removal (RHR) system and the spent fuel pool cooling and demineralizer system components are not adversely affected by increasing the spent fuel pool temperature design limit from 125°F to 140°F. The proposed change in spent fuel pool temperature design limit will make that limit compatible with that of the refueling cavity and reactor coolant system during refueling (PGE Ex. 2, pp. 3-17). Changes in support systems were not required because of the rack replacement, since the increase in heat load because of the longer term storage is small and existing systems have sufficient capacity (Rabe written testimony, p. 2, fol. Tr. 5220). The displacement of 5% of the water in the existing SFP by the new racks, and the increased amount of fuel that could be stored under the proposed amendment will have no effect on this cooling capability (Frewing written testimony, p. 66a, fol. Tr. 5216).

60. The relatively small discrepancy between design and as-built capability of the SFP forced circulation flow has no significance in cooling the SFP (Rabe, Tr. 5226). With respect to long-term storage, the Licensees have evaluated the point in time when decay heat is at its maximum, and that point is just after the tenth region is placed in the pool. From that time forward, heat input to the pool drops off. Thus the maximum heat condition for the duration of the license has been evaluated and found to be of no concern (Frewing, Tr. 5229).

[10]All of the Oregon contentions on cooling systems were withdrawn leaving McKeel Contentions A1(a) and A8. The Board will make findings on these two although Ms. McKeel presented no supporting testimony and did not file proposed findings.

61. The maximum incremental heat from the proposed amendment will not be added all at once but will build up in stages as the pool is filled. When the total incremental heat load is added to the modified SFP, the average pool temperature will have increased by 6°F. This small increase in temperature is not detrimental to the SFP pumps, heat exchangers, filters, demineralizer, valves, or other components of the cooling and demineralizer system (Lantz written testimony, pp. 1-2, on McKeel A1(a), fol. Tr. 5257).

62. In view of the foregoing, we find that the operating requirements under the proposed amendment will not impose an excessive burden on the SFP cooling and demineralizer system or its components or cause significant degradation of those components beyond that which would result from operation of the existing, unmodified SFP. Consequently, we conclude that McKeel Contention A1(a) is without merit.

McKeel Contention A8:

The Licensees have failed to adequately demonstrate that systems used commonly by both the reactor and the SFP, specifically the residual heat removal system, the chemical and volume control system, and the service water system, will have adequate capacity to maintain safe operating conditions for both the reactor and the SFP in light of the increased amount of spent fuel that may be stored under the proposed license amendment.

63. The maximum incremental heat load due to the proposed modification, 2.4 million Btu's per hour, is about 3.5% of the design heat load for the component cooling water system (CCWS) which transfers heat from the SFP to the service water system (SWS). This incremental heat load will raise the CCWS outlet temperature by less than 1°F which will have no effect on the SWS (Lantz written testimony, p. 1 on Contention A8, fol. Tr. 5256).

64. The chemical and volume control system (CVCS) is not needed for the SFP at any particular time and so can be used to service the reactor when needed. The situation is the same in this regard for the unmodified SFP. The proposed modification will have no effect on the required capacity of the CVCS (Lantz written testimony, p. 2 on Contention A8, fol. Tr. 5256).

65. The RHR system can only be used to cool the SFP during or after a full core transfer to the SFP or after refueling but prior to the time the reactor is restarted. Use of the RHR during these times when the reactor is shut down will not lessen its ability to perform its safety function. The RHR system will be used to cool the SFP only after the reactor has been shut down for 125 hours or more. By that time, the combined decay heat from the

reactor and the fuel in the SFP will be less than 45 million Btu's per hour. Since the RHR capacity is 75 million Btu's per hour, it has adequate capacity to maintain safe conditions for the shutdown reactor and the modified SFP together (Lantz written testimony, p. 2 on McKeel Contention A8, fol. Tr. 5256).

66. In view of the foregoing, we find that the SWS, CVCS, and RHR systems have adequate capacity to maintain safe conditons for both the reactor and the modified SFP and that no changes to these systems are required because of the proposed amendment. Accordingly, we find McKeel Contention A8 to be without merit.

H. Thermal Impacts[11]

McCoy Contentions A1(1), (2), (3):

The Licensees' analysis of cumulative environmental impacts of the proposed licensing action is inadequate in that it fails to account for the effect of increased heat to be discharged to the river due to the proposed modification (1) on aquatic biota, (2) on water availability as a result of increased consumptive use, and (3) on increased fogging caused by the discharge of greater amounts of heated water.

McKeel Contention A5:

Section 2.1.3 of the Trojan Environmental Technical Specifications limits heat discharged into the Columbia River during power operations to less than 79×10^6 Btu/hr. The proposed amendment would permit the storage of more SFA's for longer periods of time which will, in turn, generate more heat to be discharged into the Columbia River than is permitted by the current Environmental Technical Specification limits. This additional amount of excessive heat will impose an unacceptable thermal impact on the biota of the river and result in a deleterious imbalance of the ecosystems contained within the Columbia River.

67. PGE presented the written testimony of Messrs. Katanski and Frewing (fol. Tr. 5280 and 5301). The Staff presented the testimony of Messrs. Lantz, Donohew, and Cain (fol. Tr. 5322, 5323 and 5345). On the basis of this testimony, which was confirmed, reiterated, and extended during cross-examination, the Board finds that:

[11]The Board notes that neither Mr. McCoy nor Ms. McKeel presented any evidence in support of their contentions on thermal impacts nor did they file any proposed findings with regard thereto.

(a) the incremental increase in heat load due to the proposed SFP modification is only 0.03% of the total heat load from the plant, an increase that is less than can be measured;

(b) at most, heat discharges to the Columbia River by the whole plant will increase by about 4% due to modification of the SFP, an increase that will not cause any significant rise in river temperature, even in the mixing zone;

(c) actual river studies have detected no impact on river biota due to Trojan operations and it is clear that the impact of the very small incremental heat added will be negligible;

(d) the incremental heat load would at worst increase evaporation of water from the cooling towers by 4 gallons per minute, an increase of only 0.0085% in consumptive use of water by the plant due to the SFP modification. This increased evaporation will result in an indiscernable increase in the dew point and no observable increase in fogging;

(e) the incremental discharge of heat to the river is so small that the pool modification cannot result in Trojan exceeding the current National Pollutant Discharge Elimination System permit or NRC Technical Specification limits governing discharge of heat to the river.

68. In view of the foregoing, we find that the additional heat from the proposed modification will have negligible impact on consumptive use of water and the availability of water to downstream users, no observable effect on fogging in the plant vicinity or the compliance with heat discharge specifications, and no impact of any kind on aquatic biota or the ecosystems of the Columbia River. Accordingly, we conclude that McCoy Contention A1(1, 2, and 3) and McKeel Contention A5 are without merit.

I. Radiological[12]

McCoy Contentions A2(a), (b), (c):

While the Trojan request identified planned environmental releases of

[12]All of Oregon's radiological contentions having been withdrawn, only those advanced by Mr. McCoy and Ms. McKeel are left for adjudication. The Board notes that these two In-

(Continued on next page.)

radioactivity, no consideration is given to the environmental impacts associated with these releases. Specifically (a) the analysis presented does not, on a cumulative basis for the maximum time of storage under consideration, evaluate the potential impacts on biota (both terrestrial and aquatic) in the vicinity of the facility which may ultimately affect the human food chain, in a cost-benefit framework, (b) no analysis is made of the overall costs (in terms of both health effects and potential associated medical costs) associated with the additional exposures of the plant personnel to increased radioactivity levels due to the increased spent fuel storage, and (c) no analysis is made of the overall costs (in terms of both health effects and potential associated medical costs) associated with the additional exposures of persons off the Trojan site to increased radioactivity levels due to the increased spent fuel storage.

69. The environmental impacts of the potential releases of radioactivity due to the proposed modification were addressed in detail in the Staff's Environmental Impact Appraisal (Staff Ex. 1B, Section 5.3). The maximum time of storage considered was the operating license lifetime for the Trojan facility (Trammell, Tr. 2165). The radiological impact on marine life, plants, foodstuffs, soil and hydrology of the additional radioactivity released under the proposed modification was evaluated as was the additional impact through all pathways considered in the NRC's Final Environmental Impact Statement related to operation of Trojan. The impacts on terrestrial and aquatic biota of increased releases due to the proposed modification are insignificant and so small that all conclusions set forth in the Final Environmental Statement are unaffected (Donohew written testimony on A2, pp. 2-3, fol. Tr. 5400; Staff Ex. 1B, pp. 7-8 and 10-13; Frewing written testimony, p. 76, fol. Tr. 5337).

70. Based on experience at similar facilities, the Staff estimates that the occupational exposure during installation of the new racks in the SFP, which is already storing spent fuel, will be about 2 man-rems (Staff Ex. 1B, p. 13). The incremental exposure to plant workers from operation of the modified SFP is estimated to be about 2.4 man-rem per year or substantially less than 1% of the expected annual exposure for the facility (Donohew written testimony on McCoy A2, pp. 3-5, fol. Tr. 5400; Staff Ex. 1B, p. 13). It is clear that these exposures are extremely low, that the proposed modification will result in an insignificant increase in doses received by occupational workers, and that it will have an insignificant effect on health costs to workers (Donohew written testimony on McCoy A2, pp. 4-6, fol.

(Continued from previous page.)
tervenors did not present any evidence in support of their radiological contentions and did not file proposed findings thereon.

Tr. 5400; Staff Ex. 1B, p. 13; Donohew written testimony on Oregon B3, p. 2, fol. Tr. 5401; Frewing written testimony, p. 73, fol. Tr. 5337).

71. Additional releases from the facility as a result of the proposed modification have been evaluated in detail. These include the release of an additional 54 curies per year of krypton-85. The additional krypton results in a dose of less than 0.001 mrem per year at the site boundary as compared to 0.31 mrem per year for total plant releases of noble gases or to 100 mrem per year which an individual receives from natural background radiation (Donohew written testimony on McKeel A3(a), pp. 1-2, and on McCoy A2, p. 6, fol. Tr. 5400). The additional total body dose to the population within a 50-mile radius due to the total additional releases from the modified SFP is less than 0.005 man-rems per year. This is less than the normal fluctuations in the dose this population would receive from natural background and is less than 0.5% of the level of exposure to the population from the plant as a whole (Donohew written testimony on McCoy Contention A2, pp. 6-7, fol. Tr. 5400). The potential dollar cost to the population within a 50-mile radius from this incremental exposure would be $5 per year based on the $1,000 per man-rem figure set forth in Section 2. D of Appendix I to 10 CFR Part 50. These doses to the public will not result in any observable health effects (Donohew written testimony on McCoy Contention A2, p. 8, fol. Tr. 5400) and can only be considered as insignificant.

72. The effect of the generation of solid waste to be shipped offsite was also evaluated conservatively assuming that one additional resin bed a year would be replaced because of the proposed modification. This would increase the total volume of rad-waste shipped from the plant by less than 1% per year. Disposal of the existing fuel storage racks as rad-waste would also increase the total volume of rad-waste shipped from the plant by less than 1%, averaged over the plant lifetime. These quantities are small fractions of solid rad-waste previously evaluated for plant operation and the overall environmental impact of these slight increases in the amount of solid rad-waste due to the proposed modification is insignificant (Staff Ex. 1B, pp. 11-12).

73. Based on the foregoing, we find that the additional releases of radioactivity from normal operation of the modified SFP have been adequately evaluated and that the environmental impacts of such releases on biota, plant workers, and persons off the Trojan site are insignificant. We also find that health costs to plant workers and to the public will not be measurably increased due to additional radioactivity from the proposed modification. Consequently, we find McCoy Contention A2 to be without merit.

McCoy Contention A3:

There is no adequate analysis of the environmental impacts, such as described in Contentions 2(a)-(c), which would result from abnormal and/or accidental releases of the increased radioactivity from the modified spent fuel storage pool.

74. Staff does address environmental impacts of abnormal events which are high probability events resulting in releases greater than normal but less than the limits imposed by the Technical Specifications. These specifications will not be changed, will be applicable to the modified SFP, and will prevent release of radioactive materials due to abnormal events in excess of Part 20 limits. The environmental impacts of postulated accidents are given in Section VI of the FES for Trojan. These postulated accidents will not change because of the proposed modification of the SFP and the analysis of environmental impacts made in the FES is still valid (Donohew written testimony on McCoy A3, pp. 1-2, fol. Tr. 5400).

75. On the basis of this testimony, the Board finds that an adequate analysis of environmental impacts due to abnormal and/or accidental releases of increased radioactivity from the modified SFP has been made and that McCoy Contention A3 is without merit.

McKeel Contentions A3(a), (b):

The potential increase in gaseous emissions resulting from the proposed SFP modifications, when considered in combination with gaseous releases from reactor operations as proposed by the Licensees, will increase total gaseous emissions to the environment to the extent that such emissions are likely to exceed the emissions of Appendix I to 10 CFR Part 50, and (b) the Licensees' inability to accurately predict the type of radionuclides released, and therefore, its inability to accurately predict the quantity of such releases increase the likelihood that the limits of Appendix I to 10 CFR Part 50 will be exceeded if the SFP capacity is increased.

76. The Staff has not completed its review of overall Trojan compliance with Appendix I to 10 CFR Part 50 limits as applied to gaseous emissions. However, these emissions were conservatively estimated in the Staff's Environmental Impact Appraisal as an additional 54 curies per year of Kr-85 due to modification of the SFP, compared with a total noble gas release of 3,244 curies per year, *i.e.*, an increase of 2.6%. This additional release would result in a dose rate of less than 0.001 mrem per year at the site

boundary. Since the design objective for gas releases in Appendix I is 5 mrem per year to the whole body at the site boundary, the 0.001 mrem/year is not expected to cause the plant to exceed Appendix I requirements (Donohew written testimony on McKeel A3(a), pp. 1-2, fol. Tr. 5400; Staff Ex. 1B, p. 10).

77. In both the Final Safety Analysis Report for the Trojan facility and PGE Ex. 2, the Licensees list radionuclides expected to be released to the atmosphere from refueling and fuel storage operations. Those radionuclides listed were those of greatest dosimetric significance and those calculated to have release rates above certain minimum values. The evidence shows that the Licensees' analytical methods and models for predicting radionuclide releases are consistent with those recommended for use by NRC regulatory guides and that the accuracy of the estimates produced by the models has been confirmed by studies and actual measurements at operating reactors. Thus there is no evidence that the Licensees' predictions of radionuclide releases are inaccurate or that calculational errors will result in releases exceeding the limits of Appendix I to 10 CFR Part 50 (Walt written testimony, pp. 1-2, fol. Tr. 5338; Donohew written testimony on McKeel A3(b), pp. 1-2, fol. Tr. 5401). Accordingly we find McKeel Contentions A3(a) and (b) to be unfounded.

McKeel Contention A4:

The Licensees have failed to adequately assess the environmental impacts of increased liquid and gaseous radioactive emissions and leaks likely to result from assemblies which are not subject to removal from the SFP under current contractual arrangements.

78. The environmental impacts from the release of radioactive effluents as a result of the proposed modification have been addressed in our findings regarding McCoy Contentions A2 and A3. The incremental total body dose that might be received by an individual or the estimated population within a 50-mile radius due to the proposed modification is less than 0.001 mrem per year and 0.005 man-rem per year respectively. These doses are less than the normal fluctuations that would be received from natural background radiation and are clearly insignificant. Releases of radioactivity in liquid form would not change because of the modification since pool water will be processed in the rad-waste system prior to release (Donohew written testimony on McKeel A4, pp. 1-2, fol. Tr. 5400). In summary, there is substantial evidence demonstrating that the environmental impacts of additional releases of liquid and gaseous radioactive effluents due to the proposed

modification have been adequately considered and are insiginificant (Staff Ex. 1B, pp. 7-13). Thus, McKeel Contention A4 is without merit.

McKeel Contention A6:

The Licensees' calculation of personnel exposure rates and doses (Section 5.2.1.4 of PGE-1013), based on infrequent change (once per year) of the SFP CDS filter and demineralizer changeouts, is inaccurate in that the proposed expansion of SFP capacity and increased fission product inventory will require more frequent changes of such filters to maintain efficient operation, thereby increasing the radiation doses to plant personnel beyond those calculated.

79. The amount of additional solid radioactive waste generated by the proposed modification will be very small. The evidence indicates that the frequency of filter and demineralizer resin bed changeouts will not be significantly affected by the proposed amendment since the amount of solid material in the SFP water will not change significantly (Frewing written testimony, p. 41, fol. Tr. 4181; Staff Ex. 1B, p. 11; Donohew written testimony on McKeel A6, pp. 1-3, fol. Tr. 4501). Nevertheless, for purposes of its assessment of environmental impacts, the Staff conservatively assumed that the amount of solid rad-waste may be increased by an additional resin bed a year due to the proposed modification.[13] This would increase the total waste volume shipped from the plant by less than 1% per year (Staff Ex. 1B, p. 12). The annual occupational exposure due to the additional resin bed replacement is a very small fraction of the annual occupational exposure due to operating the SFP and will not affect the Licensees' ability to maintain individual occupational exposures to the levels required by regulations (Donohew written testimony on McKeel A6, pp. 3-4, fol. Tr. 5401).

80. Accordingly, we find that the evaluation of occupational exposures due to the proposed modification has adequately accounted for more frequent changes of the cooling and demineralizer system filters and resin beds and that McKeel Contention A6 is without merit.

Staff's Proposal for Conditions on Installation of Modified Racks While Fuel is Stored in SFP

81. The Staff has recommended an additional condition requiring that

[13]Although the Staff did not assume that the frequency of filter replacement would increase due to the proposed modification, this is of no moment from the standpoint of occupational exposures. Since filter changes are performed remotely, with no direct personnel involvement (Lentsch, Tr. 4262-63), occupational exposures from such changes should be extremely low.

new fuel racks be installed in the SFP only after spent fuel stored therein has decayed more than 60 days. Since this will assure that the offsite consequences of a seismic event damaging spent fuel during the installation operation will be well within guidelines of 10 CFR Part 100 (Donohew written testimony, fol. Tr. 5400, "Unresolved Item in the Staff's Safety Evaluation Dated November 11, 1977," pp. 1-4), we find that this condition, in addition to that regarding minimum boron concentration specified, *supra,* is appropriate, and it is imposed in our order, *infra.*

J. Environmental Impact Appraisal

1. Adequacy

McCoy Contention B2:

> The environmental impact statement (or impact appraisal) required for this licensing action must fully consider all environmental impacts attributable to expansion of the Trojan spent fuel storage pool capacity as well as similar impacts at other facilities, and such statement (or appraisal) must consider those impacts as persisting for the period of the operating license.

82. The Staff issued the Environmental Impact Appraisal (EIA) on November 11, 1977 (Staff Ex. 1B). The EIA describes the proposed modification of the Trojan SFP, identifies and discusses the environmental impacts involved, and under the heading captioned "Basis and Conclusion for Not Preparing an Environmental Impact Statement," states that:

> We have reviewed this proposed facility modification relative to the requirements set forth in 10 CFR Part 51 and the Council on Environmental Quality's Guidelines, 40 CFR 1500.6 and have applied, weighed, and balanced the five factors specified by the Nuclear Regulatory Commission in 40 Fed. Reg. 42801. We have determined that the proposed license amendment will not significantly affect the quality of the human environment. Therefore, the Staff has found that an environmental impact statement need not be prepared, and that pursuant to 10 CFR 51.5(c), the issuance of a negative declaration to this effect is appropriate. [Staff Ex. 1B, p. 26.]

The impacts were evaluated for the period of the operating license (Donohew, Tr. 5578-79).

83. The EIA's conclusions were as follows: (1) The proposed modifica-

tion will not require any additional commitment of land (Staff Ex. 1B, p. 5). (This conclusion was uncontroverted.) (2) There will be no significant change in plant water usage (p. 6). (See findings 67 and 68, *supra,* wherein we conclude that the increase in water use due to the proposed modification will be negligible and will have no environmental impact, that the thermal impacts on biota from incremental increases in heat released because of the proposed modification will be negligible, and that the small amount of additional heat will have no observable effect on fogging.) (3) There will be no significant liquid or gaseous radioactive releases to the environment as a result of the proposed modification (pp. 10-13). (See findings 73 and 78, *supra,* wherein we conclude that incremental liquid and gaseous releases will have an insignificant environmental impact.) (4) The amount of additional solid radioactive waste resulting from the proposed modification will be less than one percent of the amount shipped annually from the plant (pp. 11-12). (See finding 79, *supra.*) (5) The proposed modification will add less than one percent to the total annual occupational radiation exposure at the facility and will not result in any significant increase in doses received by workers (p. 13). (See finding 79, *supra,* wherein we find that the increase in occupational exposure due to the proposed modification is not significant.) (6) There will be no change in the chemical or biocidal effluents from the plant as a result of the proposed modification (p. 14). (This conclusion was uncontroverted.) (7) No significant environmental impact on the community is expected to result from the fuel rack conversion or from subsequent operation with the increased storage of spent fuel in the SFP (p. 14). (With respect to conclusion number (7), while the Staff did not address and calculate in the EIA any cumulative environmental impacts either of other spent fuel modifications in other parts of the country upon Trojan or of the Trojan modified SFP upon other modified SFP's in other parts of the country, it did not overlook these impacts. The Staff considered the environmental impacts resulting from the SFP modifications at Trojan and at other plants in the country to be localized and inconsequential, and concluded that there would be no cumulative environment impacts (Donohew written testimony, pp. 1-2, fol. Tr. 5558; Donohew, Tr. 5559-61; 5565-66). The testimony of the Staff's witness withstood cross-examination and the Intervenors did not present direct testimony challenging this conclusion.)

84. Accordingly, we find that, for the lifetime of the operating license, the EIA fully considered all environmental impacts attributable to the expansion of the Trojan spent fuel storage pool capacity as well as similar impacts at other facilities. The contention is without merit.

85. We note that the State of Oregon asserts that Staff and Licensees have failed to meet their burden of proving that certain factors have been

applied, weighed, and balanced in Section 8.4 of the EIA[14] as required by the Commission's notice of "Intent to Prepare Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel," 40 Fed. Reg. 42801 (September 16, 1975)[15] (Oregon's Proposed Findings 58-64 and Memorandum of Law, pp. 2-9).

86. Since Oregon agrees that the evidence supports a finding that the first factor has been adequately evaluated, no further discussion is needed. With regard to the second factor, Oregon asserts that it has been adequately evaluated in part because the amount of materials and money expended would not significantly tend to foreclose consideration of alternatives, but that, in part, it has not been evaluated because a Staff witness testified that, assuming the modification is approved and in place, there will be a strong disincentive to do anything other than use the modified racks until they are full. However, our review of the witness's entire testimony shows that he did not necessarily concur that, once the modified racks were in place, there would be a strong disincentive to do anything other than use them until they were full (Clark, Tr. 5748). Accordingly, the evidence supports a finding that the second factor has been adequately evaluated. As concluded above in finding 83, the Staff did not overlook any cumulative environmental impacts and thus the third factor has been sufficiently evaluated. With regard to the fourth factor, while we agree with Oregon that there is a technical problem concerning the transportation of heavy objects which could impact

[14]In passing, we reject Oregon's criticism that the Staff's discussions in the EIA are brief and are in summary form since such treatment is in accord with a Council on Environmental Quality Guideline, 40 CFR 1500.6(e), and NRC regulation, 10 CFR 51.7.

[15]In this notice the Commission concluded that there should be no general deferral of licensing actions intended to ameliorate a possible shortage of spent fuel storage during the period required for the completion of the generic environmental impact statement. The Commission listed the following five factors to be applied, weighed, and balanced within the context of an environmental impact statement or impact appraisal:

(1) It is likely that each individual licensing action of this type would have a utility that is independent of the utility of other licensing actions of this type;

(2) It is not likely that the taking of any particular licensing action of this type during the time frame under consideration would constitute a commitment of resources that would tend to significantly foreclose the alternatives available with respect to any other other individual licensing action of this type;

(3) It is likely that any environmental impacts associated with any individual licensing action of this type would be such that they could adequately be addressed within the context of the individual license application without overlooking any cumulative environmental impacts;

(4) It is likely that any technical issues that may arise in the course of a review of an individual license application can be resolved within that context; and

(5) A deferral or severe restriction on licensing actions of this type would result in substantial harm to the public interest.

upon stored spent fuel, we disagree that this problem cannot be resolved by the Board—see finding 25, *supra*, where we have imposed a condition to the license amendment.[16] Finally, regarding the fifth factor, we are aware that 1/3 of the core was off-loaded and stored in the Trojan SFP in March 1978. At this annual rate of off-loading and refueling, by the spring of 1979, the existing SFP will lose full-core storage capacity. Because full-core discharge would not be possible thereafter, the Licensees might be unable to perform ad hoc necessary inspections and maintenance, and the plant might have to be shut down (Frewing, Tr. 5643; Clark written testimony, p. 6, fol. Tr. 5692; Clark, Tr. 5694; Trammell, Tr. 5695, 5825-26). We are advised that there is a greater than 0.50 chance that Trojan will have to discharge a full-core in the period between 1979 (when full-core storage capacity will be lost) and 1982 (when the existing SFP will be filled) (Frewing, Tr. 5621; Owens, Tr. 5644, 5649-51, 6159, 6161-63). Since Trojan might be forced to shut down after the spring of 1979 because the SFP could not accommodate a full-core if necessary or, at the latest by 1982, when the pool will be filled, we concur with the Staff's conclusion in the EIA that deferral or severe restriction of the action here proposed would result in substantial harm to the public interest (Staff Ex. 1B, p. 26).

87. We conclude that the Staff has shown that it adequately applied, weighed, and balanced the five factors set forth in the notice of Intent to Prepare Generic Environmental Statement on Handling and Storage of Spent Light Water Power Reactor Fuel.

2. Proper Issuance

McCoy and Garrett Contention B1:

The proposed license amendment constitutes a major Federal action which significantly affects the quality of the human environment and, therefore, requires the preparation, circulation for comment, and issuance in final form of a formal Environmental Impact Statement, in

[16]We note that, on the one hand, Oregon asserts in substance that not all concerns regarding the transportation of heavy objects which could impact upon stored spent fuel have been resolved satisfactorily in this proceeding, that the Staff is conducting a generic review upon the subject, and thus that the license amendment should not be granted at this time (Proposed Finding 62). On the other hand, however, Oregon asserts that, if the license amendment is granted, it would be reasonable to impose a Technical Specification prohibiting PGE from carrying loads over the SFP at heights such that the impact energy of any dropped object upon the storage racks cannot exceed 240,000 in-lb (Proposed Finding 31).

Further, we note that, except for this technical problem, Oregon states that it "believes there is a minimal danger to public health and safety posed by the modification" (Memorandum of Law in Support of Proposed Findings of Fact and Conclusions of Law, p. 1).

accordance with the requirements of the National Environmental Policy Act and the guidelines of the Council on Environmental Quality, prior to any Commission action on the proposed license amendment.

87. Despite the fact that the State of Oregon concedes, "based upon the record in this case, that the site-specific environmental impacts of the Trojan modification are insignificant," and despite the fact that it does not oppose *installation* of the new SFP storage racks, it opposes the *use* of such racks for the storage of more than 1-1/3 cores of spent fuel. Apparently Oregon argues that, insofar as permitting the use of the new racks is concerned, the requested license amendment cannot be granted without violating the National Environmental Policy Act (42 U.S.C. 4321, *et seq.*), absent completion of an adequate generic environmental impact statement on the subject of handling and storage of light water reactor spent fuel. It requests that we defer ruling upon the requested amendment until after said generic statement (GEIS) has been issued and evaluated in the instant proceeding (Oregon's Memorandum of Law in Support of Proposed Findings and Conclusions, pp. 1-2, 16).

89. The National Environmental Policy Act of 1969, § 102(2)(c), 42 U.S.C. 4332(2)(c) (NEPA),[17] provides in pertinent part that:

> . . . all agencies of the Federal Government shall. . . (c) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on—
>
> (i) the environmental impact of the proposed action . . . .

90. We conclude that the contention, as well as Oregon's argument, are without merit. NEPA does not require the issuance of either a Final Environmental Impact Statement or of a GEIS on the handling and storage of light water reactor spent fuel before this Board can proceed to determine whether or not to grant the requested modification. Our unpublished memorandum and order, dated December 14, 1977, recognized this in affirming previous rulings with regard to the McCoy-Garrett Contention B1, wherein we had held that we would defer determining whether or not a Final Environmental Impact Statement was required until after we had heard the evidence and reviewed the Staff's EIA.[18] Even were we to assume that this action could be considered a "major" one, the evidence of record establishes and our findings reflect that the proposed modification will not

[17]The language of the Council on Environmental Quality's Guidelines, 40 CFR 1500.2, tracks that of NEPA.

[18]At the time of these rulings, Oregon had not advanced its legal argument concerning the generic environmental impact statement on the handling and storage of spent fuel.

significantly affect the quality of human environment. Accordingly, we affirm the Staff's determination to make a negative declaration to that effect pursuant to the Commission's regulations, 10 CFR 51.5(c)(1) and 51.7, and pursuant to the Council on Environmental Quality Guidelines, 40 CFR 1500.6(e).[19]

K. Alternatives to and Need for the Proposed Modification

Oregon Contention A1:

The Licensees' justification for the proposed amendment, in terms of the economic and environmental costs and benefits thereof and of alternatives thereto, is inadequate to support issuance of the proposed amendment. Specifically:

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[19]10 CFR 51.5(c)(1) provides in pertinent part:

> . . . if it is determined that an environmental impact statement need not be prepared . . . a negative declaration and environmental impact appraisal will . . . be prepared . . . .

10 CFR 51.7 provides in pertinent part:

> (a) *Negative declarations.* The negative declaration required by § 51.5(c) will be prepared prior to the taking of the associated action and will state that the Commission has decided not to prepare an environmental impact statement for the particular action and that an environmental impact appraisal setting forth the basis for that determination is available for public inspection. Negative declarations will be published and made publicly available in accordance with §§ 51.50(d) and 51.55. Lists of negative declarations will be maintained and made publicly available in accordance with § 51.54(b).
> (b) *Environmental impact appraisals.* An environmental impact appraisal will be prepared in support of all negative declarations. The appraisal will include:
> (1) A description of the proposed action;
> (2) A summary description of the probable impacts of the proposed action on the environment; and
> (3) The basis for the conclusion that no environmental impact statement need be prepared.

☆ ☆ ☆ ☆

40 CFR 1500.6(e) provides in pertinent part:

> . . . If an agency decides that an environmental statement is not necessary for a proposed action. . . (iv) for which the agency has made a negative determination. . . the agency shall prepare a publicly available record briefly setting forth the agency's decision and the reasons for that determination . . . .

(b) the Licensees' brief, conclusionary discussion in Section 6 of PGE-1013 does not constitute adequate consideration of the economic and environmental consequences of other alternatives deserving of present consideration including Trojan shutdown, shipment of spent fuel to another reactor, or shipment of spent fuel to an off-site repository.

(c) the Licensees did not establish that the taking of the requested licensing action would not constitute a commitment of resources that would tend to significantly foreclose other alternatives such as development of an offsite interim repository, development of a regional spent fuel storage facility, or shipment of spent fuel to another reactor or offsite facility.

Oregon Contention B1:

The Licensees' justification for the proposed amendment, in terms of the economic and environmental costs and benefits thereof and of alternatives thereto, is inadequate to support issuance of the proposed amendment. Specifically:

(a) the Licensees have not provided an adequate justification, *i.e.*, need for the amount of expanded storage capacity it has selected.

Garrett Contention A-1:

The Licensees have not provided an adequate analysis of alternatives to the proposed spent fuel pool modifications. Specifically:

(a) The Licensees have not adequately considered the comparative costs and benefits of such alternatives as the following: storage at a commercial facility; storage at the Allied General Nuclear Services' reprocessing plant; storage at a Federal military facility; storage at another nuclear plant; storage of four regions of spent fuel in the existing unmodified Trojan spent fuel pool without retaining a three-region reserve capacity;

(b) The Licensees have not adequately considered the comparative premature expansion of spent fuel storage capacity would tend to significantly preclude or foreclose such as the above and the following: storage at Federal retrievable surface storage sites; the use and promotion of measures such as conservation and development

of nonnuclear power sources, which would allow reactor shutdown or reduced power output from Trojan and a consequent reduction in the rate of generation of spent fuel.

Such failure to adequately consider alternatives violates the National Environmental Policy Act. In addition, foreclosure of development or exploration of such alternatives would tend to significantly affect other licensing actions designed to ameliorate a possible shortage of spent fuel storage capacity.

Garrett Contention A-2:

The explicit basis for the Licensees' application for expanded spent fuel storage is that offsite storage will not be available when needed. This "need for expanded storage capacity" assumption is speculative. Since (1) the Licensees can store spent fuel in existing unmodified facilities (without retaining reserve capacity) until 1982, and (2) offsite storage could be available by 1982, the Licensees have not adequately demonstrated a present or future need for expanded storage capacity which would justify the economic and environmental risks and costs which will be incurred as a result of premature modification of the existing spent fuel pool. Moreover, for these same reasons, the Licensees have not demonstrated that "substantial harm to the public interest" would result if approval of the proposed modification were to be delayed until after the issuance of the generic Environmental Impact Statement now being prepared by the Commission.

McCoy Contention A4:

The Licensees' analysis of alternatives to the proposed modification is inadequate in that it fails to properly consider both the comparative economic and environmental costs of those alternatives identified in Section 6.0 of the Application for License Amendment. In addition, the Licensees have failed to provide an adequate basis for limiting its consideration to those alternatives which it has discussed.

McKeel Contention A7:

The Licensees' analysis of the alternative of suspending power operations at the Trojan plant, in lieu of installing the modified spent fuel storage racks, is inadequate in that comparative cost estimates for replacement power for Trojan are predicated upon the Licensees' erro-

neous calculations of the future availability of power sources and the present and future demand for power generated.

91. The Staff and the Licensees submitted proposed findings on all these contentions. Oregon and Ms. Garrett submitted proposed findings on their respective contentions. For the reasons set forth below, we will not make findings on each contention, but will treat these as a group.

92. Both Oregon's and Ms. Garrett's witnesses testified regarding these contentions (Timm written testimony, fol. Tr. 5957; Oregon Ex. 1, pp. 3-8; Garrett Ex. 8). We heard extensive direct testimony of the Staff's and Licensees' witnesses (Clark written testimony, fol. Tr. 5692; Frewing written testimony, fol. Tr. 5638) and rebuttal testimony of the Licensees' witnesses (Hunt written testimony, fol. Tr. 6495; Schultz written testimony, fol. Tr. 6398; Moke written testimony, fol. Tr. 6404).

93. The gist of the Intervenors' witnesses' testimonies was that Trojan could be shut down for certain periods without causing either serious shortages of electric power or incurring excessive costs. Indeed, one witness, Dr. Timm, predicted that shutdown would save money under certain circumstances, principally because of the effect on his calculations of a concept he favored: the notion that Trojan's expected lifetime could be extended by some fraction of any period for which the plant might be shut down (Timm written testimony, p. 23, and Schedule 10, fol. Tr. 5957). The Licensees' witness disputed this idea (Moke written testimony, pp. 8-10, fol. Tr. 6404). Further, in order to generate figures showing a cost advantage for shutdown, Dr. Timm assumed availability of hydropower at average, rather than "critical water" flows. The average flow he assumed was, in fact, 20% above the critical flow (Timm written testimony, pp. 17-18, fol. Tr. 5957). We note that hydroelectric power is very low cost power (Anderson, Tr. 6157; Schultz, Tr. 6471).

94. Mr. Lionel Topaz, whose testimony comprises Garrett Exhibit 8, made no economic analysis of the Trojan plant, but attempted to demonstrate that the need for power in this region could be met without operating Trojan. He used demand growth curves considerably below those of the Licensees (Garrett, Ex. 8, attachment 4) and urged changes in Bonneville Power Administration water policy which would make more hydropower available (rather than conserving large amounts of water) (Garrett Ex. 8, p. 13), but he did not take credit for such changes. He assumed 100 MW of secondary hydropower at 78% availability and surplus 1,000 MW at 56% availability (Garrett, Ex. 8, p. 15). Both Dr. Timm and Mr. Topaz assumed the availability of plants not yet built (Timm, Tr. 6049-51; Topaz, Tr. 6318).

95. The Staff's position is that no significant change has occurred in the

need for power since the plant was licensed to operate nor has any interim change occurred in the availability of alternatives (Clark written testimony, pp. 8-9, fol. Tr. 5692).

96. Licensees' position is that the matter of need for power was established in the operating license proceeding (Applicants' Proposed Findings at pp. 56-7) and that other alternatives have been adequately considered (Applicants' Proposed Findings, pp. 47-57, *passim*).

97. The Board recognizes the difficulties which inhere in comparing the costs of various alternatives and in extrapolating electrical power requirements. Indeed, in an area where hydroelectric power is an important resource, both the availability and the comparative cost of power depend strongly on the availability of such hydroelectric power, and that in turn depends upon that paradigm of unpredictability, the weather itself.

98. It is not necessary, however, to choose among alternatives or to predict needs on the basis of the present evidence. In our findings, *supra*, we have determined that the adverse environmental impacts of this license amendment will be negligibly small. Clearly, if the adverse impacts of the proposed action are negligible, the impacts of any alternative must be equal or greater, and it has been held that "an alternative which would result in similar or greater harm need not be discussed" (*Sierra Club* v. *Morton*, 510 F.2d 813, 825 (5th Cir. 1975)). As to the question of need for power, as we view it, that question could only be considered against the background of a cost-benefit balance, and absent any substantial environmental costs, any benefit whatever would tip the scale. We therefore believe that we need not consider alternatives or the need for the modification in any detail. Indeed, in the opinion of this Board, not only is such consideration unnecessary, it is very inadvisable, since it infringes upon those very prerogatives and duties of corporate management which we should eschew usurping. To be sure, were there substantial adverse environmental impacts, our duties under NEPA would require us to balance them against benefits and examine less damaging alternatives. But where, as here, the proposed action has no such impacts, we can leave considerations such as economic advantage, capacity requirements, and the vigor with which offsite storage should be pursued to those within the company to whom such decisions are normally entrusted.

L. Board Questions on Volcanism, Landslides, and the Release of Plutonium

99. During the taking of limited appearance statements, several members of the public expressed concerns with regard to a possible increase in volcanic activity in the Pacific Northwest region (Tr. 434), the potential for landslides in the vicinity of the Trojan facility (Tr. 474; Tr. 833-48), and

the release of plutonium from the Trojan facility (Tr. 564). After review of these limited appearance statements, the Board determined that additional consideration should be given to the concerns expressed therein and directed that evidence should be presented with regard to volcanism and landslides as they might affect SFP integrity and with regard to the effects of the proposed modification on the release of plutonium from the Trojan facility (Tr. 884-85). These matters are addressed below.

Board Question 1:

"We note that one of the limited appearors mentioned a recent increase in volcanism in this area, an increase in the activity of volcanoes. We have not seen anything that discussed this in your direct testimony or the safety portion of the Staff's testimony, and we would like the Staff, the Applicant, or for that matter, any of the other parties to be prepared to present evidence as to whether any increases in volcanism could present a hazard to the integrity of the fuel pool.

The same is true of the phenomenon of landslides. We recognize that landslides are associated with earthquakes, but they are in this area also present when there are no earthquakes, and we want to know whether the threat which landslides might present to the integrity of the spent fuel pool has been thoroughly investigated. We will welcome testimony from any of the parties" (Tr. 844).

100. Two new studies on Cascade volcanism have been performed since the issuance of the Trojan Safety Evaluation Report in 1974. Neither study shows anything that would affect the SFP at Trojan (Christensen written testimony, p. 2, fol. Tr. 5581). Mt. St. Helens, 65 km from the Trojan site, has the highest potential to affect Trojan, but this potential is very small. Although there has been some recent increase in activity at Mt. Baker in the State of Washington, an eruption at Mt. Baker would not affect the Trojan site because of the distance from the site (Christensen written testimony, p. 1, Tr. 5601). An eruption at Mt. St. Helens would have little or no effect on Trojan from the standpoint of ashfall because the prevailing winds are in the opposite direction (Christensen written testimony, p. 2, Tr. 5602). The winds blow from Mt. St. Helens toward the 12° sector including Trojan less than 1% of the time. The probability of persistent winds from Mt. St. Helens toward Trojan for a 12-hour period is less than .001 per year and for a 24-hour period is less than .00001 per year (Christensen written testimony, p. 2). In addition, ashfall decreases rapidly with downwind distance from the volcano. At a distance of 25 to 30 km, the problem from ashfall is

reduced to one of cleanup (Christensen written testimony, p. 2). Mud or lava flows present no hazard because of the distance of Cascade volcanos from the site (Tr. 5605). In view of all of this, we conclude that potential hazards to the Trojan site and the SFP from Cascade volcanoes have been adequately addressed and that these hazards are essentially nonexistent. No evidence to the contrary was presented by any party.

101. Landslides were evaluated in the Trojan Safety Evaluation Report issued in 1974. More recently, a study on landslides in the Columbia River Gorge was performed for the Licensees in 1978 (Christensen written testimony, p. 1). That study considered landslide phenomena and potential mechanisms for an area from the Bonneville Dam to the Dalles. Nothing above the Bonneville Dam could result in a landslide that would dam the river and landslides below the study area would be of such a nature that the plant site would not be endangered, although some blockage of the river could occur (Christensen, Tr. 5593-94). The study performed for the Licensees shows that only one slide, the Collins Point Landslide, has even a remote potential to block the Columbia River. The resulting flood would crest at 25 feet above MSL and would not affect the Trojan facility which is designed against floods up to 45 feet above MSL (Christensen written testimony, p. 1; Tr. 5599-5600). As to the slide-block phenomenon, the available geological and geophysical information shows that the Trojan site is underlain by bedrock and that deep mass movement below the site is not a factor (Christensen written testimony, pp. 1-2). No evidence suggesting that landslides present a hazard was presented by any party. In view of the foregoing, we conclude that the potential hazards to the Trojan site and to the integrity of the SFP from landslides have been adequately addressed and that those hazards are essentially nonexistent.

Board Question 2:

"Several limited appearors suggested that there might be a substantial increase in the leakage of plutonium because of the additional storage in the fuel pool. This seems to the Board intuitively unlikely, but we would like to have this addressed, some comparison between the total leakage from the plant of plutonium before and after the expansion of the fuel pool" (Tr. 884-885).

102. Pursuant to the Board's direction, an analysis was performed to determine the total plutonium inventories in fuel assembies as a function of burnup. Leakage of plutonium into SFP water was calculated assuming .12% of the stored spent fuel had defects (Lentsch written testimony, pp. 1-2, fol. Tr. 5438). From this analysis, which includes a factor of conserva-

tism on releases of at least ten (Lentsch, Tr. 5494), the total incremental gaseous releases of plutonium as a result of the proposed modification were shown to be less than 4.3 x 10^{-8} curies per year (Lentsch written testimony, Table 3). The maximum incremental offsite doses from plutonium releases in gaseous form due to the proposed modification, considering all possible exposure pathways, were shown to be on the order of 10^{-5} mrem per year for bone and 10^{-6} mrem per year for all other organs and the whole body (Lentsch written testimony, p. 2). These doses are less than 0.01% of doses from total plant emissions, less than 0.001% of 10 CFR Part 50, Appendix I, design objective values, and less than 0.0001% of natural background doses (Lentsch written testimony, p. 3).

103. Although, in the Licensees' view, no plutonium would be released in liquids from the SFP (Lentsch written testimony, p. 2), the Staff assumed, for purposes of analysis, that the primary mechanism for plutonium release would be through liquid releases. Based on its evaluation, the Staff predicted that the maximum amount of plutonium released from the plant as a whole will be less than 10^{-5} curies per year, resulting in offsite exposures of less than 10^{-7} mrem per year, which is insignificant compared to doses from natural background or other plant releases (Donohew written testimony, p. 1, Tr. 5504). The amount of plutonium in SFP water will not be significantly affected by the proposed modification and any increased amounts that do result from the modification should be removed by the SFP purification systems (Donohew written testimony, pp. 1-4).

104. The evidence shows that plutonium releases from the plant should be undetectable (Donohew, Tr. 5509-10) and that the increase in releases due to the proposed modification will be negligible and infinitesimally small (Lentsch written testimony, p. 3; Lentsch, Tr. 5447, Tr. 5459; Donohew written testimony, p. 4). The evaluation of the environmental effects of plutonium release took account of environmental accumulation (Lentsch, Tr. 5491-92; Donohew, Tr. 5531). The evidence shows that the total amount of plutonium released from the modified SFP over 40 years is considerably less than the equivalent amount of americium in a home smoke detector (Lentsch, Tr. 5447). Resultant doses are insignificant (Donohew, Tr. 5510, Tr. 5531). No evidence to the contrary was offered. We conclude that concerns with regard to plutonium releases have been adequately addressed, that the amount of plutonium released due to the proposed modification will be infinitesimal, that the resultant doses will be negligible, and that the environmental impacts, if any, will be insignificant.

III. CONCLUSIONS OF LAW

The Licensing Board has thoroughly reviewed and evaluated the

evidence submitted by all parties with respect to the contentions raised by the Intervenors herein which have not been withdrawn and remain as issues in this proceeding. The Licensing Board has also considered all of the proposed findings of fact and conclusions of law submitted by the parties. Those proposed findings not adopted by the Board are herewith rejected. Based upon its evaluation of the Staff's Safety Evaluation and Environmental Impact Appraisal, the Licensees' safety evaluation, the written testimony of all of the witnesses, as well as the answers elicited from these witnesses in response to questions of the Board and the parties, the Board makes the following conclusions of law:

(1) That there is reasonable assurance that the activities authorized by the operating license amendment can be conducted without endangering the health and safety of the public provided that the conditions set forth in the order, below, are incorporated into the license;
(2) That the activities authorized by the operating license amendment will be conducted in compliance with the Commission's regulations;
(3) That the issuance of the operating license amendment will not be inimical to the common defense and security or to the health and safety of the public provided that the conditions set forth in the order, below, are incorporated into the license; and
(4) That the issuance of the license amendment is not a major Commission action significantly affecting the quality of the human environment and that it does not require the preparation of an environmental impact statement under the National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321, *et seq.*, and Part 51 of the Commission's regulations, 10 CFR Part 51.

IV. ORDER

Wherefore, it is ORDERED, in accordance with the Atomic Energy Act, as amended, and the regulations of the Nuclear Regulatory Commission, and based on the findings and conclusions set forth herein, that the Director of Nuclear Reactor Regulation is authorized to make appropriate findings in accordance with the Commission's regulations and to issue the appropriate license amendment authorizing the requested expansion of the spent fuel storage pool capacity at the Trojan Nuclear Plant.

The aforementioned license amendment shall contain the following conditions:

(1) Fuel stored in the spent fuel pool shall have a ^{235}U loading less than or equal to 44.3 grams per axial centimeter;

(2) Since spent fuel is now being stored in the spent fuel pool, upon commencement of work on either the existing racks or the new racks in the spent fuel pool in conjunction with replacement of the existing racks with new racks:

   (a) the water in the spent fuel pool shall contain at least 2,000 ppm boron and shall be maintained at this boron concentration until completion of the rack replacement, and

   (b) spent fuel stored in the spent fuel pool must have decayed at least 60 days from the time it was last removed from the reactor;

(3) The sizes of loads carried over the SFP and the heights at which they may be carried over racks containing spent fuel shall be limited in such a way as to preclude impact energies over 240,000 in-lb, if the loads are dropped.

It is further ORDERED, in accordance with 10 CFR 2.760, 2.762, 2.764, 2.785, and 2.786, that this Initial Decision shall be effective immediately and shall constitute the final action of the Commission forty-five (45) days after the issuance thereof, subject to any review pursuant to the above-cited Rules of Practice. Exceptions to this Initial Decision may be filed within ten (10) days after service of this Initial Decision. A brief in support of the exceptions shall be filed within thirty (30) days thereafter (forty (40) days in the case of the NRC Staff). Within thirty (30) days of the filing and service of the brief of the Appellant (forty (40) days in the case of the NRC Staff), any other party may file a brief in support of, or in opposition to, the exceptions.

IT IS SO ORDERED.

THE ATOMIC SAFETY AND
LICENSING BOARD

Dr. Frederick P. Cowan, Member

Frederick J. Shon, Member

Sheldon J. Wolfe, Esquire
Chairman

Dated at Bethesda, Maryland,
this 5th day of October 1978.

[Appendix A has been omitted from this publication but is available in the NRC Public Document Room, 1717 H Street, N.W. Washington, D.C.]

Cite as 8 NRC 461 (1978) LBP-78-33

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Edward Luton, Chairman
Gustave A. Linenberger
Dr. Harry Foreman

In the Matter of Docket Nos. 50-70
70-754

GENERAL ELECTRIC COMPANY

(Vallecitos Nuclear Center,
General Electric Test Reactor) October 24, 1978

The Licensing Board denies Intervenors' motion for referral of a Board ruling compelling Intervenors to respond to Licensee's interrogatories. The Board also denies Licensee's cross-motion for imposition of sanctions upon Intervenors; and allows intervenors 14 days to respond to the interrogatory in question.

RULES OF PRACTICE: REFERRAL OF RULING TO COMMISSION

Dislike of an industry does not give rise to such "public interest" considerations as would warrant referral of a licensing board ruling pursuant to 10 CFR 2.730(f).

RULES OF PRACTICE: DISCOVERY

What a party contends and the names of persons who provided information on which the party bases those contentions are within the proper bounds of discovery even if the party's attorney solicited the information and has sole knowledge of the names involved.

RULES OF PRACTICE: DISCOVERY

Where the Commission's discovery rules contain no provision expressly analogous to particular provisions in the Federal Rules of Civil Procedure, a reasonable inference is that "the Commission did not intend for the unselected Federal Rules to control its proceedings."

Experts who are specially engaged in connection with a specific case (as opposed to those merely consulted informally) are quite likely to have information or knowledge concerning that case; the identity of such experts who are not expected to be called as witnesses at trial is normally discoverable.

MEMORANDUM AND ORDER

These are motions (1) for referral of a Board ruling on a discovery matter to the Commission and (2) for the imposition of sanctions upon the Intervenors for their failure to comply with a Board order compelling responses to an interrogatory propounded by the Licensee.

Background of the Disputes

On or about June 26, 1978, the Licensee served identical interrogatories upon the Intervenors in this proceeding. The present disputes involve the first interrogatory in those filings, interrogatory no. 1. That interrogatory seeks the identity, professional qualifications, and certain other information about "each person [the Intervenors] have utilized to conduct any review, analyses, tests, or studies related to" the issues in this proceeding. All of the Intervenors responded to this interrogatory on July 10, 1978, in identical fashion. They said then that "professional qualifications, subject matter of review, and description of review will be given, under intervenor's continuing discovery obligation, as soon as they are available."

Then, by a pleading dated July 10, 1978, the Intervenors, in a shift of position, interposed objections to interrogatory no. 1. There, they took the view that (1) the names and qualifications of persons assisting them are "not relevant to any issue to be considered by this Board"; (2) ". . . the identity of individuals aiding intervenors is privileged"; and (3) production would be "unduly burdensome," for the reason that, "GE has the power to effectively erase the career of any professional person connected in any way with the nuclear and electric power industry." On August 14, 1978, the Licensing Board granted the Licensee's motion to compel responses to all of the Licensee's June 26, 1978, interrogatories. Particularly with respect to interrogatory no. 1, it appeared that the information sought which was "not available" at the time it was first requested, was indeed available at the time the motion to compel was before us. In particular, our order took note of the fact that Intervenors Dellums and Burton and Burton had stated, in their response to the Licensee's motion to compel discovery, that "intervenor's have submitted documents to many experts in various fields.

Some of these individuals have made comments on these documents." Additionally, Staff counsel informed us in a pleading that he had been contacted on more than one occasion by a person who represented himself as acting in a technical capacity on behalf of all of the Intervenors. We gave no weight to the claim that the identity of individuals aiding the intervenors "is privileged," because the privilege asserted was neither specified nor attempted to be supported. Similarly, we did not credit the assertion that production would be "unduly burdensome."

By a pleading dated September 25, 1978, the Licensee filed a cross-motion for the imposition of sanctions upon the Intervenors for their failure to comply with the Board's August 14, 1978, order compelling production. On October 6, 1978, the Intervenors filed a joint response to the Licensee's cross-motion and set out more particularly the bases for their objections to interrogatory no. 1. We address these issues herein.

Motion for Referral of Ruling

We will not refer our August 14, 1978, ruling on interrogatory no. 1 to the Commission. Intervenors expressly seek referral "pursuant to 10 CFR Section 2.730(f)." They can thus fairly be presumed to be basing their request on the requirements of that rule. Section 2.730(f) permits referral, "when in the judgment of the presiding officer prompt decision is necessary to prevent detriment to the public interest or unusual delay or expense . . . ." No claim of "unusual delay or expense" is made in connection with our ruling on interrogatory no. 1. We presume, then, that the argument made is intended to describe a situation in which a referral is necessary "to prevent detriment to the public interest."

The argument is directed against the release of the names of persons assisting the Intervenors. It consists of a generalized, vitriolic, denunciation of the "nuclear industry," with the General Electric Company being characterized as "one of the heads of the nuclear hydra."[1] From it all, we are urged to embrace the notion that release of the names of the individuals assisting the Intervenors would be harmful to those individuals, because the Licensee "could" or "would effectively erase the career of any professional person connected in any way with the nuclear or electric power industry." We do not credit this argument. It is simply available to anyone of similar viewpoint in any case, depending for its persuasiveness on neither specific facts nor even precisely focused allegations concerning the particular "nuclear industry" target in view. That the Licensee in this case, the General Electric Company, is a member of an industry which is apparently

[1]Intervenors' Response to Licensee's Cross-Motion for Imposition of Sanctions, pp. 1-4.

disliked by the Intervenors hardly gives rise to such "public interest" considerations as would warrant referral of this discovery matter to the Commission.

The Claim of Privilege

In their response to Licensee's Cross-Motion for Imposition of Sanctions, Intervenors for the first time spell out their claim of privilege:

> The privilege applicable to the names of persons to whom an attorney[2] has submitted technical papers is the attorney work product privilege. The list of names of persons aiding intervenors was prepared in anticipation of administrative hearings, and therefore is privileged.

We observe at the outset that interrogatory no. 1 seeks the *names* of certain individuals, and not the production of some previously prepared document, *i.e.*, a "list," containing such names. We also observe that the Intervenors have provided no citation of case authority for the proposition that such names constitute attorney work product protecting the names from disclosure. *Roberson* v. *Ryder Truck Lines, Inc.*, 41 F.R.D. 166, dealt with a plaintiff's refusal to respond to interrogatories seeking the names of persons, known to plaintiff's attorney, who may have witnessed the accident which gave rise to plaintiff's action. In requiring disclosure, the court stated the following:

> It is plaintiff's position that since the names and addresses of these possible eye witnesses were obtained by an investigator employed by plaintiff's attorney, that this is a part of the attorney's work product, and under *Hickman* v. *Taylor*, 329 U. S. 495, 67 S. Ct. 385, and its progeny, disclosure of these names may not now be required. But this is a misconception of what was said in that case. There the court was dealing with an attempt, without any showing of justification, to secure *statements*, private memoranda, and personal recollections *prepared* or *formed* by an adverse party's counsel. Defendant here asks only for the names and addresses of prospective witnesses or of people who might know something about the accident upon which plaintiff's claim is based.

The court in that case went on to say, "It is inconceivable that any court would say that the names and addresses of prospective witnesses could be

[2]The attorney work product privilege is available only to attorneys. Intervenors Dellums, *et al.*, are not represented by counsel in this proceeding. We assume that those Intervenors are not seeking to claim this privilege.

classified as the work product of an attorney." In *Cedolia* v. *C. S. Hill Saw Mills, Inc.*, 41 F.R.D. 524, the plaintiff objected to certain interrogatories on the ground that the names and addresses of her witnesses were discovered by her attorney and, therefore, constituted attorney work product. In rejecting the claim, the court held that the "work product" rule enunciated in *Hickman* v. *Taylor, supra,* did not apply. The reason for this holding was that the court was not there concerned with memoranda, correspondence, mental impressions, or the personal beliefs of counsel, but only with "the effort of defendant to require the disclosure of true facts." The case here is not meaningfully different.

The intention of the Licensee can be inferred from the questions it has asked. The June 26 interrogatories seek a description of the seismic and geologic design bases which the Intervenors believe would be proper for the GETR facility; a listing of the facility structures believed by the Intervenors to be important to safety in that regard; Intervenors' view about which of such structures will require design modifications; and Intervenors' views concerning whether any such structures can be appropriately modified. In short, it appears that the Licensee is seeking to determine just what the Intervenors contend with respect to the proper seismic and geologic design bases for the GETR facility. Such information will most likely be relevant to the testimony of the Licensee's witnesses on the trial of the case. Just what the Intervenors contend, and from what persons they obtained the information on which to base their contentions, is, in our view, within the proper bounds of discovery, even though the information may have been solicited from them by Intervenors' attorney, and even though their identities may be known only to him.

Rule 26, FRCP

"By analogy," say the Intervenors, "Federal Rule of Civil Procedure 26 supports" their position against disclosure of the requested names. They place particular reliance on FRCP 26(b) (4) (B). But there is no Commission discovery rule even remotely similar to FRCP 26(b) (4) (B); hence, we are unable to apprehend the supposed "analogy."

This is not a case in which resort to the Federal Rules may be appropriate in order to properly *interpret and apply* a Commission discovery rule. See *Commonwealth Edison Company* (Zion Station, Units 1 and 2), ALAB-196, 7 AEC 457, April 25, 1975: ". . . we think that the 'broad, liberal interpretation' given to the Federal Rules [citation omitted] must similarly be accorded the Commission's discovery rules." Instead, the suggestion seems to be that we simply read FRCP 26(b) (4) (B) into the discovery scheme expressly set out in 10 CFR Part 2. We decline to do so.

While it is true that some of the Commission's discovery rules "are strikingly parallel to the analogous provisions of the Federal Rules of Civil Procedure," *Commonwealth Edison Company, supra,* that fact hardly provides a reasonable basis for inferring a Commission intention to have discovery in its proceedings governed by the Federal Rules in instances such as this, *where no analogous provision is to be found in the rules expressly adopted.* Indeed, we think the contrary inference is the better one: having expressly selected some, but not all, of the discovery provisions set out in the Federal Rules, the Commission did not intend for the unselected Federal Rules to control its proceedings.

On the scope of discovery, 10 CFR 2.740 reads, in pertinent part, as follows:

> *In general.* Parties may obtain discovery regarding any matter, not privileged, which is relevant to the subject matter involved in the proceeding, whether it relates to the claim or defense of the party seeking discovery or to the claim or defense of any other party, including the existence, description, nature, custody, condition, and location of any books, documents, or other tangible things and *the identity* and location of persons having knowledge of any discoverable matter [emphasis supplied].

It thus appears that the identities of the persons assisting the Intervenors are expressly discoverable under the Commission's rules. The quoted language is almost identical to FRCP 26(b) (1). Under that provision of the Federal Rules, the sought names would also be discoverable. *Sea Colony, Inc.* v. *Continental Insurance Company,* 63 F.R.D. 113.

The Intervenors rely on FRCP 26(b) (4) (B) (a Federal Rule which has no analogous provision in 10 CFR Part 2). In our view, however, even if the Commission's rules contained the identical provision, it would not aid the Intervenors' case. FRCP 26(b) (4) (B) is as follows:

> a party may discover facts known or opinions held by an expert who has been retained or specially employed by another party in anticipation of litigation or preparation for trial and who is not expected to be called as a witness at trial, only as provided in Rule 35(b) or upon a showing of exceptional circumstances under which it is impracticable for the party seeking discovery to obtain facts or opinions on the same subject by other means.

Intervenors say that they have not yet decided which experts will be called at trial; we should therefore conclude that these experts are not expected to be called at trial and, under Federal Rule 26(b) (4) (B), all discovery of these experts, including their identities, should be denied.

In *Baki* v. *B. F. Diamond Const. Co.,* 71 F.R.D. 179, the plaintiff sought an order compelling the defendant to answer certain interrogatories which requested, among other things, the names, addresses, and other identifying information of experts in possession of information relevant to the plaintiff's case. The defendant claimed, as do the Intervenors here, that since it had made no determination to utilize any of these individuals as experts at the trial, their identities were not subject to disclosure under FRCP 26. In ordering disclosure the court rejected the reasoning and the holding in *Perry* v. *W. S. Darley & Co.,* 54 F.R.D 278.[3] The *Baki, supra,* court relied on the language of Rule 26. It first noted that Federal Rule 26(b) (1) (a provision which is almost identical to the language of 10 CFR 2.740, quoted above) requires that the identities and locations of persons having knowledge of any discoverable matter be supplied. And then:

> This provision of Rule 26(b) (1) is not by its terms limited to the identity and location of nonexperts but, on the contrary, expressly allows such information to be obtained as to any "persons having knowledge" of discoverable matter. Such a broad umbrella encompasses the category of experts, who have been retained or specially employed in anticipation of litigation or preparation for trial and who are not expected to be called as witnesses at trial, since they may have knowledge of matter discoverable or potentially discoverable under the provisions and requirements of Rule 26(b) (4) (B).

Thus, the *Baki* case holds that, under FRCP 26, the names and addresses and other identifying information, of experts who have been retained or specially employed in anticipation of litigation or preparation for trial and who are not expected to be called as witnesses at trial may be obtained through interrogatories without any special showing of exceptional circumstances.

The Intervenors correctly point out that *Baki* distinguishes "between experts who are or are not 'retained or specially employed.'" The court in that case expressed the view that discovery of experts "merely consulted informally" and not retained or specially employed on the case, and not ex-

[3]The holding of Judge Myron Gordon in *Perry* v. *W. S. Darley & Co., supra,* is that the identities of experts, who are not expected to be called as witnesses, are not discoverable except upon satisfaction of the standards of Rule 26(b) (4) (B). While Rule 26(b) (4) (B) in terms applies to the discovery of facts known and opinions held by experts not to be called as witnesses, Judge Gordon reasoned that since a more rigorous standard is applied to discovery relevant information known to experts under Rule 26(b) (4) (B) than is applied to discovery such information from ordinary witnesses, a more rigorous standard should also be applied to discovering the identity and location of ordinary witnesses.

71 F.R.D. 179 at 181. As indicated, *Baki* rejected this reasoning, and the *Darley* case has not been followed.

pected to be witnesses at trial, should not ordinarily be permitted:

> If they were merely consulted informally, but not retained or employed, in the absence of the most unusual circumstances, they would not have any information or knowledge concerning a specific case at hand which would be discoverable. Such information as they would have would be that which generally could be possessed by any expert in their respective field. To allow discovery of the identity of such persons merely consulted informally would be to interfere unduly with trial preparation and investigation.

We accept the Intervenors' representations in the instant case that they have "signed no consultants contracts, nor paid any fees, nor promised to pay any such fees." It nevertheless seems plain enough that these facts do not fully meet the reasoning of the *Baki* court. The court's view does not really depend (surely not totally, if at all) upon the existence of contracts, the payment of fees, or upon any promise to pay such fees. Rather, the stated view seems to us to depend primarily upon an assessment of the liklihood that there may be discovered "information or knowledge concerning a specific case at hand." According to the papers before us, counsel for Intervenor Friends of the Earth has submitted technical papers for review to persons in anticipation of these administrative hearings. The intervening Congressmen have "submitted documents to many experts in various fields," some of whom "have made comments on these documents." These experts assisting the Intervenors are, or have been, specially engaged in connection with this case and are quite likely to have information or knowledge concerning this specific case. Preparation for trial is not likely to be hampered by the discovery sought here.

Motion for Imposition of Sanctions

We deny the Licensee's September 25, 1978, cross-motion for the imposition of sanctions upon the Intervenors. We deny the motion in the expectation that the Intervenors will reconsider their position[4] on this discovery question in light of the analyses set forth herein. Intervenors shall have fourteen (14) days from the service of this Memorandum and Order in which to respond to interrogatory no. 1.[5]

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[4]"Intervenors have no intention of releasing the names of individuals who are aiding intervenors to GE under any circumstances, unless these individuals are willing to publicly testify in upcoming GETR hearings." Intervenors' Response to Licensee's Cross-Motion for Imposition of Sanctions, p. 4.

[5]The sequence of pleadings and responsive pleadings has become somewhat confused. The

(Continued on next page.)

The Intervenors' motion for referral of the Board's August 14, 1978, ruling is *denied.*

The Licensee's cross-motion for the imposition of sanctions upon the Intervenors is *denied.*

IT IS SO ORDERED.

THE ATOMIC SAFETY AND
LICENSING BOARD

Edward Luton, Chairman

Dated at Bethesda, Maryland,
this 24th day of October 1978.

(Continued from previous page.)

Licensee's cross-motion appears to complain of nonresponsiveness to all its June 26 interrogatories. Intervenors' response to that motion includes some additional response to some of those interrogatories. The Licensee should have a further opportunity to consider those additional responses before the Board is called on to make a judgment concerning the adequacy of any of them. We have dealt herein only with interrogatory no. 1 of the June 26 set of interrogatories.

Cite as 8 NRC 470 (1978) LBP-78-34

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Elizabeth S. Bowers, Chairman
Dr. Donald P. deSylva
Dr. Walter H. Jordan

In the Matter of **Docket Nos. STN 50-488**
STN 50-489
DUKE POWER COMPANY **STN 50-490**

(Perkins Nuclear Station,
Units 1, 2, and 3) **October 27, 1978**

The Licensing Board finds that the applicable standards concerning technical qualifications, financial qualifications, and common defense and security have been met, but that the record is to be reopened to receive additional evidence on alternate sites and supplementary staff testimony on plans for dealing with certain generic safety issues.

TECHNICAL ISSUES DISCUSSED: Construction effects; release of radioactive materials in effluents; nonradioactive effluents; impact of plant on recreation and property values; impact of plant on development; eutrophication and fish kills; need for power; site suitability; plant design; evacuation plan (camping resort); dilution of liquid wastes; financial qualifications.

PARTIAL INITIAL DECISION
(Construction Permit Proceeding)

Appearances

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I. BACKGROUND

1. This decision considers Duke Power Company's ("Duke" or "Applicant") application to construct and operate the Perkins Nuclear Station,

Units 1, 2, and 3,[1] which was filed with the Atomic Energy Commission[2] on March 29, 1974. Perkins is proposed to be located on the Yadkin River in southeastern Davie County, North Carolina. Its design calls for three pressurized water reactors each of which is designed for operation at a power level of 3,817 megawatts thermal and a net output of 1,280 megawatts electric.

2. On July 19, 1974, the Commission published in the FEDERAL REGISTER a notice entitled "Hearing on Application for Construction Permits" (39 Fed. Reg. 26470). This notice ordered a hearing to be held to consider issues pursuant to the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011, *et seq.*, and the National Environmental Policy Act of 1969 ("NEPA"), 42 U.S.C. 4321, *et seq.* It also provided that any person wishing to participate in the proceeding as a party should file a petition to intervene by August 19, 1974.

3. On August 16, 1974, the State of North Carolina petitioned to participate as an interested State pursuant to 10 CFR 2.715(c). There was no objection to this petition and it was granted by the Board on July 2, 1975.

4. In early June 1975, Mary Apperson Davis and the Yadkin River Committee filed a late petition to intervene; the petition was granted on November 21, 1975.

5. On July 26, 1976, Mr. David Springer filed a "Motion to Dismiss" and a "Petition to Intervene" questioning the jurisdiction of the NRC to issue a construction permit. By orders dated July 15 and September 6, 1977, the Board denied the motion and petitions to intervene filed by Mr. Springer. The Board found that none of the documents filed by Mr. Springer, either alone or in combination, constituted a timely petition to intervene and that he had failed to show good cause for failure to file on time. These denials were affirmed by the Atomic Safety and Licensing Appeal Board in its Orders of September 8 and 16, 1977 (see ALAB-431 and ALAB-433, respectively 6 NRC 460 and 469).

6. Public hearings were conducted in this matter on April 26-30, May 6,

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[1]Perkins is the sister plant of Duke's Cherokee Nuclear Station, Units 1, 2, and 3, planned for eastern Cherokee County, South Carolina, on the Broad River. Together they comprise Duke's Project 81 which employs the concept of engineering standardization which is based on utilizing the same design for multiple sites (Tr. 205-206; see also the Commission's Statement of Considerations at 40 Fed. Reg. 2974). The nuclear steam supply system standard design in this instance is Combustion Engineering, Incorporated's ("CE"), System 80 design for which the NRC Staff has issued a generic safety evaluation ("SER") pursuant to 10 CFR Part 50, Appendix O (Staff Exhibit 8, SER, Appendix A, admitted at Tr. 2010).

[2]Pursuant to the Energy Reorganization Act of 1974, 42 U.S.C. 5801, *et seq.*, the Nuclear Regulatory Commission ("NRC") succeeded to the licensing and regulatory functions of the Atomic Energy Commission. The NRC and AEC will be referred to here as the "Commission."

1976, and April 28-29, July 18-21, 1977,[3] to consider environmental and health and safety issues. The parties presenting evidence at the hearings were Applicant, Staff, Intervenor, and the State of North Carolina.

7. On June 15, 1978, the Staff filed a motion to reopen the evidentiary record in this matter because, it concludes, "the Staff's review of alternative sites for the Perkins facility falls short of the guidance set forth by the Appeal Board in *Pilgrim*" and *Seabrook*.[4] The Staff indicates that it is developing a schedule for its reanalysis of alternative sites. The Intervenors have indicated in motions of their own that they feel the alternate site analysis is insufficient though their emphasis is not so general as is the Staff's. Intervenors' primary concern is that the Lake Norman site proposed by them (and in an intervention attempt by a Mr. Springer) has not been considered. The Applicant opposes the position of the Staff and the Intervenors in this regard and states its reasons in a carefully and ably prepared document dated June 27, 1978.

8. The Board determined in its order of July 14, 1978, that while the Staff may be in most respects like other parties, it has obligations under NEPA that other parties do not share. One of the Board's duties is to review the record and to determine whether the Staff has performed its NEPA function. If that finding cannot be made then no license may be authorized. Thus, if the Staff has not performed adequately its NEPA function, that inadequacy is not cured because the Staff is late in drawing attention to it or has failed to show that a new review would change things. We are convinced that the evidence now in the record would not permit approval of the Staff's alternate site review. The Staff's motion was sustained and *the record is reopened for new evidence* regarding the Staff's analysis of sites alternate to the Perkins site.

9. On April 11, 1978, the Commission amended Table S-3 relative to radon releases from the uranium fuel cycle and directed Licensing Boards in pending proceedings to reopen the record. Following an evidentiary hearing, this Board issued a partial initial decision on July 14, 1978.

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[3]The health and safety aspects of the Cherokee and Perkins applications were combined into one 4-day hearing session with evidence being taken at Gaffney, South Carolina, on the first 2 days and at Mocksville, North Carolina, on the third and fourth days. Thus, the Cherokee transcript for July 18 and 19, 1977, contains the first portion of the hearing and the Perkins transcript for July 20 and 21, 1977, contains the final 2 days. The Perkins Intervenors did not participate in that part of the hearing held at Gaffney but were provided transcripts of the proceedings and were given the opportunity to cross-exaimine the witnesses that appeared at Gaffney during the sessions at Mocksville. The pertinent parts of the Cherokee transcripts were received into the Perkins records (Tr. 2245).

[4]*Boston Edison Company* (Pilgrim Nuclear Generating Station, Unit 2), ALAB-479, 7 NRC 774 (May 25, 1978), and *Public Service Company of New Hampshire, et al.* (Seabrook Station, Units 1 and 2), 7 NRC 477, ALAB-471 (April 28, 1978).

10. The decision record in this proceeding consists of the transcripts ("Tr.") covering the prehearing conferences of June 13, 1975, and April 5, 1976, the evidentiary hearings referenced above, and all exhibits received into evidence by the Board.

II. FINDINGS OF FACT ON ENVIRONMENTAL IMPACTS

A. Basic Findings

General

11. On March 29, 1974, Applicant submitted an Environmental Report ("ER") pursuant to 10 CFR Part 51, to which it subsequently added Amendments 1 through 4. This ER, as amended, was admitted into evidence as Applicant's Exhibit 1 (Tr. 266). It contains detailed information on and evaluations of the environmental impacts associated with the construction and operation of the facilities.

12. Based on the information submitted by the Applicant in the ER, and on its review and analysis, the Staff prepared a Draft Environmental Statement ("DES") which was issued in May of 1975. Copies of the DES, with requests for comments, were sent to appropriate Federal, State, and local agencies. A notice of availability of the DES, with request for comments, was published in the FEDERAL REGISTER on May 9, 1975 (40 Fed. Reg. 20370). Applicant, one individual, and 13 Federal and State agencies commented on the DES (FES, Appendix A). The Staff then prepared a Final Environmental Statement ("FES") which was issued in October 1975 (Staff Exhibit 2, Tr. 402). A notice of availability of the FES was published in the FEDERAL REGISTER on October 20, 1975 (40 Fed. Reg. 47878): The FES concludes that the action called for under NEPA and 10 CFR Part 51 is the issuance of construction permits for the plant subject to certain conditions for protection of the environment (FES, p. ii-iii).

Impacts of Construction

13. Construction related activities will disturb approximately 400 acres at the Perkins site and about 1,400 acres at the Carter Creek Impoundment, a supplemental water storage pond. Virtually all of this land is either forest, farmland, or pasture (ER, §§4.1, 4.1.6, Table 5.1.4-1; FES, §4.1, Table 9.4). The activities will result in increased turbidity in the Yadkin River during consideration, but it will be reduced by Applicant's erosion control plan (ER, §§4.1.1.5, 4.1.1.6, 4.1.4; FES, §4.2.1).

14. About 400 acres of land will be cleared for the transmission lines that

connect the plant to the Duke system. The routes have been selected to minimize environmental impact. Lines will be constructed and maintained according to the appropriate Federal guidelines for transmission right-of-way construction and maintenance (ER, §4.2; FES, §4.1.3). About 77 acres of land will be required for the construction of a railroad spur (ER,§4.1.1.4; FES, §4.1.4).

15. Clearing for construction and site development constitutes an impact on local flora and fauna. Impacts on the fauna include killing and displacement of numerous animals which will result in a reduction of the population of the species involved (FES, §4.3.1).

16. The construction of Perkins will displace some 26 families at the plant site and 16 families at the Carter Creek Impoundment. Traffic on local roads will increase. The housing and schools are adequate to accommodate the influx of construction workers, which at peak will be about 2,600 (ER, §4.1, Table 5.1.4-1; FES, §§4.4.1, 4.4.3; Tr. 1235-1236).

17. The Board finds that the environmental impacts of construction will be acceptable particularly in light of Conditions 7(a)-(e) in the FES, to which Applicant has agreed (Tr. 288).

Impacts of Operation

1. Radioactive Effluents

18. Potential environmental impacts of operating the Perkins Nuclear Station include the effects of radioactive effluents, the effects of non-radioactive effluents such as salts, chemicals, and heated water, as well as the possible effects of entrainment and impingement upon the aquatic organisms. The effect of the consumptive use of water upon the Yadkin River and High Rock Lake has been a major concern of the Intervenors and will be considered below.

19. The effects of low-level radiation discharged during routine operation have been evaluated. The sources of radioisotopes in liquid wastes are the small amounts of fission products that leak from the fuel rods into the reactor cooling water and activated corrosion products in the cooling water. Leaks in equipment and piping systems that contain reactor cooling water, and liquids from decontamination processes make up the liquid waste. These liquid wastes are classified, collected, and treated by filtration, demineralization, evaporation, or a combination of these methods, and are either recycled for in-plant use or released after dilution (ER, §§5.2, 5.3.2; FES, §3.5.1). In estimating radiation doses from liquid effluents, consideration was given to pathways including drinking water, eating fish, swimming, and consuming meat and milk from animals which use the river for drinking water.

20. Most of the fission product gases that leak from the fuel elements will be collected in tanks and held up until the short-lived radioactive species have decayed. There will, however, be some leakage at valve stems and seals, and consequently there will be some escape of radioactive noble gases (such as xenon and krypton), tritium, carbon-14, radioactive iodine, and particulates (FES, §§3.5.2, 5.4.2).

21. The Staff presented testimony on the "as low as reasonably achievable" radioactive releases as set forth in 10 CFR Part 50, Appendix I (Parsont following Tr. 616). This testimony updated the presentation contained in FES, §5.4.2, and included the results of a detailed Staff assessment of the matter. Specifically, the Staff evaluated the radioactive waste management systems proposed for Perkins (*id.* at 2) and based on more recent data supplied by Applicant and on changes to the Staff's calculational model, generated new liquid and gaseous source terms to determine conformance with Appendix I (*id.* at 3). Included in the Staff's analysis were dose evaluations of three effluent categories: (1) pathways associated with liquid effluent releases to the Yadkin River; (2) noble gases released to the atmosphere; and (3) pathways associated with radioiodines, particulates, carbon-14, and tritium released to the atmosphere (*id.* at 3). The Staff concluded that the doses associated with the normal operation of Perkins meet the design objectives of Sections II.A, B, and C of Appendix I and that the expected quantity of radioactive materials released in liquid and gaseous effluents and the aggregate doses meet the design objectives set forth in RM-50-2 (*id.* at 6). Further, the Staff's evaluation shows that Applicant's proposed Perkins design satisfies the criteria specified in the option provided by the Commission's September 4, 1975, amendment to Appendix I and, therefore, meets the requirements of Section II.D of Appendix I (*id.* at 6). In sum, Staff found that Perkins' proposed liquid and gaseous rad-waste management systems meet the criteria set forth in Appendix I and are, therefore, acceptable (*id.* at 7).

22. The Board notes that in choosing the Appendix I option provided by the Commission on September 4, 1975, the Applicant is committed to lower doses to offsite individuals than would be required under the unamended regulation. We also note the Applicant's commitment to nonremoval of rad-waste equipment as stated in Appendix B of the FES.

23. The Staff has also estimated the integrated exposure to the U.S. population resulting from the liquid and gaseous effluents from Perkins. The estimated whole body exposure of 77 man-rem per year is negligible compared to that from natural background.

24. The major component of population exposure due to operation of the plant will be that due to the occupational exposure of plant personnel.

Although no individual will receive more than 5 rem/yr, the total dose to all employees may be as high as 1,400 man-rem/yr.

25. The Board finds that no significant environmental impacts are anticipated from radiation exposure resulting from normal operations.

2. Nonradioactive Effluents

26. Perkins will withdraw up to 135 cfs of the Yadkin River including a maximum of 104 cfs for evaporative losses in the cooling towers, 31 cfs maximum for cooling tower blowdown, and 0.25 cfs for cooling tower drift. The 31 cfs of cooling tower blowdown will be returned to the river after use. Perkins will also use and return to the river 150 cfs on an intermittent basis for dilution of radioactive waste (Applicant's testimony of L.C. Dail at p. 5, following Tr. 275).

27. The average flow of the Yadkin River is 2,880 cfs (Dail, p. 3, following Tr. 275). However, during periods of drought the daily average flow has been as low as 330 cfs; the 7Q10 flow is 625 cfs. The Applicant plans to create an artificial lake by impounding Carter Creek. Water from Carter Creek Impoundment can be used to supplement the flow of the river during periods of drought. This matter was considered at length by the State of North Carolina during the proceedings which considered a discharge permit for the Perkins Nuclear Station. The State has granted a discharge permit (State Exhibit 1) subject to the following conditions:

(a) Duke will make no net withdrawals from the Yadkin River when the stream flow is less than 1,000 cfs (645 Mgal/d).

(b) Duke will limit net withdrawals to not more than 25% of the total stream flow, or not more than that portion of this measured stream flow that is in excess of 1,000 cfs, whichever is the lesser quantity.

(c) Duke's maximum daily consumptive use of water due to forced evaporation will not exceed 112 cfs (72 Mgal/d).

28. The Board adopts the above condition as minimum conditions for licensing the nuclear plant.

29. The consumptive use of 104 cfs maximum (average 68.8 cfs—see Dail, p. 8) and the return of heated and chemically altered blowdown will have an adverse impact on the river. These impacts have been considered by the Staff (FES, §5.2) under the assumption that Perkins make no net withdrawals when the river flow falls below 880 cfs.

30. The cooling tower blowdown will contain about ten times the concentration of salts that are present in the ambient river water. This will result in a minor increase in the salt concentration in the river and will not

adversely affect the quality of the water for municipal or industrial use downstream (FES, §5.2.1.1).

31. One of the most important uses of the Yadkin River is to carry wastes from municipal waste treatment plants and from industry. It is apparent that the river is already overburdened during periods of minimum flow. Fish kills have resulted and have been attributed to the high biochemical oxygen demand (BOD) resulting from excess wastes in the river. These adverse effects become more serious during periods of low flow. Since Perkins will not, on balance, withdraw water during periods of low flow, it will not contribute to the reduced assimilative capacity of the river during such periods. There will continue to be critically low flow conditions in the Yadkin River whether or not Perkins operates. Perkins will reduce the average flow of the river whenever the flow exceeds 1,000 cfs and hence reduce the assimilative capacity of the river by an amount proportioned to its consumptive use. These matters will be considered more thoroughly in connection with Intervenors' Contention III(A)4.

32. The blowdown from the cooling towers will continually discharge a maximum of 35 cfs of heated water into the river. Under average river flow conditions the Applicant has estimated the area of the heated plume (3 °C isotherm) would be 142 acres (Dail, p. 15, following Tr. 275) and extend no more than one-third of the width of the river. The Staff has estimated that even under low flow conditions (7Q10) the 5 °F isotherm would extend no more than half the width of the river (FES, §5.3.1.2).

33. The Staff has made an independent evaluation of the effects of the thermal plume on the aquatic environment. They conclude that under summer conditions, the area of the plume will be small and there should be no appreciable adverse impacts (FES, p. 5-31). During winter conditions there is a potential for a cold kill of fish if the temperature of the plume were to drop suddenly. However, the volume of heated water is small so very few fish could be kept in a warm region for an extended period. They consider that the potential for cold-shock fish fills will be negligible (FES, p. 5-32).

34. Since an appreciable fraction of the Yadkin River is used for cooling the Perkins Nuclear Station, the effects of entrainment of river biota and the possible impingement of fish on the intake screen must be considered. The Staff concludes that fish impingement losses at Perkins Nuclear Station should be insignificant due to good design of the intake structure. They also conclude that entrainment losses of phytoplankton and zooplankton will not have a serious impact on the biota of the Yadkin River (FES, p. 5-32).

35. The Applicant plans to add chlorine to the water circulating through the condenser and cooling towers. Daily application of chlorine will be

made to control the growth of organisms and thus prevent fouling of the heat transfer surfaces. This could result in a free residual chlorine concentration of 1 ppm in the blowdown which might result in fish kills (FES, §5.5.2.2). However, during the course of this proceeding the Applicant has proposed that blowdown be held up for a considerable period following chlorination. The concentration of total residual chlorine will drop continuously during this period. Blowdown will be held up until the level has dropped to 0.2 ppm. The Staff has reevaluated the effect based on this commitment and finds it acceptable for protection of the aquatic environment (Staff response to Board Question 5 following Tr. 1227). The Board includes this commitment as a license condition.

36. In addition to the impacts noted above, consumptive use of water from the Yadkin River will contribute to the eutrophication of High Rock Lake, have a minor effect on the lake levels, and reduce the amount of hydropower from dams below Perkins Nuclear Station. These impacts will be considered under contested issues.

37. The vapor plume from the cooling towers will result in some increase in fogging and icing but the increases should be insignificant (ER, §5.1.5; FES, §5.1.1). Droplets from the cooling towers will carry some 250,000 lb/yr of solids which will be deposited on the land surrounding the station. The Staff estimated that the maximum fallout would amount to about 13 lb/acre/yr (FES, §5.3.2.3).

38. The area in the immediate vicinity of the Perkins Nuclear Station site is rural and sparsely populated. Terrestrial impacts are expected to be minimal. The increased burden on local schools and other demands for governmental services should be insignificant (FES, §5.6).

3. Effects of Accidents

39. The environmental effects of accidents have been assessed by the Applicant (ER, ¶7). The Staff has reviewed the Applicant's assessment, has made independent calculations, and has concluded that under realistic assumptions the radiation dose to a nearby resident from a so-called "design basis accident" would be less than that allowed by 10 CFR Part 20. They did not consider accidents which involve failure of the containment vessel because a Staff study (WASH-1400) has concluded that such accidents are exceedingly improbable. On the basis of the record of this proceeding the Board concludes that the environmental risks due to postulated radiological accidents are extremely small.

4. Transportation of Fuel and Radioactive Waste

40. Transportation of fuel to and from the site and of radioactive waste from the site will be in accordance with Commission regulations, require-

ments of the Department of Transportation, and applicable State regulations (ER, §5.3.4.2; FES, §5.4.2.4). Under normal shipping conditions, there will be small unavoidable radiation exposure to the transportation personnel and to the general public along the route (FES, §5.4.2.4). Under postulated accident conditions, the probability of significant exposure is also small. Since the facilities at Perkins, their operation, and associated activities are as described at 10 CFR 51.20(g)(2), the environmental impact of the transportation of fuel and radioactive waste to and from the plant is as described in Summary Table S-4 of Section 51.20 and is negligible.

5. Environmental Consequences of the Uranium Fuel Cycle

41. The environmental consequences of the uranium fuel cycle associated with the operation of the Perkins Nuclear Station were considered in the FES (dated October 1975) by including Table S-3[5] and by factoring those consequences into a cost-benefit balance. On March 7, 1977, the Commission promulgated its final interim rule as to environmental impact values for the uranium fuel cycle which amended Table S-3. At the hearing, the Staff provided testimony that the new figures contained in the revised Table S-3 were so little different from those in the original Table S-3 that the cost-benefit balance would not be disturbed (see affidavit of Robert A. Gilbert at 6, following Tr. 1778; see also 1779-1782).

42. In addition to presenting the revised Table S-3, the Staff presented an analysis comparing the health effects associated with the coal and nuclear fuel cycles. In making this evaluation, Dr. R. L. Gotchy considered the entire fuel cycle associated with each alternative. The coal fuel cycle consists of mining, processing, transportation, power generation, and waste disposal. The nuclear fuel cycle includes mining, milling, uranium enrichment, fuel preparation, fuel transportation, power generation, irradiated fuel transport, reprocessing (if permitted), and waste disposal (see supplemental testimony of R. L. Gotchy following Tr. 1740). The Applicant also presented testimony concerning the health effects associated with the coal fuel cycle (see testimony of Lionel Lewis following Tr. 1776).

43. After the close of the evidentiary record in this proceeding, one of the members of this Board prepared a memorandum which was transmitted to the Commission. The chief thrust of this memorandum was to bring into question the Table S-3 value for the amount of radon (Rn-222) emitted from tailings piles associated with uranium mills.

44. On April 11, 1978, the Commission amended Table S-3 by removing the value contained in the table for radon releases from the uranium fuel cycle.[6] The Commission directed that in proceedings pending before Licens-

[5]Table S-3 is part of 10 CFR Part 51.

[6]43 Fed. Reg. 15613.

ing Boards, the record be reopened for the limited purpose of receiving new evidence on radon releases and on health effects resulting from radon releases.

45. In response to the Commission's directive, a public hearing was convened on May 16 and 17, 1978, in Bethesda, Maryland, to receive evidence on the amount of radon that might be released into the environment resulting from the mining and milling of an amount of uranium sufficient to supply the Perkins Nuclear Station for 40 years of operation. The subsequent health effects were also considered.

46. In reviewing the testimony presented at that hearing (Tr. 2247-2666) and the subsequent deposition of Dr. Kepford (Tr. 2667-2819), we cannot agree with the Staff that we should consider only potential deaths attributable to the nuclear cycle over the next 1,000 years. Neither can we agree with the Intervenors that we must consider possible deaths that may occur millions—even billions—of years in the future due to the radon from unstabilized tailings piles and unfilled mining pits. We conclude that "when it comes to balancing adverse impacts to those descendants who may follow a million years from now against the benefits to the present generation, we would weigh (heavily) benefits to the present population" (see *Perkins*, Partial Initial Decision—Environmental Consequences of the Uranium Fuel Cycle, ¶49). In comparing the impact of coal and nuclear cycles on future generations "we believe that future generations will be better off if Perkins is nuclear" (*ibid.*,¶50). We have further found ". . . that the best mechanism available to characterize the significance of radon releases associated with the mining and milling of the nuclear fuel for the Perkins facility is to compare such releases with those associated with natural background. The increase in background associated with Perkins is so small compared with background and so small in comparison with the fluctuations in background, as to be completely undetectable. Under such a circumstance the impact cannot be significant" (*ibid.*, ¶51). In conclusion we have stated ". . . this Board has carefully considered available information concerning the releases of radon-222 associated with the uranium fuel cycle and health effects that can reasonably be deemed associated therewith, and concludes that such releases and impacts are insignificant in striking the cost-benefit balance for the Perkins Nuclear Power Station" (*ibid.*, ¶52).

6. Alternative Sources of Power

47. Possible alternative means considered for furnishing the projected energy capability of the facility included the possible purchase of power, upgrading of older plants, baseload operation of an existing peaking facility, hydroelectric power, fossil fuel plants, geothermal, solar, and other un-

proven types of generation (ER, ¶9.2; FES, ¶9.1.1, ¶9.1.2). The Staff concluded that the only viable alternative to nuclear power was coal; that nuclear was cheaper than coal with no offsetting environmental advantages of coal over nuclear. The Staff's evaluation was made prior to the discovery of the error in Table S-3 for radon. On the basis of the complete record of this proceeding we conclude that the adverse environmental impacts of nuclear are less than those of coal. There are no other viable alternatives for producing the power generated by Perkins.

48. The Staff and the Applicant have considered alternative cooling systems (FES, ¶9.2.1). At the Perkins site only cooling towers or cooling ponds were considered since the river flow is not adequate for once-through cooling.[7] The Applicant has chosen circular mechanical-draft towers for Perkins chiefly on the basis of cost. The Staff believes that a cooling pond, in view of its large size, would be impractical at the Perkins site. Three natural-draft towers would be a viable alternative but do not offer significantly smaller environmental impacts. The mechanical-draft towers are an acceptable method of cooling the Perkins Nuclear Station.

7. Alternative Sites

49. The matter of alternative sites has been considered at length during this proceeding. On June 15, 1978, the Staff filed a motion to reopen the record to take further evidence on Staff review of alternate sites. The motion was opposed by the Applicant. We have agreed with the Staff and on July 17 this Board issued an order reopening the record for new evidence regarding the Staff's analysis of sites alternate to the Perkins site. We will issue a decision on this matter at a later date.

8. Environmental Monitoring

50. The Applicant has submitted to the Staff a preoperational monitoring program (ER, §6.1). The program has been reviewed and approved by the Staff (FES, §6.1.3; Tr. 670-72, 1132-33). The Board has reviewed the revised preoperational monitoring program and finds that the program is adequate. The Applicant has described an ecological monitoring plan from the present until the first unit goes into commercial operation (ER, §6.2.5; Tr. 427). The Staff has reviewed such plan and believes it is adequate to establish a baseline for operational monitoring after the plant goes into operation (Tr. 427, 670-72, 1132-33). The Board so finds.

[7]In reply to a Board question Applicant's witness Dail stated that since the average flow of the Yadkin River was only 2,880 cfs it could not supply the amount of water required for once-through cooling, namely some 5,500 to 6,000 cfs (Tr. 1024, 25).

B. Matters in Controversy

Detrimental Effects on Recreational and Property Values at High Rock Lake and on the Yadkin River

51. Intervenors' Contention III(A)1 provides:

III(A) The affects upon Petitioners and others of the consumptive water loss of up to 112 cfs and the proposed drawdown limitation of 880 cfs resulting from the operation of the Perkins Nuclear Station are so adverse as to make the site and design for the plant unsuitable for the following reasons:

1. The summer months are both the period of Applicant's systemwide peakloads and also the period of maximum recreational use of High Rock Lake. Since Perkins is intended as a baseload plant, it will be operated as close to 100% capacity as possible during those summer months. Consequently, the level of High Rock Lake will drop 2 feet below normal by September 15 nearly every year the station operates at full power during summer. As a result the area of the reservoir will be decreased by a maximum of about 1,000 acres, more mud flats, stumps, and rocks will be exposed making swimming less desirable and increasing boating hazards. Members of the Yadkin River Committee and other residents and users of High Rock Lake fought for over 20 years to achieve the maximum drawdown conditions presently imposed upon the operating license of High Rock Lake (Yadkin, Inc.). To permit the Applicant to consume up to 112 cfs from the Yadkin River during the summer months would deprive Petitioners and thousands of other North Carolinians of their accustomed recreation and reduce the property values of members of the Yadkin River Committee and other lakeside landowners by millions of dollars.

52. Intervenors' assertion that, during the recreational season Perkins will cause the water level to drop 2 feet below the usual level, thereby adversely affecting recreational and property values, was based on a statement in the FES at p. 5-4. It is now apparent that the statement was incorrect; it failed to take into account the "rule curve" which governs the release of water from the lake. The error by the Staff was corrected during the course of the hearing.

53. By way of background, the High Rock Lake Impoundment is approximately 31 miles downstream from Perkins (ER, Figure 2.1-1) and was built in 1927 as the uppermost of a series of hydroelectric projects. Yadkin, Inc., a subsidiary of Alcoa, operates the Impoundment under a Federal

Power Commission license which imposes minimum release limits on the Impoundment. In 1968, the FPC amended that license to require Yadkin, Inc., to use a "rule curve" in releasing lake water (Applicant's Water Use Report ("WUR") at WUR-III-2, following Tr. 523; see also 39 FPC 396). The rule curve does not limit the lake elevation to a maximum drawdown. Rather, it limits the production of power before and during the recreational season of May 15 to September 15 in order to preserve, with a high degree of confidence, the lake level. It accomplishes this end by imposing restraints on the volume of water that can be discharged through the High Rock Lake Dam (Tr. 539, 588-89; WUR-III-2 following Tr. 523). As a result of the rule curve, the maximum drawdown during the recreational season would be limited to 5 feet or less 96% of the time (Tr. 597; WUR-III-2 following Tr. 523). During 4% of the time, the drawdown could exceed 5 feet; indeed, the testimony showed that the drawdown during this limited period could approach 10 feet (Tr. 597).

54. The NRC Staff testified that the 2-foot figure appearing in the FES at 5-4 was too pessimistic, since it did not reflect application of the rule curve on the drawdown levels of High Rock Lake (Tr. 1077-78). The Staff stated that the FES calculation was based on the worst case that could be assumed, *i.e.*, merely subtracting Perkins consumptive loss from the High Rock Lake level and without factoring in the rule curve adjustment using the worst year (Tr. 1075-76). Staff witness presented a supplemental and more sophisticated study which applied the rule curve, covered the recreation seasons from 1968 to 1975, and assumed a 100% capacity factor at Perkins (Staff testimony of R. C. Robertson following Tr. 1062, Tr. 1092). The Staff witness emphasized that the application of the rule curve, in its revised study was most significant inasmuch as it has such a powerful influence on lake levels that the water consumption upstream of High Rock Lake makes very little difference if the rule curve is rigorously applied (Tr. 1087-88). In this regard, the Staff found that in the worst year of the study in terms of low flow conditions, 1971, Perkins would have contributed 6 inches to the total drawdown, which was already at 4 feet (Staff testimony of R. C. Robertson at p. 2, following Tr. 1062). In the Staff's opinion, this additional amount will not have a major impact on recreational use of the lake (Staff testimony of R. C. Robertson at pp. 3-4, following Tr. 1062).

55. Applicant's testimony is in agreement with the Staff's (Applicant's testimony of L. C. Dail following Tr. 275). The basis of such testimony is Applicant's study utilizing 800 cfs base flow which shows, for the recreation season in each year from 1952 to 1971, the maximum drawdown of the lake (a) without Perkins, (b) with Perkins operating at 76% capacity, and (c) with Perkins operating at 88% capacity. The results of the study, set out in Table 12 of Applicant's Water Use Report (following Tr. 523), show that

Perkins would have had an insignificant effect on High Rock Lake drawdowns. Perkins would have had absolutely no effect on lake levels for 15 of the 20 years of the study. In 3 of the 5 years of Perkins operation at a 76% capacity factor, the additional amount of drawdown would have been negligible: 0.1 inch, 1.6 inches, and 2.2 inches. In the other 2 years, it would have an additional drawdown of 7.9 inches and 18.6 inches, but during those years the lake was drawndown to such an extent (6.7 feet in 1954 and 9.8 feet in 1956) that even without Perkins recreational use of the lake would be curtailed (WUR-VI-2 following Tr. 523). It should be noted that Applicant's study reflects conservative factors. First, the study period includes the driest water year of record, 1956, and the worst drought period of record, 1954 to 1956. Second, it does not reflect the effect of the upstream W. Kerr Scott Reservoir prior to 1962, which would probably serve to maintain a higher stream flow during dry periods due to maintaining minimum releases (Applicant's testimony of L. C. Dail at pp. 11-13, following Tr. 275; WUR-VI-1-2 following Tr. 523).

56. Consistent with the above-referenced testimony and studies is the testimony of Mr. George Popovich. Mr. Popovich, an employee of Alcoa, helped develop the operating guide for the High Rock Lake Impoundment, which is the basis for rule curve limits the FPC imposed in 1968 (testimony of George Popovich at pp. 1, 3-5, following Tr. 287). In addition, he conducted his own independent analysis of Perkins's impact on the drawdowns at High Rock Lake which shows that Perkins will only add 1/10th of a foot to the drawdown at the lake 98% of the time (Tr. 549, 576-77, 591). He stated that he believes a tenth of a foot difference in elevation will not be discernable (Tr. 549). It is important to note that the methodology he used was completely his own and the majority of the information relied upon was developed by him (Tr. 577). While Mr. Popovich was called by Applicant he stated that he received no direction from them with respect to the nature of his study nor was he paid by Applicant to testify in the proceeding (Tr. 577, 581).

57. Mr. Popovich's study considered a data base of 49 years (Tr. 589-90) and used adverse meteorology (Tr. 558). The study's results, as discussed above, were in agreement with Applicant's analysis of Perkins' impact on High Rock Lake (Tr. 586-87). However, Mr. Popovich noted that Applicant's model was somewhat conservative in that it did not consider Yadkin, Inc.'s, secondary downstream storage reservoirs which at times would be called on to generate power (Tr. 586). In addition, Applicant assumed passage of water to generate maximum generation at High Rock Lake permitted by the rule curve. This is conservative since low flows can sometimes be anticipated and adjustments made to generation of energy (Tr. 586; see also Tr. 531, 549). Mr. Popovich stated that his own model was likewise

conservative in that he deliberately made assumptions that overemphasized critical situations (Tr. 582).

58. We have received conflicting testimony concerning the effect of the drawdown on property values. Intervenors' witnesses concluded that the operation of Perkins would adversely affect property values by reducing the lake level (Intervenors' testimony of David Springer following Tr. 1305; Intervenors' testimony of Lawrence Pfefferkorn following Tr. 1286). Applicant's witnesses testified that property values would be unaffected; that even a 4-foot drawdown would not significantly affect property values (Tr. 1171-72). We consider the argument between parties is irrelevant since there is no evidence that the operation of Perkins will appreciably affect the lake levels.

59. Intervenors have not presented any testimony that would demonstrate that withdrawal of water by Perkins will appreciably affect the lake level. They argue that withdrawals by Perkins will reduce the amount of hydropower available to Alcoa; that economic self-interest will cause Alcoa to deviate from the rule curve which will result in a lowering of the lake level (Intervenors' Proposed Findings, p. 7). We reject such arguments. Our finding that withdrawal of 100 cfs from the Yadkin River will not lead to unacceptable consequences is based in a large measure, on the continued application of the rule curve. A change in the rule curve would require a reevaluation of the impact of Perkins.

60. On the basis of the above facts, the Board finds that Perkins' use of Yadkin River water will have a negligible impact on High Rock Lake drawdowns. Since the effect on drawdowns is negligible, the effect on recreation and property values should also be negligible.

Further Development in the Yadkin River Basin

61. Intervenors' Contention III(A)2 follows:

2. Both the Applicant and Staff have radically underestimated the affect of the proposed 880 cfs drawdown limitation upon the future water needs of the Yadkin River Basin. The Staff has admitted that "if the future water needs for the river grow significantly, critical water shortages could develop." In its 1974 Third Annual Report, the official North Carolina State government Council on State Goals and Policies estimates the population of the Piedmont area of North Carolina (roughly the area traversed by the Yadkin River) will increase by almost 55% from 1970 to 2000, approximately one half of the way through the life of the plant.

The possible daily consumptive loss of 112 cfs of water represents ten

times the daily consumptive loss from the entire City of Winston-Salem, and the amount of water necessary for the operation of the PNS would support a domestic-industrial complex of over four million people.

The operation of the Perkins Nuclear Station under the 880 cfs maximum drawdown limitation proposed by the Applicant and accepted by the Staff will result in one or both of the following:

(a) Significant inhibition of future municipal and industrial growth both upstream and downstream from the plant.

(b) Critical water shortages during periods of low flow.

62. Intervenors argue that Perkins consumptive water loss will significantly inhibit future growth both upstream and downstream from the plant and cause critical water shortages during periods of low flow. Intervenors' case in this regard consists chiefly of the testimony of David Springer (Tr. 1305), two exhibits,[8] plus extensive cross-examination of Applicant's witness Dail (Tr. 893-997). Mr. Springer's testimony included a table which was taken from a report of the North Carolina Department of Natural and Economic Resources (Exhibit 5) showing the projected fructuary uses of the Yadkin River Basin for the years 1990, 2000, and 2010. It indicated that the amount of water used would increase from 170 Mgal/d[9] in 1970 to 628 Mgal/d in 2020. Mr. Springer also presented data on minimum flows in the Yadkin River. There have been occasions when the flow has been as low as 260 Mgal/d (the 7Q10 flow is 725 cfs or 468 Mgal/d—Springer, p. 9). Thus, although the average flow of the river is 2,700 cfs, he argues that there will be periods when the river flow is inadequate for future needs; that an additional consumptive use of 100 cfs (65 Mgal/d) by Perkins should not be permitted.

63. Applicant argued that the needs of present and potential users of the Yadkin River can be satisfied even during periods of low flow. Witness Dail sponsored a document entitled "Water Use Report," (abbreviated WUR) which projected the total withdrawals of water from the Yadkin River for each county within the Yadkin River Basin in the decades for 1970 to 2020 (WUR, Table 8, following Tr. 523). Withdrawals for 1970 totaled 152 Mgal/d (235 cfs); for 2020 the projected total was 380 Mgal/d (590 cfs). The figure for 1970 (152 Mgal/d) is somewhat smaller than that of Intervenors'

[8]Intervenors' Exhibits 5 and 6 admitted into evidence at Tr. 1326.

[9]Mgal/d is an abbreviation of millions of gallons per day.

witness (170 Mgal/d) but the projected figure for 2020 (380 Mgal/d) is much less than Intervenors' figure (628 Mgal/d). Applicant based his future requirements on estimated population growths. Since the average Yadkin River flow is 2,880 cfs the consumptive withdrawal of 100 cfs by Perkins would still leave plenty of water for other uses.

64. Applicant, however, admitted that with minimum flows as low as 177 cfs and 7Q10 flows of 625 cfs that some measures must be taken at times of low flow. They proposed the construction of Carter Creek Impoundment which will store enough water to supply the consumptive requirements of Perkins for about 100 days (L. C. Dail at pp. 9-11, following Tr. 275). They proposed no net withdrawals of water from the Yadkin when the river flow was less than 880 cfs. Thus downstream users' needs (projected at 232 Mgal/d or 360 cfs) would be met except for extended drought periods and would not be affected by Perkins' operation.

65. The Staff did not make an independent estimate of future demands on the Yadkin River and have submitted no proposed findings regarding this contention. The FES (§5.2.1) points out that the operation of Perkins will increase the frequency at which flows below 880 cfs will occur.

66. The State of North Carolina pointed out that the State has long been vitally interested in the development of the Yadkin River Basin—that they planned to hold hearings on the use of water from the Yadkin in connection with the application of Duke Power for a certificate. Since such proceedings were imminent the State requested that their presentation of evidence in this proceeding be deferred until such time as the State had resolved the matter to its satisfaction. The Board granted the State's request (see Board order of April 15, 1976).

67. On April 28, 1977, the State of North Carolina introduced into the record of this proceeding two documents which describe the action of the State. State Exhibit 1 was a copy of an order by the North Carolina Utilities Commission (NCUC) granting a "Certificate of Public Convenience and Necessity" to Duke Power authorizing the construction of Perkins. State Exhibit 2 is a copy of Environmental Management Commission (EMC) corrected Resolution No. 76-41. In that document EMC found that the effects of Duke's withdrawal on downstream users will be minimized if the net withdrawal is limited to no more than 25% of stream flow and is prohibited when stream flow is 1,000 cfs or less. The maximum consumptive withdrawal is not to exceed 112 cfs. These conditions were made a part of the certificate from the NCUC.

68. Raising the limiting stream flow from 880 cfs to 1,000 cfs will further minimize the impact of Perkins on downstream users. We find that with such a restriction the adverse effects of consumptive use of water by Perkins will be minimized and is a tolerable impact in view of the benefits of the

power produced. We adopt the conditions imposed by the State of North Carolina.

Loss of Hydroelectric Power

69. Intervenors' Contention III(A)3 follows:

3. The Applicant and Staff have only considered the loss of downstream hydroelectric generating capacity from existing generating facilities and have ignored the potential loss of capacity from future hydroelectric generating facilities.

70. Applicant testified that the Corps of Engineers has conducted a cost-benefit analysis of potential hydroelectric sites and found them economically unjustifiable (testimony of L. C. Dail at p. 13, following Tr. 275).

71. Intervenors offered no direct testimony in support of their contention. There will be a loss of hydroelectric power from *present* facilities downstream of Perkins. Intervenors questioned one of the Applicant's witnesses concerning the accuracy of the dollar estimates for loss of hydropower (Tr. 570-576), but this Board believes that matter has been adequately considered by the Staff and the Applicant (FES, §5.2.1.4; ER, §3.3.1).

72. Intervenors filed no brief in support of their contention. Neither did the Staff. The contention remains unsupported.

Eutrophication and Fish Kills

73. Intervenors' Contention III(A)4 follows:

4. The operation of the Perkins Nuclear Station with a consumptive water loss of up to 112 cfs and an 880 cfs drawdown limitation will contribute to and hasten eutrophication of the High Rock Lake. It will further increase the frequency and severity of fish kills.

74. The Yadkin River and High Rock Lake are at present badly polluted as a consequence of municipal and commercial discharges into the river. Fish kills and other signs of eutrophication are particularly evident during times of low flow. The consumptive withdrawal of 100 cfs of water and the addition of some chemicals by Perkins will contribute to a reduction in water quality in the river and lake. However, the requirement that Perkins make no net withdrawals when the river flow is less than 1,000 cfs will be an important factor in limiting the adverse effects of Perkins on the water quality.

75. Intervenors argue that Perkins will contribute to and hasten eutrophication of High Rock Lake and will further increase the severity and

frequency of fish kills. In support of their contention, Intervenors offered two witnesses, Mr. David Springer (testimony following Tr. 1305) and Mr. Lawrence Pfefferkorn (testimony following Tr. 1286). Mr. Springer, who has lived for many years on the river and Mr. Pfefferkorn, who is also personally acquainted with High Rock Lake since it was built in the 1920's—both testified to the steadily deteriorating quality of the water. Neither witness claimed any expertise in the field of biology or aquatic ecology. Neither attempted to show any specific effects of Perkins on water quality or frequency of fish kills.

76. As to fish kills, Applicant testified that such have been caused in the Yadkin River by (1) insufficiently treated sewage discharged from the City of Winston-Salem, (2) effluents discharged from finishing plants near the headwaters of High Rock Lake, and (3) algae bloom, a blue-green algae, which during nights started respiring, used up the oxygen, and the fish died from lack of oxygen (Tr. 1203). Applicant testified that Perkins' discharge, either in terms of chemical or thermal emissions, will not interact with the sewage from Winston-Salem or the finishing plant discharges and exacerbate the fish kill (Tr. 1205). With respect to the algae bloom, Applicant testified that the general low light penetration due to high turbidity in the Yadkin effectively inhibits the development of the bloom (Tr. 1205).

77. Applicant stated that the only nutrient discharged from Perkins that would contribute to the expulsion of the biomass would be phosphorous (Tr. 1209). However, phosphorous poses no problem with respect to eutrophication at High Rock Lake in that the maximum discharge is estimated to cause only a 1% increase in the total phosphorous content of river and lake water (Tr. 1207; 1219-20). Applicant also testified that the oxidation of water caused by Perkins will actually help to increase the quality of the Yadkin River water (Tr. 1212-13, 1219-20).[10]

78. The Staff testified that Perkins will have little or no effect on eutrophication at High Rock Lake (testimony of Benjamin R. Parkhurst at pp. 2-3, following Tr. 1099). He based this conclusion on the fact that Perkins will add only small amounts of phosphorous to the Yadkin River (*id.*).

79. As to the probability of Perkins increasing the frequency and severity of fish kills, the Staff found such to be small because of the several mitigating factors also testified to by Applicant above (testimony of Benjamin R. Parkhurst at p. 4, following Tr. 1096).

80. The Board finds that the testimony of Staff and Applicant biologists is probative and convincing; that the operation of Perkins will not signif-

[10]It should be noted that Applicant has obtained a 401 certification from the State of North Carolina pursuant to the Federal Water Pollution Control Act, as amended, which provides that any discharge from Perkins will comply with the applicable provisions of Sections 301, 302, 306, 307 of the Act (see Applicant's Exhibits 3A and 3B admitted at Tr. 293).

icantly add to the eutrophication of High Rock Lake or appreciably add to the fish kills.

Need for Power

81. Intervenors' contend in their Contention III(E):

E. The Perkins Nuclear Station will not be needed at the time the facility is scheduled to come on line for the following reasons among many others:

1. The Applicant's forecasts of future peak demand are inadequate and inaccurate.

2. The Applicant's forecasts of future peak demand do not adequately take into account the effects of negative price elasticity, advances in alternatives energy sources, and other methods of energy conservation.

3. The North Carolina General Assembly passed a bill in the 1975 session allowing the North Carolina Utilities Commission to adopt peakload pricing as an incentive to load staggering.

82. Applicant presented testimony which included projections of its peakloads, generation additions with date of commercial operation, system capability, and reserve percentages. Those projections are:

Peak Period	Forecast Peakload	Unit Additions	Date of Commercial Operation	System Capability	Percent Reserve
1977 Summer	9,523			12,456	30.8
Winter	9,510			12,456	31.0
1978 Summer	10,163			12,456	22.6
Winter	10,235	McGuire 1	1/1/79	12,456	21.7
1979 Summer	10,820			13,636	26.0
Winter	11,053	McGuire 2	1/1/80	13,636	23.4
1980 Summer	11,645			14,795	27.0
Winter	11,884			14,795	24.5
1981 Summer	12,337	Catawba 1	7/1/81	14,795	19.9
Winter	12,685			15,948	25.7

Peak Period	Forecast Peakload	Unit Additions	Date of Commercial Operation	System Capability	Percent Reserve
1982 Summer	13,059			15,948	22.1
Winter	13,506	Catawba 2	1/1/83	15,879	17.6
1983 Summer	13,810			17,032	23.3
Winter	14,352	Cherokee 1	1/1/84	16,804	17.1
1984 Summer	14,589			18,084	24.0
Winter	15,220	Perkins 1	1/1/85	17,823	17.1
1985 Summer	15,400			19,103	24.0
Winter	16,112			19,010	18.0
1986 Summer	16,243	Cherokee 2	7/1/86	19,010	17.0
Winter	17,019			20,290	19.2
1987 Summer	17,122	Perkins 2	7/1/87	20,290	18.5
Winter	17,943			21,570	20.2
1988 Summer	18,037			21,570	19.6
Winter	18,883	Cherokee 3	1/1/89	21,570	14.2
1989 Summer	18,974			22,850	20.4
Winter	19,825	Perkins 3	1/1/90	22,850	15.3
1990 Summer	19,943			24,130	21.0

(Applicant's testimony of D. H. Sterrett, Attachment 1, following Tr. 1491.)

83. These projections were developed by Duke using past experience as the basis for its conclusions. Two fundamental components of its peakload were considered: the baseload component and the temperature responsive component which were identified by means of an equation explained by Applicant's witness Beyer (p. 9, following Tr. 268). After the two components were identified they were independently subjected to a trending technique thought by Duke to be appropriate. The peakload was then computed by adding the components. The result was checked by comparisons with independent information, such as other forecasts, known marketing information, and the like *(id.,* p. 10). Price elasticity was not used in forecasting but Duke is investigating the use of econometric modeling as an additional help

in forecasting because of the rather large price increases that occurred in 1974 and 1975 as compared to the comparatively small changes that had been previously experienced. A second reason is the current interest in peakload pricing (*id.*, p. 11). This technique has been suggested by Duke to the State but has not been implemented (Tr. 1525).

84. Since 1970, Duke's peakloads have changed as follows:

Peakload		Increase Over Previous Year
1970	6,284 MWe	11.9%
1971	6,622 MWe	5.4%
1972	7,450 MWe	12.5%
1973	8,236 MWe	10.6%
1974	8,058 MWe	(2.2%) decrease
1975	8,422 MWe	4.5%

The 1974 decrease and the 1975 comparatively small increase were attributed by Duke to the then current energy "crisis" and the recession. A recovery economy, Duke believes, will bring a return to more traditional trends (Beyer, p. 2).

85. The North Carolina Utilities Commission forecast a 6.90% growth in peakload until 1986 and 6.85% thereafter until 1990 (State Exhibit 1, p. 8). These forecasts were preceded by public hearings which Intervenors here and others appeared to present evidence. The hearings resulted in the issuance of a Certificate of Public Convenience and Necessity in which the NCUC said that: "Public convenience and necessity mandates that the Perkins and subsequent plants be constructed as scheduled by Duke" (see State Exhibit 2, p. 11).

86. The NRC Staff agrees. The Staff's projection is for Duke's growth in peakload to be a 6.5% to 7.0% average compound rate until 1990 (Cleary, following Tr. 456, p. 8). These rates would result in reserve margins until 1990 of from 20% (for some 6.5% growth rate years) to a -4.0% if the growth rate averages 7.5%. Reserves in the low to mid 30.0% range would result if growth averages 5.5% and the construction schedule is not slipped (*id.*, p. 43). The Staff thinks a reserve margin of 30% on Duke's system is reasonable and that 15% is too low (FES, §8.3.1).

87. The Intervenors presented the testimony of two witnesses. Dr. Miles O. Bidwell, an Assistant Professor of Economics at Wake Forest University, criticized the demand projections of Duke because the Duke methodology assumed that people would increase their use of electricity in the future because they have done so in the past. A better method, according to the witness, would be to try and explain what determines how much electric-

ity people will use. When that has been determined, modern econometrics could be used to measure the effect of changes in these variables on electrical consumption. The next step would be to project the changes in the variables and from that to predict future electrical demand (Tr. 419). The witness has studied the behavior of Duke system customers for 20 years and has determined that the major factors which affect electrical demand are per capita income, the price of electricity, the price of substitute energy, and the price of electrical appliances. One of the variables having the most effect on conservation is price. In the sixties, the price of electricity declined in relation to real prices so that consumption went up. Dr. Bidwell believes that following and predicting such changes in price would be a more useful tool for the prediction of peakload than would following past trends. The witness has worked out three equations for the prediction of residential demand and one equation each for the prediction of commercial and industrial demand; those equations are a part of and explained in his testimony (Tr. 419, *et seq.*, and attachment). Dr. Bidwell believes that there is no basis for Duke's projections and that depending on what happens to per capita income and to price increases in electricity in the next 10 years there may be no increase in total demand (Tr. 425). Dr. Bidwell also spoke to peakload pricing. He noted that Duke uses only about one-half of its generating capacity on an average. Under a different pricing system, demand would even out and Duke could double the amount of power they generate with no new capacity (*id.*).

88. Dr. Bidwell has not made any projections into the future but his techniques fit history for the 20 years ending in 1974 (Tr. 428). He feels the failure of Duke to use econometrics causes its projections to be severe overestimates. He has not been able to make projections because of lack of time and money (Tr. 444).

89. Intervenors' second witness on their Contention III(E) was Mr. Jesse L. Riley, a Senior Research Associate with Celanese Fibers Company and the holder of a B.S. in Chemistry and Physics and an M.S. in Physical Organic Chemistry. Over the past few years, Mr. Riley has extensively studied utility economics and load forecasting and has testified as an expert on that subject in NRC proceedings; he has addressed and advised other groups in that field (Riley, p. 1, following Tr. 795).

90. Mr. Riley said that for many years, Duke's projections of peakload were accurate, but that since 1971, Duke predictions have been high (Riley, p. 2). The reason for the failure to accurately predict in recent years, is that the projection methods are archaic. He suggested an econometric projection with the "crux" being an adverse relationship between constant dollar costs of electricity and demand. There is a correlation, says Mr. Riley, of baseload with constant dollar cost to the consumer, a "negative elasticity" (*id.*

at 4). Various approaches to Duke's load over the past few years contradict Duke's trend method of projection because the latter method ignores recent history. The 7-8% increase projected by Duke is short-run behavior (*id.* at 6). Duke has also failed to consider the effect of escalation in nuclear fuel cost and its impact on "negative elasticity" (*id.* at 9).

91. Mr. Riley believes that Duke's projections are too inadequate a basis to support a decision to build Perkins. The result of possible power shortages are not substantial. He suggests that at worst, Duke might have to delay retirement of capacity or run at reduced voltage for short periods. This is a less risky outlook than to ignore the "strong indications" that the vast amount of money spent for Perkins will inflate the cost of electricity enough to further depress demand through the effect of negative elasticity (*id.* at 13). Mr. Riley provided no projections of his own.

92. Events, since the testimony was received, have lent strength to the view that Duke's projections have been high. Early this year, Duke served on the Board and parties a notice that two of the Perkins units have been delayed 3 years and one has been delayed 4 years.[11]

93. We are not convinced, however, that this circumstance outweighs the evidence in the record of the long-term trend in demand produced by Duke, Staff, and NCUC. These projections square well with the list of studies published by FEA in 1976 and which are set out in Staff's testimony (Cleary following Tr. 456, p. 4). We note also the inclination of this Commission to prefer historical trending techniques to econometrics discussed by the Appeal Board in Nine Mile Point.[12]

94. We find that Duke and the Staff have proved the need for the Perkins facility.

C. Board Questions on Environmental Impact of Perkins

Timing of Perkins Units With Respect to Cherokee

95. By letter of March 8, 1977, the Board asked Applicant and Staff to

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[11]In a comment to Duke's notice, the Staff indicates that Duke's delayed construction schedule reflects a drop in demand of about 0.6% according to Duke projections and a 1990 peak demand of 861 MWe less than the Staff's projection (filing of March 8, 1978). That reduction is in the range of changes in demand projections characterized by the Appeal Board in *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-458, 7 NRC 155 (1978), and *Niagara Mohawk Power Corporation* (Nine Mile Point, Unit 2), ALAB-264, 1 NRC 347 (1975), as within the "substantial margin of uncertainty" that attends forecasting of power demands. We do not believe it necessary to reopen the record to reexamine the new projections.

[12]*Niagara Mohawk Power Corporation* (Nine Mile Point Nuclear Station, Unit 2), ALAB-264, 1 NRC 347 (1975).

address the feasibility of deferring all Perkins units until all Cherokee units might be completed rather than planning to introduce into service each Perkins unit alternately with a Cherokee unit.[13] The purpose of the question was to determine whether a delay in Perkins might be beneficial in allowing a further study of Duke's lessening demand and a delay in the environmental damage to be done by the construction and operation of Perkins (Tr. 1658). Applicant's response to the question appears in a letter from Duke's Mr. Dail to the Staff dated April 13, 1977, and in Mr. Dail's testimony (both following Tr. 1661). The Staff's response appears in the form of prefiled testimony and cross-examination on that testimony (both following Tr. 1560). It appears that a delay in Perkins construction and an attendant acceleration in Cherokee construction will result in a substantially higher cost for Perkins due to a projected escalation in the cost of construction and a modest decrease in the cost of Cherokee due to earlier construction of some units. This stated disadvantage to a delayed Perkins schedule does not consider the cost difference in constant (as opposed to inflated) dollars; what the real cost difference may be does not appear from the testimony of either Applicant or Staff.

96. An additional cost would result from an inbalance of the location of generation on the Duke transmission system. This would result, Duke says, in a minimum of $50 million spent for beefing up transmission lines "a significant part" of which would "probably" not be needed when Perkins is built. Another disadvantage to this plan is that a larger work force is needed at each site while construction there is accomplished. This results in less efficient management of the work force, more competition for skilled workers at the work locations, more strain on access facilities, and added pressure on community services.

97. There would be an advantage to the delay of Perkins until Cherokee comes on line only if it is determined now that Perkins will not likely be needed during the time that we deal with here. In another part of the decision we have found a need for the Perkins plant; to delay its beginning until Cherokee is finished would provide no benefit.

98. The Board by letter dated March 15, 1976, directed certain questions to the Staff respecting matters contained in the Final Environmental Statement. The Staff responded in detail thereto (testimony of Robert A. Gilbert following Tr. 1227 and following Tr. 1336; Tr. 1228-49; 1337-41). The Board questioned some of the answers that were provided in the written

[13]Duke's revised construction schedule issued January 9, 1978, shows an operational date for Perkins' first unit to follow Cherokee Units 1 and 2.

testimony and deems that the Staff's responses were satisfactory. One of our questions precipitated an argument between Applicant and Staff counsel concerning the authority of NRC to impose a condition requiring an approved erosion control plan prior to start of construction (Tr. 1230-35). Applicant's Brief, dated June 23, 1976, argues that Section 402 of the FWPCA grants sole authority to regulate pollution to EPA. The Board declines to be drawn into this argument. We note that the Applicant has agreed to send NRC a copy of their erosion control plan in accordance with Staff proposed Condition 7b, FES, p. iii; however, they argue that approval by the NRC Staff is not necessary. Only in the event that the Staff were to turn down the proposed plan would adjudication be required.

D. Cost-Benefit Analysis

99. In accordance with the Commission's rules and regulations and notice of hearing published in the FEDERAL REGISTER on July 19, 1974 (39 Fed. Reg. 26470), this Board has independently considered the costs and benefits of the proposed facilities upon the basis of the evidence of record and has arrived at an overall cost-benefit balance.

100. Most of the testimony submitted by the parties in this proceeding was directed toward the environmental impact of the Perkins plant. We take note of the Staff's summary of adverse impacts listed in Chapter 10 of the FES. The Intervenors have called to our attention those impacts that they consider to be most serious and we have addressed them in previous sections of this decision. We have made an independent analysis of the evidence and find that the principle environmental costs are as follows:

(1) The clearing and grubbing of approximately 1,700 acres of predominately forested and semiforested land for the plant site, Carter Creek Impoundment, transmission line, and railroad spur.

(2) The withdrawal of 1,500 acres of land from agricultural production.

(3) The possible disturbance of 2,000 acres of arid western lands due to open-pit mining operation in connection with supplying uranium to the Perkins plant for 30 years of operation.

(4) The escape of radon-222 into the atmosphere as a consequence of mining and milling operation. This will increase the radon background by a small fraction of one percent.

(5) Withdrawal of 60,000 gal/min (133 cfs) maximum, 42,000 gal/min (94 cfs) average, from the Yadkin River for cooling tower makeup.[14]

[14]Applicant's Water Use Report Table 1.

During times of low flow (7Q10 flow = 625 cfs) up to 20% of the entrainable river organisms will be destroyed. On the average over a year some 3% of the organism will be entrained and presumably killed.

(6) The consumptive withdrawal of up to 100 cfs from the Yadkin River. The reduction in the capacity of the river to assimilate wastes is a serious consideration but is tolerable in view of the limitation on net withdrawal when the river flow is less than 1,000 cfs.

(7) Perkins will be a very minor contributor to fluctuation in the level of High Rock Lake.

(8) Reduction of flow to hydrostations downstream will result in an economic loss to the owners; not an environmental impact.

(9) Small amounts of radioactivity will be released during normal operation. The dose to individuals will be very small compared to background. Even if an accident resulting in considerable damage to the reactor were to occur, doses to the public would be small since the reactor and primary systems are within the containment vessel. Failure of the containment is considered by the Staff to be so improbable that the risk to the public is negligible. We have not made any attempt to quantify the risk but we do not believe it to be so large as to tip the cost-benefit balance.

101. The Board finds that the principle benefit of the proposed project is the addition of 25.57 million megawatt hours per year of electricity which is needed to provide reliable electric service to residential, commercial, and industrial users in Applicant's service area and grid.

102. Based on the entire record, the Board finds that the environmental and economic benefits from the construction of Perkins, Units 1, 2, and 3, will be greater than the environmental and economic costs which will necessarily be incurred by construction and operation of the facilities.

103. The Board cannot find that the balance between the benefits and costs involved in the construction of Perkins, Units 1, 2, and 3, warrants granting the construction permits for the facilities since it has determined that further consideration must be given to alternate sites. The Board cannot find on the record to date that the requirements of NEPA and 10 CFR Part 51 have been met.

III. RADIOLOGICAL HEALTH AND SAFETY FINDINGS

A. Basic Findings

104. On May 24, 1974, the Commission docketed the Applicant's Preliminary Safety Analysis Report (PSAR).[15] The PSAR contains a description and safety assessment of the site and the preliminary design and analysis of all of the facility's components and structures except for the nuclear steam supply system which has been designed by Combustion Engineering, Inc. That part of the system is described in the CESSAR and was incorporated by reference in the PSAR in accordance with Appendix O to 10 CFR Part 50. The PSAR includes a discussion of the compliance with the Commission criteria of 10 CFR Parts 20 and 100 and those criteria of 10 CFR Part 50 for which the Applicant was directly responsible. The PSAR also describes the Applicant's proposed organization, technical and financial qualifications, and preliminary plans for training of personnel and conduct of operations.

105. The Staff performed a technical review and evaluation of the information and data submitted by the Applicant in the PSAR and subsequent amendments, the CESSAR, and the interface requirements between the CESSAR and the PSAR. As a result of this review and its own independent analysis, the Staff prepared a Safety Evaluation Report ("SER"), issued in March of 1977, and Supplement No. 1 to the SER ("SER Supp."), issued in July of 1977[16] The Staff concluded in that SER that, assuming favorable resolution of the then outstanding matters discussed therein, the facilities can be constructed and operated at the proposed site without undue risk to the health and safety of the public (SER, §21). In the SER Supplement No. 1 the Staff addressed these outstanding matters and concluded that all outstanding were resolved (SER Supp., §21) (Tr. 2011).

106. In the SER and the supplement the Staff analyzed and evaluated the distribution of population and land use offsite, and the physical characteristics of the site including seismology, geology, hydrology, and meteorology. It analyzed and evaluated the design, fabrication, construction, testing, and expected performance of the plant structures, systems, and components important to safety, and the response of the facilities to various operating transients and to a broad spectrum of postulated accidents, including design basis accidents. The Staff analyzed and evaluated

[15]The PSAR (with amendments and the license application, with amendments) were received into evidence as Applicant's Exhibit 2 at the hearings held on April 26, 1976 (Tr. 266).

[16]The SER was received into evidence as Staff Exhibit 8 at the hearing held on July 21, 1977 (Tr. 2010). The supplement to the SER was also received into evidence as Staff Exhibit 9 at that time (Tr. 2014).

the Applicant's plans for the conduct of plant operations and plans for actions to be taken in the event of an accident which might affect the general public, Applicant's organization structure and the technical qualifications of operating and technical support personnel, and measures to be taken for industrial security. The supplement also contains an analysis and evaluation of the financial qualifications of the Applicant to design and construct the facilities.

107. The Board has considered the license application, the PSAR, and amendments thereto, the SER and the supplement, and the evidentiary record in this proceeding. We find that the Staff's technical review and safety evaluation have been adequate in nearly all respects. However, in our order of September 7, 1978, we questioned the adequacy of the evidence on generic safety issues. On September 14, the Staff replied that they proposed to introduce supplemental testimony. Our final findings will be reserved pending the receipt of that testimony.

108. The Advisory Committee on Reactor Safeguards ("ACRS") has reviewed the application for Cherokee and Perkins and has concluded in its letter dated April 14, 1977, that the Perkins units can be constructed with reasonable assurance that they can be operated without undue risk to the health and safety of the public (SER Appendix C of Appendix A; SER Supp., Appendix D). The Applicant and the Staff have duly considered and are taking appropriate action to implement recommendations of the ACRS (SER Supp., §18).

General Desciption of Site and Plant

109. The Applicant and Staff have evaluated the suitability of the proposed Perkins site from the standpoint of radiological health and safety considerations. The evaluation has included a consideration of the reactor site criteria identified in 10 CFR Part 100 of the Commission's regulations (PSAR, §2; Staff testimony following Tr. 407 and 696).

110. The site is located in the southeastern portion of Davie County, North Carolina, approximately 7 miles southeast of Mocksville, North Carolina, and 48 miles north-northwest of Charlotte, North Carolina (Staff testimony at p. 1, following Tr. 407).

111. The nearest population cented having more than 25,000 people, as defined in 10 CFR Part 100, is the Salisbury-Spencer, North Carolina, area, which is centered about 12 miles from the site. The 1970 population of Salisbury and Spencer was about 25,600 people. The 1980 population density within 10 miles of the site is projected to be about 135 persons per square mile, and the population density within 50 miles of the site in 1980 is pro-

jected to be about 250 persons per square mile (Staff testimony at pp. 2-3, following Tr. 407).

112. Applicant's projected population levels for the region within 50 miles, based on projections by the U.S. Environmental Protection Agency, indicate a population growth of about 120% during the period 1970 to 2020, which corresponds to an average rate of about 17% per decade. The Staff independently projected a growth of about 66% by applying the 1974 OBERS[17] projections growth rates to the present population in this general area. The Staff concluded that the higher population density, as projected by the Applicant will not likely be exceeded over the life of the station, and that population density is not a deterrence to locating the Perkins Nuclear Station at the selected site (Staff testimony at p. 3, following Tr. 407).

113. The minimum exclusion area distance proposed by the Applicant is 2,500 feet for the centrally located unit, and 1,960 feet for each of the other two units, and the low population zone radius proposed is 5 miles. The population center distance of 10 miles is well in excess of the minimum distance of one and one-third times the low population zone radius required by 10 CFR Part 100. The Applicant has projected a population growth within the 5-mile low population zone from the present level of about 4,500 to about 9,400 by 2020. In addition to the resident population, transient population within the low population zone is estimated to include as many as 3,100. There are two schools within the low population zone about 5 miles from the site. The Staff conducted its own review and concluded that the population within the low population zone has been appropriately described in the Preliminary Safety Analysis Report (Staff testimony at pp. 3 and 4, following Tr. 407).

114. Applicant owns all of the property within the exclusion area. None of the property acquired by it has mineral easements or rights owned or controlled by a second party. The Staff concluded that by owning the property within the proposed exclusion area, the Applicant can provide control of the exclusion area in accordance with the requirements of 10 CFR 100.3 (Staff testimony at p. 4, following Tr. 407).

115. The Staff has analyzed the 5-mile low population zone distance and concluded that appropriate protective measures can be taken to protect the resident and transient population in the event of a serious accident. The Staff has not identified any unusual features for this site which would prevent a favorable conclusion with regard to the feasibility of developing appropriate emergency plans. The Staff concluded that there is reasonable

[17]OBERS is the descriptive title of a projection program conducted by the U.S. Department of Commerce' former Office of Business Economics (OBE), now renamed the Bureau of Economic Analysis (BEA), and the Economic Research Service (ERS) of the U.S. Department of Agriculture.

assurance that appropriate and adequate engineered safety features can be provided to meet the radiation dose guidelines values specified in 10 CFR Part 100 (Staff testimony at p. 6, following Tr. 407.

116. The Board finds that with respect to the minimum exclusion area radius, the low population zone, and the population center distance, the Perkins site meets the guidelines of 10 CFR Part 100 and is acceptable.

117. The nearest industry to the proposed facility is the Williams Manufacturing Company, a manufacturer of women's apparel, located two and two-tenths miles north-northeast of the site. The Staff found that this activity will not interact with the plant. A pipeline corridor approximately 3 miles southeast of the site includes pipelines that carry natural gas and methane. The Staff has investigated the hazards associated with these pipelines and concluded that the pipelines do not pose a significant threat to plant safety. There are no other industrial facilities within 5 miles of the plant location (Staff testimony at pp. 6 and 7, following Tr. 407).

118. The nearest major highway to the proposed Perkins site is North Carolina 801, which passes six-tenths of a mile north and one and one-half miles west of the site. There is adequate separation distance between the road and the proposed facility to assure that the effects of postulated accidents along the roadway will not adversely affect the safe operation of the Perkins Station (Staff testimony at p. 7, following Tr. 407).

119. The Staff performed an analysis of air traffic in the vicinity of the site and found that the aircraft hazards to Perkins are sufficiently low that they do not need to be considered as a basis for design of the principal features of the plant and that with regard to the subject aviation facilities and activities the site is acceptable for reactors of the general size and type proposed (Staff testimony following Tr. 696).

120. The Board has reviewed the evidence and concluded that with regard to nearby industrial, transportation, and aviation facilities, the site is acceptable for reactors of the size and type proposed.

121. The physical characteristics of the site, such as meteorology, geology, and hydrology, have been considered extensively by Applicant and Staff (SER §§2.3; 2.4; 2.5). The Board finds that such consideration has been adequate.

122. The Board requested and received additional testimony concerning the choice of 0.15g as the safe shutdown earthquake for nuclear plants located in the Piedmont Province (see Staff Response to Question 8, Cherokee Tr. following p. 954; see Applicant's testimony, Cherokee Tr. 1034-35; see also Staff's testimony, Perkins Tr. 2070). On the basis of this record, the Board concludes that 0.15g represents a conservative choice for the SSE.

Design Description, Principal Architectural and Engineering Criteria

123. Perkins incorporates nuclear steam supply systems consisting of pressurized water reactors supplied by Combustion Engineering, Incorporated ("CE"), and designated as their System 80 design. On September 17, 1973, CE filed with the then Atomic Energy Commission a proposed preliminary reference system design for System 80. A standard safety analysis report entitled "Combustion Engineering Standard Safety Analysis Report" ("CESSAR") also was submitted to the Commission. The information in CESSAR was supplemented through December 31, 1975, with 44 amendments. On that date the NRC Staff issued a Safety Evaluation Report which summarizes the results of the Staff's technical evaluation of the System 80 design, and which delineates the scope of the technical matters considered in evaluating the radiological safety aspects of the System 80 design. Based upon its evaluation of CESSAR, the Staff concluded that the System 80 design can be incorporated by reference in applications for construction permits and can be constructed without endangering the health and safety of the public. See 10 CFR Part 50, Appendix O. The Safety Evaluation Report for the System 80 design is attached as Appendix A to the Perkins SER. The CESSAR was incorporated by reference into the PSAR.

124. Each Perkins unit will be designed for a power level of approximately 3,800 megawatts thermal and a net electrical output of 1,280 megawatts electric (SER, Appendix A, §1.2). Water will serve as both moderator and coolant, and will be circulated through each reactor vessel and core by four reactor coolant pumps (SER, Appendix A, §1.2.2). Each reactor has 241 fuel assemblies in its core with a 16 x 16 fuel rod array (SER, Appendix A, §4.3). Fuel pellets of 95% density uranium dioxide will be sealed in Zircalloy-4 tubing and pressurized with helium to form the fuel rods. Neutron absorber rods (boron carbide) will be provided in place of fuel rods at selected locations in the fuel assemblies. Each fuel assembly will be provided with a threaded joint to allow the attachment of upper and lower end fittings to the guide tubes so they may be removed to allow replacement of individual fuel rods (SER, Appendix A, §4.2.1).

125. Each unit will be housed in a spherical steel containment vessel surrounded by a reinforced concrete shield building that is a cylindrical shell with an upper spherical dome closure. The vessel and the spherical portion of the shield building will be separated by an annular air space. The containment will be designed for an internal pressure of 46.8 pounds per square inch gauge ("psig") and for a temperature of 280°F (SER, §6.2.1). The containment pressure calculated by the Applicant for the worst design basis accident was about 43 pounds per square inch gauge (SER, §6.2.1).

126. The containment houses the reactor, steam generators, reactor coolant pumps, and pressurizer. The shield building (also called the reactor building in the PSAR) contains certain components of the engineered safety features systems for the facilities including the emergency core cooling system equipment, containment spray system equipment, and shutdown cooling system equipment (SER, §§1.2.2 and 3.8.1 and Fig. 1.1; PSAR Figure 1.2.1). An auxiliary building immediately adjacent to the shield building includes areas for fuel handling, auxiliary systems equipment, and the control room (SER, §1.2.3). Other major structures for each unit include the two individual buildings for the diesel generators (SER, §8.3.1), the turbine building, and the three circular mechanical cooling towers. Each of two nuclear service water pump structures, and each of two nuclear service water cooling tower structures are shared by the three units (SER, §1.2.3).

127. The steam and power conversion system for each unit will be designed to remove heat energy from the nuclear steam supply and convert it into electrical energy by means of a steam turbine generator (SER, §10.1 and Appendix A, §5.1). Waste heat rejected to turbine condensers will be discharged from the closed-cycle circulating water system to the atmosphere through mechanical-draft cooling towers (SER, §1.2.3).

128. Perkins will have a number of engineered safety features designed for limiting the consequences of postulated accidents. The principal engineered safety features include the emergency core cooling systems, the reactor containment systems (including the containment heat removal system), the control room filtration systems, the ultimate heat sinks, the hydrogen control system, and the redundant onsite power systems.

129. A major portion of the Applicant's description of the proposed design of the facilities, including the principal architectural and engineering criteria for the design appears in the CESSAR. The Staff has testified as to the adequacy of the Applicant's description (SER, §21.0) and the Board will adopt their testimony in that respect.

Quality Assurance

130. The Applicant's quality assurance program has been described in a topical report which was incorporated by reference into the PSAR and is part of the record in this hearing. This program has been reviewed by the Staff and judged adequate to satisfy the requirements of Appendix B to 10 CFR Part 50 (SER, §17.2).

Technical Qualifications

131. Duke Power Company is responsible for the design, construction, and operation of the Perkins Nuclear Station. Duke Power Company will act as its own architect-engineer and be responsible for all site construction activities. Combustion Engineering, Inc., will design the nuclear steam supply systems.

132. The Applicant's proposed organization and training programs have been reviewed by the Staff (SER, §13.1). They questioned the Applicant's proposal to reduce the required experience of the Radiation Protection Manager from 9 to 7 years. This matter has been resolved to the satisfaction of the Staff (Cherokee Tr. 948-949).

133. The Staff has concluded that the Applicant has an acceptable organization to design and construct the facility and that the proposed plant organization, their qualifications, and the plans for offsite technical support of plant operations are acceptable (SER, §13.1). The Board relies on the Staff testimony in concluding that the Applicant is technically qualified to design and construct the Perkins plant.

Common Defense and Security

134. The Applicant states that the activities to be conducted will be within the jurisdiction of the United States and that all of the directors and principal staff officers are citizens of the United States. The Applicant is not owned, dominated, or controlled by an alien, foreign corporation, or a foreign government. The activities to be conducted do not involve any restricted data, but the Applicant has agreed to safeguard any such data that might become involved in accordance with the requirements of 10 CFR Part 50. The Applicant will obtain fuel as it is needed from sources of supply available for civilian purposes, so that no diversion of special nuclear material from military purposes is involved (SER, §19). The Board finds that the issuance of construction permits for the Perkins units will not be inimical to the common defense and security.

Research and Development

135. No new research and development programs have been identified as necessary to reach a final design. There are, however, a number of test programs which Combustion Engineering, Inc., will conduct to demonstrate the safety of the CESSAR System 80 design to the satisfaction of the Staff including: design tests of 16 x 16 fuel assembly, verification of in-reactor fuel densification, loss-of-coolant accident refill tests, blowdown heat

transfer tests, verification of reflood heat transfer coefficients, verification of assumed iodine partition factors, development of a realistic and conservative model for the iodine spiking phenomenon, verification of models used to predict transient and accident loads on the steam generator, and demonstration of performance of the proposed core protection calculator system software and hardware (SER, Appendix A, §1.4). In addition, the Staff's generic evaluation of anticipated transients without scram is not yet complete (SER, Appendix A, §15.6).

136. The Staff has evaluated those requirements needed to complete the safety analysis and concluded there is reasonable assurance that they will be resolved and the final design will be acceptable (SER, Appendix A, §§1.4 and 19.0). The Advisory Committee on Reactor Safeguards has also concluded that the items left to be accomplished can be resolved during construction and, when resolved, will allow the Perkins Units 1, 2, and 3 to be operated without undue risk to the health and safety of the public (SER, Supp. 1, Appendix C). The Board has reservations as to the adequacy of the Staff's treatment of some generic safety issues and will reserve findings until the supplemental testimony promised by the Staff has been received.

B. Board Questions

137. On July 7, 1977, the Board addressed several questions to the parties concerning health and safety aspects of Perkins.[18] These questions dealt with anticipated transients without scram ("ATWS"), atmospheric diffusion, evacuation, unresolved safety questions, dilution of liquid waste, compliance with Regulatory Guide 1.4, percentage of bypass leakage, and magnitude of the safe shutdown earthquake. Both the Applicant and Staff presented testimony in this regard (see Applicant's Response following Cherokee Tr. 940 and NRC Staff Response following Tr. 2017 respectively). Each topic will be addressed separately below.

138. Board Questions 1, 2, 4, 6, 7, and 8 applied to both Cherokee and Perkins. Findings with respect to those questions have been reported in the Cherokee Partial Initial Decision of December 30, 1977 (6 NRC 1314-1333) and will not be repeated here. We will address Questions 3 and 5 which apply only to Perkins.

139. **Question 3: Evacuation at Forest Lake Camping Resort**

> Does the possible 2,100 people at the Forest Lake Camping Resort, 3 miles east of the Perkins site, pose a problem in evacuation within 2 hours in the event of an accident?

[18]The questions were also directed to the health and safety aspects of Cherokee.

140. The Applicant stated that there are two exits from the campground to Highway 64, a major State highway. It believes that evacuation of the people at the campground within 2 hours is reasonable. It noted that the finalization of emergency plans will be considered in detail at the operating license stage (Applicant's Response at p. 6, following Cherokee Tr. 940).

141. The Staff stated that its review experience is that emergency plans can be developed without any unusual difficulty to include capability for evacuating 2,100 people concentrated at a location 3 miles from a site. Transient populations, like those at the camping resort, are generally highly mobile and would have motor vehicles available. A vehicle capacity from 1,000 to 4,000 cars per lane per hour has been observed in actual evacuations. Using 2,000 cars per lane per hour and assuming two persons per car, the entire camping resort could be evacuated in about one-half hour, well within the 2-hour time frame (Staff Response at pp. 7 and 8, following Tr. 2017; Tr. 2051-52). The Staff also provided examples of how individuals at such locations could be notified (Tr. 2052-55).

142. The Board finds that the reponses have adequately treated its question in this area.

143. **Question 5: Dilution of Liquid Wastes by Pumping of Bypass Water**

What is now proposed at Perkins and Cherokee with regard to pumping bypass water for the dilution of liquid wastes? We were told that such a bypass stream was necessary in order to meet 10 CFR Part 20 requirements. Explain.

144. The Applicant stated that pumped dilution was not needed at Cherokee because the liquid wastes were released directly into the water flowing through the dam which would provide adequate dilution to meet Part 20 requirements. At Perkins provision is made for pumping as much as 280 cfs of bypass water (ER, Table 3.3.0-1). The Applicant stated that such a bypass stream may be needed to meet Part 20 requirements on a short-term basis when the radioactive releases are unusually high (Applicant's Response at p. 8, following Cherokee Tr. 940).

145. In the Staff's opinion the provision of so large a dilution flow reflects the Applicant's choice to facilitate batch releases of liquid radioactive wastes rather than slower continuous releases as well as provide other operational flexibilities.

146. Although slower releases might be preferable, the Applicant will at all times comply with 10 CFR Part 20; the operating specifications will assure compliance with Appendix I for the average release rates. No member of the public will be exposed to a radiation dose as high as 5 millirem per year as a result of liquid releases from the Perkins plant.

Financial Qualifications

147. In addition to the written questions discussed above, the Board had orally advised the Staff that it wished to explore the Staff's evaluation of the Applicant's financial qualifications. The Staff presented a witness who testified that he is satisfied that Applicant is financially qualified to design and construct the proposed Perkins and Cherokee facilities (Perkins Tr. 2127).

148. The Commission's regulations relating to the determination of an applicant's financial qualifications appear in Section 50.33(f) and Appendix C to 10 CFR Part 50. These regulations state that there must be reasonable assurance that an applicant can obtain the necessary funds to cover the estimated construction costs of a proposed nuclear power plant and its related fuel cycle costs. This standard of reasonable assurance, however, must be viewed in light of the extended period of time from the start of construction to the date of commercial operation. The earliest dates for commercial operation of the Cherokee and Perkins plants are estimated to be January 1984, for Cherokee Unit No. 1; January 1985, for Perkins Unit No. 1; July 1986, for Cherokee Unit No. 2; July 1987, for Perkins Unit No. 2; January 1989, for Cherokee Unit No. 3; and January 1990, for Perkins Unit No. 3.[19] Consequently, one must necessarily make certain assumptions about future conditions. Two basic assumptions the Staff has made in its analysis are that there will be rational regulatory policies with respect to the setting of rates and that viable capital markets will exist. The former assumption implies that rates will be set to at least cover the cost of service, including the cost of capital; the latter assumption implies that capital will be available at some price. Given these assumptions, the Staff then focused on the reasonableness of the Applicant's financial planning.

149. The Staff witness further testified as to the reasonableness of the Applicant's financial assumptions (Perkins Tr. 2129, 2218). He stated that the policy to internally generate 40% of capital requirements projected by Applicant is reasonable and attainable (Perkins Tr. 224; SER Supp. §20.4) and that Applicant's assumptions of 51% long-term debt, 13% preferred stock, and 36% common stock is in line with other utilities (Perkins Tr. 2147; SER Supp. §§20.3.2, 20.4).

150. The Board inquired as to Applicant's experience with interest

[19]The dates for commercial operation stated above were the ones used by the Staff witness in analyzing the ability of the Applicant to finance the construction of the plant. On January 9, 1978, the Applicant announced that Perkins Units 1 and 3 will each be delayed 3 years (to 1988 and 1993, respectively) and Perkins No. 2 will be delayed 4 years (to 1991). This delay should not make financing more difficult and we see no reason for reevaluating the testimony on financial qualifications.

coverage (Perkins Tr. 2148-54). The Staff testified that the past experience of the company is that they have been able to maintain a reasonable interest coverage figure (Perkins Tr. 2156). Further, it also testified that the company has been in an improving position over the past 2 years with respect to interest coverage (Perkins Tr. 2156). In response to a specific question, the Staff stated that the increase in the Applicant's construction project due to Cherokee and Perkins should not worsen the company financially, for as long-term debt increases, items that make up the coverage of interest would also be increasing (Perkins Tr. 2157).

151. The Staff evaluated Duke's plant growth rates to determine if the Applicant was attempting to undertake a program beyond that which is achieved in the past 10 years and found that the proposed construction program was not beyond what they had achieved in the past (Perkins Tr. 2180). Applicant's annual compound growth rate was 15% in terms of gross plant for the period 1966-1976; for the period 1976-1986 it will be 11½% (Perkins Tr. 2179, 2202). In the event growth does not meet projections of the Applicant, the Staff stated such would not have a serious effect on the financial condition of the company inasmuch as the company has several alternatives available, such as slowing construction and selling power outside (Perkins Tr. 2162, 2185-89; see also Tr. 2146).

152. The Staff stated that it had received all the information it needed from the Applicant to make a determination as to financial qualifications (Perkins Tr. 2166) and that it will continue to keep abreast of the current financial situation of the Applicant (Perkins Tr. 2165).

153. The Staff has reviewed the financial information presented in the application, and amendments thereto, and has concluded that there is reasonable assurance that the Applicant can raise the necessary funds to design and construct the Cherokee and Perkins facilities. Accordingly, the Staff found Applicant financially qualified to carry out the activities for which the construction permits are sought. This conclusion was based on detailed analyses and the Staff's determination that the Applicant's projected financing plans and underlying assumptions are reasonable. The conclusion was also based on the assumption of rational regulatory policies and viable capital markets. These assumptions were necessary because of the lengthy future period involved and the expected heavy dependence on external financing. The Board finds that the Staff's review was adequate.

IV. CONCLUSIONS OF LAW

154. The Board has reviewed the entire record of this proceeding, including the proposed findings of fact and conclusions of law submitted by the parties. All of the proposed findings and conclusions submitted which

are not incorporated directly or inferentially in this Partial Initial Decision are herewith rejected as being unnecessary to the rendering of this Partial Initial Decision.

155. The Board concludes that the review of the application by the Staff has been adequate except for consideration of generic safety issues and alternate sites. The Board's order of July 14, 1978, determined that the record would be reopened to receive additional evidence on alternate sites. We will also expect supplementary testimony from the Staff concerning the plans for dealing with certain generic safety issues.

156. Findings in accord with 10 CFR 50.35(a) and findings concerning the health and safety of the public will be reserved pending the receipt of additional evidence concerning generic safety issues. At this time we find that:

(1) The Applicant is technically qualified to design and construct the proposed facilities.

(2) The Applicant has reasonably estimated the costs and is financially justified to design and construct the proposed facilities.

(3) The issuance of permits for construction of the facilities will not be inimical to the common defense and security.

157. The Board's conclusions under the National Environmental Policy Act of 1969 (NEPA) and the requirements of 10 CFR Part 51 will be deferred pending the completion of the evidentiary hearing on alternate sites.

V. ORDER

Based upon the Board's findings and conclusions, and pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's regulations, IT IS ORDERED, in accordance with 10 CFR 2.760, 2.762, 2.764, 2.785, and 2.786 that this Partial Initial Decision shall become effective immediately and shall constitute with respect to the matters covered therein the final action of the Commission forty-five (45) days after the date of issuance hereof, subject to any review pursuant to the Commission's Rules of Practice. Exceptions to this Partial Initial Decision may be filed by any party within ten (10) days after service of this Partial Initial Decision. Within thirty (30) days thereafter (forty (40) days in the case of the Staff) any party filing such exceptions shall file a brief in support thereof. Within thirty (30) days of the filing of the brief of the appellant (forty (40) days in the case of the Staff), any other party may file a brief in support of, or in opposition to, the exceptions.

FOR THE ATOMIC SAFETY AND LICENSING BOARD

Donald P. deSylva, Member

Walter H. Jordan, Member

Elizabeth S. Bowers, Chairman

Dated at Bethesda, Maryland,
this 27th day of October 1978.

Cite as 8 NRC 513 (1978) LBP-78-35

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Atomic Safety and Licensing Board

John F. Wolf, Chairman
Dr. J. Venn Leeds, Jr.
Dr. Forrest J. Remick

In the Matter of **Docket Nos. STN 50-518**
STN 50-519
TENNESSEE VALLEY AUTHORITY **STN 50-520**
STN 50-521

(Hartsville Nuclear Plant,
Units 1A, 2A, 1B, and 2B) **October 31, 1978**

The Licensing Board grants the Applicant's motion for summary disposition of all matters relating to the construction of the facility discharge diffuser. The NRC Staff is directed to incorporate the construction phase monitoring plan into any authorization for the construction of the discharge diffuser.

TECHNICAL ISSUES DISCUSSED: Endangered species.

DECISION ON MOTION FOR SUMMARY DISPOSITION

The Tennessee Valley Authority (Applicant or TVA), pursuant to 10 CFR 2.749 (1977), filed a motion for summary disposition of the question of the acceptability of the construction of a discharge diffuser at a point in the Cumberland River between Dixon Island and the upstream end of a bed of an endangered species of mussel.[1] The motion was accompanied by the affidavits of Robert O. Barnett, Jr., Billy G. Isom, Christopher D. Ungate, and Harold J. Monroe III; a statement of facts material to the location of the discharge diffuser as to which the Applicant claims there is not a genuine issue to be heard; and Applicant's brief in support of the motion.

Intervenors William N. Young, *et al.* (Intervenors), in answering Appli-

[1]Applicant's Motion for Summary Disposition on the Acceptability of Construction of the Discharge Diffuser at a Point Between Dixon Island and the Upstream End of the Mussel Bed, dated March 20, 1978.

cant's motion for summary disposition, contended that the lack of evidence from the Department of Interior on the diffuser location issue precludes the Intervenors from presenting facts to justify their opposition to the Applicant's motion for summary disposition.[2] The answer was accompanied by a statement of facts material to the location of the discharge diffuser as to which Intervenors claim that there is a genuine issue to be heard; and an affidavit of Robert Jack Neff. They contend that there are issues of material fact concerning the impact on the endangered species from heated water that would be discharged from an upstream location of the diffuser, and concerning the impacts on the endangered species from radionuclides that would be discharged, and from other environmental factors, if the diffuser were located upstream.

Intervenors' statement of material facts as to which there are genuine issues to be heard indicates that they agree with TVA's statement of facts numbered 1 and 2. However, they indicate that TVA's statement of facts number 3 through 7 are statements as to which there are genuine issues to be heard.

In a filing dated June 7, 1978, the NRC Staff stated that for the reasons set out in attached affidavits (both dated June 6, 1978) by Dr. Charles W. Billups and William S. Bivins, respectively, it "supports" the Applicant's motion for summary disposition on the acceptability of the construction of the discharge diffuser at a point between Dixon Island and the upstream end of the mussel bed.[3]

The Board's findings regarding facts as to which Applicant contends there is no genuine issue to be heard follow:

Proposed Statement of Fact Number 1

A mussel bed in the Cumberland River at mile 284.1 contains some specimens of the endangered mussel species *Lampsilis orbiculata,* also known as the pink mucket pearly mussel.

The Intervenors agree with TVA's statement of fact no. 1.

The Board finds that there is no genuine issue of fact to be heard as to TVA's statement of fact no. 1.

Proposed Statement of Fact Number 2

The Nuclear Regulatory Commission has consulted with the Depart-

[2]Answer of Intervenors, William N. Young, *et al.,* to Applicant's Motion for Summary Disposition on the Acceptability of Construction of the Discharge Diffuser at a Point Between Dixon Island and the Upstream End of the Mussel Bed, dated June 7, 1978.

[3]NRC Staff Response to Applicant's Motion for Summary Disposition, dated June 7, 1978.

ment of the Interior concerning the acceptability of construction of the Hartsville Nuclear Plant's discharge diffuser in the area between Dixon Island and the upstream edge of the mussel bed.

The Intervenors agree with TVA's statement of fact no. 2.

The Board finds that there is no genuine issue of fact to be heard as to TVA's statement of fact no. 2.

Proposed Statement of Fact Number 3

The Biological Opinion of the Department of the Interior is that construction of the discharge diffuser in the area between Dixon Island and the upstream edge of the mussel bed will not jeopardize the continued existence of the pink mucket pearly mussel, *L. orbiculata.*

The Intervenors indicate that the Biological Opinion letter of the Department of Interior does not support the position taken by the Applicant. The Intervenors correctly point out that the Biological Opinion does not state that construction of the discharge diffuser in the area between Dixon Island and the upstream edge of the mussel bed (upstream location) will not jeopardize the continued existence of the pink mucket pearly mussel. The Biological Opinion indicates that the construction and operation of the diffuser ". . . are not likely to jeopardize the continued existence . . . " of the endangered species.[4]

The opinion letter indicates only that the construction and operation of the discharge diffuser, if placed in the area between Dixon Island and the upstream edge of the mussel bed, are not likely to jeopardize the continued existence of the endangered pink mucket pearly mussel. The Board finds that in the context of deciding this motion the distinction between ". . . are not likely to jeopardize . . ." and ". . . will not jeopardize . . ." is not significant. It is clear from the Biological Opinion that the Department of Interior has approved the proposed location of the diffuser discharge from the standpoint of its possible impact on the endangered species. The Appeal Board indicated in deciding an appeal by the same Intervenors of one of this Board's earlier findings that "the law attaches no magical significance to the incantation of a special phrase" and that "insignificant effects are not proscribed by the statute."[5]

The Board finds that the construction and operation of the diffuser discharge at the upstream location will not jeopardize the continued existence

[4]Exhibit 1 to Applicant's brief in support for summary disposition at 1 and 3.

[5]ALAB-463, 7 NRC 341, 360 (1978).

of the endangered pink mucket pearly mussel, *Lampsilis orbiculata.* Therefore, there is not a genuine issue of material fact to be heard as to TVA's statement of fact no. 3.

Proposed Statement of Fact Number 4

> The record in this proceeding confirms the opinion of the Department of the Interior that the small amount of sediment which would be added by construction of the discharge diffuser will not adversely affect the mussels.

The Intervenors contend that the proposed statement of fact no. 4 raises an issue which must be heard.

In the letter of Regional Director Kenneth E. Black of the Department of Interior's fish and Wildlife Service to the NRC, dated March 15, 1978, he stated that Service personnel considered that impact from siltation, as a result of the construction of the discharge diffuser, if located between Dixon Island and the upstream edge of the mussel bed "is anticipated to be minimal because construction of the diffuser portion of the discharge system is expected to [re]quire approximately 6 months with dredging to be completed within a few weeks."[6]

The Atomic Safety and Licensing Appeal Board observed in its Decision of March 17, 1978,[7] that:

> . . . sedimentation, would be occasioned by dredging activities in the course of construction of the diffuser. The mussels are filter feeders, and although they can remove and dispose of a limited amount of sediment in the river, too much would cause them problems. The record is not clear as to how much is too much. [Footnotes omitted.]

It does not appear from any evidence offered in this matter, that there is available any precise answer to "how much is too much" on a quantitative basis. However, in the opinion letter of the Fish and Wildlife Service, it is stated that because of the number of variables involved in the construction of the diffuser and the operation of the plant "a systematic preproject and postproject monitoring of the mussel beds, above and below the diffuser, should be initiated with the objective of determining if population changes occur . . . ."[8]

The Board has reviewed the construction phase monitoring plan agreed

[6]Ex. 1 to Applicant's brief at p. 2, *supra.*

[7]ALAB-463, 7 NRC 341, 363 (1978).

[8]Ex. 1 to Applicant's brief at p. 3, *supra.*

upon in a meeting among Staff, Intervenors, State of Tennessee, U. S. Fish and Wildlife, and the Applicant.[9] The Board approves the plan with one change. In item 6, Diffuser Excavation Period, if the mussels placed near the blasting zone are *Lampsilis orbiculata,* they should be removed, examined, and returned immediately to the river with care.

In addition, the Staff is to observe the diffuser dredging periodically to verify that the Applicant is adhering to the monitoring plan and that any accumulation of sediment on the mussel bed is acceptably small.[10] A report is to be prepared by the Staff after the dredging is completed and served on all parties to this proceeding.

The Board finds that, in view of the agreement of the parties as to monitoring, there is no longer any genuine issue of fact to be heard as to TVA's statement of fact no. 4.

Proposed Statement of Fact Number 5

> The record in this proceeding confirms the opinion of the Department of the Interior that the heated water discharged from the Hartsville Nuclear Plants during plant operation will not impact the mussel bed or fish in the area.

The Intervenors indicate that the above "is a statement as to which there is a genuine issue to be heard." In support of this position, the Intervenors rely upon an affidavit[11] in which it is stated that:

> The range of the proposed hosts for the glochidia of *Lampsilis* are very wide and not nearly as restricted as the mussel itself. This would suggest that factors other than glochidia host play the limiting role in the mussels range. The restricting factor may be in part temperature. Further, the limited number of specimens and beds of the mussel suggest that *Lampsilis* is a delicate species. Small changes in a variety of environmental factors could affect survival. For example, a key factor in restricting range could be temperature. If so, one would predict that shifts in temperature of the extent encountered from the discharge from the proposed diffuser outflow may reduce survival ability of adults, of larvae, or otherwise reduce reproduction potential of the species.

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[9]Monitoring Plan for Mussels During Discharge Diffuser Construction—Hartsville Nuclear Plants, enclosed with letter from Herbert Sanger, Jr., General Counsel, TVA, dated September 25, 1978. A copy of the agreed to monitoring plan (construction phase) is attached to this Decision as attachment.

[10]A representative of the U. S. Fish and Wildlife Service (FWS) will be present during the initial 2-3 days of dredging. See the FWS letter to TVA of October 27, 1978.

[11]Affidavit of Robert Jack Neff, dated June 7, 1978, *supra.*

The Board, in its partial initial decision on environmental and site suitability aspects of the facility, indicated that:

> 312. Blowdown from the cooling towers will be discharged through a multiport diffuser into the Cumberland River. During low river flows the blowdown will be discharged to a holding pond which will enable the plant to operate at full power without violating the applicable thermal water quality standards. [Footnote omitted.]

and that:

> 314. The Board finds that no significant adverse impact will occur from operation of the heat dissipation system.[12]

However, the Board's partial initial decision was issued prior to the knowledge of the presence of the endangered species, *Lampsilis orbiculata.*

Pointing out that this Board was obligated to examine all possible adverse effects upon the species, in addition to resolving the issues in contention, the Appeal Board proceeded from the record established to make the following finding:

> . . . Danger from the increases in water temperature is also unlikely. No matter which of the two alternate locations for the diffuser is used, it would be located on the deeper side of the river; as the mussel bed is on the shallower side, it will be outside of the mixing zone for the discharged water. The average temperature rise outside that zone will be 1.6° F, and the maximum rise will be 3.3° F. But because the discharged water will be forced upward by the angle of the pipes and the buoyance of the discharge, these higher temperatures should be found in the upper layers of the water and not on the river bottom where the mussels are. In any event, *Lampsilis orbiculata* is a warm-water species and the small increase in water temperature, even should it occur at the level of the mussel bed, would not harm it. For these reasons, we find that the endangered species would not be adversely affected by heat from the water discharged through the diffuser.[13] [Footnotes omitted.]

The Department of Interior opinion letter states:

> The blowdown flow (thermal pollution) from the plant could have a temperature difference between the blowdown and river before mixing of -5° F in October to 33° F in March, averaging 16° F. This thermal pollution could possibly affect the biological needs of the mussel and

[12] 3 NRC 485, 550 (1976).
[13] ALAB-463, 7 NRC 341, 362 (1978).

could present a thermal barrier for fish migration in this area. However, blowdown discharge through the diffuser is interlocked with flow from upstream dams and will be mixed with river water by jets. No thermal impact to the mussel bed or to fish in the area is expected since the water temperature rise outside the mixing zone over the mussel bed would usually be less than 1° F, although it could be as high as 1.6° F. The mixing zone is expected to be in the main channel across from the mussel bed. There should be little thermal influence of the fish fauna associated with the area of the mussel bed. The mixing zone should occupy less than one-half of the width and depth of the main channel and should be no barrier for fish migration in this area.[14]

Based on the record of this proceeding and after considering the Department of Interior Biological Opinion, the Board finds that the heated water discharged from the plant discharge diffuser during operation will not adversely affect the endangered species, and therefore, there is not a genuine issue of material fact to be heard as to TVA's statement of fact no. 5.

Proposed Statement of Fact Number 6

The record in this proceeding confirms the opinion of the Department of the Interior that the release of radiation from the Hartsville Nuclear Plants during routine operation will have no effect on the pink mucket pearly mussel.

In response, the Intervenors indicate that the above "is a statement as to which there is a genuine issue to be heard." In support the Intervenors provided an affidavit which indicates that:

. . . An additional factor that could decide the survival of the species is the low level of routine emissions of radionuclides from the Hartsville Nuclear Plants. It must be recalled that these organisms are filter feeders. As such they can be expected to show an extraordinary ability to concentrate radioactivity into their living body parts and shells. Thus, they may expose themselves in time to lethal doses of ionizing radiations.[15]

During the course of the construction permit evidentiary hearing, the Intervenors proposed and the Board admitted a new contention based on newly discovered evidence which indicated that:

The routine releases of radioactivity from normal operation of the proposed plants will harm certain mussel species found in the area proposed

[14]Ex. 1 to Applicant's brief at 2-3, *supra.*

[15]Afffidavit of Robert Jack Neff, *supra.*

for the plant diffuser, namely *Dromus dromas, Lampsilis orbiculata,* and *Dysnomia sulcata.* Said releases have been underestimated by Applicant and NRC Staff. Said releases will harm said mussel species in the following manner: by injuring or killing mussels of said species; annoying said species to such an extent as to significantly disrupt essential behavioral patterns, including breeding; and by causing significant environmental modification or degradation, namely, the contamination of the sediment and waters of the Cumberland River.[16]

The Department of Interior Biological Opinion indicates that:

. . . Because the potential radiological dose to benthic organisms in the river near the plant would be less than 1 millirad per year compared to natural background radiation of 50 to 100 millirads per year, no effect to the pink mucket pearly mussel is expected.[17]

After considering the evidence in the record of this proceeding, the Board previously found that the radiological releases from the plant will not produce significant adverse effects on the mussels in the Cumberland River.[18] The information contained in the affidavit of Robert Jack Neff does not cause the Board to alter its previous findings which were affirmed on appeal. Therefore, the Board finds no genuine issue of material fact to be heard as to TVA's statement of fact no. 6.

Proposed Statement of Fact Number 7

The record in this proceeding confirms the opinion of the Department of the Interior that construction and operation of the discharge diffuser in the area between Dixon Island and the upstream end of the mussel bed is environmentally acceptable and will not jeopardize the continued existence of the pink mucket pearly mussel, *L. orbiculata.*

The Intervenors indicate that this is a statement as to which there is a genuine issue to be heard.

The Appeal Board, in ALAB-463, stated that "[o]nce informed that an endangered species lived in the vicinity of the plant, the Licensing Board was obligated to examine all possible adverse effects upon the species which might result from construction or operation of the plant and to make findings with respect to them."[19] Noting that the Licensing Board failed to

[16] 5 NRC 1081, 1107 (1977).
[17] Ex. 1 to Applicant's brief at 2, *supra.*.
[18] 5 NRC 1081, 1108 (1977).
[19] 7 NRC 341, 361 (1978).

make all of the requisite findings but had admitted evidence on the effects of operation, the Appeal Board was ". . . in a position to evaluate . . . [the evidence] and to make the findings ourselves." The Appeal Board then proceeded to make findings with respect to the operational effects of chlorine and thermal discharges.[20] Furthermore, the Appeal Board agreed with the Licensing Board that the radiological releases during operation would not harm the *Lampsilis orbiculata.*[21]

> The Department of Interior Biological Opinion indicates that the Possible impacts from the construction and operation of the diffuser, if located between Dixon Island and the upstream edge of the mussel bed, are siltation from dredge construction, mortalities from blasting, and thermal and radiological pollution.[22]

Even a casual reading of the Appeal Board Decision will force the reader to conclude that the chlorine, thermal, and radiological discharges were the *only* operational effects. The Appeal Board stated:

> . . . Accordingly, the only remaining Section 7 question with respect to the downstream location, Interior's approval of it having been obtained, is whether sedimentation from construction at that location would jeopardize the continued existence of the species.[23]

and

> However, we have found that operation of the plant *will not cause any significant adverse effects* upon the endangered mussels. It follows that operation of the plant *would not "harm"* the mussels within the meaning of 50 CFR 17.3 and therefore would not effect a taking of them within the meaning of Section 9 of the Act.[24] [Emphasis added.]

With our original finding on radiological discharges which was affirmed by the Appeal Board, and with the Appeal Board findings on the chlorine and thermal discharges, all the necessary findings have been made on the effects of operation upon *Lampsilis orbiculata.*

Intervenors argued that among other things the monitoring program initially proposed by the Department of Interior was deficient in that it was limited to the preconstruction, construction, and postconstruction periods, but did not cover the time of operation of the plant.[25] Proposed modifica-

[20] 7 NRC 341, 362 (1978).
[21] 7 NRC 341, 364 (1978).
[22] Ex. 1 to Applicant's brief at 2, *supra.*
[23] 7 NRC 341, 364 (1978).
[24] 7 NRC 341, 366 (1978), footnote 114.
[25] Further Response of Intervenors, William N. Young, *et al.,* to Applicant's Motion for Summary Disposition on the Discharge Diffuser Location Issue, August 14, 1978, at 4-5.

tions to the monitoring program to cover the period of operation were made in an accompanying affidavit.[26]

In reporting on the results of the successful negotiations among the parties regarding an acceptable monitoring program during the diffuser construction, the Applicant argued that a monitoring program for the period during plant operation should not be adopted until much nearer to initial plant operation and that an operational monitoring plan is not an appropriate subject for a construction permit proceeding.[27]

In further pleadings, the Intervenors indicated that they do not contend that an operating license stage monitoring plan should be formulated or established at this time, but that this Board should impose as a condition on the construction of the diffuser, a requirement of some minimum standards for a plan to monitor the impacts on the endangered mussels species of plant operation.[28]

As indicated previously, the record and findings in this construction permit proceeding clearly show that operation of the plant will not cause any significant adverse effects upon the endangered species of mussels. Therefore, this Board will not require as a condition for the construction of the discharge diffuser, a monitoring program of any format for the period of plant operation. However, the Board orders the NRC Staff to consider the protection of the endangered mussel species, *Lampsilis orbiculata,* in developing the environmental technical specifications for the plant at the operating license stage.

The effects of construction of the discharge diffuser in the area between Dixon Island and the upstream edge of the mussel bed have been discussed under Proposed Statement of Fact Numbers 3 and 4, above. Therein, the Board found that the construction of the discharge diffuser would not adversely affect the mussels.

Therefore, the record in this proceeding does confirm the opinion of the Department of Interior that construction of the discharge diffuser in the area between Dixon Island the upstream end of the mussel bed is environmentally acceptable and is not likely to jeopardize the continued existence of the pink mucket pearly mussel, *Lampsilis orbiculata.* Further operation of the plant will not cause any significant adverse effects upon the endangered species of mussels. Therefore, the Board finds there is not a genuine issue of material fact to be heard as to TVA's statement of fact no. 7.

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[26]Affidavit accompanying Intervenors' further response to Applicant's motion, *supra,* dated August 14, 1978, at 9-10.

[27]Letter from Herbert Sanger, Jr., General Counsel, TVA, dated September 25, 1978.

[28]Letter from Leroy J. Ellis III, Counsel for Intervenors, dated September 27, 1978; Further Response of Intervenors to Applicant's Motion for Summary Disposition on the Upstream Diffuser Location, dated October 10, 1978.

ORDER

The Board finds that the filings in this proceeding, the depositions, answers to interrogatories, together with the statements of the parties and the affidavits, show that there is no genuine issue as to any material fact and that the Applicant is entitled, as a matter of law, to a summary decision approving construction of the discharge diffuser at a point between Dixon Island and the upstream end of the mussel bed.

The NRC Staff is directed to incorporate the construction phase monitoring plan, which has been approved in this Decision on Motion for Summary Disposition, into any authorization issued to permit the construction of a discharge diffuser at a point in the Cumberland River between Dixon Island and the upstream end of the bed of endangered species of mussels, *Lampsilis orbiculata*. Further, the Staff is to observe the diffuser dredging periodically to verify that the monitoring plan is being adhered to and that any accumulation of sediment on the mussel bed is acceptably small.

IT IS SO ORDERED.

THE ATOMIC SAFETY AND
LICENSING BOARD

J. Venn Leeds, Jr.

Forrest J. Remick

John F. Wolf, Chairman

Dated at Bethesda, Maryland,
This 31st day of October 1978.

ATTACHMENT

MONITORING PLAN FOR MUSSELS DURING DISCHARGE DIFFUSER CONSTRUCTION—HARTSVILLE NUCLEAR PLANTS

This monitoring plan has as a goal a complete assessment of the impacts of the construction of the Hartsville Nuclear Plant's discharge diffuser. The

keys to the environmental monitoring plan for the diffuser construction are the decision points which have been devised for early feedback to assure integrity of the Dixon Island mussel bed. Appropriate mitigative actions to be taken during construction of the diffuser, should significant perturbations occur, have been incorporated into this plan.

Special monitoring of the discharge diffuser construction will include the following:

Prediffuser Construction

1. Square meter grid samples will be collected along approximately 30 transects at 50-foot intervals approximating those established during the December 1976 mussel survey. The number of quadrats established on each transect will depend on the width of the mussel bed at that particular transect. The square meter grid will be placed on the bottom at approximately 20-foot intervals and all mussels will be carefully removed and examined and immediately returned to the river. This reassessment of the mussel bed prior to the initiation of diffuser construction is necessary because a visit to the Cumberland River and Hartsville site in July 1977 revealed that mussels were being removed from the Dixon Island mussel bed by commercial mussel fishermen.
2. Prior to the initiation of instream construction activities, sediments in the area of diffuser construction and downstream will be sampled and characterized as to particle size and total volatile solids. This will provide a baseline of data for evaluating the deposition of sediments resulting from the excavation activities. The following procedures will be followed for this activity:
   a. Core sampler will be utilized.
   b. Two transects will be established at the site of dredging—10 samples will be taken.
   c. Three transects will be established on the Dixon Island mussel bed—15 samples will be taken.
3. Chemical constituents of the sediments will be determined prior to the diffuser construction. An elutriate test will be performed to detect any significant release of contaminants in the material to be dredged. Six samples will be collected in the area to be dredged and three samples will be collected on the Dixon Island mussel bed. Samples will be analyzed for Hg, Pb, As, Cd, Cu, Zn.
4. Sedimentation traps will be placed by scuba divers at specified intervals along the length of the Dixon Island mussel bed downstream of the proposed dredging operation to estimate the loss of and ac-

cumulation of materials in the sediments (to be continued throughout the instream dredging activities). A control station (one transect) upstream of the dredging operation will be monitored to detect natural sedimentation rates for comparative purposes.

5. Scuba divers will search the area from Dixon Island downstream to the upper edge of the Dixon Island mussel bed and remove any isolated mussel specimens. Any specimens found will be placed on or in the substrate of an established mussel bed.

Diffuser Excavation Period

1. Sedimentation traps will continue to be placed at the same stations used in the prediffuser excavation period. The traps will be returned twice per 8-hour dredging crew working shift (once after 4 hours and once after 8 hours) during excavation of approximately the first 1,000 cubic yards of material.
2. Turbidity levels of the river above and below the dredging activities will be measured at 1-meter depth intervals from surface to the bottom and averaged over the water column to document changes in natural turbidity levels resulting from these activities. Samples will be taken hourly during excavation. Natural turbidity levels of record as defined in the Hartsville Nuclear Plant's ER will be the feedback criteria for regulating the rate of instream dredging. Maximum documented levels of turbidity are 85 ppm (JTU).
3. Measurement of light intensity in the water column will be performed with a submarine photometer both above and below the dredging activities. Measurements will be made hourly during excavation. A 50 percent reduction in the depth of 0.1 percent of the light transmission at some selected point at the mussel bed relative to an upstream location (above the dredging activities) will be the feedback criteria for instituting corrective mitigative actions.
4. Should turbidity levels or light penetration data indicate a need for mitigative action, the inspector will report his findings and make his recommendation to the project environmental engineer, who will present these findings and recommendations to the project manager. The project manager will make the decision on the mitigative actions to be taken, *i.e.*, to slow down or halt construction.
5. Dissolved oxygen, pH, conductivity, and temperature profiles will be made at upstream and downstream locations to document any perturbations of these parameters.
6. During blasting activities, mussels will be placed by scuba divers at established intervals from the area of the blasting to determine if

mussels on the Dixon Island bed are harmed by shock waves from these activities.

Postdiffuser Construction

1. A postdiffuser construction survey of sediments in the area of the diffuser and mussel bed will be conducted to document any perturbation of river sediments as a result of these construction activities. A total of five samples will be collected from each of three transects approximating those established in prediffuser construction (2).
2. Transects approximating those established during the prediffuser construction survey will be established at 50-foot intervals beginning at the upper end of the mussel bed (CRM 284.1). Square meter samples will be taken along the transect. Mussels recovered from the square meter grids will be carefully removed and examined and immediately returned to the river. This qualitative and quantitative data will serve as a reeevaluation of the mussels found on the Dixon Island mussel bed following completion of the diffuser construction activities.

The breeding season for *Lampsilis orbiculata* is reported to be during August and September, with glochidia being discharged the following June. Since mussels are mucoid filter feeders, the increase in turbidity levels should pose no problem to mussels during any period of the year. We therefore recommend that instream dredging activities associated with the discharge diffuser be conducted at any time of the year. However, dredging during the breeding season (August and September) will be avoided if possible.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Dr. W. Reed Johnson
Jerome E. Sharfman

In the Matter of

Docket Nos. STN 50-556
STN 50-557

PUBLIC SERVICE COMPANY OF OKLAHOMA
ASSOCIATED ELECTRIC COOPERATIVE, INC.
WESTERN FARMERS ELECTRIC COOPERATIVE, INC.

(Black Fox Station, Units 1 and 2)

November 2, 1978

The Appeal Board denies intervenors' motion seeking a stay of the Licensing Board's partial initial decision permitting issuance of a limited work authorization (LBP-78-26, 8 NRC 102 (July 24, 1978)).

RULES OF PRACTICE: STAY PENDING APPEAL

A motion for a stay pending appeal must contain a concise statement of grounds for a stay, with reference to the factors specified in 10 CFR 2.788(e).

RULES OF PRACTICE: STAY PENDING APPEAL

Although a party seeking a stay need not prevail on each of the criteria enumerated in 10 CFR 2.788 (and in *Virginia Petroleum Jobbers Association* v. *FPC,* 259 F.2d 921, 925 (D.C. Cir. 1958)), a stay application that fails even to attempt to show irreparable injury is virtually assured of failure.

RULES OF PRACTICE: RESPONSIBILITIES OF COUNSEL

Counsel appearing before NRC adjudicatory tribunals have a manifest and iron-clad obligation of candor. That obligation is hardly fulfilled where there is a failure to call attention to facts of record which cast a different light upon the substance of arguments being advanced by counsel.

Mr. Paul M. Murphy, Chicago, Illinois, for the applicants Public Service Company of Oklahoma, *et al.*

Mr. Andrew T. Dalton, Jr., Tulsa, Oklahoma, for the intervenors Ilene H. Younghein, Lawrence Burrell, and Citizens' Action for Safe Energy.

Mr. L. Dow Davis for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

Pending before us is the appeal of the intervenors[1] from the Licensing Board's July 24, 1978, partial initial decision in this construction permit proceeding.[2] In that decision, and subject to certain specified conditions, the Board resolved all environmental and site suitability issues in such a manner as to pave the way for the issuance of a limited work authorization for the facility under 10 CFR 50.10(e). On September 21, we denied a motion filed by the intervenors which, based upon considerations totally extraneous to the matters determined in the partial initial decision, sought a revocation or suspension of the limited work authorization. ALAB-498, 8 NRC 315.

Three weeks later, on October 12, the intervenors filed another motion, seeking a stay of the effectiveness of the partial initial decision (*i.e.*, a withdrawal of the limited work authorization) pending the outcome of their appeal. The motion was based upon the requirement in Section 401(a)(1) of the Federal Water Pollution Control Act (FWPCA), as amended in 1972, 33 U.S.C. 1341(a)(1), that an applicant for a Federal license for a facility which may occasion a discharge into navigable waters furnish a certification from the appropriate State or interstate agency.[3] More specifically, the in-

[1]Ilene H. Younghein, Lawrence Burrell, and Citizens' Action for Safe Energy.

[2]LBP-78-26, 8 NRC 102. On August 24, 1978, the Licensing Board entered an order modifying the partial initial decision in some respects. LBP-78-28, 8 NRC 281.

[3]For a discussion of what must be certified, see *Washington Public Power Supply System* (Hanford No. 2 Nuclear Power Plant), ALAB-113, 6 AEC 251 (1973).

tervenors' claim (also advanced on their appeal) is that the Licensing Board erred in holding that this requirement had been waived by reason of the failure of the Oklahoma Water Resources Board[4] to act in a timely fashion upon the lead applicant's request for a Section 401 certification.[5] That holding by the Board had been based upon a finding that, during the one-year period following the submission of the certification request, the State agency had not issued a certification, denied a certification, or notified the lead applicant that additional information from or action by that applicant would be required before agency action could be taken. LBP-78-26, *supra,* 8 NRC at 123 (para. 55).

The applicants and the NRC staff oppose the stay motion on a variety of grounds.[6]

1. 10 CFR 2.788, added to the Commission's Rules of Practice in 1977,[7] specifically provides, *inter alia,* that a motion for a stay pending appeal must contain "[a] concise statement of grounds for a stay, with reference to the factors specified in paragraph (e) of this section." Those factors are the familiar four which were set out long ago in *Virginia Petroleum Jobbers Association* v. *Federal Power Commission,* 259 F.2d 921, 925 (D.C. Cir. 1958):

(1) Whether the moving party has made a strong showing that 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.

Even before the promulgation of Section 2.788, the *Petroleum Jobbers* factors were deemed to govern the disposition of applications for stay relief filed with this Board.[8] Thus, that section merely codified established prior

[4]The Black Fox facility is to be located in Rogers County, Oklahoma, (near Tulsa) on the east bank of the Verdigris River.

[5]Section 401(a)(1) of the FWPCA also provides that:

If the State, interstate agency, or Administrator, as the case may be, fails or refuses to act on a request for certification, within a reasonable period of time (which shall not exceed one year) after receipt of such request, the certification requirements of this subsection shall be waived with respect to such Federal application.

[6]The staff's response was late but was accompanied by a motion for leave to file it out of time. That motion is granted.

[7]42 Fed. Reg. 22128, 22130 (May 2, 1977).

[8]See, *e.g., Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-338, 4 NRC 10, 13 (1976), and cases there cited; *Toledo Edison Company* (Davis-Besse Nuclear Power Station, Units 1, 2, and 3), ALAB-385, 5 NRC 621, 624-25 (1977).

Commission practice.[9]

An examination of the motion at bar discloses that, although the first factor was there addressed, the other three plainly were not. The motion is devoid of any mention of irreparable injury, let alone an attempted demonstration that such injury might be sustained by the intervenors were the limited work authorization to remain in effect *pendente lite.* Similarly, it says nothing about either the potential harm to the applicants which would attend upon a lifting of the limited work authorization or the relevant public interest considerations.

Standing alone, these deficiencies mandate the denial of the motion. It is quite true that

> . . . Our past practice in applying those criteria has not been to require that the movants prevail on each one. Rather, we have balanced them all: "the strength or weakness of the showing by the movant on a particular factor influences . . . how strong his showing on the other factors must be . . . ."*Public Service Company of New Hampshire* (Seabrook, Units 1 and 2), ALAB-338, 4 NRC 10, 14 (1976).

Marble Hill, ALAB-437, *supra,* fn. 9, 6 NRC at 632. But this scarcely relieves the movant of the obligation—specifically imposed by Section 2.788—to come to grips with each of the factors in its papers. Beyond that, as we have had previous occasion to stress, "[i]t is a well established rule of administrative law that 'a party is not ordinarily granted a stay of an administrative order without an appropriate showing of irreparable injury.'" *Davis-Besse,* ALAB-385, *supra,* fn. 8, 5 NRC at 626, quoting *Permian Basin Area Rate Cases,* 390 U.S. 747, 773 (1968). Consequently, a stay application which does not even attempt to make a showing on that factor is virtually assured of failure.

The intervenors here are represented by counsel, who fairly can be held accountable for an awareness of the terms of Section 2.788, as well as of the adjudicatory decisions concerning the criteria which govern stay applications. In this circumstance, we perceive no good reason to accord those parties yet another opportunity to establish their entitlement to a stay.[10]

2. Although normally there would be no necessity to go beyond the foregoing discussion in acting upon the stay motion, certain representations made in the applicants' opposition to that motion prompt this further comment.

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[9]*Public Service Company of Indiana* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-437, 6 NRC 630, 631-32 (1977).

[10]We do not mean to imply that parties represented by a layman necessarily would be given a second opportunity.

The applicants called our attention both (1) to the additional requirement in Section 2.788 that a motion for a stay of the effectiveness of a licensing board decision be filed within 15 days after service by mail of that decision;[11] and (2) to our earlier observation that it is preferable practice to seek a stay from the Licensing Board prior to moving for such relief before us. See *Florida Power and Light Company* (St. Lucie Nuclear Power Plant, Unit No. 2), ALAB-404, 5 NRC 1185, 1186, fn. 2 (1977), and cases there cited. We were then told that, in this instance, the intervenors not merely waited 80 days after the rendition of the July 24 partial initial decision before filing their stay papers but, in addition, did not first seek stay relief from the Licensing Board. According to the applicants, these considerations warrant our summary rejection of the motion.[12]

Taking the applicants' papers at face value, one is left with the impression that the intervenors sat idly by between July 24 and October 12 without taking any action to obtain immediate relief *pendente lite* on their claim that a limited work authorization was unlawfully issued. Scrutiny of the Licensing Board record of this proceeding reveals, however, that this was not the case. Specifically, it appears that, on September 5, one of the intervenors (Citizens' Action for Safe Energy) requested the Licensing Board by letter to revoke the limited work authorization *on the precise ground later assigned in support of the stay motion filed with us.* Choosing to treat the letter as a motion for reconsideration of the July 24 decision (insofar as that decision dealt with the issue of compliance with Section 401 of the FWPCA), the Licensing Board entered an order on September 29 in which it denied the sought relief. That order was served on October 2 and the stay motion was filed less than 15 days thereafter.

In short, contrary to the implication left by the applicants' papers, it turns out that one of the intervenors[13] had sought what was tantamount to stay relief from the Licensing Board and, further, that the intervenors came to us promptly once that relief had been denied.[14] Without pausing to con-

[11]As originally promulgated, Section 2.788 provided that a stay application had to be filed within 7 days of the rendition of the decision in question. The section was amended, effective May 26, 1978, to increase the period to 10 days. At the same time, the Commission amended Section 2.710 of the Rules of Practice, 10 CFR 2.710, to provide that, in the case of service of a document by mail, an additional 5 (rather than 3) days is to be added in the computation of any period of time specified by the rules. See 43 Fed. Reg. 17798, 17801, 17802-3 (April 26, 1978).

[12]It should be noted that the staff's opposition to the motion was confined to the point that the intervenors had not made the requisite showing on the four *Petroleum Jobbers* factors.

[13]It appears from the Licensing Board's September 29 order that the September 5 letter was deemed by the Board to have been submitted on behalf of all of the intervenors.

[14]Although the word "stay" may not have been employed in the September 5 letter, what was being sought (*i.e.*, a lifting of the limited work authorization) was in essence the same relief

(Continued on next page.)

sider whether the request to the Licensing Board was timely (and if not, what significance that might have respecting the timeliness of the stay motion now in hand),[15] this much can be said: the failure of the applicants to have referred to these developments was inexcusable. Counsel appearing before this Board (as well as other NRC adjudicatory tribunals) have a manifest and iron-clad obligation of candor. That obligation is hardly fulfilled when, as here, there is a failure to call attention to facts of record which, at the very least, cast a quite different light upon the substance of arguments being advanced by counsel.[16] We shall expect that, in the future, applicants' counsel will take pains to avoid this kind of conduct.

The intervenors' motion is *denied.*
It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

(Continued from previous page.)
which a formal stay motion would have requested. Further, as should have been perfectly obvious to the applicants, given the Licensing Board's September 29 order any further attempt to obtain a lifting of the limited work authorization by that Board would have been futile. Thus, even if the September 5 letter were not regarded the equivalent of a stay motion, the applicants still could not have fairly argued (without reference to the letter) that the intervenors should have formally moved for a stay from the Licensing Board before filing their motion with us.

[15]As we have seen, the stay motion is being denied on grounds other than its purported tardiness.

[16]Indeed, in this instance there might well be more involved than simply a failure to mention relevant facts. In their stay motion (at p. 2), the intervenors stated, without elaboration, that the Licensing Board had refused "to grant the relief requested." The applicants' response to this assertion (at p. 3) was that the intervenors "are simply wrong. Intervenors provide no citation in support of their assertion and, based on [their] review of the pleadings filed in this case, Applicants can find none." Even giving the applicants the benefit of all doubt with respect to the import of the intervenors' September 5 letter, we nonetheless find that statement misleading in the extreme.

Cite as 8 NRC 533 (1978) ALAB-506

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Richard S. Salzman

In the Matter of Docket Nos. 50-553
50-554

TENNESSEE VALLEY AUTHORITY

(Phipps Bend Nuclear Plant,
Units 1 and 2) November 9, 1978

Affirming a ruling (LBP-77-14, 5 NRC 494) referred by the Licensing Board, the Appeal Board holds that both TVA and the NRC have NEPA compliance obligations in licensing proceedings but that the NRC is properly responsible for striking the ultimate cost-benefit balance for the proposed facility and may impose environmental conditions on any permit or license. It suggests, however, that the two agencies attempt to redraft a lead agency agreement. The Board further affirms initial decisions authorizing issuance of construction permits for the Phipps Bend units (LBP-77-60, 6 NRC 647, and LBP-78-1, 7 NRC 73), except that it retains jurisdiction over the radon issue pursuant to ALAB-480, 7 NRC 796 (1978).

NRC: ENVIRONMENTAL RESPONSIBILITIES

Because a nuclear facility may be lawfully constructed only pursuant to Commission licensing, and because such licensing is a major Federal action under NEPA, the Commission in usual cases can and must consider all environmental consequences of proposed facilities in deciding whether to license them.

NRC: JURISDICTION

Section 271 of the Atomic Energy Act, as amended (42 U.S.C. 2018), does not prevent NRC from including in licenses it issues to TVA

conditions designed to minimize the adverse environmental effects of constructing the licensed facility.

NRC: JURISDICTION

Because Section 273 of the AEA directs that government agencies be on equal footing with private applicants before the Commission, and because Congress has not declared TVA's environmental jurisdiction to be inviolable in nuclear licensing proceedings, TVA and the Commission must independently evaluate the environmental consequences of a proposed TVA facility and determine whether NEPA has been satisfied.

Messrs. David G. Powell and **Justin M. Schwamm**, Knoxville, Tennessee, argued the cause for the Tennessee Valley Authority, applicant; with them on the briefs were **Messrs. Herbert S. Sanger, Jr., W. Walter LaRoche**, and **William L. Dunker**, Knoxville, Tennessee.

Mr. William B. Hubbard, Assistant Attorney General of Tennessee, Nashville, Tennessee, argued the cause for the State of Tennessee, intervenor; with him on the briefs was Assistant Attorney General **William M. Barrick**, Nashville, Tennessee.

Mr. Ballard Jamieson, Jr., Washington, D.C., filed a brief for the Council on Environmental Quality, *amicus curiae.*

Mr. Milton Grossman argued the cause for the Nuclear Regulatory Commission staff; **Mr. Steven C. Goldberg** on the briefs.

DECISION

I

The Tennessee Valley Authority has applied for Commission[1] licenses

[1]The Energy Reorganization Act of 1974 transferred the Atomic Energy Commission's responsibilities for regulating nuclear power to the Nuclear Regulatory Commission on January 19, 1975. 42 U.S.C. 5841(f). "Commission" refers to the AEC or the NRC as the context requires.

to build a two-unit nuclear power plant in Hawkins County, eastern Tennessee. TVA objects, however, to NRC's (1) undertaking an environmental cost-benefit analysis of the Phipps Bend proposal and (2) imposing license conditions designed to minimize the facility's adverse environmental consequences. Applicant's premise is that exclusive responsibility for taking these steps to implement the National Environmental Policy Act[2] resides with TVA itself. The staff and the State of Tennessee (an intervenor in this proceeding) disputed that reading of the law, and TVA sought a declaratory ruling from the Licensing Board to clarify the matter. The Board ruled against TVA, holding this Commission to have "a statutory obligation under NEPA to impose conditions designed to mitigate adverse environmental consequences on any permit or license it may issue to the Application in this case." LBP-77-14, 5 NRC 494, 498 (1977).

At TVA's request, the Licensing Board referred that ruling to us.[3] We in turn solicited the views of the Council on Environmental Quality (CEQ), which was created by NEPA and is charged with monitoring Federal agencies' compliance with that statute.[4] CEQ responded by filing an *amicus* brief with us that supports the Licensing Board's decision. According to the Council, applicant's status as another Federal agency provides "no basis for curtailing [this] Commission's responsibilities under NEPA."

The proceedings before the Licensing Board were completed while the referred question was pending before us. Consequently, Board decisions now authorize construction of the Phipps Bend facility subject, however, to the conditions designed to safeguard the environment.[5] TVA did except to those conditions, but solely to preserve its legal position that the NRC may not impose them.[6]

The entire case is thus now before us. Accordingly, we shall both decide the jurisdictional dispute and perform the record review we normally undertake on our own initiative where cases are essentially uncontested.

II

1. **Background.** A decision to license construction of a nuclear-powered

[2]Commonly referred to by its acronym "NEPA," 42 U.S.C. 4321, *et seq.*

[3]See 10 CFR 2.730(f).

[4]42 U.S.C. 4342, 4344; *National Helium Corp.* v. *Morton*, 455 F.2d 650, 656 (10th Cir. 1971); *Environmental Defense Fund* v. *TVA*, 468 F.2d 1164, 1177-78 (6th Cir. 1972).

[5]LBP-77-60, 6 NRC 647 (1977); LBP-78-1, 7 NRC 73 (1978).

[6]The exceptions were taken to LBP-77-60, *supra*, which dealt with environmental matters. Except to indicate that they were taken as a matter of caution to protect its jurisdictional position, TVA filed no additional briefs or papers in support of them. No other exceptions were taken to LBP-77-60 and none to LBP-78-1.

electric generating facility is "major Federal action" which may have significant consequences for the environment.[7] For this reason (at least when the prospective licensee is not a Federal agency) NEPA requires the NRC to determine whether there exist reasonable alternatives to the utility's proposal less likely to harm the environment. If there are, the Commission must decide, in light of the costs and environmental benefits involved, whether the nuclear license should be awarded in the form proposed, modified in some manner, or rejected.[8]

TVA is a Congressionally created corporation owned by the Federal government.[9] Among its authorized undertakings is the provision of electric power in a multi-State segment of the southeastern United States. When TVA wishes to generate that power with nuclear plants, it, like any other utility, must get a Commission license. And indeed TVA has obtained or is seeking NRC licenses for six nuclear power facilities in addition to the one at Phipps Bend now under consideration.[10] With respect to those other facilities, TVA and the Commission reconciled—though sometimes with difficulty—their respective NEPA responsibilities.[11] In this case, however a reconciliation could not be achieved outside the formal adjudicatory process.

2. **The parties' positions.** TVA acknowledges that it is subject to

[7]42 U.S.C. 4332(2)(C); *Scientists' Institute for Public Information* v. *AEC*, 481 F.2d 1079, 1088 (D.C. Cir. 1973); *Public Service Co.* v. *NRC*, 582 F.2d 77, 80 (1st Cir. 1978) (certiorari petition pending).

[8]See, *e.g.*, *Boston Edison Company* (Pilgrim Station, Unit 2), ALAB-479, 7 NRC 774, 778 (1978), and the authorities cited there.

[9]Tennessee Valley Authority Act of 1933, Section 1, 48 Stat. 58, as amended, 16 U.S.C. 831.

[10]Bellefonte, Browns Ferry, Hartsville, Sequoyah, Watts Bar, and Yellow Creek.

[11]In 1971, TVA and AEC agreed that the former would serve as " 'lead agency' with respect to the preparation and circulation for comment of detailed environmental statements for applications for licenses for TVA nuclear power plants." Letter dated June 30, 1971, from Harold L. Price, AEC, to James E. Watson, TVA (appended as Exhibit A to *TVA's Brief Seeking Reversal of the Licensing Board's Order of February 28, 1977* (hereafter *TVA's Opening Brief)).* Consistent with the notion of lead agency agreements, the arrangement provided for a contribution by Commission staff but gave TVA ultimate responsibility for preparation of the environmental impact statement (EIS). CEQ found the agreement to be in accordance with its then applicable guidelines. (See 40 CFR 1500.7(b) (1977 Rev.) for CEQ's current guidelines on lead agencies.)

In two proceedings, EIS' prepared by TVA pursuant to the agreement were approved. *Tennessee Valley Authority* (Watts Bar, Units 1 and 2), LBP-72-35, 5 AEC 230 (1972), *affirmed*, ALAB-97, 6 AEC 37 (1973); and *Tennessee Valley Authority* (Sequoyah, Units 1 and 2), LBP-74-86, 8 AEC 99 (1974), *affirmed*, ALAB-261, 1 NRC 57 (1975). But in the next, *Browns Ferry*, the Licensing Board expressed concern that the agreement did not ensure that the staff would conduct the full "process of interdisciplinary study,

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NEPA's requirements.[12] It contends, however, that it alone may make environmental determinations about the "nonradiological" aspects of a proposed nuclear power plant, even though it needs the NRC's permission to build the facility.[13]

The NRC staff is willing to accord due deference to TVA's environmental judgments. But, because Congress vested responsibility for licensing nuclear facilities in NRC, the staff asserts that NEPA makes the Commission ultimately responsible for assuring compliance with that statute's directives, which include determining whether a facility's benefits will outweigh *all* its environmental costs.

CEQ and Tennessee support the staff's position.

The environmental conditions incorporated at the staff's instance in

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cost-benefit analysis, and weighing of alternatives prescribed by [NEPA] and by [Commission regulations]." *Tennessee Valley Authority* (Browns Ferry, Units 1, 2, and 3), LBP-73-29, 6 AEC 682, 685 (1973). The issue did not come before us on appeal because a few months before the Licensing Board's decision the agencies had dissolved their agreement in favor of a new procedure: TVA would submit its own EIS with its application; the Commission would treat that EIS as the environmental report required of all applicants and would independently prepare its own EIS. See letter dated June 15, 1973, from L. Manning Muntzing to Lynn Seeber, TVA (appended as Exhibit D to NRC *Staff Brief in Support of the Licensing Board's Referred Ruling of February 28, 1977* (hereafter *Staff's Brief*)). However, they followed this procedure only in the *Bellefonte* proceeding (see *Tennessee Valley Authority* (Bellefonte Nuclear Plant, Units 1 and 2), LBP-74-66, 8 AEC 472 (1974)). Since then TVA has filed applications to construct three nuclear facilities: Hartsville, Yellow Creek, and the Phipps Bend facility with which we are concerned here. In *Hartsville*, TVA argued, as it does here, that NRC may not regulate nonradiological environmental aspects of TVA's plants. The Licensing Board rejected that assertion, *Tennessee Valley Authority* (Hartsville Plant, Units 1A, 1B, 2A, and 2B), LBP-76-16, 3 NRC 485, 493-96 (1976); the issue was not pressed before us. See ALAB-463, 7 NRC 341 (1978). In its decision in *Yellow Creek* authorizing issuance of a "limited work authorization," the Licensing Board merely stated that it had responsibility for determining whether NEPA's requirements had been met and said it would base that determination in part on TVA's Environmental Report and the staff's environmental statements. *Tennessee Valley Authority* (Yellow Creek, Units 1 and 2), LBP-78-7, 7 NRC 215, 219 (1978). TVA raised a jurisdictional question there only in connection with proposed license conditions that it thought were within the jurisdiction of the Environmental Protection Agency under the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1251, *et seq.*, rather than NRC. The Licensing Board agreed and modified some of the conditions. *Id.* at 229-31(appeal pending).

[12]*Environmental Defense Fund* v. *TVA*, 468 F.2d 1164 (6th Cir. 1977); *Duck River Preservation Ass'n* v. *TVA*, 410 F. Supp. 758 (D. Tenn. 1974), *affirmed*, 529 F.2d 524 (6th Cir. 1976); *Distributors Opposing Objectionable Rates* v. *TVA*, _____ F. Supp. _____, _____, (N.D. Ala 1972).

[13]TVA accepts that its NEPA compliance is subject to *judicial* review. See *TVA's Opening Brief* at 33.

the Phipps Bend construction permits appear neither unusual nor onerous, and TVA does not contend that they are.[14] The disagreement here is entirely jurisdictional. TVA is not concerned with whether NRC prepares its own environmental impact statements (although it thinks this an unnecessary duplication of effort—we deal with this aspect of the case *infra,* pp. 546-547). But it insists that no matter how NRC assesses the nonradiological environmental costs and benefits of a proposed TVA nuclear facility, it may not override TVA's own judgment on these matters. TVA views the NRC as having transgressed the limits of its jurisdiction by freighting the Phipps Bend construction permit with environmental requirements.

TVA proffers a number of arguments for its position. First, the agency contends that the NRC's Atomic Energy Act mandate is restricted to radiological health and safety matters and that NEPA did not enlarge that jurisdiction. Second, it argues that even if NEPA gave the Commission responsibility for avoiding all adverse environmental consequences at non-Federal nuclear plants, Atomic Energy Act Section 271, 42 U.S.C. 2018, restricts the exercise of that authority over TVA facilities. Third, TVA says that its Congressional charter affords it full and exclusive control over the disputed matters and that NEPA may not be used as a vehicle to impair its statutory independence in the environmental area. Finally, the assertion is made that TVA and not the NRC is the "responsible Federal agency" for the Phipps Bend project and, therefore, has the final word on the cost-benefit analysis and any "nonradiological" environmental protection that NEPA may require.

The Licensing Board rejected all these arguments. At TVA's urging, we reexamine each in turn.

3. **The "environmental jurisdiction" of the NRC.** Prior to passage of NEPA, the Commission's authority was confined to radiological health and safety matters (together with national defense and antitrust considerations not involved here).[15] TVA contends that NEPA did not expand the NRC's jurisdiction, that the license conditions designed to minimize

[14]The license conditions for protection of the environment are set out in a decision below at 6 NRC 671-72 (with appropriate references to the Final Environmental Statement for additional details). TVA has registered no specific objection to any of those conditions. It appears that, among other things, they contemplate NRC approval of certain transmission line corridors not yet finally selected. See FES §4.5 and license condition (c) (ii) (1) at 6 NRC 671.

[15]*New Hampshire* v. *AEC*, 406 F.2d 170 (1st Cir.), *certiorari denied*, 395 U.S. 962 (1969); *Cities of Statesville* v. *AEC*, 441 F.2d 962 (D.C. Cir. 1969); *Detroit Edison Company* (Greenwood Energy Center, Units 2 and 3), ALAB-247, 8 AEC 936, 938 (1974).

the adverse environmental consequences of the Phipps Bend facility are thus impermissible, and that this ends the case.[16]

It is far too late in the day to be pressing that line of argument. Not only have we rejected it long previous[17] but so have the Commission,[18] courts of appeals,[19] and the Supreme Court;[20] it also runs counter to the Council on Environmental Quality guidelines.[21] The District of Columbia Circuit put it concisely: "NEPA, first of all, makes environmental protection a part of the mandate of every Federal agency and department." *Calvert Cliffs, supra,* 449 F.2d at 1112. Consequently, as the First Circuit recently observed, "[t]he Commission is under a dual obligation: to pursue the objectives of the Atomic Energy Act *and* those of the National Environmental Policy Act. 'The two statutes and the regulations promulgated under each must be viewed in *pari materia.*' " *Public Service Co.* v. *NRC, supra,* 582 F.2d at 86, quoting from *Citizens for Safe Power* v. *NRC,* 524 F.2d 1291, 1299 (D.C. Cir. 1975) (emphasis in original). Accordingly, where the environment must be guarded from the adverse effects of nuclear plants—even from their nonradiological consequences—this Commission has stressed that it may "where necessary impose license conditions to minimize those impacts." *Wolf Creek, supra,* fn. 18, CLI-77-1, 5 NRC at 8 (involving connecting roads and railroad spurs).

This Board is, of course, bound to follow the Commission's holding in *Wolf Creek.* But even were we writing on a clean slate, TVA's contrary position would not be well taken. The agency relies on five court decisions that purportedly put to rest the question of NEPA's expansionary effect. Those cases do examine the relationship between NEPA and preexisting authority, but the discussion in the margin shows that none is analogous to the instant proceeding.[22] The Supreme Court's *SCRAP* decision, for example, while stating that "NEPA" was not intended

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[16]See *TVA's Opening Brief* at 19 and *TVA's Reply Brief* at 11.

[17]*E.g., Greenwood, supra,* ALAB-247, 8 AEC at 938; *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-422, 6 NRC 33, 82-84, *Commission review denied,* CLI-77-22, 6 NRC 451 (1977), *affirmed sub. nom. Public Service Co.* v. *NRC, supra,* fn. 7.

[18]*Kansas Gas and Electric Company* (Wolf Creek, Unit No. 1), CLI-77-1, 5 NRC 1, 6-11 (1977).

[19]*E.g., Public Service Co.* v. *NRC, supra; Culpeper League* v. *NRC,* 574 F.2d 633 (D.C. Cir. 1978); *Calvert Cliffs' Coord. Com.* v. *AEC,* 449 F.2d 1109 (D.C. Cir. 1971).

[20]*Vermont Yankee Nuclear Power Corp.* v. *NRDC;* 435 U.S. 519 (1978); *accord, Kleppe* v. *Sierra Club,* 427 U.S. 390, 409 (1976).

[21]40 CFR 1500.2(b).

[22]See *TVA's Opening Brief* at 20-21 and *TVA's Reply Brief* at 10-15. The cases are: *United States* v. *SCRAP,* 412 U.S. 669 (1973) (NEPA did not amend or repeal a statutory

(Continued on next page.)

to repeal by implication any other statute,"[23] does so in the context of holding that NEPA had not "sub silentio revived judicial power that had been explicitly eliminated by Congress."[24] The Court in *SCRAP* made essentially two points: first, compliance with NEPA is excused where directly precluded by another Federal statute; second, where the entity lacks the power to act in a particular manner (*e.g.*, to grant injunctive relief), NEPA does not furnish it.[25] The NRC, however, indisputably possesses the right to grant conditional licenses and construction permits and no enactment forbids the use of that authority to implement the purposes of NEPA.

In *Kitchen*, as the District of Columbia Circuit (which authored the decision) explained in a later case, "the agency possessed no jurisdictional toehold"—and hence no environmental grasp—on the proposed action;[26] the same was true in *Edwards*. *Gifford-Hill* involved an action within the agency's authority but outside NEPA's scope, and *Gage* merely reminded us in dictum of NEPA'a limitations.[27]

These cases hold that NEPA does not make Federal agencies guardians of the environment regardless of the discrete roles Congress has otherwise assigned them. But they do not call for the rigid, crabbed reading that TVA urges. Indeed, to hold now that the NRC still may not consider all the environmental consequences of nuclear power plants in deciding whether to license them would be to flout both the statutory directive that, "to the fullest extent possible . . . the public laws of the United States shall

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(Continued from previous page.)
provision of Interstate Commerce Act so as to restore Federal courts' power temporarily to suspend railroad rates, even in the absence of compliance with Section 102 of NEPA); *Kitchen* v. *FCC*, 464 F.2d 801 (D.C. Cir. 1972) (where Communications Act expressly precluded FCC jurisdiction over local telephone exchange building, the agency was held without authority to assure that its construction met NEPA requirements); *Gage* v. *AEC*, 479 F.2d 1214 (D.C. Cir. 1973) (petition for review of AEC environmental regulations dismissed for lack of jurisdiction; in *dictum* on question of AEC construction permit as prerequisite for land acquisition that might or might not be devoted to nuclear purposes, court noted that NEPA does not mandate action beyond agency's organic jurisdiction); *Gifford-Hill & Co.* v. *FTC*, 523 F.2d 730 (D.C. Cir. 1975) (FTC initiation of adjudicatory process pursuant to antitrust authority was not "major Federal action" within meaning of Section 102 of NEPA); and *Edwards* v. *First Bank of Dundee*, 534 F.2d 1242 (7th Cir. 1976) (no Federal involvement—and therefore no NEPA obligations—in State bank's proposed demolition of privately owned building that petitioners wanted preserved).

[23]412 U.S. at 694.

[24]*Id.* at 696.

[25]*Id.* at 695, fn. 20. *Accord*, *Calvert Cliffs* , *supra*, 449 F.2d at 1115.

[26]*Henry* v. *FPC*, 513 F.2d 395, 407, fn. 33 (D.C. Cir. 1975).

[27]Cf. *Wolf Creek*, *supra*, CLI-77-1: "The acquisition of land, which was the subject of challenge in *Gage* v. *AEC* . . . would appear to be an activity which would not require advance Commission approval." 5 NRC at 11 (citation omitted).

be interpreted and administered in accordance with [NEPA]," 42 U.S.C. 4332, and the First Circuit's explicit holding that

> NEPA provides the Congressional mandate to force "timely and comprehensive consideration of nonradiological pollution effects in the planning of installations," which was previously missing [citations omitted].[28]

Moreover, as we mentioned, none of the decisions relied on by TVA adequately reflects the case before us. NRC clearly has jurisdiction over the "*res*" here—the nuclear facility that TVA wants to build and operate.[29] Indeed, building that plant without a Commission license would be unlawful.[30] And, to reiterate, NEPA indisputably embraces the Commission's licensing process in cases involving non-Federal applications. In those proceedings—the usual proceedings—NRC can and must take actions to comply with NEPA. Our task, then, is to determine not whether the Commission's authority extends to environmental concerns, but whether it extends to TVA's application. In relying on the decisions discussed above, TVA does not help its cause on that question.

4. **The application of Atomic Energy Act Section 271.** In rejecting TVA's broad initial contentions, however, we have not resolved the next point of the applicant's argument: that the staff is overstepping jurisdictional bounds laid down in the Atomic Energy Act itself. Section 271 of that statute, as amended, 42 U.S.C. 2018, provides that:

> Nothing in this Act shall be construed to affect the authority of any Federal, State, or local agency with respect to the generation, sale, or transmission of electric power produced through the use of nuclear facilities licensed by the Commission: *Provided, that this section shall not be deemed to confer upon any Federal, State, or local agency any authority to regulate, control, or restrict any activities of the Commission.* [Emphasis added.]

TVA reads Section 271 as "preclud[ing] NRC from claiming regulatory authority over the generation, sale, or transmission of electricity produced at a TVA nuclear plant."[31] It argues that the provision means that the

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[28] *Public Service Co.* v. *NRC, supra,* 582 F.2d at 81, fn. 6.

[29] Once again we may analogize this proceeding to *Henry, supra,* where the court distinguished the FPC's "plain jurisdiction" over projects at issue there from the FCC's lack of jurisdiction in *Kitchen.* 513 F.2d at 407, fn. 33.

[30] *Greenwood, supra,* 8 AEC at 938.

[31] *TVA's Opening Brief* at 21.

NRC may take cognizance only of those environmental aspects of a TVA nuclear power facility that are related to radiological health and safety.[32]

The Board below rejected that argument. It held Section 271 not to limit the NRC's authority to condition its license in furtherance of NEPA, but merely to preserve whatever preexisting regulatory jurisdiction other Federal, State, and local agencies may have possessed over electric power generation and distribution. 5 NRC at 498. We agree.

We need not dwell on the point, for it is made quite clear by both Congressional and judicial actions. In 1965, the Ninth Circuit construed Section 271 to bar the United States from condemning a right of way for power lines to serve an AEC project in the face of objections by local zoning authorities. *Maun* v. *United States*, 347 F.2d 970. The court of appeals' decision rested on its reading of Section 271, which did not then include the *proviso*. Congress immediately overturned the *Maun* decision by adding that *proviso*, together with the clause to the first sentence of Section 271 noted in the margin.[33]

As the House committee report on the amendatory legislation explained, Congress initially included Section 271 in the Atomic Energy Act to quell "uneasiness among the drafters of the legislation over the effect of the [AEA] upon other agencies"[34] and

> to make it explicit that licensees of the AEC who produced power through the use of nuclear facilities would otherwise remain subject to the authority of all appropriate Federal, State, and local authorities with respect to the generation, sale, or transmission of electric power.[35]

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[32]TVA also points to 10 CFR 50.10(e)(2), which establishes that a construction permit may be issued only after all necessary findings have been made and the proposed site has been deemed suitable "from the standpoint of radiological health and safety considerations" pursuant to the AEA and the Commission's rules and regulations. TVA sees this as limiting the class of considerations over which NRC has authority. But the regulation must ride the coattails of the statute: if the statute grants NRC authority over issues not strictly "radiological," then the regulation may not nullify it; if the statute grants no such authority, then the regulation adds nothing.

[33]Pub. Law 89-135 (79 Stat. 551) (1965). The legislative history of the amendment is at H.R. Rep. No. 567, 89th Cong., 1st Sess. (1965), reprinted in 1965 *U.S. Code Cong. & Ad. News* 2775. The clause added to the first (and only other) sentence of Section 271, was as follows (added phrase *underscored*): "Nothing in this Act shall be construed to affect the authority or regulations of any Federal, State, or local agency with respect to the generation, sale, or transmission of electric power *produced through the use of nuclear facilities licensed by the Commission.*" The *proviso* is quoted in italics in the text at p. 541, *supra*.

[34]1965 *U.S. Code Cong. & Ad. News* at 2779.

[35]*Ibid.*

The *Maun* court, however, had held that Section 271 removed the Commission's own sovereign immunity with regard to local control over such matters and, in so doing, upheld actions of a California county and town hampering an AEC research and development project. Seeing a need to dispel such notions and their application, Congress acted swiftly to "reaffirm a conclusion already implicit in the [AEA]."[36] The House committee report states unequivocally that the purpose of the 1965 amendment was to

> clarify the language of Section 271 so as to correct any such erroneous conclusion that Congress intended that AEC's activities, as authorized by Congress, be limited by the authority or regulations of local authorities with respect to the generation, sale, or transmission of electric power. It would accordingly reaffirm the intent of Congress that AEC possess the same sovereign immunity, under the supremacy clause of Article VI of the Constitution, that other Federal agencies possess. This is the major purpose of this bill.[37]

In other words, as the First Circuit has observed, Congress meant Section 271 to be nothing more than "a garden variety nonpreemption clause."[38]

Although TVA recognizes that Congress enacted the amendment to overturn *Maun* and prevent similar misreadings of Section 271, it seems not to have appreciated the thrust of the amendment's legislative history, namely, that the language added in 1965 did not alter the meaning of that section. The intent of both the original and the amended sections was to preserve juristiction in all quarters, not to restrict it in the Commission's quarter alone. In rejecting arguments akin to those TVA urges here—that Section 271 precludes NRC from exercising jurisdiction over transmission lines—the First Circuit explained:

> Petitioner's flawed interpretation can perhaps best be exposed by extending its reading to the entire section, and not just to the word "transmission." If we were to adopt petitioner's position that Section 271 operates as a positive bar, then it must perforce extend to the entire section, *viz.*, the Commission is also barred from maintaining jurisdiction over the *generation* or sale of electricity. Since commercial nuclear power plants' *raison d'etre* is to generate electricity and since they are constructed to perform this function, petitioner's strained reading of Section 271 would mean that the Commission is barred

[36] *Id.* at 2784.

[37] *Id.* 2780.

[38] *Public Service Co.* v. *NRC*, *supra*, 582 F.2d at 85; *cf.*, *Portland General Electric Company* (Pebble Springs, Units 1 and 2), CLI-76-27, 4 NRC 610, 614, fn. 5 (1974).

from any exercise of jurisdiction over the very plant itself. We think this result demonstrates the fundamental error in [petitioner's] interpretation.[39]

For the reasons spelled out above and elucidated by the First Circuit, we hold that the Board below correctly construed Section 271. The provision does not prevent the NRC from including in TVA's licenses to construct nuclear generating plants conditions designed to minimize their adverse environmental effects. We turn then to the agency's next argument, which is that TVA's status as an independent Federal agency precludes the Commission from imposing such license conditions.

5. **TVA's "exclusivity" argument.** As is the case with a privately owned utility, TVA must obtain a Commission license to build and operate nuclear-powered generating facilities.[40] The draftsmen of the Atomic Energy Act were unequivocal "that Government agencies are on an equal footing with all others before the Commission with respect to obtaining licenses from the Commission. . . ."[41] It is not disputed here that, as used in the Act, "Government agency" embraces TVA.[42] In other words, in framing the Commission's basic charter, Congress specified that the same license requirements were to govern government and private applicants alike.

NEPA added to the Commission's original responsibilities in the sense that it must now consider and act to prevent or minimize the adverse environmental as well as radiological consequences of the facilities it licenses. And, for the reasons we have explained, neither the Atomic Energy Act in general nor Section 271 in particular bars the inclusion in licenses for government-owned plants of conditions designed to achieve such results.[43] TVA insists, however, that those conditions may not be included in its nuclear licenses because Congress alone has "the power to oversee TVA" in the absence of legislative direction to the contrary.

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[39]*Public Service Co.* v. *NRC*, *supra*, 582 F.2d at 84 (emphasis in original).

[40]See Section 273 of the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2020, "Licensing of Government Agencies."

[41]H.R. Rep. No. 2639, 83rd Cong., 2nd Sess. (1954) (conference report), at 46.

[42]Section 103(a) of the Act, 42 U.S.C. 2133(a), authorizes the issuance of licenses for commercial power reactors to "persons"; Section 11(s), 42 U.S.C. 2014(s), defines persons to include a "government agency," which is further defined in Section 11(l), 42 U.S.C. 2014(l), to encompass, *inter alia*, a corporation owned by the United States. TVA is such a corporation. See fn. 9, *supra*. The possibility of TVA obtaining Commission licenses was expressly contemplated in the debates on the Act. See, *e.g.*, 100 Cong. Rec. 10742 (July 21, 1974) (remarks of Sen. Humphrey).

[43]See pp. 538-544, *supra*.

The NRC's assertion of that authority, says the agency, rests on a reading of NEPA that "conflicts with the TVA Act and must give way."[44] These arguments are bottomed on statutory provisions giving TVA, among other things, "exclusive . . . control" of its property and operations[45] and on pre-NEPA decisions like *U.S. ex rel. TVA* v. *Welch*[46] holding that TVA has always had a special statutory obligation to protect the human environment.

The question we must therefore address is whether the NRC is excused from carrying out its usual NEPA obligations because the license applicant is TVA. NEPA, however, is a later enactment than the statutes relied upon by TVA, and Section 102 of NEPA directs "all" Federal agencies to comply with its requirements "to the fullest extent possible."[47] The leading authorities teach that an agency is excused from those NEPA duties only "when a clear and unavoidable conflict in statutory authority exists." *Concerned About Trident* v. *Rumsfeld*, 555 F.2d 817, 823 (D.C. Cir. 1977); *accord*, *Flint Ridge Development Co.* v. *Scenic Rivers Ass'n*, 426 U.S. 776, 788 (1976). Attempts to construe that section narrowly to limit activities subject to NEPA have not met with judicial favor, as the applicant is undoubtedly aware. "Section 102 exempts agencies from compliance *only when other statutory authority under which the agencies are proceeding expressly precludes compliance.*" *Environmental Defense Fund* v. *TVA, supra,* 468 F.2d at 1176 (per McCree, J.) (emphasis supplied). The CEQ Guidelines mirror that understanding (50 CFR 1500.4(a)):

> The phrase "to the fullest extent possible" in Section 102 [of NEPA] is meant to make clear that each agency of the Federal Government shall comply with that section unless existing law applicable to the agency's operations expressly prohibits or makes compliance impossible.

TVA's position boils down to this: it desires to fulfill its mandate to provide electricity by employing nuclear power reactors, and it wants the Commission to ignore some of the environmental costs in considering its applications to build and operate those reactors. But as the Board below pointed out, TVA does not and cannot rely on specific language in the Tennessee Valley Authority Act of 1933 in claiming "exclusive" authority over the environmental decisions at issue here: that statute, quite simply, contains no such language.[48] Nor could that Act alone

[44]See *TVA's Opening Brief* at 6-7, 16, and 28.

[45]See, *e.g.*, Section 2(g) of the TVA Act, 16 U.S.C. 831a(g), which provides that the TVA board of directors shall direct the exercise "of all the power of the corporation."

[46]327 U.S. 546, 549 (1946).

[47]42 U.S.C. 4332.

[48]See 5 NRC at 495-96.

answer the particular question before us, for it long antedates both the Commission's regulatory authority over nuclear power and the enactment of NEPA itself. TVA has shown us nothing in its own (or any other) statute that "expressly prohibits or makes compliance impossible" insofar as NRC environmental review of all aspects of a TVA license application is concerned.

But even accepting *arguendo* everything TVA tells us about its statutory "independence," its status for other purposes neither authorizes its construction and operation of nuclear power facilities *sans* Commission approval nor permits the NRC to license such projects in disregard of its own NEPA responsibilities. The kind of statutory conflicts which excuse NEPA compliance arise where the responsible agency is itself forbidden to act as NEPA might otherwise demand (the situation in *SCRAP, supra*) or where following NEPA's procedures would directly frustrate the agency's ability to carry out its specific statutory responsibilities, the case in *Flint Ridge Development Co., supra* (Secretary of Housing and Urban Development need not prepare impact statements on Interstate Land Sales Full Disclosure Act registration statements when impossible to do so within the statutory time allowed for reviewing them). Circumstances analogous to those simply are not present here. Even assertions that "NEPA cannot possible apply" to strategic military decisions have been rejected by the courts. *Concerned About Trident* v. *Rumsfeld, supra.*

To the extent that *NRDC* v. *Callaway*, 524 F.2d 79 (2nd Cir. 1975), relied on by TVA, is relevant here, the decision cuts against the agency's position. The case holds that the Federal agency with the overall responsibility for a project may be designated "lead agency" and prepare the necessary NEPA impact statement. But it does *not* hold that the other agencies must accept the lead agency's environmental analysis; indeed, it suggests just the opposite. While the issue was not directly litigated, the court of appeals' opinion reveals that the lead agency—the Navy—was forced to bow to the judgment of the Corps of Engineers (from whom it needed a permit) about where to dump certain dredged spoil. See *id.* at 90-91. TVA's scope for independent action is hardly broader than the Navy's.[49]

The Licensing Board observed that "Congress has not specifically addressed the situation in NEPA, the TVA Act, or elsewhere, in which the TVA is seeking a license from another Federal agency having its own independent NEPA responsibilities."[50] It concluded that "Congress

[49]*Levinson* v. *Spector Motor Service*, 330 U.S. 649 (1947), relied on by TVA, manifestly does not deal with the proper implementation of NEPA (1969).

[50]5 NRC at 497.

did not intend TVA jurisdiction to be inviolable" in such a situation and that, therefore, "no impermissible statutory conflict" exists.[51]

We agree. As far as Congressional directives are concerned, the issue of TVA exclusivity is a blank slate. But TVA has been at odds with the Commission over this NEPA issue for more than 5 years.[52] If anything is to be drawn from Congressional inaction in these circumstances, it is that Congress has had opportunity to take action manifesting TVA's exclusive authority in the situation and it has not done so.[53]

Not having been instructed otherwise by the legislature, we must heed the rule generally applicable for major Federal action in which two (or more) agencies are involved. That rule is *not* that one of them must yield up its NEPA duties to the other. Rather, it is the converse: *both* must evaluate the environmental consequences of the entire project and *both* must determine independently whether NEPA has been satisfied. *Silentman* v. *FPC*, 566 F.2d 237, 240-41 (D.C. Cir. 1977); *Henry* v. *FPC*, *supra*, 513 F.2d at 406-7 (per Leventhal, J.); *cf.*, *NRDC* v. *Callaway*, *supra*.

Henry is particularly instructive. The case involved a proposal to manufacture, transport, and sell synthetic gas derived from coal. The approval of several agencies was needed to complete this "coal gasification" project, the Federal Power Commission among them. The "lead agency" for NEPA purposes was the Department of the Interior's Bureau of Reclamation. The FPC's interest in the project stemmed from its jurisdiction under the Natural Gas Act over the interconnections needed to introduce the synthetic gas into pipelines transporting natural gas, a relatively small part of the overall proposal.

The FPC's contentions in *Henry* parallel those TVA makes here about the NRC's authority. The FPC argued that it was not called upon under NEPA to evaluate the costs and benefits of the entire project, but only those involving the segment under its jurisdiction in deciding whether to license the latter. The District of Columbia Circuit flatly rejected that approach as inconsistent with NEPA. While the court of appeals agreed that the FPC need not prepare its own impact statement on the

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[51] *Ibid.*

[52] See fn. 11, *supra*, and accompanying text.

[53] To the contrary, Congress has in the interim curtailed TVA's freedom of action with other environmentally protective legislation. For example, the Endangered Species Act, 16 U.S.C. 1531, *et seq.*, administered by the Secretary of the Interior, has been invoked successfully to enjoin construction of the Tellico Dam, a multimillion dollar TVA project, the Chief Justice specifically observing that "it is clear Congress foresaw that a §7 [of the Act] would, on occasion, require agencies to alter ongoing projects to fulfill the goals of the Act." *TVA* v. *Hill*, 437 U.S. 153, _____, 57 L.Ed. 2d 117, 141 (1978).

project but could "rely on the statement prepared by the lead agency," the court made unmistakably plain in *Henry* that (513 F.2d at 407):

> *What is required is that the FPC*, in deciding whether to grant, deny, or condition certificates of public convenience and necessity for admittedly jurisdictional facilities, *take into account the environmental costs of the gasification projects as a whole. It may do this by accepting, rejecting or modifying the analysis of the lead agency* [emphasis supplied].

And last year, in *Silentman*, the District of Columbia Circuit expressly reaffirmed its holding in *Henry*. The court ruled that "it is impermissible for any one agency to avoid addressing the environmental consequences of an entire Federal project because its own involvement was small." It reiterated that, even under a "lead agency" arrangement, each agency involved must reach independent environmental conclusions "by accepting, rejecting, or modifying the analysis of the lead agency" and then taking whatever action is appropriately called for by them in light of that judgment. 566 F.2d at 240-41.

Our reading of NEPA's requirements accords with the early "lead agency agreements" between the Commission and TVA. These were expressly construed by CEQ as mandating the Commission's "independently weighing the benefits and costs discussed in the final [TVA] statement and reaching an independent conclusion as to the appropriate licensing action, if any, in light of environmental considerations."[54] This hardly means that lead agency agreements serve no useful purpose. To the contrary, as the reported cases amply illustrate, they have demonstrated their utility in numbers of other instances where more than one Federal agency was involved in a project. Appropriately cast and implemented, such an agreement between TVA and this Commission could well avoid unnecessary duplication of effort, not only in the identification and in the analysis of the environmental effects attendant upon the

[54]See letter of October 9, 1973, from the General Counsel of CEQ to Mr. Muntzing, then AEC Director of Regulation (appended as Exhibit "B" to *TVA's Opening Brief*). The Commission decision in *Project Management Corp.* (Clinch River Breeder Reactor Plant), CLI-76-13, 4 NRC 67 (1976), is not to the contrary. That case involved the unique circumstance of Congress directing the Energy Research and Development Administration to develop a demonstration breeder reactor under license from the NRC. The Commission accepted the need for a demonstration "breeder" as a given, but held itself bound under NEPA to evaluate the environmental costs and benefits of ERDA's specific proposal—including whether another type of facility or a different plant site might be a preferable alternative. With far less Congressional authority behind its proposal, TVA would have the NRC conduct a much more restrictive NEPA review. To the extent that *Clinch River* bears at all on this case, it calls for rejection, not acceptance of TVA's position.

construction and operation of additional TVA nuclear facilities, but also in their mitigation. Whether TVA contemplates a further expansion of its nuclear generating capacity is unclear. If it does, however, there appears to be good reason why it and the staff should try their hands at drafting a new agreement in light of the recent judicial pronouncements clarifying NEPA jurisprudence in this area.

In closing, we note that TVA sought to frame the issues in terms of NRC attempts to "overrule" TVA's board of directors on questions of "need for power" and electric rates. There is no occasion for us to discuss those issues at length because there is no dispute about those matters in this case. It suffices to observe that we are unaware of any instance in which the Commission has ever invoked NEPA to regulate electric power rates,[55] and that our decisions reflect the Commission policy of "heavy reliance" on the judgment of those responsible for assuring adequate electric service in deciding whether power to be generated by new facilities is needed.[56]

In short, the actual areas of disagreement between the TVA and NRC staffs here are small ones; for the most part, the two have seen eye-to-eye on environmental matters. The license conditions in question essentially direct TVA to (1) monitor its Phipps Bend construction operations, (2) be alert to the possibility of unforeseen circumstances arising that could affect the environment unfavorably, and (3) if such do arise, consult with NRC in devising appropriate solutions. See fn. 14, *supra*. As we indicated at the outset, TVA does not challenge their substantive requirements. *Ibid.* We believe that the officials involved in constructing this project will not be unduly hampered in their tasks with them continuing in force.

III

In addition to our consideration of the jurisdictional issue raised by TVA, we have reviewed on our own initiative the remainder of the two

[55]More particularly, there is nothing in the record to suggest that the staff was proposing the imposition of a condition upon the Phipps Bend permits which might have a bearing upon what TVA might charge for its electricity. Although NRC adjudicatory boards have the authority to grant declaratory relief to remove uncertainty or to avoid delay (*Kansas Gas & Electric Company* (Wolf Creek Nuclear Generating Station, Unit No. 1), CLI-77-1, 5 NRC 1 (1977)), there is no occasion to invoke that authority to resolve purely hypothetical questions which appear unlikely to arise in a concrete setting. Put another way, there will be time enough to address the matter when and if TVA is ever confronted with an actual endeavor to have this Commission exercise dominion over its rates.

[56]*Rochester Gas and Electric Corp.* (Sterling, Unit No. 1), ALAB-502, 8 NRC 383 (October 19, 1978), and cases there cited.

Licensing Board decisions before us. See fn. 5, *supra*. Leaving aside the question of the environmental effects of radon emissions attributable to mining and milling of uranium, we have encountered no errors warranting corrective action. Final disposition of the radon issue must, however, abide the event of the completion of the procedures for dealing with that issue which are outlined in ALAB-480, 7 NRC 796 (1978).

The referred ruling (LBP-77-14, 5 NRC 494) is *affirmed*. Also *affirmed* on all issues but radon are LBP-77-60, 6 NRC 647, and LBP-78-1, 7 NRC 73. Jurisdiction over the radon issue is *retained*.

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

Cite as 8 NRC 551 (1978) ALAB-507

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Richard S. Salzman

In the Matter of Docket No. STN 50-485

ROCHESTER GAS AND ELECTRIC CORPORATION, et al.

(Sterling Power Project Nuclear Unit No. 1) November 17, 1978

The Appeal Board denies intervenor's motion to enjoin applicants from purchasing uranium fuel for the subject facility.

NRC: JURISDICTION

The Nuclear Regulatory Commission has regulatory jurisdiction over the procurement of uranium fuel.

ATOMIC ENERGY ACT: MATERIALS LICENSES

The Commission has granted a general license to acquire *title* to nuclear fuel without first obtaining a specific license. A utility needs a specific license, *i.e.*, a materials license, to take *possession* of uranium fuel.

ATOMIC ENERGY ACT: MATERIALS LICENSES

Because persons may obtain title to and own uranium fuel without a specific license from the Commission, *a fortiori* they are free to contract for uranium fuel under a general license to receive title to and own special nuclear material, *i.e.*, uranium fuel. 10 CFR 70.20. However, before contractual ownership rights are reduced to actual possession, a specific "materials license" must be obtained.

RULES OF PRACTICE: STAY PENDING APPEAL

Where there has been no decision or order either permitting or prohibiting the applicants from contracting for uranium fuel, there is nothing for the Appeal Board to stay.

RULES OF PRACTICE: STAY PENDING APPEAL

Intervenor's request to bar the applicants from contracting for uranium fuel amounts to an application for an injunction. But the Appeal Board may not forbid what Commission regulations permit.

RULES OF PRACTICE: STAY PENDING APPEAL

Commission regulations place the burden on the movant to demonstrate, *inter alia*, that it will be irremedially harmed unless a stay is granted. 10 CFR 2.788(e).

RULES OF PRACTICE: STAY PENDING APPEAL

A party is not ordinarily granted a stay of an administrative order without an appropriate showing of irreparable injury.

TECHNICAL ISSUES DISCUSSED: Radon-222.

Mr. Lex K. Larson, Washington, D.C., for Rochester Gas and Electric Corporation, *et al.*, applicants.

Mr. Dirk S. Adams, Rochester, New York, for Ecology Action of Oswego, intervenor.

Mr. Stephen M. Sohinki for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

1. Introductory. Intervenor Ecology Action of Oswego moves, for the second time, to have us "stay" Rochester Gas and Electric Corporation and certain other public utilities "from contracting for the purchase of the uranium to be used at the proposed Sterling nuclear power plant." The motion arises in the following context.

A consortium of public utilities led by Rochester Gas and Electric has sought NRC permission to build a large, nuclear-powered electric generating facility at "Sterling," a site in upstate New York near Oswego. Ecology Action intervened in the construction permit proceeding before the Licensing Board to oppose the plant. That Board, however, approved the Sterling application and authorized issuance of the necessary licenses. LBP-77-53, 6 NRC 350 (August 26, 1977). After noting an appeal from that decision, Ecology Action filed its first "stay motion" on April 28, 1978, asking us, *inter alia*, to bar applicants' purchase of uranium fuel for the Sterling plant pending our disposition of the appeal. On May 5, 1978, we denied that request because intervenor had not demonstrated that the relief was warranted.[1] The Commission declined to review our May 5th order, thereby rendering it the agency's final action.[2]

On August 18, 1978, Ecology Action petitioned the Court of Appeals for the District of Columbia Circuit for review of the May 5th order.[3] The motion now before us—intervenor's second stay motion, dated October 18, 1978—is for an order barring applicants from purchasing uranium fuel for Sterling pending completion of judicial review of our refusal on May 5th to grant similar relief.

(In the interim, we completed appellate review of the Sterling application and affirmed the Licensing Board's decision on all points except two. ALAB-502, 8 NRC 383 (October 19, 1978). For reasons there explained, disposition of the remaining points must abide the outcome of future proceedings. Ecology Action's petition for review of ALAB-502, filed on November 6, 1978, is pending before the Commission.)

2. NRC jurisdiction over nuclear fuel acquisition.

(a) Intervenor's motion for relief is met at the outset by challenges to our authority to "stay" a utility from contracting for nuclear fuel.[4] Applicants tell us flatly:

> No statute gives NRC jurisdiction to grant the requested relief. The Atomic Energy Act of 1954 authorizes the NRC to license the construction and operation of nuclear facilities, but this does not extend to private uranium contracting activities. Authorization is not and never has

[1]Intervenor also asked us to suspend the Sterling construction permit. We declined to do so on applicants' express representation that work at Sterling would not commence for a considerable time. We did order no work undertaken at Sterling without 10 days' prior written notice to all parties. Applicants have represented most recently that work at Sterling will not start before the fall of 1980. See ALAB-502, 8 NRC 383 (October 19, 1978).

[2]See 10 CFR 2.785(c) and 2.786(b).

[3]Case No. 78-1855.

[4]In denying intervenor's first stay motion on May 5th, we did not find it necessary to reach (and did not pass on) the question of our jurisdiction to grant it.

been required from the NRC to undertake uranium procurement.[5]

They further assert that the National Environmental Policy Act of 1969 (NEPA) does not broaden this agency's substantive regulatory jurisdiction and that intervenor's motion should therefore be denied on jurisdictional grounds alone.[6]

The short answer to applicants' arguments is that they are mistaken. "The production, processing, and sale of uranium and uranium ore are controlled by the Atomic Energy Act of 1954, as amended. After removal from its place in nature, uranium ore may be disposed of only to a licensee of the [Nuclear Regulatory] Commission . . . . " *Homestake Mining Co.* v. *Mid-Continent Exploration Co.,* 282 F.2d 787, 791 (10th Cir. 1960).[7] More specifically, natural uranium and ores bearing it in sufficient concentration constitute "source material" and, when enriched for fabrication into fuel for nuclear power plants, become "special nuclear material" within the meaning of the Atomic Energy Act of 1954.[8] Both are expressly made subject to Commission regulation by the 1954 Act;[9] and (with limited exceptions not relevant here) "no person may transfer or receive in interstate commerce, transfer, deliver, acquire, own, possess, receive possession of or title to, or import into or export from the United States" any special nuclear material or source material unless authorized by a license from this Commission.[10] The applicants' objection to our granting the relief sought by intervenor on the ground that NRC lacks jurisdiction over the procurement of uranium is thus not well taken.

(b) The staff's objection rests on an entirely different footing. It contends not that the Commission lacks jurisdiction over fuel contracting activities but rather that this authority has been exercised to grant general licenses to acquire title to nuclear fuel without first obtaining a specific NRC license. The staff calls attention to Section 70.20 of the Commission regulations, which provides in pertinent part that: "A general license is hereby issued to receive title to and own special nuclear material without regard to quantity."[11] The staff reasons that, if persons may obtain title to

[5]*Applicants Brief* at 1-2 (footnote omitted).

[6]*Id.* at 304, citing, *inter alia, Gage* v. *AEC,* 479 F.2d 1214 (D.C. Cir. 1973).

[7]Citations omitted. The Atomic Energy Commission's jurisdiction in this area was transferred to the NRC on January 19, 1975, by the Energy Reorganization Act of 1974, 42 U.S.C. 5841(f). As the quoted observation indicates, the Commission's authority over uranium ore and other "source material" attaches only "*after* removal from its place of deposit in nature," and not when the ore is mined. 42 U.S.C. 2092 (emphasis supplied).

[8]See 42 U.S.C. 2014(z) and (aa), 2071, and 2091.

[9]42 U.S.C. 2073 and 2093.

[10]42 U.S.C. 2077 and 2092.

[11]10 CFR 70.20. Such "general licenses" are authorized by the Atomic Energy Act. See 42 U.S.C. 2077.

and own uranium fuel without a specific license from the Commission, *a fortiori* they are free to contract for that fuel as well—and this Board may not "stay" activities the Commission's regulations authorize. We agree.

The NRC rules in this area do not abrogate effective supervision of nuclear fuel. The Commission has merely disengaged itself from concern with paper transactions which—though of legal significance—do not directly affect the physical control, location, or use of special nuclear material. The regulation cited by the staff (10 CFR 70.20) goes on to provide that:

> A general licensee under this section is not authorized to acquire, deliver, receive, possess, use, transfer, import, or export special nuclear material, except as authorized in a specific license.

Put another way, the licensing regime which the Commission has administered under the Atomic Energy Act for many years is geared to insuring Commission scrutiny of circumstances or conditions involving a possibility of danger to the public health and safety. Contracting for legal title to fuel is simply not one of them. When, as and if the applicants seek to reduce their contractual ownership rights to actual possession—for example, by taking delivery of the uranium fuel (for use at Sterling or elsewhere)—then they must obtain a specific "materials license" from the Commission.[12] At that time they will have to demonstrate that they meet the governing Commission requirements[13] and satisfy the Commission that granting them the materials license would not "be inimical to the common defense and security" or "constitute an unreasonable risk to the health and safety of the public."[14]

This leads directly to the result we are constrained to reach. Nuclear power plant licensing proceedings are conducted in two discrete stages: first for permission to construct the plant and then for a license to operate the completed facility. A construction permit does not ripen automatically into an operating license. *Power Reactor Co.* v. *Electricians,* 367 U.S. 396 (1961); *Vermont Yankee Power Corp.* v. *NRDC,* 435 U.S. 519 (1978). Because construction of these complex power stations takes several years, operating license proceedings commence well after a construction permit has been awarded. And an application for a materials license—the specific license needed to take possession of uranium fuel—is normally considered in conjunction with the proceeding to license operation of the completed plant. It is ordinarily only at that late stage that the utility needs to take possession of the fuel to load the reactors.[15]

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[12]See, *e.g., Pacific Gas and Electric Company* (Diablo Canyon Plant, Units 1 and 2), ALAB-334, 3 NRC 809, 811 (1976).

[13]See generally 10 CFR Part 70.

[14]10 CFR 70.31(d).

[15]See *Diablo Canyon, supra,* fn. 12.

The case before us concerns an application for a construction permit, the earlier of the two licensing stages. Not surprisingly, therefore, applicants made no request for a specific license to use, transfer, or store nuclear fuel; the Licensing Board did not consider the matter; and it did not come before us on appeal. The staff is accordingly correct in its assertion that intervenor's "motion should be denied because there is nothing for this board to stay; there has been no decision or order either permitting or prohibiting [the applicants from contracting for] uranium."[16]

In short, intervenor's request to bar the applicants from contracting for uranium fuel amounts to an application for an injunction. But we may not forbid what Commission regulations permit. There are channels open whereby those regulations may be challenged;[17] intervenor, however, has not pursued them. The motion must therefore be denied.

3. A stay is not justified in any event. Even were we to assume for argument's sake that we could "stay" the applicants from contracting for uranium fuel, that relief is unwarranted. Commission regulations place the burden on one moving for a stay to demonstrate, *inter alia,* that it will be irremediably harmed unless that relief is forthcoming. 10 CFR 2.788(e). The regulations reflect "the established rule that a party is not ordinarily granted a stay of an administrative order without an appropriate showing of irreparable injury. See, *e.g., Virginia Petroleum Jobbers Ass'n* v. *FPC,* 259 F.2d 921, 925." *Permian Basin Area Rate Cases,* 390 U.S. 747, 773 (1968).[18]

In the initial motion for a stay, intervenor's claim of injury rested on danger perceived from the seepage of radioactive radon gases from tailings remaining after uranium has been mined and milled. In denying that motion, our order of May 5th pointed out to intervenor that it had "proffered no evidence to suggest that radon is generated in quantities sufficient to have possibly serious health or environmental consequences." Shortly thereafter, another Licensing Board, having held an evidentiary hearing on this precise question, determined that radon releases associated with the mining and milling of fuel for one nuclear facility are so small compared to naturally occurring releases of that element "as to be completely undetectable" against the normal background radiation and therefore "insignificant" in striking the cost-benefit balance for the plant. *Duke Power Com-*

[16]*Staff Brief* at 1-2.

[17]See 10 CFR 2.802, 2.803, and 2.758; *Public Service Co.* v. *NRC,* 582 F.2d 77, 83 (1st Cir. 1978); *Union of Concerned Scientists* v. *AEC,* 499 F.2d 1069, 1080-94 (D.C. Cir. 1974); *Metropolitan Edison Company* (Three Mile Island Station, Unit No. 2), ALAB-456, 7 NRC 63, 67 (1978), and cases there cited.

[18]The Commission's rules are modeled on the *Virginia Petroleum Jobbers* decision. See, *Public Service Company of Oklahoma* (Black Fox Station, Units 1 and 2), ALAB-505, 8 NRC 527 (November 2, 1978).

pany (Perkins Nuclear Station, Units 1, 2, and 3), LBP-78-25, 8 NRC 87, 100 (July 14, 1978) (appeal pending).

Given the requisites for a stay set out in the rules, our express observations on May 5th, and the *Perkins* decision,[19] we would have expected intervenor, in renewing its stay motion, to point to some concrete injury to itself (or its members) that we had overlooked. This is not the case, however. Intervenor's second stay motion rests solely on the theory that it will be deprived of its day in court unless we grant that relief because applicants may purchase the fuel needed for Sterling before intervenor can be heard and thereby moot the appeal. Apart from the fact that this is a "bootstrap" argument—it boils down to the assertion that our determination that a stay pending appeal is not warranted cannot be tested unless we grant a stay pending appeal[20]—it will not withstand analysis.

This is not a proceeding to license a uranium mining, milling, or fuel fabricating establishment (the closest of which is a thousand miles from intervenor). What is before us is an application to construct a nuclear power plant in upstate New York. The relevance of radon is confined to the National Environmental Policy Act issue whether its adverse effects fairly attributable to this plant (together with all the other environmental costs of building it) outweigh the plant's benefits. That question is still open before us and intervenor has been assured of and will be afforded opportunity to be heard on it.[21] We have not approved construction of the Sterling facility, and—as we noted earlier—applicants have represented that they will not commence work on it for some time. Moreover, they are under express instructions from us not to do so without giving all concerned advance notice. In these circumstances, no matter what quantity of uranium fuel applicants may contract for, we can perceive no possibility that intervenor will be deprived of the opportunity to challenge the correctness of the determination we have yet to make about the effect of radon emissions on the plant's cost-benefit balance—assuming that, when our decision is rendered, intervenor disagrees with our conclusions.

Intervenor's reliance on *Kepford* v. *NRC*, ___ F.2d ___, 2 CCH Nuc. Reg. Rep ¶20,075 (D.C. Cir. 1978), as authority to the contrary is not well placed. Indeed, that case supports the result we reach here. *Kepford* concerned a challenge to a Commission license to operate a nuclear power plant

[19]We cite *Perkins* solely for the reason stated and not for the correctness of its conclusions. Review of that case is pending before us and is not complete.

[20]We note that intervenor is not simply asking for time to go to the court of appeals for relief. (Its petition for judicial review is dated August 18, 1978, and presumably filed 2 months ago.) Rather, it seeks a stay until the court hears and decides the case on the merits, which intervenor represents will take 9 months at a minimum.

[21]See ALAB-480, 7 NRC 796 (May 30, 1978).

in Pennsylvania pending completion of necessary further proceedings on the environmental effects of radon releases from uranium tailings, essentially the issue involved in this case. In denying a stay in *Kepford,* the court of appeals—consistent with our analysis here—described the radon problem as "a merits issue which may be explored on appellate review within the agency or in the courts." *Id.* at p. 16, 427. It was thus made clear that the purchase of uranium fuel for the plant would not deprive those opposing the facility of their day in court. The court did not refuse a stay simply because the fuel had been acquired—as intervenor here asserts. Rather, relief was denied because movant in *Kepford* was unable to show any irreparable injury from the uranium tailings which, as the court correctly observed, were situated "not at the nuclear power plant site but at the mills operated at various unspecified sites in the Western United States." *Ibid.*[22]

Finally, our conclusion that no stay is in order is buttressed by a recent Congressional enactment attacking the radon emission problem at its source. The Uranium Mill Tailings Radiation Control Act of 1978, Pub. Law No. 95-604, 92 Stat. 3021 (November 8, 1978), apportions responsibilities in this area not only to the Commission, but to the Secretary of Energy, the Environmental Protection Agency, and several States as well. Without attempting to detail the complexities of that lengthy enactment, it suffices to state that Congress did not deem it appropriate to stop the mining and milling of uranium pending completion of the remedial steps there called for.

Motion for stay *denied.*
It is so ORDERED.

FOR THE APPEAL BOARD

Romayne M. Skrutski
Secretary to the Appeal Board

[22]Senior Circuit Judge Fahy dissented in *Kepford* on the ground that the agency's failure to consider adequately the radon question meant that its impact statement was incomplete and, under NEPA, a court "may" enjoin major Federal action in these circumstances without a showing of irreparable injury, citing *Jones* v. *D.C. Redevelopment Land Agency,* 499 F.2d 502 (D.C. Cir. 1974). We are not prepared to take issue with the views of one of the most distinguished sitting Federal judges on the powers of the court of appeals. With all deference, however, we suggest that neither we nor the courts are *compelled* to disregard the *Virginia Petroleum Jobbers* standards in passing on stay applications where NEPA is involved. Recent cases indicate that, where departure from that Act's requirements are not egregious, the traditional tests for a stay continue to obtain. See, *e.g., Fund for Animals* v. *Frizzell,* 530 F.2d 982, 986 (D.C. Cir. 1975); and *Environmental Defense Fund* v. *Froehlke,* 477 F.2d 1033 (D.C. Cir. 1974). In our judgment, the circumstances of this case do not warrant dispensing with the usual requirements for entitlement to injunctive relief.

Cite as 8 NRC 559 (1978) ALAB-508

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Richard S. Salzman, Chairman
Dr. W. Reed Johnson
Jerome E. Sharfman

In the Matter of

Docket Nos. STN 50-556
STN 50-557

PUBLIC SERVICE COMPANY
OF OKLAHOMA
ASSOCIATED ELECTRIC
COOPERATIVE, INC.
WESTERN FARMERS ELECTRIC
COOPERATIVE, INC.

(Black Fox Station, Units 1 and 2)

November 24, 1978

The Appeal Board denies intervenors' motion to reconsider their request for a stay. The Board also denies applicants' motion to reconsider and withdraw the Board's earlier criticism of counsel.

RULES OF PRACTICE: STAY PENDING APPEAL

Response to motions for reconsideration need not be filed unless they are called for by the Appeal Board. *Maine Yankee Atomic Power Company* (Maine Yankee Station), ALAB-166, 6 AEC 1148, 1150 (1973).

RULES OF PRACTICE: STAY PENDING APPEAL

No single one of the four *Virginia Petroleum Jobbers* factors is of itself necessarily dispositive; rather, the strength or weakness of the showing by the movant on a particular factor influences principally how strong his showing on the other factor must be in order to justify the sought relief. *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-338, 4 NRC 10, 14 (1976).

RULES OF PRACTICE: STAY PENDING APPEAL

As a general proposition, denial of reconsideration by a licensing board does not mean that it must also deny a stay. A stay may be granted on equitable grounds alone.

Messrs. Michael I. Miller and **Paul M. Murphy**, Chicago, Illinois, and **Joseph L. Gallo**, Washington, D.C., for Public Service Company of Oklahoma, *et al.*, applicants.

Mr. Andrew T. Dalton, Jr., Tulsa, Oklahoma, for Ilene H. Younghein, *et al.*, intervenors.

MEMORANDUM AND ORDER

In ALAB-505,[1] we denied intervenors' October 16th motion to stay the effectiveness of a Licensing Board decision authorizing a "limited work authorization" (LWA) for the Black Fox nuclear plant.[2] The intervenors and the applicants have moved us to reconsider discrete aspects of our decision. We turn first to intervenors' concerns.[3]

I

Our denial of a stay was predicated on intervenors' failure to address three out of the four factors that Commission regulations require us to consider in deciding whether to grant that relief. See 10 CFR 2.788(e).[4] Intervenors ask us to reconsider, contending that they were not obliged to discuss the other factors because their claim on the merits is patently cor-

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[1]8 NRC 527 (November 2, 1978).

[2]LBP-78-26, 8 NRC 102 (July 24, 1978).

[3]The staff responded to neither motion for reconsideration and the applicants did not respond to intervenors' motion. Under our practice, such responses are not expected unless we call for them. *Maine Yankee Atomic Power Company* (Maine Yankee Station), ALAB-166, 6 AEC 1148, 1150, n. 7 (1973).

[4]Those factors 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.

rect. They assure us that the issuance of an LWA in the absence of either a State certification under §401(a)(1) of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1341(a)(1), or a formal waiver of that certification by the State concerned or the Environmental Protection Agency, was an illegal act that in and of itself warrants a stay.[5]

Intervenors confuse the merits of their appeal with the showing needed to obtain a stay. We pointed out in *Seabrook,*[6] referring to the considerations bearing on the right to such interim relief now codified in 10 CFR 2.788, that, "[i]n our view, no single one of the four *Virginia Petroleum Jobbers* factors is of itself necessarily dispositive; rather, the strength or weakness of the showing by the movant on a particular factor influences principally how strong his showing on the other factors must be in order to justify the sought relief." Had intervenors made a very strong showing on the one factor they discussed—the likelihood of their success on the merits—a correspondingly lesser showing might have sufficed on the others. To prevail on that factor alone, however, they had to make "an overwhelming showing of likelihood of success on the merits . . . ."[7]

In this case, the Board below made detailed findings in support of its conclusion that certification had in fact been waived. See 8 NRC at 121-23. For us to decide whether the Board erred in this regard requires an extended review of the evidence of record and a careful analysis of the governing law. It would be inappropriate for us to undertake that task now, without the benefit of a full briefing on the merits from the other side and, in all likelihood, oral argument as well. In these circumstances, intervenors' failure even to attempt to demonstrate that the other three factors militate strongly in favor of granting the relief they seek leaves us no choice but to deny once again their request for a stay.

II

For their part, the applicants understandably do not complain of the result reached in ALAB-505. Rather, their request for reconsideration is directed exclusively to the criticism leveled in the second portion of that opin-

[5]In intervenors' words: "When a statute specifically forbids an act, questions of harm, irreparable injury, and public interest have already been decided by the Congress. In such instances, it is necessary to demonstrate only that the forbidden act has occurred and to request relief." Intervenors cite no authority for this proposition.

[6]*Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-338, 4 NRC 10, 14 (1976) (footnote omitted).

[7]*Florida Power & Light Company* (St. Lucie Plant, Unit No. 2), ALAB-404, 5 NRC 1185, 1189 (1977). To put it another way, had we been able to say that intervenors' "no waiver" conclusion was ineluctable, we could have treated their motion as one for summary reversal.

ion against the papers they filed in opposition to the stay motion. Applicants insist that the criticism was unwarranted and therefore should now be withdrawn.

More specifically, at issue is the propriety of the failure of applicants' counsel to have mentioned in their brief that, on September 5th, intervenors' counsel had written the Licensing Board specifically requesting that it revoke the limited work authorization because it was issued in violation of the certification requirements of the Federal Water Pollution Control Act. The letter had gone on to give notice that, unless that request were honored, intervenors intended to seek a writ of mandamus in a Federal district court compelling the Board to take that action.

In ALAB-505, we stated that counsel for the applicants had a duty at least to acknowledge the existence of the September 5th letter, given their argument to us that the stay motion was not made until 80 days after the issuance of the July 24th partial initial decision (LBP-78-26, *supra*) and that the intervenors had not heeded our admonition in earlier cases that stay relief should be first sought from the Licensing Board. We recognized that the letter did not explicitly request a stay and, further, that it had been treated (and denied on September 29) by the Licensing Board as in effect a motion for reconsideration of the July 24th order. Nonetheless, we expressed the view that

> what was being sought (*i.e.*, a lifting of the limited work authorization) was in essence the same relief which a formal stay motion would have requested. Further, as should have been perfectly obvious to the applicants, given the Licensing Board's September 29 order any further attempt to obtain a lifting of the limited work authorization by that Board would have been futile. Thus, even if the September 5 letter were not regarded the equivalent of a stay motion, the applicants still could not have fairly argued (without reference to the letter) that the intervenors should have formally moved for a stay from the Licensing Board before filing their motion with us.

ALAB-505, *supra,* 8 NRC at 531-532, n. 14. We went on to criticize counsel for applicants for not fulfilling their obligation of candor when they failed to call our attention to the September 5th letter and its treatment by the Licensing Board. *Ibid.*

Applicants' counsel tell us that we were in error about this and that, contrary to our further suggestion,[8] they were justified in making the arguments they advanced without any reference to the September 5th letter. That is because, in their view, the letter was not a motion at all but merely a

[8] 8 NRC at 532, n. 16.

notice of intent to institute a legal proceeding against the Licensing Board if it did not change its decision. They claim that this interpretation is supported by (1) the failure of intervenors to have served the letter upon applicants' counsel, (2) the absence of any discussion in the letter of the four factors governing stay relief,[9] and (3) two telephone conversations which they say they had with intervenors' counsel.

None of these factors proves their point. The lack of service implies nothing with regard to the purpose of the letter; no matter what its objective may have been, intervenors' counsel was under a plain duty to serve it on all other parties to the proceeding. 10 CFR 2.701, 2.780. Similarly, little weight can be attached to intervenors' failure to address the four stay factors in the letter, in light of the fact that the intervenors' motion to us—expressly seeking a stay—was equally deficient in that respect.

The third ground urged on us by counsel for the applicants is based upon an affidavit appended to their most recent filing. In it, one of them states that, in a telephone conversation following his receipt of the September 5th letter, he was advised by intervenors' counsel that the letter was not intended to be a request for affirmative relief but only the statutory notice required prior to the institution of a lawsuit against the Licensing Board under the Federal Water Pollution Control Act. The affidavit goes on to aver that this advice was repeated in a second telephone conversation which took place subsequent to the issuance of ALAB-505.

The matters alleged in the affidavit are irrelevant to the issue here. Applicants' attorneys admit (affidavit, paragraph 4) that they filed a pleading in response to the September 5th letter.[10] Thus, they treated it as a motion. It is beyond dispute that the Licensing Board also treated the letter as a motion and denied it. Applicants' counsel should therefore have disclosed it to us, so that we could evaluate its nature for ourselves. Their failure to do so left open the possibility that we might be misled into thinking that relief from the partial initial decision had not been sought before the Licensing Board, particularly as applicants urged that intervenors' failure to seek relief from that Board was an important factor militating against the grant

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[9]See n. 4, *supra*.

[10]Though they say that they did so "out of an abundance of caution," they showed no similar abundance of caution in telling us that their review of the pleadings filed in this case uncovered nothing to support the allegation in intervenors' motion papers that the Licensing Board had refused to grant the relief requested in the stay motion. See pp. 564-565, *infra*. Their treatment of the letter as a motion at that earlier time renders suspect their thesis that they could not possibly have regarded it as one when they filed their brief in opposition to the stay motion before us. If it was subject to being interpreted as a motion by those not privy to their first phone call to intervenors' attorneys, they should have at least mentioned it, so that we would not be mislead by the argument they were making.

of a stay. Of course, had applicants' counsel mentioned the letter, they would have been free to explain it or characterize it in any way they liked. Our criticism was based on their failure to mention it at all.

Counsel for applicants now argue that our "judgment that the September 5th letter could be otherwise construed as a motion to stay is clearly a doubtful one."[11] But we never construed it as a motion for a stay; we merely said that it sought "in essence the same relief which a formal stay motion would have requested."[12] On reflection, we realize that even that is not quite correct. A stay motion would only have sought suspension of the limited work authorization pending appeal, whereas the September 5th letter demanded its revocation. It is true that a licensing board's decision to grant reconsideration might require it to admit that it made a mistake, whereas a stay may be granted on equitable grounds.[13] Therefore, as a general proposition, denial of reconsideration by a licensing board does not dictate its denial of a stay. However, in this case, intervenors urged the same single ground in support of the stay motion made to us (legal error in the partial initial decision) that they had urged in their motion for reconsideration below. Therefore, we believe that we were correct in concluding in ALAB-505[14] that application for a stay from the Licensing Board in the circumstances of this case would have been futile. Thus, applicants' argument (made in opposition to the stay motion) that the motion should have been first addressed to the Licensing Board had no merit. Of course, we would not have been able to reach that conclusion had we not become aware on our own of the September 5th letter, the existence of which applicants' counsel chose not to mention to us.

Finally, nowhere in their motion for reconsideration do applicants' counsel reply to the following point which we made in footnote 16 of ALAB-505:[15]

> Indeed, in this instance there might well be more involved than simply a failure to mention relevant facts. In their stay motion (at p. 2), the intervenors stated, without elaboration, that the Licensing Board had refused "to grant the relief requested." The applicants' response to this assertion (at p. 3) was that the intervenors "are simply wrong. Intervenors provide no citation in support of their assertion and, based on [their] review of the pleadings filed in this case, Applicants can find none." Even giving the applicants the benefit of all doubt with respect

[11]Motion for reconsideration, p. 4.
[12]ALAB-505, *supra*, 8 NRC at 531-532, n. 14.
[13]See 10 CFR 2.788(e).
[14]8 NRC at 532, n. 14.
[15]8 NRC at 532.

to the import of the intervenors' September 5 letter, we nonetheless find that statement misleading in the extreme.

Even though the relief sought in the September 5th letter was not precisely that sought in the stay motion, it was similar enough so that counsel could not say with complete candor that he had searched all the pleadings filed in the case and could not find any support for intervenors' claim that the Licensing Board had refused them the relief requested. The appropriate course would have been for counsel to mention the September 5th letter and its disposition by the Licensing Board, and then to argue about its significance.[16]

The motions for reconsideration are *denied.*
It is so ORDERED.

FOR THE APPEAL BOARD

Romayne M. Skrutski
Secretary to the Appeal Board

Mr. Salzman, concurring:

I join in Part I of the Board's opinion and, for the reasons which follow, concur in Part II.

My assignment to this case occurred after ALAB-505 was rendered and I did not participate in that decision. I concur in my colleagues' judgment, however, that the motion to reconsider and withdraw the criticism directed at applicants' counsel should be denied. Even if intervenors did not explicitly ask the Licensing Board to "stay" the effectiveness of the LWA, counsel was cognizant of their letter to that Board and of its treatment by the Board

[16]Applicants now advise us that, although (as reflected by the listing of counsel in ALAB-505) only one of their attorneys signed the opposition to the stay motion, in actuality three were involved directly or indirectly in its preparation. Although we see no reason to add the names of the other two to the ALAB-505 listing, we note that assertion here. All three attorneys signed the motion for reconsideration now at bar and each is accordingly included in the listing of counsel in this opinion.

as a motion for relief that, if granted, would have obviated the need for a stay. In these circumstances, it was less than candid—if not potentially misleading—to oppose intervenors' request to this Board for a stay with the unqualified representation that they had not sought relief below. We ought to be able to rely on counsel's representations about what transpired in the course of the proceeding. We could not do so here.

Cite as 8 NRC 567 (1978) LBP-78-36

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Elizabeth S. Bowers, Chairman
Dr. William E. Martin
Mr. Glenn O. Bright

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)

November 3, 1978

On reconsideration (as directed by the Appeal Board in ALAB-504 (October 27, 1978)), the Licensing Board denies intervenors' petition to establish David Comey as a security plan expert witness.

RULES OF PRACTICE: EXPERT WITNESS

The party sponsoring a proposed expert witness cannot meet its burden of showing the intended witness' expertise without evidence of actual practical knowledge, or its equivalent, of the areas in question.

RULES OF PRACTICE: EXPERT WITNESSES

In general, the qualifications of an expert witness are established through a showing of either academic training or relevant experience, or some combination of the two.

RULES OF PRACTICE: EXPERT WITNESSES

An individual whose academic training bears no particular relationship to the matters as to which he or she has been proposed as an expert witness cannot be qualified as an expert witness on the basis of academic training alone.

RULES OF PRACTICE: EXPERT WITNESSES

One board's acceptance of an individual as an expert witness does not necessarily mean that a subsequent board will qualify that person as such.

RULES OF PRACTICE: EXPERT WITNESSES

An individual's participation on a Congressional panel and testimony before NRC officials will not assist in qualifying him or her under applicable guidelines as an expert witness in a particular area without some indication of the reasons for such participation/appearance and of the subjects involved.

RECONSIDERATION OF THE BOARD'S ORDER OF SEPTEMBER 5, 1978

INTRODUCTION

On September 5, 1978, this Licensing Board issued an order which denied Intervenors' (San Luis Obispo Mothers for Peace) petition to qualify Mr. David Comey as a security plan expert witness. The order recited the positions of Intervenors, Applicant, and the NRC Staff. On September 22 and October 6, 1978, the Intervenors petitioned the Atomic Safety and Licensing Appeal Board to grant direct certification in this matter and to issue an immediate order that Mr. Comey is qualified as an expert witness for discovery purposes. On October 27, 1978, the Appeal Board, in ALAB-504 (8 NRC 406), determined that the petition for directed certification is granted; this Board's order of September 5, 1978, is vacated. The order remanded the matter to this Board for prompt reconsideration and a full explication of the reasons underlying the result upon such reconsideration.[1]

GENERAL CONSIDERATIONS

The Board has before it the following documents: Intervenors' petition of May 23, 1978; the Applicant's and the Staff's responses of June 5, 1978; Mr. Comey's deposition of July 5, 1978; the Staff's response of August 14, 1978; Intervenors' petition for Immediate Order and Response to NRC on August 25, 1978; and Applicant's response to the original petition following deposition of August 28, 1978. The Board has also reviewed the Appeal

[1] *Pacific Gas and Electric Company* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-504, 8 NRC 406.

Board Memorandum and Order in ALAB-410 which was issued on June 9, 1977.[2] We perceive the pertinent part of this decision concerning the criteria to be applied to determine who is an expert witness to be in paragraph (3) on pp. 1404, 1405, as follows:

> (3) A security plan need not be revealed to a witness who lacks relevant expertise for evaluating it. Access to the plan or portions thereof should be given only to witnesses who have been shown to possess the technical competence necessary to evaluate the portions of the plan which they may be shown. Any other course would contravene the requirement that access be afforded only to "persons properly and directly concerned" (10 CFR 2.790(b)(6)). See also Federal Rules of Evidence, Rule 702.
>
> In the latter connection, it is noteworthy that when an expert is challenged (as on *voir dire* examination), the party sponsoring the witness has the burden of demonstrating his expertise. As Wigmore has pointed out, it is "universally conceded" that the "*possession of the required qualifications* by a particular person offered as a witness, *must be expressly shown by the party offering him.*" 2 Wigmore, *Evidence*, §560, at pp. 640-41 (3d Ed. 1940) [emphasis in original].

The key words here are "technical competence" and "the party sponsoring the witness has the burden of demonstrating his expertise." Webster defines "technical" as "having special, usually practical knowledge, especially of a mechanical or scientific subject." We believe that "technical competence" to evaluate the components of a security plan ideally requires practical knowledge flowing from working with the assembly of the "nuts and bolts," etc., of the various components of the security system, at least to the extent of being able to design an overall system. It does not necessarily mean the raw manual labor involved, but an intimate, on-the-spot knowledge of the fabrication and assembly of each component. We recognize that the Board must make a subjective determination here, but, noting the fact that the burden is on the party sponsoring the candidate, we believe that the burden will not have been met unless there exists evidence of actual practical knowledge or its equivalent.

We are also aware that if we recognize a candidate as technically qualified, before discovery can proceed, we must also be assured that the person has signed a proper protective order and will honor it. This could demand extreme care, as was illustrated prior to our *in camera* prehearing conference. Members of the Mothers for Peace excused themselves from the

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[2]*Pacific Gas and Electric Company* (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-410, 5 NRC 1398 (1977).

hearing room before we commenced, saying that they were concerned that if they had actual knowledge of the security plan or if potential saboteurs believed they did, they feared for the safety of their homes and their persons. Concern about security of the plant and the community also prompted the Criminal Justice Administrator's Association of San Luis Obispo County to pass a resolution on May 12, 1976, which received full service, asking the Board not to permit disclosure of the security plan due to their concern about "the risk of unauthorized release of the details of such plans." The Board of Supervisors, County of San Luis Obispo, passed a similar resolution on August 24, 1976, which also received full service. We recognize the concern of the individuals and the organizations, but it does not persuade us that a technically competent individual under a carefully drawn protective order will not fully honor the protective order. We believe it can be done or we would not have admitted the security plan contention.[3]

The Board does not believe, however, that these expressed concerns, along with those stated by, *inter alia*, the Advisory Committee on Reactor Safeguards and the Atomic Safety and Licensing Appeal Board in this case, mandate the Board to quantify, insofar as possible, the requirements for establishing expertise in this field. It is for this reason the Board has attempted to define "technical competence," above, and has adopted the suggested guidelines set forth in the comments by Drs. Johnson and Quarles which were attached to ALAB-410. This has led to what are perhaps somewhat more restrictive requirements for the demonstration of expertise than has existed previously.

SPECIFIC CONSIDERATION OF MR. DAVID COMEY

In general, the qualifications of an expert witness are established either through consideration of his academic training or of his relevant experience, or through some combination of these factors. The Board has considered these factors, and addresses them, *seriatim.*

Academic Background and Training

In its original petition to establish the qualifications of Mr. Comey, Intervenors attached a "Statement of Personal Qualifications of David Dinsmore Comey." In this statement, it was revealed that he ". . . is a graduate of Princeton University and worked for many years as an analyst of Soviet scientific research. He had two, 1-year Ford Foundation Fellow-

[3]We have no reason to believe that Mr. Comey would in any way violate the restrictions of a protective order, and this factor did not enter into the Board's original disqualification of Mr. Comey.

ships, and spent 2 years as an Assistant Professor at the Osteuropa Institut of the Universitat Freiburg/Schweiz. In 1963 he became a Research Associate at the Center for International Studies at Cornell University, and for 6 years he was the Director of the Research Institute on Soviet Science."

The Board feels that this bare statement sheds little light on Mr. Comey's academic qualifications. No mention is made of his undergraduate major, nor is any information presented to the Board on any relevance his studies might have to the question of nuclear plant security. In his deposition, he did state that he had audited 12 graduate courses in physics at Cornell University while he was on the staff of the University, but again, no particular relationship between this academic training and the various areas of expertise laid out by the Appeal Board guidelines was made (Tr. 5-6, 51-52). He also stated (Tr. 52-53) that he had taken courses in symbolic logic and social psychology, which he believed had some relevance to the security problem. He further stated that he had taken no formal course work which principally involved physical security (Tr. 6), and that he has no educational background in electronics (Tr. 60).

Based on the representations by the Intervenors and the proposed witness, the Board finds no *prima facie* qualification of Mr. Comey by virtue of academic training grounds alone has been established.

Relevant Experience

In Mr. Comey's statement of qualifications and subsequent deposition a number of items concerning relevant experience were presented for the Board's consideration. After thorough review of these submissions, the Board finds them less than compelling.

The Intervenors have relied heavily on Mr. Comey's "experience qualifications" from the fact that he participated in the Zion 1 and 2 hearings in 1973, and the Donald C. Cook 1 and 2 proceedings in 1974. Mr. Comey stated he was qualified in the Zion proceeding as a "2.733 expert," and was qualified by the Chairman of that Board to conduct cross-examination on security matters (Tr. 10). In the Cook case, he reviewed security plans and participated in negotiations of an *in camera* settlement agreement on security matters.

Careful review of the pertinent section of Mr. Comey's deposition (Tr. 6-14) yielded little in the way of hard facts. It is certainly true that Mr. Comey participated in these actions. In the case of Cook 1 and 2 it appears that no formal acceptance of Mr. Comey's status as an expert was made, but that he was allowed to participate inasmuch as the Applicant in the case did not object. The situation during the Zion 1 and 2 hearings was somewhat more complex. The Intervenors have not established whether Mr.

Comey actually underwent a *voir dire* examination on security matters.[4] The Board has no way of determining what standards were adopted by the Zion Board for Mr. Comey's qualifications as an expert. Testimony on these points was somewhat inhibited by the fact that it was an *in camera* session and by Mr. Comey's understandably less-than-eidetic memory of the proceeding plus the fact that he recognizes that he is still under a protective order in that proceeding.

In any event, the Board does not believe that Mr. Comey is automatically qualified as a security expert in this case simply because he might have been accepted as such by another Board in an earlier case. The instant Board would, of course, give appropriate weight to his previous qualifications. However, the Board believes that the situation today is not parallel to that which existed some 4 or 5 years ago. Until ALAB-410 was handed down the various Boards had few guidelines to follow, and little in the way of quantitative standards to apply. This Board believes that more definitive, perhaps stricter standards apply today. We, therefore, must evaluate Mr. Comey's qualifications in this case without presumption of his standing as an expert.

Other Experience

Mr. Comey's membership in the Nuclear Safeguards and Proliferation Panel of the Office of Technology Assessment of the U.S. Congress is indeed, perhaps, prestigious, as attested by the names of the other members, most of whom are readily recognized by the Board as being elder statesmen. What is not apparent is what they actually do. This Board is not concerned with general findings and recommendations which usually emanate from such a group.[5] We are concerned with the implementation of the philosophy, if you will, that is laid out in 10 CFR Part 73. The Board is unable to find, from the evidence presented by Intervenors, any specific relationship between our objective and the workings of the Panel.

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[4]The Staff was able to locate two *in camera* transcripts and neither shows *voir dire* on security (Tr. 11-13).

[5]The qualifications statement also included, as a matter to be considered by this Board, the fact that Mr. Comey ". . . has served, together with Willy Higinbotham and a staff of outside consultants from Brookhaven National Laboratory, the Defense Nuclear Agency, and the Rand Corporation, on a special review group on physical security and safeguards against terrorist attack on nuclear facilities." In Mr. Comey's deposition, Ex. 1, Testimony of Deponent on Sundesert Plant—Sabotage Consideration, p. 2, it continues (although not included in the qualifications statement), "The discussions and majority concensus of the January group were never incorporated in the Panel's final report." The Intervenors have not established the significance if any, of these statements. Discussions in the deposition (Tr. 20, 42-47) shed little further light.

It is further represented that Mr. Comey ". . . has testified on nuclear plant security matters in *in camera* sessions before the Advisory Committee on Reactor Safeguards, and has had numerous consultations on the subject of reactor sabotage with members of the Staff of the U.S. Atomic Energy Commission and the U.S. Nuclear Regulatory Commission, both at the regional office level and also at headquarters in Bethesda, Md."

This type of statement is of little value to the Board in its evaluation of Mr. Comey's expertise. Unless the Intervenors have apprised the Board of the reasons for appearance and/or participation, plus the subjects involved, it is impossible for the Board to relate possible expertise to the various specific components of the guidelines which the Board has set forth previously. An inspection of the deposition yields little further insight (Tr. 14-18).

The Board does agree that Mr. Comey has acceptable status in his general knowledge of reactor plant layout and operation of its various components. While he has not specifically inspected the Diablo Canyon installation (Tr. 41-42), his stated familiarity with some six pressurized water and four boiling water reactors satisfies the Board in this regard. This familiarity with reactor plant systems and layouts is, we must add, a necessary but not sufficient condition to qualify as an expert on security.

Although no specific claim was made in the statement of qualifications as to Mr. Comey's knowledge of plant detection and alarm mechanisms, this was gone into at some length in his deposition (Tr. 30-32, 61-65). The Board reviewed this testimony closely, and could only come to the conclusion that, based on the information before us, no depth of knowledge sufficient for expert qualification was revealed. Rather, the general tenor of Mr. Comey's statement appeared to the Board to be at the level we would expect of a well-informed layman.

SUMMARY

The Board has carefully reviewed the submissions which have been made relevant to the qualifications of Mr. Comey to act as an expert witness in the security field. We find that he is not qualified on the basis of his academic background alone. After considering Mr. Comey's relevant experience, on the basis of the submissions we have before us, the Board finds that Mr. Comey is a well-informed layman, with a broad general knowledge of the field, but does not have the requisite depth of knowledge in any specific aspect identified in ALAB-410 (and adopted by this Board) to

qualify as an expert. On reconsideration, the petition of the San Luis Obispo Mothers for Peace to establish qualifications of David Comey is therefore DENIED.

IT IS SO ORDERED.

FOR THE ATOMIC SAFETY AND LICENSING BOARD

Elizabeth S. Bowers, Chairman

Dated at Bethesda, Maryland,
this 3rd day of November 1978.

Cite as 8 NRC 575 (1978) LBP-78-37

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Charles Bechhoefer, Chairman
Dr. David R. Schink
Frederick J. Shon

In the Matter of **Docket No. 50-341**

DETROIT EDISON COMPANY, et al.

(Enrico Fermi Atomic Power Plant, Unit 2) **November 13, 1978**

The Licensing Board denies Applicants' motion for limited discovery against certain petitioners for intervention and also denies Applicants' motion to certify the discovery question to the Commission under the waiver provisions of 10 CFR 2.758. The Board orders a special prehearing conference. Finally, it denies a request that the notice of opportunity for hearing be republished.

RULES OF PRACTICE: DISCOVERY

Although a petitioner for intervention not yet a party to the proceeding has no right under 10 CFR 2.730(c) to respond to applicants' motions, treated as a third party the petitioner is entitled to respond to a request for discovery against it.

RULES OF PRACTICE: INTERVENTION

10 CFR 2.714(c) accords a party 10 days (staff 15 days) from the date of *filing* in which to respond to a petition for intervention. The 5 additional days provided by 10 CFR 2.710 for mailing may be added only when the time for filing a response runs from the date of service, not when it runs from the date of filing as in § 2.714(c).

RULES OF PRACTICE: DISCOVERY

The general authorization of discovery provided for in 10 CFR 2.740 appears to be directed toward matters of substance and does not seem to

extend to matters relating to a petitioner's standing to intervene.

RULES OF PRACTICE: DISCOVERY

There is no inherent or statutory right in NRC proceedings granting parties discovery. Any right to discovery is solely a product of applicable regulations.

RULES OF PRACTICE: DISCOVERY

Where a provision of the NRC discovery rules is similar or analogous to one of the Federal rules, judicial interpretations of the Federal rule can serve as guidance for interpreting the particular NRC rule.

RULES OF PRACTICE: DISCOVERY

Where there is no NRC rule even remotely similar to a Federal rule, there is no basis for reading the Federal rule into the discovery scheme expressly set out in 10 CFR Part 2.

RULES OF PRACTICE: HEARING REQUIREMENT

In an operating license proceeding, if no petitioner for intervention can satisfactorily demonstrate standing, it is likely that no hearing will be held. *Cincinnati Gas & Electric Company* (William H. Zimmer Nuclear Power Station), ALAB-305, 3 NRC 8, 9-10 (1976).

RULES OF PRACTICE: INTERVENTION

NRC rules provide that a special prehearing conference be convened, rather than that discovery be undertaken, to obtain information needed to rule upon intervention petitions. 10 CFR 2.751a(2).

RULES OF PRACTICE: STANDING TO INTERVENE

There are two disparate types of showings which may undergird intervention in NRC licensing proceedings, insofar as standing is concerned: a petitioner may have standing to intervene as a matter of right, or (where not entitled to intervene as of right) it may be permitted to intervene as a matter of discretion where it may "make some contribution to the proceeding." *Portland General Electric Company* (Pebble Springs Nuclear Plant, Units 1 and 2), CLI-76-27, 4 NRC 610, 612 (1976).

RULES OF PRACTICE: STANDING TO INTERVENE

An organization may establish its standing through the interest of its

members; but, to do so, it must identify specifically the name and address of at least one affected member who wishes to be represented by the organization. *Allied-General Nuclear Services* (Barnwell Fuel Receiving and Storage Station), ALAB-328, 3 NRC 420, 422-23 (1976).

RULES OF PRACTICE: STANDING TO INTERVENE

Where an organization is represented by one of its members, the member must also demonstrate authorization by that organization to represent it. *Tennessee Valley Authority* (Watts Bar Nuclear Plant, Units 1 and 2), ALAB-413, 5 NRC 1418, 1421 (1977).

RULES OF PRACTICE: INTERVENTION (DISCRETIONARY)

Foremost among the factors to be considered by a licensing board when granting or denying discretionary intervention is whether participation would likely produce "a valuable contribution" to the decision-making process. *Virginia Electric and Power Company* (North Anna Power Station, Units 1 and 2), ALAB-363, 4 NRC 631, 633 (1976).

RULES OF PRACTICE: STANDING

A claim that a local governmental unit was prejudiced by deficiencies in the notice of opportunity for hearing should be raised by such a unit itself and not by a third party.

MEMORANDUM AND ORDER WITH RESPECT TO VARIOUS MOTIONS AND PETITIONS

This proceeding concerns the application of Detroit Edison Company, *et al.* (Applicants), for an operating license for the Enrico Fermi Atomic Power Plant, Unit 2, located on a site in Frenchtown Township, Monroe County, Michigan. In response to the notice of opportunity for hearing published on September 11, 1978 (43 Fed. Reg. 40327), two timely petitions for intervention have been received. The first was filed on October 9, 1978, by the Citizens for Employment and Energy (CEE). The other, dated October 10, 1978, was submitted by Martha Drake and Dan Drake. In addition, an individual member of CEE also has requested that the notice of opportunity for hearing be republished. This Board has been established to consider and rule on these petitions and related matters (43 Fed. Reg. 49081, October 20, 1978).

On October 20, 1978, the Applicants filed a motion for leave to

commence limited discovery against certain of the petitioners. Specifically, they seek to depose (1) Mr. Dan Drake and (2) the particular CEE member asserted by that organization's petition to reside within 1 mile of the Fermi 2 plant, in order to assess "whether petitioners possess the necessary interests requisite to intervention." In the alternative, the Applicants ask that, should we decide that discovery is barred by 10 CFR 2.740, we certify the question to the Commission pursuant to the waiver provisions of 10 CFR 2.758. Finally, the Applicants move for an extension of time within which to answer the two petitions. (Reflecting the latter request, they have thus far not filed any such answers.)

CEE has filed a response opposing the requested discovery as contrary to the Commission's Rules of Practice.[1] The NRC Staff has filed responses to both petitions, pointing out that the Drakes have not established an interest in this proceeding with sufficient specificity and that CEE's petition includes certain other defects.[2] In addition, the Staff has opposed the Applicants' discovery request, taking the position that it is barred by Commission regulations and should be denied for that reason. The Staff also opposes certification of the legal authority question to the Commission.

We have carefully reviewed the considerations advanced by the various parties and petitioners. Although we entertain substantial doubt as to our authority to order the requested discovery, we are declining to grant the Applicants' request on a different ground—the absence of any demon-

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[1]Because CEE is not presently a party to this proceeding, it has no right under 10 CFR 2.730(c) to respond to the Applicants' motion. However, we will treat CEE for this purpose as a third party against which discovery is being sought and, on that basis, entitled to respond to the discovery request. *Cf. Kansas Gas & Electric Company* (Wolf Creek Generating Station, Unit 1), ALAB-311, 3 NRC 85, 87-88 (1976); *Consumers Power Company* (Midland Plant, Units 1 and 2), ALAB-122, 6 AEC 322 (1973).

[2]We note in passing that, as CEE points out, the Staff did not respond to its petition in a timely fashion. NRC rules accord the Staff 15 days from the "filing" of a petition for leave to intervene in which to file an answer. 10 CFR 2.714(c). CEE's petition was filed on October 9, 1978; 15 days thereafter was October 24, 1978. CEE's petition was filed by mail, and we surmise that the Staff derived its October 30 response date by adding 5 days for such mailing (plus 1 day to account for that period's ending on a Sunday). However, those 5 days may be added *only* when the time period runs from the date of service, not when it runs (as here) from the date of filing. See 10 CFR 2.710. The Applicants also have misread the rule in this respect. They sought an extension of time to respond, but this request was not filed until October 20, 1 day after the expiration of the 10-day response period accorded to the Applicants by 10 CFR 2.714(c).

Because the rules have recently been amended and have not been widely interpreted as of this time, we have elected to consider the Staff's response and the Applicants' request for an extension of time notwithstanding their untimeliness. In the future, we will expect the Applicants and Staff to abide by applicable time limitations with greater care.

strated necessity or even utility in following that course of action. For essentially the same reason, as well as the failure of the Applicants to have demonstrated the existence of conditions which would warrant certification, we also decline to certify the legal authority question to the Commission. We are, however, granting an extension of time within which the Applicants may respond to the intervention petitions. We are also ordering the convening at an early date of a prehearing conference for the further consideration of those petitions.

A.1. In seeking leave to commence discovery at this incipient stage of the proceeding, the Applicants recognize, as they must, the explicit provision of the Commission's Rules of Practice which, on its face, would appear to bar outright the requested discovery. That provision states that:

> In a proceeding on an application for . . . an operating license for a production or utilization facility, *discovery shall begin only after the prehearing conference provided for in §2.751a* . . . .

10 CFR 2.740(b)(1) (emphasis supplied). No such conference has yet been held in this proceeding. The Staff accordingly regards this provision as dispositive of the discovery question.[3] Nevertheless, the Applicants seek to except their requested discovery from the constraints of that provision, by construing it to apply solely to "discovery on the merits." This is evidenced, they assert, by the further provision of that same section specifying that the discovery covered thereby "shall relate only to those matters in controversy which have been identified . . . in the prehearing order entered at the conclusion of [the first] prehearing conference."

The Applicants' interpretation of this section of the rules as applying only to discovery on the merits has much to commend it. Certainly it is not inconsistent with the statement of considerations which accompanied the enactment of the rule imposing the time limit. The rule's applicability solely to matters of substance is strongly suggested by the statement that "discovery will not be permitted until the matters in controversy have been preliminarily identified." 37 Fed. Reg. 15127, 15128 (July 28, 1972).[4]

2. This is not to say, however, that the NRC rules contemplate any discovery prior to the first prehearing conference. For although the

[3]As the Staff points out, the rule deals only with formal discovery requests; informal discovery is permitted at any time. Applicants' request is for formal discovery.

[4]Although we construe the time limit in §2.740 as directed at substantive discovery, we do not find that view supported by *Allied-General Nuclear Services* (Barnwell Fuel Receiving and Storage Station), LBP-77-13, 5 NRC 489, 492 (1977), upon which the Applicants rely in part. That decision merely analogized the Federal rules in order to rule on a question of relevance.

Applicants' discovery request may not technically be barred by 10 CFR 2.740, it also does not appear to be specifically authorized by that provision (which constitutes the Commission's general authorization of discovery). Not only the limitation of that section but, as well, the entire authorization of discovery included therein appears to be directed toward matters of substance.[5] Nor does any other section of the NRC rules appear to focus on discovery with respect to a potential party's standing to litigate.

The Applicants direct our attention to the provisions of 10 CFR 2.718 and 2.721(d), which provide us authority "to take appropriate action to avoid delay"; to §2.718(d), which authorizes us to "[o]rder depositions to be taken"; to §2.718(1), which includes a residual blanket delegation of authority; and to §2.740a(a), which permits the taking of the deposition of any person, regardless of party status. In general, all except the last of these provisions parallel the similar authorizations appearing in the Administrative Procedure Act, 5 U.S.C. 556(c). Insofar as discovery is concerned, their purpose appears to us to be no more than to authorize presiding officers such as this Board to permit the conduct of such discovery as is otherwise permitted by rule. Indeed, the APA grant of authority is explicitly "subject to published rules." *Ibid.* The last of those provisions is merely an elaboration of the discovery devices encompassed by 10 CFR 2.740 and is subject to all of the limitations of that section—including confinement to matters of substance.

That explicit authorization is required with respect to discovery is particularly evident, for there is no inherent or statutory right in NRC proceedings granting parties any such discovery; any rights thereto which may exist are solely a product of applicable regulations. As Professor Davis has explained:

> The APA contains no provision for pretrial discovery in the administrative process, and of course, the provisions of the Federal Rules of Civil Procedure for discovery do not apply to administrative proceedings. Therefore, in absence of special statutory provision, and in absence of special administrative regulation, no procedure for discovery is normally available in a Federal administrative proceeding [fn. omitted].

Davis, *Administrative Law* (1958), §8.15 at p. 588.

That being so, it is questionable whether the general authorities

[5]The Staff describes the narrow authorization of this section as a "limitation"; but however it is viewed, the section would in no event appear to authorize the discovery sought by the Applicants.

referenced by the Applicants can be read as authorizing the particular discovery requested here. Nor can the cited Appeal Board decisions, which are said to stand for the proposition that NRC discovery rules are to be construed in parallel with the Federal Rules of Civil Procedure. *Toledo Edison Company* (Davis-Besse Nuclear Power Station), ALAB-300, 2 NRC 752, 760 (1975); *Commonwealth Edison Company* (Zion Station, Units 1 and 2), ALAB-196, 7 AEC 457, 460 (1974). Insofar as they are pertinent, those decisions appear to stand for no more than that, where a provision of the NRC discovery rules is similar or analogous to one of the Federal rules, judicial interpretations of that Federal rule can serve as guidance for interpreting the particular NRC rule.

The Federal rules may permit, as Applicants claim, the taking of depositions at any time after commencement of the action. See F.R.C.P. 30(a).[6] But, as we have seen, the explicit provisions of NRC rules are different—significantly so, in our view. The situation before us is more analogous to that recently faced by another Licensing Board, which determined that, where there was no NRC rule "even remotely similar" to a Federal rule, there was no basis for reading the Federal rule "into the discovery scheme expressly set out in 10 CFR Part 2." *General Electric Company* (Vallecitos Nuclear Center—General Electric Test Reactor), LBP-78-33, 8 NRC 461, 465 (October 24, 1978). That Board aptly observed that, "having selected some, but not all, of the discovery provisions set out in the Federal rules, the Commission did not intend for the unselected Federal rules to control its proceedings." *Id.* at 466. In like manner, there being no NRC rule with provisions comparable to those of F.R.C.P. 30(a), it seems unlikely that the discovery sought by Applicants is available under the NRC rules.

3. Even if the discovery sought by Applicants were within the authority granted by NRC rules, there is yet another—and, indeed, more persuasive—reason why we decline to invoke that authority here. At best, the Applicants would have no right to such discovery (as they might well have to types of discovery specifically authorized by the rules).[7] Rather, to the extent such discovery might be deemed to be authorized by the general provisions cited by the Applicants, its availability would be manifestly subject to our discretion. Applicants recognize as much by seeking our leave to engage in such discovery. And, in the exercise of our discretion, we conclude that the taking of the depositions sought by the Applicants is neither necessary nor warranted.

[6]Even that rule imposes limits on discovery by certain parties for a specified period after the commencement of the action. And 10 CFR 2.740 in any event is patterned after F.R.C.P. 26, not F.R.C.P. 30(a).

[7]In other words, there are specific limits to the discretion accorded us by 10 CFR 2.740(c).

There is no question that, in an operating license proceeding, the question of a potential intervenor's standing is a significant one. For if no petitioner for intervention can satisfactorily demonstrate standing, it is likely that no hearing will be held. *Cincinnati Gas & Electric Company* (William H. Zimmer Nuclear Power Station), ALAB-305, 3 NRC 8, 9-10 (1976).

The Applicants' proposed depositions relate solely to the standing of CEE and Martha and Dan Drake, the petitioners for intervention. CEE's petition founds standing on the basis, *inter alia*, of one member who resides within 1 mile of the plant and other members who reside "at slightly greater distances." The Applicants wish to inquire as to the identity of such members; they rationalize that, "'[d]epending on the number of other members (if any) in the vicinity, CEE's interest as an organization may be *de minimis*." As for the Drakes, that petition bases its standing on, *inter alia*, the residence of Dan Drake in Ann Arbor, Michigan, "within 50 miles of the plant," and the asserted membership of both of the Drakes in the cooperatives owning a portion of the plant. The Applicants seek to inquire whether Dan Drake is a real party in interest or, alternatively, whether Martha Drake (who apparently resides more than 300 miles from the site) is utilizing her son Dan's closer residence merely to bolster her own showing of standing.

To some extent the Applicants' inquiries would lead to relevant information. But there are two reasons why we would decline to sanction such inquiries even had we authority to authorize them. The first is that the rules contemplate a different (and in our view more productive) manner of obtaining such information as may be required in order for us to rule on the intervention petitions. Most notably, the rules provide that we convene a special prehearing conference for the purpose, *inter alia*, of considering the intervention petitions and obtaining information which we need to rule on those petitions. 10 CFR 2.751a(a). See also *Zimmer*, ALAB-305, *supra*, 3 NRC at 12.

The second reason why we would decline to grant the requested discovery is that the information sought by the Applicants (as they have described it in their motion and accompanying affidavit) would not be sufficient to enable us to rule on the intervention petitions. For the Commission has held that there are two disparate types of showings which may undergird intervention in NRC licensing proceedings, insofar as standing is concerned: a petitioner may have standing to intervene as a matter of right, or (where not entitled to intervene as of right) it may be permitted to intervene as a matter of discretion where it may "make some contribution to the proceeding." *Portland General Electric Company* (Pebble Springs Nuclear Plant, Units 1 and 2), CLI-76-27, 4 NRC 610, 612

(1976). The depositions sought by the Applicants here would be limited to resolving questions bearing upon intervention as a matter of right. The Applicants would apparently make no inquiry whatsoever respecting intervention as a discretionary matter. But, as we shall see, the latter type of inquiry may well be crucial in considering the acceptability of the intervention petitions before us.

In that connection, it is apparent that, as the Staff has pointed out in its responses to the intervention petitions, the information included in those petitions is not at this time complete enough to permit us to determine that any of the petitioners has standing as of right. For example, with respect to CEE, it is clear that an organization may establish its standing through the interest of its members; but, to do so, it must identify specifically the name and address of at least one affected member who wishes to be represented by the organization. *Allied-General Nuclear Services* (Barnwell Fuel Receiving and Storage Station), ALAB-328, 3 NRC 420, 422-23 (1976); *Public Service Company of Indiana, Inc.* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-322, 3 NRC 328, 330 (1976); *Public Service Electric and Gas Company* (Salem Nuclear Generating Station, Units 1 and 2), ALAB-136, 6 AEC 487, 489 (1976); *Duquesne Light Company* (Beaver Valley Power Station, Unit No. 1), ALAB-109, 6 AEC 243, 244, n. 2 (1973). Where an organization is represented by one of its members, the member must also demonstrate authorization by that organization to represent it. *Tennessee Valley Authority* (Watts Bar Nuclear Plant, Units 1 and 2), ALAB-413, 5 NRC 1418, 1421 (1977); *Barnwell, supra*, LBP-75-60, 2 NRC 687, 690 (1975), *affirmed*, ALAB-328, *supra*. The CEE petition does not fulfill these requirements as of this time, but CEE may freely amend its petition until 15 days prior to the special prehearing conference to which we earlier made reference. 10 CFR 2.714(a)(3).

Furthermore, both the Drakes and CEE advance certain economic interests, but the petitions are not adequate for us to judge whether they qualify under criteria for such interests established in earlier Commission and Appeal Board rulings. See, *e.g.*, *Pebble Springs*, CLI-76-27, *supra*, 4 NRC at 613-14; *Detroit Edison Company* (Greenwood Energy Center, Units 2 and 3), ALAB-376, 5 NRC 426, 428 (1977); *Watts Bar*, ALAB-413, *supra*, 5 NRC at 1421; *Kansas Gas & Electric Company* (Wolf Creek Generating Station, Unit 1), ALAB-424, 6 NRC 122, 128 (1977). Further clarification of the nature of those interests is manifestly in order; the

[8]We are unaware of any "*de minimis*" doctrine such as that being advanced by the Applicants. If one member is demonstrated to have an interest (and authorizes the organization to represent that interest), the showing of interest is deemed adequate.

prehearing conference (together with amendment of the intervention petitions as permitted by the rules) appears to us to be an appropriate vehicle for obtaining such clarification.

As for possible discretionary intervention, the Commission has established several discrete factors bearing upon our exercise of such discretion. Foremost among these is whether participation would likely produce "a valuable contribution" to the decisionmaking process. *Virginia Electric and Power Company* (North Anna Power Station, Units 1 and 2), ALAB-363, 4 NRC 631, 633 (1976); *Public Service Company of Oklahoma* (Black Fox Station, Units 1 and 2), ALAB-397, 5 NRC 1143, 1148-50 (1977); *Watts Bar,* ALAB-413, *supra,* 5 NRC at 1422-23. Because of the potentially serious safety significance of some of the allegations in CEE's petition, the ability of that organization to assist in developing a sound record on such questions is likely to be at least as significant as whether that organization technically has standing of right. Moreover, although the Drakes' asserted membership in the cooperatives is very likely not of a nature which could confer standing as of right (see *Detroit Edison Company* (Enrico Fermi Atomic Power Plant, Unit 2), ALAB-470, 7 NRC 473 (1978)), it may well provide a background for assisting us in developing a sound record on the Applicants' financial qualifications, should that turn out to be an issue in the proceeding.[9] The prehearing conference is a much more suitable device to enable us to confront such questions than is the narrow, limited discovery suggested by the Applicants.

We are accordingly *denying* the Applicants' discovery request and, in lieu thereof, ordering a prehearing conference to be convened. Because of the need expressed by the Applicants to resolve the standing questions as quickly and expeditiously as possible, and also because of the potential safety significance of some of CEE's allegations, we are setting an early date for this conference. See p. 586, *infra.*

B. The Applicants request that, if we determine that discovery is barred by 10 CFR 2.740, we certify the question to the Commission pursuant to the waiver provisions of 10 CFR 2.758. Such request of necessity presumes both that we read §2.740 as barring the requested discovery and that that section was not intended to bar discovery of the type here requested; for §2.758 itself provides for certification only where a Licensing Board determines that, as a result of special circumstances, a *prima facie* showing has been made that application of the rule in

[9]The Drakes appear to be attempting to raise this issue. The Staff observes, however, that Mrs. Drake may not be a member of one of the cooperatives which is a co-owner of the facility but, rather, may instead be a member of a retail cooperative which purchases power from a co-owner. We express no opinion on this matter, which is appropriate for consideration at the prehearing conference.

a particular way would not serve the purposes for which the rule was adopted and, accordingly, that a waiver should be authorized.

We have not in fact held that the requested discovery is barred by 10 CFR 2.740. Rather, we have found that such discovery is not authorized by any provision of the rules but that, even if it were, its authorization would be discretionary and, as a matter of discretion, we would not resort to its use. That being so, we do not view our ruling as one which falls within the scope of the Applicants' certification request.

In any event, the Applicants have not in our view presented the requisite *prima facie* case. They have demonstrated no "special circumstances" in this proceeding which would warrant invoking the certification authority. The requested certification is accordingly *denied.*

C. We *grant* the Applicants an extension of time within which they might file their response to the intervention petitions, until Wednesday, November 22, 1978.

D. On September 15, 1978, we received an undated request from Dr. Robert G. Asperger, a member of CEE, seeking republication of the notice of opportunity for hearing. The request asserts that the original notice was defective in that it failed to spell out the rights of local governmental units to participate as "interested" governmental units pursuant to 10 CFR 2.715(c). The rules were amended effective May 26, 1978, to permit such participation (43 Fed. Reg. 17798, April 26, 1978), and Dr. Asperger claims that the units had a right to be notified that they have "standing as a matter of right."

Dr. Asperger apparently served neither the Applicants nor the Staff with his request. The Applicants have not responded; but the Staff, in a response dated November 1, 1978, indicates that it did not receive the request until October 17, 1978. The Staff opposes Dr. Asperger's request both because of his lack of standing to raise it and on the merits.

It is apparent to us that a claim that a local governmental unit was prejudiced by deficiencies in the notice should be raised by such a unit itself and not by a third party. See *Watts Bar*, ALAB-413, *supra*, 5 NRC at 1421; see also *Project Management Corp.* (Clinch River Breeder Reactor Plant), ALAB-345, 4 NRC 212 (1976). We agree with the Staff, therefore, that Dr. Asperger lacks standing to raise his instant claim. Moreover, on the merits, we are unaware of any requirement that the rights of interested local governmental units be spelled out in the notice of opportunity for hearing. See 10 CFR 2.105. That being so, Dr. Asperger's request is *denied.*

If a hearing in this matter is eventually authorized and a local govern-

mental unit seeks to participate pursuant to 10 CFR 2.715(c), we are certain that the Board authorized to conduct that hearing will bear in mind the recent enactment of such participational authority in determining whether the local unit should be permitted to participate under that authority.

E. The special prehearing conference will be held beginning at 10 a.m. on Monday, December 18, 1978 (and continuing through Tuesday, December 19, 1978, if necessary), in Judge Patton's Courtroom (Room 1057), U. S. Courthouse, 231 West Lafayette Street, Detroit, Michigan.

The petitioners for intervention may file amendments to their petitions until Monday, December 4, 1978. By that date, they must also file a list of their contentions, and the bases for each contention set forth with reasonable specificity. 10 CFR 2.714(b). In order to be permitted to participate as a party, a petitioner must fulfill this requirement with respect to at least one contention. *Ibid.*

F. At the aforementioned prehearing conference, we will hear the limited appearance statements of those who have requested to make such an appearance. At the present time, we have received only one such request. If we receive further requests at the conference, they will be accommodated to the extent that time permits.

IT IS SO ORDERED.

THE ATOMIC SAFETY AND
LICENSING BOARD DESIGNATED
TO RULE ON PETITIONS FOR
LEAVE TO INTERVENE.

Charles Bechhoefer, Chairman

Dated at Bethesda, Maryland,
this 13th day of November 1978.

Cite as 8 NRC 587 (1978) LBP-78-38

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Samuel W. Jensch, Chairman
Dr. Frank F. Hooper
Gustave A. Linenberger

In the Matter of **Docket Nos. 50-522**
50-523

PUGET SOUND POWER AND LIGHT COMPANY, et al.

(Skagit Nuclear Power Project, Units 1 and 2) **November 24, 1978**

The Licensing Board grants the intervention petition of three Indian tribes. Although untimely by more than 3 years, the petition is granted on the basis that:Petitioners have made a substantial showing for good cause for failure to file a timely petition for intervention; other means do not exist to protect Petitioners' interest; Petitioners can reasonably be expected to assist in developing a sound record; Petitioners' interest cannot be represented by existing parties; and Petitioners' participation will not broaden the issues or delay the proceeding.

RULES OF PRACTICE: INTERVENTION

The grant of a petition to intervene only determines that the petition raises substantial issues of fact. It does not resolve those issues of fact. The complete presentation of evidence is not part of the general allegations of an intervention petition.

RULES OF PRACTICE: BURDEN OF PROOF

When an Indian tribe has reserved its rights under a treaty, the burden of proof is on the applicant to show that the proposed facility will not infringe the Indian rights.

RULES OF PRACTICE: INTERVENTION

A petition to intervene is not the mechanism to permit an appraisal of evidentiary matters.

RULES OF PRACTICE: INTERVENTION

If the United States were to petition for intervention either on the basis of enforcing treaty rights as guardian for the Indians, or on the basis that the Indian tribes constituted an instrumentality of the government, no laches could be effectively asserted to bar the petition. The Indians have the same rights in this respect as does the Government.

DECISION AND ORDER GRANTING INTERVENTION

The Upper Skagit Indian Tribe, the Sauk-Suiattle Indian Tribe, and the Swinomish Tribal Community, on June 15, 1978, filed a petition to intervene in this proceeding which was commenced by the issuance of a notice of hearing on December 12, 1974, and hearings commenced on April 15, 1975.

The petition is supported by an accompanying brief which in totality asserts that the Petitioners are three Federally recognized Indian tribes holding fishing rights secured by treaties in reference to the Skagit River system and adjacent marine areas. The Petitioners state that the tribes are directly dependent on the treaty fishing rights and that the Skagit River is the largest tributary of Puget Sound containing significant wild runs of Steelhead, Chinook, Coho, Chum, and Pink Salmon, as well as a vestigial run of Sockeye, all of which contribute one-third of the total wild salmon in the Puget Sound fishery.

The Petitioners recognize the lateness of the filing of the petition but they contend that their interests have not been adequately protected before this Board and that Applicants' proposal to add a nuclear power plant adjacent to the Skagit River poses inadequately researched risks to the health and welfare of the Petitioners and to the rich fishery upon which they depend.

The three petitioning Indian tribes trace their rights to the Treaty of Point Elliott, 12 Stat. 927, which provides in part:

> The right of taking fish as usual and accustomed grounds and stations is further secured to said Indians in common with all citizens of the territory . . . .[1]

[1]The copy of a portion of treaty attached as part of the supplement to the petition

(Continued on next page.)

The Petitioners assert that this provision has been construed by a Federal court to guarantee a defined allocation of the harvestable share of anadromous fish and the rights, in the nature of real property rights, of access and use of usual and accustomed grounds and stations. Also set forth in the petition are recitations of difficulties had by the Petitioners in securing performance of their rightful portions of the fish and that legal proceedings by the United States Government and the tribes have now established firm procedures for the protection of their rights.

The Petitioners assert that the delay in filing the petition is due in large part to the pendency of much litigation respecting their rights which has occupied their time so that they were unable to closely follow this proceeding. In addition, the petition states that they have not had adequate funds with which to employ personnel, legal and technical, to concentrate on this case. Other items set forth to excuse the delay are (1) difficulties arising from inaccessibility and time of availability for procuring information from the public depository of materials for Applicants' proposal, (2) the generality of language in the available documentary material, such as recitals of "trivial" and "insignificant" impacts in fishing, etc., (3) the failure of the United States Government, which acts as a "trustee" to protect Indian rights to intercede as a party, and (4) the incompleteness of the environmental policy statement to adequately consider the Indian treaty rights, in that no contact was made with the Indians, even though the Department of Interior comment on the environmental report suggested that that be done.

The Petitioners have set forth, also, new data which are causes of concern to them: (1) the geologic hazard possibility of earthquakes and landslides, (2) the April 1978 statement by the Assistant Secretary of Agriculture that the impact of the Applicants' proposal on fishing rights is in some doubt but that it appears that such impacts are direct and adverse within the meaning of Section 7(b) of the Wild and Scenic Rivers Act, and (3) the Applicants' proposed release of heated waters into the river and the analyses (by, for instance, the President of one Applicant) recently issued concerning that proposed release.

The Petitioners contend that this proceeding is the last administrative forum in which the Petitioners can protect their rights,[2] and that a limited

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shows that all tribe leaders signed by an "X." It would be interesting to know how many more specific provisions would have been in the treaty if the Indians had not been reliant entirely upon the form and content of the treaty presented to the tribal leaders to sign.

[2]The Staff in its answer agrees that this proceeding provides the last available forum for consideration of the Indian claims; the Staff suggests that if new geologic data

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participation by presenting statements (which the Applicants endorse) is not fully in accord with the due process needed for protection of their rights. Also set forth by the Petitioners is the contention that no party to the proceeding can adequately protect the Indian rights. By way of illustration, the Petitioners assert that the State of Washington is an adverse party as shown by court proceedings, that the NRC Regulatory Staff has not responded to suggestions by other governmental units to consider more fully the fishing rights and has not contacted the Indian tribes in any way, and that SCANP has other interests that do not in all respects coincide.

The petition was supplemented in response to the Board's order to set forth the particular areas of interest of the Petitioners as well as the subjects that will be contributed to make a sound record without undue delay to the proceeding:[3] evaluation of costs unique to petitioner tribes, importance of Skagit fisheries to the economic base of Swinomish Indian reservation, relationship of Indian community to Skagit River area, socioeconomic impacts of construction and industrialization, health effects of low-level ionizing radiation on an isolated, genetically atypical Indian community, importance of Skagit system in Pacific Northwest fisheries, cooling water intake system effects[4] (including unacceptable levels of ground water intrusion, dewatering surface streams by infiltration, etc.), hot water diffuser effects, and barge delivery (this method has been recently modified) of a pressure vessel for the proposed nuclear plant that may add to pollution problems. In many of these areas, the Applicants have presented new data which have not yet been completely examined in the hearings.

The Applicants vigorously object to the granting of the petition by asserting that (1) the petition is grossly out of time, that many members of the tribes knew of the pendency of this proceeding, that there is no valid excuse given for this late filing of the petition, (2) other means have been available to the Petitioners to protect their interests (as for instance, the State site certification proceedings and the Department of Agriculture

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are discovered as a result of exploratory work now underway, the existence of the data will assist in overcoming the untimeliness of the petition. The Board notes much more "new" data are in existence in addition to the geologic data recently developed, even before completion of the ongoing exploratory work.

[3]Overlooked in Applicants' answer to the petition and the allegations of undue delay is that this proceeding has been largely extended in time due to the additional exploratory geologic and seismic work that Applicants and their consultants have desired to undertake in further support of their application.

[4]The Board notes that the water intake system has been recently redesigned; these effects have not been fully examined.

Section 7(b) of the Wild and Scenic Rivers considerations), (3) Petitioners are not likely to assist in developing a sound record, and (4) other parties to the proceeding (such as the Regulatory Staff and SCANP) can represent the tribes' interests. These objections by the Applicants are listed in the sequence set out in the Commission's regulations.

By a supplemental briefing, as requested by the Board, the Applicants assert three principal arguments:(1) that the Petitioners are limited in the exercise of treaty fishing rights to specific locations (the language of the treaty reserves to the Indians "The right of taking fish as usual and accustomed grounds and stations. . ."; (2) Petitioners could proceed in a court proceeding to restrain any interference with their treaty rights (Applicants did not specify whether a State or Federal court should be utilized—and some caution in that regard may be necessary in view of *State of Washington* v. *U. S. District Court*, 78-139—*certiorari granted* October 1978 in the U.S. Supreme Court); and finally (3) many matters which Petitioners seek to develop at a hearing have already been covered, at least in part in prior hearings, and Intevenor SCANP could adequately represent the Petitioners (although Applicants do not urge that arrangement).

Applicants belief that some language in court decisions in upholding the treaty rights to fishing referred to fishing at regular places along the rivers. Applicants cite *U.S. v. State of Washington,* 520 F.2d 676 (which is subject to *certiorari* 78-139 USSC), which contains the following:

> . . . neither the treaty Indians nor the State on behalf of its citizens may permit the subject matter of these treaties to be destroyed. . . .
>
> [The State] . . . may not force treaty Indians to yield their own protected interests in order to promote the welfare of the State's other citizens.

Applicants argue that three specific locations to be used for plant components or a large slip on the Skagit River (for the water intake mechanism, the water release outlet, and a barge unloading pier) would not interfere with the treaty rights. Applicants assume the premise that specific locations for fishing are intended by the court decisions. Applicants do not assume that the entire Skagit River area constitutes ". . . accustomed grounds and stations" for exercise of fishing rights. Applicants overlook further rulings by the court which established that entire areas along the Skagit River are to be included as "grounds and stations" for fishing.

> Today, the treaty Indians' "usual and accustomed" fishing grounds in general are located upstream from sites of intensive nontreaty Indian fishing . . . .the Indians are entitled to catch 50 percent not simply

of the fish passing the traditional grounds, but also of those destined for those grounds but captured downstream or in marine waters.

Applicants then argue at length that the proposed nuclear project will not affect the fishing at the three specific places for plant components. The argument is somewhat irrelevant to the principal consideration here: will the fishing rights be impaired by the proposed nuclear plant and its operation; an important corollary is that there is an obligation that the fish not be destroyed nor their quantities diminished, and this is a primary concern before access rights are determined. It is enough if in a petition to intervene that a valid factual consideration has been presented as an issue, and that in the opinion of the Board has been done with the *caveat*, of course, that no decision has been made whether the fishing rights have or will in fact be impaired. Applicants' second argument in its supplemental brief is to the general effect that the Petitioners can go to some other forum and somewhere endeavor to secure a restraining order or injunction to prevent interference with fishing rights. Such an approach, of course, would involve wasteful duplicative factual presentations and in effect that course of action would be contrary to the spirit and general purpose of Federal administrative procedures. The entire history of the Administrative Procedure Act is contrary to such a relegation of a petitioner to another forum when an existing administrative proceeding can provide relief (if adequate interests and contentions are asserted). The final argument of Applicants is that many items set forth by Petitioners have already been covered in prior hearing sessions; that argument overlooks the many changes made to the original design which here reopened consideration of those matters, as well as other matters which remain on the agenda for initial examination at the hearings.

The Regulatory Staff, while offering the concession that if new geologic or seismic data are developed from the additional exploratory work now being pursued (albeit at a late date) by the Applicants, such data will assist in overcoming the effect of late filing; nevertheless, the Staff believes that the petition is so untimely that it should be denied. The Board notes that if the new data theory is to be controlling, there are several processes now underway which will develop new data,[5] and the addition of these to the geologic and seismic data, newly and almost

[5]New data have been presented by the Applicants since the commencement of the hearings in reference to change in location and possible efficiency of the water intake mechanism, geologic and seismic data, effects on creeks nearby to the site of the proposed plant, and changed method of barge delivery of pressure vessel creating different stream pollution problems.

continuously developed since the commencement of this proceeding would provide an enlarged basis for granting the petition. The Staff recites the same four factors enumerated in the Commission's regulations and as to each, the Staff concludes that the factual information presented is inadequate to overcome the restrictions implied in the regulations applicable to a late filing.

The Regulatory Staff likewise filed a supplementary brief in response to the Board's request. This brief reflects a thorough reanalysis of the Staff's position and concludes that the Petitioners have filed contentions that with some additional information warrant granting the petition.

Certain aspects of the brief should be considered by way of clarification of the matters involved in the Indian treaty fishing rights. The court decisions emphasize that the Indians were not granted any fishing rights; the Indians reserved their rights, and from that premise the courts have been careful to determine that no actions are taken, especially by non-Indians, to impair or damage those rights. In that sense, actions proposed by non-Indians must be shown by reliable, probative, and substantial evidence to avoid any impairment or damage. It is not necessary for Indians to carry the burden of proof in this regard. In that light, the petition for intervention seeks to test the adequacy of the non-Indian evidence for the proposed nuclear plant. If that adequacy is not determined, Applicants here must fail.

The Staff concludes similarly with the Applicants that there would not be delay suffered by the Petitioners if there were a denial of the petition and court proceedings were to be instituted. The Staff envisioned a possible court proceeding after appeals had been exhausted before the Commission; however, the Staff went further and stated that if the petition for intervention were denied, the Indians could not appear as a party, and therefore could not appeal the decisions made after the hearings. The combination of those possibilities could create confusion compounded.

The Staff analysis of the treaty rights concentrates, as does the Applicants' supplementary brief, on locations that may be utilized for fishing. The Staff likewise suggests that the "usual and accustomed grounds and stations" should be identified, but in any event, the conclusion was offered, as was done by Applicants, that no access to the Skagit River will be obstructed. The treaty, however, in this particular aspect is directed primarily to all fishing rights. Those rights mean not only access to but procurement of fish. The protection intended by the treaty is to avoid any lessening of the number of the fish that could be available from the natural environment.[6]

[6]The Staff believes that there is no language of the treaty which ". . . grants the

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The balance of the Staff brief is of major importance in its recognition that the petition seeking intervention has specified adequate areas of interest and concern. The Staff accompanies that recognition, however, with the suggestion that no decision should be made on granting intervention until the Petitioners present further data in aid of specificity. The Board believes that the data that might be presented by Petitioners are within areas more properly considered by discovery procedures. The Board envisions that whatever data were first supplied by Petitioners would be analyzed as needing further supplementation. The grant of a petition to intervene does not resolve the factual concerns which have been identified, but only is a determination that the subjects set forth by a petition raise substantial issues to be analyzed. The complete presentation of evidence is not a part of the general (with sufficient specificity) allegations of a petition. The need to expedite proceedings necessarily is a factor in the considerations, albeit a minor one respecting a petition. On the basis of analyzing pleadings within the scope of the detail required by the Commission's regulations, the Indian petition here is adequate.

The Staff commends the Indian supplementary brief by the statement that the Staff is now able ". . . to gain an impression regarding the contribution that Petitioners may be able to make to the record in this proceeding." The Staff enumerates the areas of possible genetic damage and the unique economic and cultural dependence of the Petitioners on the fisheries. The Staff suggests that the Board would have to determine that a loss of the fishery would result from the proposed construction and operation of the Skagit facility. That suggestion assumes that the burden of proof is on the Indians; but, it is on the Applicants, and that requires an evidentiary presentation. A petition to intervene is not the mechanism to permit an appraisal fo evidentiary matters. If parties need details before a hearing, discovery procedures provide the mechanism. The Staff also emphasizes the need to be concerned with the socio-economic impacts on the Indians; that issue is raised by the petition. Briefly, the Staff recognizes merit to the Indian assertions; the Staff would like more data and certainly the Staff should have the opportunity to secure the data.[7] That desire of the Staff does not lessen the validity

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Indians anything other than the right to have access to their usual fishing location. . ." (pg. 3, Sup. Brief). The treaty grants the rights to fish—that is the fundamental reservation of rights by the Indians. For present purposes, it is immaterial whether the 50-50 allocation for Indians and non-Indians is upheld in the decision by the Supreme Court in *United States* v. *District Court of State of Washington* (*cert. granted* October 1978).

[7]The Staff is confident ". . . that Petitioners will be able to supply information sufficient to permit their intervention on one or more of these issues, and accordingly suggests
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of the Indian petition.

The Board did not observe extensive discussions in either the Applicants' or the Staff's answers to the petition which considered whether there would be any prejudice to the parties or to the proceeding if the petition by the Indians were granted. In other words, the inherent inquiry in a consideration of the Commission's regulations pertaining to late filings is: who would be hurt or disadvantaged by a grant of the petition. This proceeding is largely in its initial stages on geologic and seismic matters pertinent to site suitability, and while other subjects have been considered at least in part, the Petitioners for intervention characterize the evidentiary record as showing only that problems exist respecting certain proposed activities, such as hot water releases, capability of fish to spawn in the changed river environment, etc., and that the existing intervenors were not previously able (apparently for financial reasons or otherwise) to present expert witnesses on these and related subjects. In addition, as mentioned, the changes made by the Applicants in their plans necessarily have opened up new avenues of inquiry, and the delay to be caused by this further presentation of data, in the language used by Applicants in reference to the Petitioners, is "of their own making." It is further noted that Petitioners propose contentions that, if admitted, would not require any repetition of evidentiary matters for those items previously and completely presented, *i.e.*, Petitioners would be taking the record as they find it, but would be permitted to examine into areas as to which changes have been made by Applicants as well as an examination of areas which have not been addressed in the hearings.

More importantly, however, and as recognized by both the Petitioners and the Regulatory Staff, are the status of the Petitioners, their rights under treaties, and the long history of jurisprudence which reflects the protection to which they are entitled. From a legislative and court decisional point of view, the Petitioners here are in a special class of United States citizens and preferences have been granted repeatedly to them which have been held nondiscriminatory[8] (such as preferences for employment on reservations and related areas).

Interesting as it may be to review the scope of the Commission's regulations on late filing of petitions to intervene, the precise issue is whether the Indians come within the broad scope of protection that the legislation and the court decisions have accorded them. The initial consideration in many cases appears to be whether the white-man-written

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to the Board that it grant Petitioners a reasonable period of time necessary to provide the required information."

[8]*Morton* v. *Mancari*, 417 U. S. 535 (1974).

treaties are as all encompassing as the many fine statements which were made to describe what the United States Government intended to provide, when they urged or forced the Indians to live on reservations and yet declared them citizens and wards of the government.

Consistent in many court decisions are the determinations that the United States Government is a trustee for the Indians and will protect their interests. Experience, however, has proven some disregard of that fine principle and for that reason, the Congress enacted the now designated 28 U.S.C. 1362 which authorizes the Indian tribes to initiate litigation when the United States Government does not do so to protect the interests as the tribes see them. That legislation is recognition that apparently the Indians will be more active in their own behalf and can proceed rapidly to test their rights. That legislation, however, has a scope as broad as if the United States (U.S.) itself were initiating litigation, and thus the late filing in the case should be considered as though the U.S. were the petitioner. The Supreme Court has determined this matter by its ruling, as follows:

> . . . it would appear that Congress contemplated that a tribe's access to Federal court to litigate a matter . . . would be at least as broad as that of the United States suing as the tribe's trustee . . . .
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> * * * * *
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> [Section 28 U.S.C. 1362] . . . though by no means dispositive, suggests that in certain respects tribes suing under this section were to be accorded treatment similar to that of the United States had it sued in their behalf. Since the United States is not barred . . . we hold that the Tribe is not barred.

Moe v. *Salish & Kootenai Tribes*, 425 U. S. 463 (1976).

This recent case is a more concise statement of many expressions in the older cases: that the U.S. could be co-plaintiff with the tribes; that the U.S. and the tribes are like co-tenants in interest; that the U.S. is a trustee or guardian for the Indians who are wards of the U.S., etc. (see: *Jones* v. *Mechan,* 175 U.S. 1 (1899)).

Based upon these considerations, recognition must be given to the preferential status of the Petitioners here, and the cases dealing with non-Indian citizens are not controlling. The fishing rights of the Indians are property rights and:

> Indian property uniformly is said to be an instrumentality of the United States . . . "the power and duty of governing and protecting tribal Indians is primarily a Federal function. . . ." (Quotation from

Federal Indian Law, authored by Felix Cohen, a recognized expert on this subject.)

Agua Caliente Band v. *County of Riverside*, 442 F.2d 1184 (1971).

Applying the co-plaintiff approach, or acting as guardian or for the protection of a government instrumentality, if the petition were solely by the United States on behalf of the Indians, the factors recited in the Commission's regulations for a late filed petition to intervene would yeild to the public interest which the government represents.[9]

The Atomic Safety and Licensing Board concludes that this proceeding reflects a changing scene, alterations, redesign, and new data which have been presented continuously since the hearings commenced. The Applicants' insistence is that the Petitioners knew that this case was set for hearing, that the Petitioners had access to the public depository that contained the original filings made in reference to the application, and that Petitioners should have appraised their position from those data. The Applicants, however, have desired to make many changes and alterations to the original filings are still being made. The Regulatory Staff has been called upon to appraise the changes and submit views on these alterations. The Applicants' insistence that the original filings revealed enough to preclude any participation by the Petitioners as parties is wholly unrealistic. The recent analysis of the 1872 earthquake involved a score of people in the accumulation and analysis of data and the relevance thereof is yet to be fully tested.

The previously enumerated items of new data, particularly the intake and release of water from the proposed nuclear plant necessarily involve

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[9]If the United States were to petition for intervention either on the basis of enforcing treaty rights as guardian for the Indians, or on the basis that the Indian tribes constituted an instrumentality of the government, no laches could be effectively asserted to bar the petition. The Indians have the same rights in this respect as does the government.

No rule is better established than that the United States are not bound by limitations or barred by laches where they are asserting a public right.

Societe Suisse Pour Valeure de Metaux v. *Cummings*, 99 F.2d 387 (1938), *cert. den.* 306 U.S. 631.

The principle that the United States are not bound by any statute of limitations, nor barred by any laches of their officers, however gross, in a suit brought by them as a sovereign government to enforce a public right or to assert a public interest is established past all controversy or doubt.

U.S. v. *Beebe*, 127 U.S. 338.

Laches within the term of the statute of limitations is no defense at law.

U.S. v. *Mack*, 295 U.S. 480 (1934).

It is well settled that the U.S. is not bound by State statutes of limitation or subject to the defense of laches in enforcing its rights.

U.S. v. *Summerlin*, 310 U.S. 414 (1940).

many interrelated aspects of pollution, effect on the fishery, the spawning activity, the kinds of fish affected, etc., so that when the Applicants make changes to the intake and release of water they open up the subjects for further review. It does not aid the Applicants' case to assert that the previously presented data for the first proposal on water intake and release operate to preclude any inquiry by the parties, or the Petitioners (if permitted to intervene) regarding the changed designs and procedures.

In general the Petitioners have categorized (page 590, *infra*) their concerns within two major areas—socioeconomic impacts and fisheries impacts, resulting variously from both construction and operation of the proposed nuclear facility. The central theme underlying both of these categories is the representation that the Petitioners constitute an atypical sample of nearby population, economically, socially, and genetically. Therefore, the Petitioners contend that their concerns deserve special considerations that may be more substantive than for the average or typical population sample. The Board makes no determination in that regard at this time except to note that the Indians do represent a specially protected class of citizens whose rights are measured by unique and unequaled arrangements. The concerns expressed by the Indians in their petition have been articulated with sufficient particularity to constitute valid contentions. The Board concludes that adequate and specific contentions have been asserted by the Indian tribe Petitioners to present valid factual issues requiring reasonable persons to examine further into the validity and scope of the contentions.

The Atomic Safety and Licensing Board therefore concludes that the items enumerated by the Petitioners and the interrelated aspects of those subjects are matters awaiting further presentation of data and an examination in the hearings. On that basis there will not be any undue delay to the participation by the present parties to the proceeding, nor by the Petitioners who seek to test the validity of these changes presented by the Applicants. The Petitioners certainly are the legally determined "real-parties-in-interest" respecting their treaty rights to the fishery and thereby constitute themselves as persons with standing to participate in the proceedings. No other party can fully represent their interests.

A further important consideration is the recognition of the flexibility intended for Federal administrative agencies, to overcome the rigidity of form and to reach the substance of disputes. This principle requires that persons be not subjected to separate proceedings when one proceeding can encompass similarly situated parties concerned with the same issues. To deny intervention to these petitioners respecting their treaty rights would require them to appeal or to start an action in Federal district court to consider the very same subjects now being developed on this

record—the folly of such wasteful duplication should be obvious. With no prejudice to existing parties to the proceeding (and the only parties likely to be prejudiced are the Applicants, who have changed many aspects of their application from time to time with some 20 amendments—the Regulatory Staff of the Commission is not prejudiced, it is still analyzing many of the Applicants' changes), this proceeding is open to consider the alterations made by the Applicants. The following case states the practicality of flexible procedures:

> . . . We know from the recent amendments to the civil rules that in the intervention area the "interest" test is primarily a practical guide to disposing of lawsuits by involving as many apparently concerned persons as is compatible with efficiency and due process . . . . in permitting intervention: "[o]bviously tailored to fit ordinary civil litigation, these provisions [of Rule 24] require other than literal application in atypical cases. *Administrative cases, as the present one demonstrates often vary from the norm.*" . . . *We not only have the greater impetus to intervention that adheres in administrative cases* . . . [Rule 24] . . . now specifies only that the "disposition of the action may as a practical matter impair or impede his ability to protect" . . . [a would-be intervenor's interest]. This alteration is *obviously designed to liberalize the right to intervene in Federal actions* . . . underscores both the burden on those opposing intervention to show the adequacy of the existing representation and the need for a liberal application in favor of permitting intervention. [Parentheses and emphasis added.]

Nuesse v. *Camp*, 385 F.2d 694 (1967).

In summary, the Atomic Safety and Licensing Board finds:

(1) That the Petitioners have made a substantial showing for good cause for failure to file their petition seeking intervention within the time period specified in the notice of hearing for this case;

(2) That other means do not exist whereby the Petitioners' interests will be protected, since these Petitioners seek to protect treaty rights which designate these Petitioners, alone, and no other party can assert those interests nor fully participate at hearings and appeal if necessary to represent those treaty rights;

(3) The petition with the supporting brief and the supplementary material filed which designate the areas of interest, the proposed witnesses who could be called, all combine to establish that the Petitioners can reasonably be expected to assist in developing a sound record in view of their commitment to submit witnesses with expertise in those areas of interest designated, so that the record in those respects need not be limited to a substantial degree to only a cross-examination of Applicants'

and the Staff witnesses who may not reflect the same experience background as Petitioners' proposed witnesses;

(4) That the Petitioners' interests cannot be adequately represented by existing parties to the proceeding; and

(5) That the participation by the Petitioners will not broaden the issues nor delay the proceeding, since their participation will be limited (a) to the changes made by the Applicants and submitted after the time of filing the original application and the supporting data, and (b) to the matters yet to be considered in the hearing which are also the areas of interest enumerated by the Petitioners.

Upon the basis of the foregoing findings, the Atomic Safety and Licensing Board concludes[10] that the petition seeking intervention in this proceeding by the Upper Skagit Indian Tribe, the Sauk-Suiattle Indian Tribe, and the Swinomish Tribal Community should be granted.

WHEREFORE, IT IS ORDERED,[11] in accordance with the Atomic Energy Act, as amended, and the Rules of Practice of the Nuclear Regulatory Commission, that the petition seeking intervention in this proceeding by the Upper Skagit Indian Tribe, the Sauk-Suiattle Indian Tribe, and the Swinomish Tribal Community is granted and such Petitioners are made parties to this proceeding to participate in the areas of interest set forth in their petition to intervene and to the extent of (a) the changes made in the designs and processes made by the Applicants and submitted after the time of filing of the original application and supporting data for the request for authority to construct a nuclear power plant, and (b) together with the other matters yet to be examined at further hearings in this proceeding.

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[10]The Board has concluded that the conference by the Board with representatives of the existing parties and the Petitioners, without objection and their implied consent, held in Seattle on June 20, 1978, which considered the petition, the objections thereto, and the general discussion which resulted in the preparation and submittal of briefs, all of which have been considered by the Atomic Safety and Licensing Board, fully complies with the provisions of 10 CFR 2.751(a) to obviate any further conference and orders which would be to the same effect. The parties and the Petitioners by their participation may be deemed to have waived any formaility specified by 10 CFR 2.751(a) in order to reach the substance of the matters considered.

[11]In the same way that the notice of hearing is required by the Administrative Procedure Act to state the legal authority and jurisdiction under which the hearing is to be held, the initial decision should reflect conformity with and strict adherence to the legal authority and jurisdiction specified in the notice of hearing which authorized the action taken. There is no authority in Federal administrative agencies to rely upon the general jurisdiction granted to Federal courts to declare "It is so ordered" as basis for administrative commission actions which are controlled by specific legislative jurisdictional limits.

Pursuant to 10 CFR Section 2.714a, this Decision may be appealed to the Atomic Safety and Licensing Appeal Board within ten (10) days after service of the order. The appeal shall be asserted by the filing of a notice of appeal and accompanying supporting brief. Any other party may file a brief in support of or in opposition to the appeal within ten (10) days after service of the appeal.

ATOMIC SAFETY AND
LICENSING BOARD

Samuel W. Jensch, Chairman

Issued:
November 24, 1978
Bethesda, Maryland

Cite as 8 NRC 602 (1978) LBP-78-39

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Ivan W. Smith, Chairman
Lester Kornblith, Jr.
Oscar H. Paris

In the Matter of **Docket Nos. STN 50-566**
STN 50-567

TENNESSEE VALLEY AUTHORITY

(Yellow Creek Nuclear Plant, Units 1 and 2) **November 24, 1978**

The Licensing Board authorizes issuance of permits to construct the Yellow Creek Plant consistent with the terms of this decision (radiological health and safety matters) and the earlier Partial Initial Decision dealing with environmental issues (LBP-78-7, 7 NRC 215 (1978)).

LICENSING BOARD: CONSIDERATION OF GENERIC ISSUES (SAFETY)

A licensing board's review of safety matters must consider whether the staff has adequately dealt with unresolved generic safety problems that might have an impact upon operation of the facility in question. *Gulf States Utility Company* (River Bend, Units 1 and 2), ALAB-444, 6 NRC 760 (1977).

LICENSING BOARD: CONSIDERATION OF GENERIC ISSUES (SAFETY)

For an applicant to meet its burden before a licensing board, the public record with regard to unresolved generic safety problems must (1) describe the problem and its relationship to the facility in question, (2) explain the program for resolving the problem, and (3) offer a rational basis for the licensing or continued operation of the reactor notwithstanding the problem.

TECHNICAL ISSUES DISCUSSED: Plant design; industrial and transportation hazards; fire protection measures; population concentrations; technical qualifications; quality assurance; organization and management; financial qualifications; generic safety problems; anticipated transients without scram; radon-222; alternatives.

INITIAL DECISION
(Construction Permit)

Appearances

Herbert S. Sanger, Jr., General Counsel; **David G. Powell**, Assistant General Counsel; **W. Walter LaRoche, Esq., Alvin Gutterman, Esq.**, and **J. William Bain, Esq.** for the Applicant, Tennessee Valley Authority.

Ronald J. Forsythe, Division of Radiological Health, State of Mississippi.

Edward G. Ketchen, Jr., Esq., and **William D. Paton, Esq.**, for the Staff of the Nuclear Regulatory Commission.

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I. INTRODUCTION

1. On December 20, 1976, pursuant to Section 103 of the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011, *et seq.*, the Nuclear Regulatory Commission docketed the final portion of the application[1] of the Tennessee Valley Authority (TVA or Applicant) to construct two nuclear reactors designated as the Yellow Creek Nuclear Plant, Units 1 and 2, to be located in Tishomingo County, Mississippi. 42 Fed. Reg. 1322 (1977). The plant would consist of two identical pressurized light-water reactors, each with a turbine generator net electrical power output of about 1,300 megawatts electric (MWe), a rated core power level limited to 3,800 megawatts thermal (MWt), and a design power of approximately 4,100 megawatts thermal (MWt).[2]

2. On February 10, 1977, the Commission published a "Notice of Hearing on Application for Construction Permits" with respect to the application. 42 Fed. Reg. 8441. The notice set forth the requirements according to the Atomic Energy Act of 1954, as amended, and the National Environmental Policy Act of 1969 (NEPA) to be met prior to the issuance of construction permits. No petitions to intervene were filed.

3. A hearing was conducted on TVA's request for authorization to perform certain limited work activities pursuant to 10 CFR 50.10(e). Pursuant to the Partial Initial Decision issued by this Board on February 3, 1978, 7 NRC 215 (1978), the Director of Nuclear Reactor Regulation

[1]The application also consisted of a segment on antitrust matters docketed November 11, 1975 (40 Fed. Reg. 43324), and one including the Preliminary Safety Analysis Report and general and financial information docketed August 2, 1976 (41 Fed. Reg. 33340).

[2]Staff's Ex. 3, "Safety Evaluation Report" (NUREG-0347), relating to construction of Yellow Creek Nuclear Plant, Units 1 and 2, December 1977, U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation ("SER"), received into evidence at Tr. 520, p. 1-1.

issued limited work authorizations on February 9, 1978, authorizing certain work activities at the plant site. 43 Fed. Reg. 7074. A more detailed history of this proceeding is set forth in the Partial Initial Decision. As required by §50.10(e), the Partial Initial Decision constituted the findings of fact with respect to the site suitability and environmental issues.

4. The remaining radiological health and safety issues were set for hearing by notice on June 5, 1978. 43 Fed. Reg. 24750. The hearing was held on July 6, 1978, at Iuka, Mississippi. An additional 18 members of the public made limited appearance statements. All limited appearance statements were considered by us in reaching our decision. This Initial Decision addresses those health and safety matters and this Board's ultimate decision on the issuance of construction permits for this facility.

5. The record in this proceeding consists of all the material pleadings filed, the transcript of the prehearing conference and the evidentiary hearings, and all exhibits received during the course of and after the hearings. A portion of the record in *Duke Power Company* (Perkins Nuclear Station, Units 1, 2, and 3) with respect to radon-222 emission has been incorporated into this record. Throughout this decision we refer to exhibits of the Staff and the Applicant, received into evidence at the hearing and after the hearing. A list of all exhibits appears in Appendix A attached hereto. For convenience we will hereinafter refer to the Staff's Final Environmental Statement (Staff's Ex. 1) as amended by Staff's Exhibit 2 and subsequent testimony as the "Staff FES"; the Staff's Safety Evaluation Report (Staff's Ex. 3) with its Supplement (Tr. following 1006) as the "SER" or "SER Supp."; the Applicant's Environmental Report (through Revision 3), including its supplement (Applicant's Ex. 1), as the "ER"; the Applicant's Preliminary Safety Analysis Report, with its 12 amendments (contained in Applicant's Exs. 3 and 12), as the "PSAR"; and the Combustion Engineering Standard Safety Analysis Report (Applicant's Ex. 2) as "CESSAR."

6. In making the findings of fact and conclusions of law in this Initial Decision, the Board reviewed and considered the entire record and all proposed findings of fact and conclusions of law submitted. Findings of fact and conclusions of law not incorporated directly or inferentially herein are rejected as being unsupported by the evidence of record, or as unnecessary to the rendering of the Initial Decision.

II. FINDINGS OF FACT—RADIOLOGICAL HEALTH AND SAFETY

A. The Nuclear Steam Supply System

7. Each of the two generating units of the Yellow Creek Nuclear Plant

will utilize a nuclear steam supply system (NSSS) to be furnished by Combustion Engineering, Inc., and designated as the CESSAR-80 design. That design had been the subject of an application by Combustion Engineering, NRC Staff and ACRS review, and Commission action prior to the TVA application for the Yellow Creek Plant. We therefore include here a brief summary of that action.

8. Pursuant to Option 1 of the Commission's standardization policy as set forth in WASH-1341, "Programmatic Information for the Licensing of Standardized Nuclear Plants," Combustion Engineering, Inc., submitted an application in September 1973 for preliminary design approval of a standardized nuclear steam supply system designated the CESSAR-80 design. The application included the Combustion Engineering Standard Safety Analysis Report (CESSAR) with 44 amendments which described and analyzed the CESSAR-80 design and the interfaces with other "balance of plant" structures and equipment not part of the CESSAR-80 design. The NRC Staff conducted a thorough safety review of this design and published the results in a Safety Evaluation Report, NUREG-75/112, December 1975. This SER is included in its entirety as Appendix A to Staff's SER for the Yellow Creek Plant, Staff's Ex. 3.

9. The Staff also reported the results of its review to the Advisory Committee for Reactor Safeguards (ACRS). After meeting with the Staff and conducting its own review, the ACRS concluded that, subject to the satisfactory resolution of certain issues then still outstanding, and the successful completion of certain R & D programs, the CESSAR-80 design can be successfully engineered to serve as a reference system. App. C to CESSAR SER, Staff's Ex. 3. Subsequently, all of the outstanding issues identified by the ACRS were resolved in a manner acceptable to the Staff. App. A to SER at 18-1. Preliminary Design Approval PDA-2 for the CESSAR-80 standard nuclear steam design system was issued on December 31, 1975. SER, 1.4. Since then, the CESSAR-80 standard design has been referenced in several applications for construction permits.

B. The TVA Application and Its Review

10. As part of its application for permission to construct the Yellow Creek Nuclear Plant, the TVA submitted its Preliminary Safety Analysis Report (PSAR) with 12 amendments contained in Applicant's Exs. 3 and 12. The PSAR incorporates CESSAR by reference. The PSAR contains a description of the site and the basis for its suitability, a detailed description of the proposed facility including those reactor systems and features which are essential to safety, an analysis of the safety features provided in the facility design, an evaluation of various postulated acci-

dents and hazards involved in the operation of such a facility, and a description of the engineered safety features provided to prevent their occurrence or limit their effects. The PSAR also includes a description of the Applicant's financial and technical qualifications, quality assurance program, plans for the conduct of operations, and information relevant to the common defense and security of the United States.

11. The Staff reviewed the information provided by the Applicant and performed its own analyses and investigations evaluating the radiological health and safety aspects of the plant. The results of Staff's technical evaluation of the proposed plant design and the scope of the technical matters considered by the Staff in that evaluation are set forth in the SER. Staff's Ex. 3, SER Supp., following Tr. 1006, and the affidavit of Aycock, Cox, and Crocker with accompanying Appendix A relating to generic safety issues (Staff's Ex. 6).[3]

12. At its 213th meeting on January 5-7, 1978, the ACRS completed its review of the application by TVA for permits to construct the Yellow Creek Nuclear Plant, Units 1 and 2. A copy of the Committee's report on the Yellow Creek facility, dated January 13, 1978, which contained comments and recommendations, is included as Appendix A to the Safety Evaluation Report, Supplement No. 1. SER Supp., Chapter 18. The ACRS concluded that, if due consideration is given to 19 issues identified by the Staff, SER 1.9, the proposed Yellow Creek Nuclear Plant can be constructed with reasonable assurance that it can be operated without undue risk to the health and safety of the public. All of these outstanding issues have now been resolved to the satisfaction of the Staff. SER Supp., 1.9.

13. In addition, the ACRS identified certain generic items considered applicable to the Yellow Creek Plant and stated that these should be dealt with by Staff and Applicant as solutions are found. These generic items are identified and discussed in the generic matters section, *infra*.

14. The Staff concluded, as a result of its review that the application is adequate and complete and that it satisfies the requirements of 10 CFR 50.34. SER, 21a, and SER Supp., 21a. Additional description of the application and its safety review is given in the following findings.

C. The Site

15. The site of the proposed Yellow Creek Nuclear Plant was described and discussed in our Partial Initial Decision. 7 NRC 215, 220. Therein,

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[3]The Board grants Staff's posthearing motion dated August 15, 1978, to admit the Aycock, Cox, and Crocker affidavit and its Appendix A as Staff's Ex. 6.

we noted that the Staff had not identified any factors which would preclude the development of acceptable emergency measures to protect the public within the low population zone. Finding 65, 7 NRC at 240. Upon further review of the record, we now also find that the Applicant has submitted its preliminary plan for coping with potential emergencies due to operation of the Yellow Creek Plant. SER, 15.3. Staff has reviewed these preliminary plans and concluded, as do we, that they meet the requirements of 10 CFR Part 50, Appendix E, Part II, that they are consistent with facility design features, analyses of postulated accidents, and characteristics of the proposed site location, and that they provide reasonable assurance that appropriate protective measures can be taken within and beyond the site boundary in the event of a serious accident.

D. The Facility

16. The CESSAR-80 nuclear steam supply system to be incorporated in each of the Yellow Creek units will consist of a pressurized water reactor and its control, protective and primary coolant system including the steam generator; engineered safety feature actuation system; chemical and volume control system; shutdown cooling system; safety injection system; and fuel-handling system. The CESSAR scope does not include the containment building or other conventional balance of plant features such as the site, plant buildings and structures, cooling towers, the ultimate heat sink during abnormal conditions, onsite and offsite electrical systems, and the turbine-generator and its auxiliaries. However, the CESSAR does include the delineation of interface requirements pertaining to those balance of plant features that have a direct bearing on the functional capability of the safety related systems within the CESSAR scope. SER, Appendix A, 1.2.

17. The Applicant, in Section 1.10.3 of the Yellow Creek PSAR, identified exceptions taken to certain CESSAR requirements. The Applicant indicated that each of these exceptions has been coordinated with Combustion Engineering to assure that safety-related functions of CESSAR systems or equipment will not be compromised. Each of the CESSAR requirements excepted to by the Applicant was reviewed by the Staff. SER, 1.11.

18. The Staff concluded that Staff requirements have been met for each exception to the CESSAR requirements for the construction stage of review. SER, 1.11; SER Supp., 1.11.

19. Systems and components within the CESSAR scope that are important to safe reactor operation will not be shared between the two Yellow Creek units. Shared facilities will be limited to (a) waste management

building, (b) central facilities building, (c) office service building, (d) intake pumping station, (e) condenser water pumping station, and (f) ultimate heat sink spray ponds. The ultimate heat sink for the plant under abnormal conditions will include two spray ponds, each capable of handling the heat load requirements for a postulated design basis accident in one unit simultaneous with a normal shutdown of the other unit. SER, 1.3. The shared systems for the Yellow Creek Plant were reviewed by the Staff and found to be in conformance with General Design Criterion 5—Sharing of Structures, Systems, and Components. SER, 1.3.

20. The containment structure will be a 200-foot diameter, spherical, freestanding, welded steel structure completely enclosed in a separate reinforced concrete structure. The spherical steel containment will have a nominal wall thickness of from 1.5 to 1.75 inches with thicker plate sections around most penetrations. This containment vessel will not be anchored, but the lower hemisphere will be encased in concrete between the interior structure base and the auxiliary building. The auxiliary building encloses the lower portion of the containment, and the concrete enclosure building encloses the upper portion of the containment. All gas leaking from the containment following any postulated accident will be collected and filtered by the auxiliary building and enclosure building emergency gas treatment systems. The containment vessel welds that are encased in concrete will be leak tested prior to encasement. The design pressure for the containment sphere will be 45 pounds per square inch gauge (internal pressure). SER, 1.2.2.

21. The auxiliary and enclosure buildings will normally be maintained at a slight negative pressure to assure that any air leakage will be into the building. Each of these buildings will have an emergency gas treatment system (an engineered safety feature, with a rated flow of 12,000 cubic feet per minute per system) to maintain their volumes at a slight negative pressure and to provide filtration of all exhaust air to the environment. SER, 1.2.2.

22. The enclosure building provides external missile protection for the containment vessel and provides an annular region for collection and filtration of any leakage from the containment prior to being exhausted to the environment. *Id.*

23. The auxiliary building will contain engineered safety feature equipment, such as the emergency core cooling system, containment spray system equipment and shutdown cooling system. The foundation of the auxiliary building and the concrete column supporting the containment internal load will be on solid bedrock. *Id.*

24. The reactor building (including the enclosure and auxiliary buildings), control building (including the main steam vault and tunnel), diesel

generator buildings, essential raw cooling water pumping stations, essential raw cooling water spray ponds, fuel building, refueling water tanks, emergency feedwater storage tanks, and the waste management building will be designed as seismic Category I structures. SER, 1.2.3.

25. Structures not designed to withstand seismic Category I requirements and wind and tornado loads will be located so that their failure will not impair the ability of the seismic Category I structures and systems to perform their intended function.

26. The turbine generator buildings will be located in a peninsular arrangement relative to the reactor buildings. Turbine generators and accessory equipment will be supplied by the General Electric Company. *Id.*

27. In amendment 10 to the PSAR, the Applicant reported that two natural-draft cooling towers will be used to reject the waste heat from the turbine generators' main condensers in place of the four mechanical-draft towers.[4] These natural-draft towers will be in approximately the same location as originally planned for the mechanical-draft towers. Makeup and blowdown water service to the natural-draft towers will remain as described in the SER. The tower design and function are not safety-related. The change by Applicant from mechanical-draft cooling tower design to the larger natural-draft cooling design will not result in any hazard to safety systems due to severe weather. Collapse of the natural-draft cooling towers caused by hurricanes or tornadoes would not result in damage to safety systems. Tr. 957; 970-972; 1034. The design change is addressed in Section 10.4 of the PSAR and a complete description of Applicant's design revision is found in the Yellow Creek Nuclear Plant Environmental Report, Revision 3, dated December 1, 1977. SER Supp., 1.2.3.

28. During normal operations two cooling ponds, which will serve as the ultimate heat sink during abnormal conditions, will provide the means to reject the heat from the nuclear service water systems. SER, 1.2.3; 2.4; 9.2.3; SER Supp., 2.4.

29. The pressurized water reactor system will include the reactor vessel, a standard design of integral supports, reactor vessel head cover, the reactor core, and all internal appurtenances required to support the reactor core. The reactor core will be composed of uranium dioxide pellets enclosed in Zircaloy-4 tubes with welded end plugs. The fuel tubes will be grouped and supported in assemblies. The reactor core will initially be loaded in three regions. All fuel in each region will have the same enrichment

[4]We have previously found the natural-draft cooling towers acceptable from an environmental standpoint. Partial Initial Decision (Limited Work Authorization), 7 NRC 215, 223-224.

of uranium-235, which will differ from the enrichment used in the other regions. SER, Appendix A, 1.2.1.

30. The reactor coolant system will consist of two closed reactor coolant loops. Each loop will include a steam generator and two reactor coolant pumps. Water will both moderate and cool the core. Water circulated through the reactor vessel and core and the two reactor coolant loops will flow through the two steam generators where heat will be transferred to the secondary (steam) system, and then back to the reactor through the reactor cooling pumps to complete the cycle. The major components of the reactor coolant system will incorporate standard designs of integral supports and snubbers. SER, Appendix A, 1.2.2.

31. The reactor control system will consist of two reactivity control systems. The vertical movement of the control element assemblies will compensate for or initiate rapid changes in reactivity. Dissolved boron will be used to compensate for long-term variations in reactivity due to fuel burnup and fission product concentration changes, and to ensure ample shutdown margin during refueling. The purity, volume, and boric acid content of the reactor coolant will be controlled by the chemical and volume control system. The vertical movement of the control element assemblies will be accomplished by magnetic jack type drives (control element drive mechanisms). The concentration of boron will be adjusted by the chemical and volume control system. SER, Appendix A, 1.2.3; 1.2.6.

32. Plant protection systems will automatically initiate appropriate action whenever a monitored condition approaches preestablished safety limits. These protection systems will act to shut down the reactor, close containment isolation valves, and initiate operation of the engineered safety features should any or all of these actions be required. Redundancy, diversity, independence, and separation of reactor protective circuits will meet the Commission's criteria. The engineered safety features systems will have instrumentation and controls to sense accident situations and to respond appropriately. SER, Appendix A, 1.2.4—1.2.5.

33. A safety injection system (emergency core cooling system) will be provided as part of the engineered safety features system to localize, control, mitigate, and terminate postulated accidents, including a loss-of-coolant accident. The safety injection system will include four safety injection tanks, and independent and redundant low pressure and high pressure safety injection trains designated to automatically inject highly borated water into each of the reactor coolant system cold legs. This system will assure core cooling and protection for the complete range of postulated primary and secondary coolant pipe break sizes. SER, Appendix A, 1.2.8.

34. Shutdown cooling operations will be accomplished by reducing the reactor coolant temperature from normal operating temperatures to approximately 350 degrees Fahrenheit by venting the steam generator, after which the reactor coolant will be cooled from 350 degrees to a cold shutdown or refueling temperature by use of low pressure safety injection pumps to circulate the reactor coolant through the shutdown cooling heat exhchangers. SER, Appendix A, 1.2.7.

35. A fuel-handling system will be provided for the safe handling of fuel assemblies and control element assemblies for refueling or maintenance purposes. This system will provide for the assembly, disassembly, and storage of the reactor vessel head and internals. SER, Appendix A, 1.2.9.

36. The plant will have independent offsite electric power sources at the 500-kilovolt and 161-kilovolt levels to supply power for normal startup and shutdown and to operate the engineered safety features in the event of an accident. The normal offsite power source will be the 500-kilovolt transmission system. Failure of the normal offsite power source will cause automatic transfer of the safety- and nonsafety-related buses of both units to a physically independent reserve 161-kilovolt power source. PSAR 1.2, 8.1; SER, 8.2.1.

37. The proposed radioactive waste treatment systems will be designed to collect and process the liquid, gaseous, and solid wastes which are byproducts of station operation and which might contain radioactive materials. The radioactive waste management systems will be shared between the two Yellow Creek units and will be designed to provide for controlled handling and treatment of liquid, gaseous, and solid wastes. SER, 11.1.

38. The Commission's regulations require that discharges of radioactive effluents during normal operation of a facility be "as low as is reasonably achievable." 10 CFR 50.34a. To this end, certain design objectives are set forth in Appendix I of 10 CFR Part 50. The evidence presented by the Applicant and the Staff demonstrates that the design objectives of the Yellow Creek facility meet the design objectives of Appendix I. SER, 11.1. Also, the Staff performed an analysis to determine whether additional gaseous and liquid rad-waste system augments would be cost-effective. It determined that there were no equipment additions which would effect a cumulative dose reduction within a 50-mile radius of the plant at a cost of less than $1,000 per total body man-rem or $1,000 per man-thyroid rem. SER, 11.2.1, 11.2.2.

39. The Staff has considered the potential consequences resulting from reactor operation with a one percent operating power fission product source term and determined that, under these conditions, the concentration of

radioactive materials in liquid and gaseous effluents in unrestricted areas will be a small fraction of the limits specified in 10 CFR Part 20. SER, 11.4. We conclude, therefore, that the liquid rad-waste system and the gaseous rad-waste treatment system, and the plant ventilation systems will be capable of reducing the release of liquid and gaseous effluents to concentrations below the limits of 10 CFR Part 20 during periods of fission product leakage from the fuel at design levels. SER, 11.2.1; 11.2.2.

40. The Staff has also considered the capabilities of the rad-waste systems to meet the anticipated demands of the plant due to anticipated operational occurrences and has concluded that the liquid, gaseous, and solid waste system capacities and design flexibilities are adequate to meet the anticipated needs of the plant. SER, 11.4.

41. The Applicant's quality assurance provisions for the rad-waste systems, the quality group classifications used for system components, the seismic classification applied to the design of the gaseous waste processing system, and the seismic classification applied to the design of structures housing the rad-waste systems and the design of the rad-waste systems and structures housing these systems meet the Staff's acceptance criteria.

42. The Staff's review of the radiological process and effluent monitoring system included the provisions for sampling and monitoring all normal and potential effluent discharge paths: for providing automatic termination of effluent releases and assuring control over releases of radioactive materials in effluents, for sampling and monitoring plant waste process streams for process control, for conducting sampling and analytical programs, and for monitoring process and effluent streams during postulated accidents. The review included piping and instrument diagrams and process flow diagrams for the liquid, gaseous, and solid rad-waste systems and ventilation systems, and the location of monitoring points relative to effluent release points. SER, 1.4.

43. The Staff has concluded that the proposed liquid, gaseous, and solid rad-waste treatment systems and the associated process and effluent radiological monitoring systems are acceptable. The basis for acceptance has been conformance of the Applicant's designs, design criteria, and design bases for the rad-waste treatment and monitoring systems to the applicable regulations and guides, as well as the NRC Staff's technical positions and industry standards. SER, 11.4. We agree.

44. As noted above, at the time it was issued, the SER identified 19 outstanding issues which required further review in order to confirm that the proposed design would meet regulatory requirements. The Staff completed its review for each of those items and each was acceptably resolved by the NRC Staff for the construction permit stage of review. SER Supp., 1.9. Two additional outstanding issues were identified at the meeting of the

ACRS on January 5, 1978. These items have also been resolved. The Applicant proposed a previously unreviewed method for computing the factor of safety against overturning of structures when the hydrostatic uplift is taken into account. Additional information was required to justify the new method. The NRC Staff concluded, after review of this information and Applicant's commitment to compute overturning moments for seismic Category I structures by the method outlined in the approved Bechtel Power Coroporation Topical Report BE-TOP-4-A, that the proposed method met NRC Staff criteria. SER Supp., 1.9; 3.7.2.

45. The Applicant proposed to use the American Concrete Institute Standard 349-76 "Code Requirements for Nuclear Safety-Related Concrete Structures." While application of that code was generally acceptable, the Staff found that certain features were unacceptable and required the Applicant to commit to alternate provisions. To meet Staff requirements, the Applicant was required to commit that walls and roofs designed to protect against tornado missiles will have a design strength verified by concrete tests at 28 days after pouring. However, walls and slabs which will not be utilized for protection from tornado missiles may be based on a design strength verified by tests at 90 days after pouring. The Applicant provided commitments that were approved by the Staff. The Staff found the Applicant's use of the American Concrete Institute Standard 349-76, as modified, to be in accordance with Staff requirements. SER Supp., 1.9; 3.8.

46. The Staff and Applicant have now resolved all outstanding issues. SER Supp., 1.9. We find the resolution acceptable for the construction permit stage of review.

E. Industrial and Transportation Hazards

47. Following the first evidentiary hearing (site suitability and environmental matters) and shortly before issuance of our Partial Initial Decision (Limited Work Authorization), Applicant moved on January 25, 1978, to reopen the record to receive into evidence the "Affidavit and Testimony of Thomas E. Spink Regarding the Yellow Creek Port Tank Farm," dated January 25, 1978. Absent an objection from Staff, the aforesaid affidavit was received into evidence in the Partial Initial Decision, but our consideration of the subject of the affidavit was deferred because Staff's review of the material was not complete. 7 NRC at 219.[5] On February 6, 1978, Staff served the parties with the "Affidavit and Testimony of Charles Ferrell Regarding the Yellow Creek Port Tank Farm," dated February 3, 1978; this

[5]The affidavit of Thomas E. Spink dated January 25, 1978, was marked "Applicant's Ex. 8."

affidavit was received into evidence at the evidentiary hearing on July 6, 1978. Tr. 796 (Ferrell Testimony). Information contained in these affidavits prompted the Board to advise the parties of certain questions concerning the matter of the Yellow Creek Port Tank Farm which we would want answered during the health and safety hearing. Tr. 795.

48. Applicant's testimony indicated that the tank farm is located about 1.8 miles northwest of the Yellow Creek Plant site and consists at present of two 80,000 bbl tanks, one of which will contain No. 6 fuel oil and the other No. 2 diesel oil. A third tank of the same size is planned for the future, to be used for heavy fuel oil. Heavy fuel oil requires preheating and atomization for ignition, and diesel oil requires atomization. Consequently detonation of the stored oil is extremely unlikely. Nevertheless, Applicant evaluated the overpressure hazard that the tank farm might pose for the plant by assuming simultaneous detonation of three tanks filled with a mixture of gasoline vapor and air.[6] Following Regulatory Guide 1.91, TVA determined that such an explosion would produce an overpressure of less than 1.0 psi at the plant. Applicant witness Spink testified that the plant is designed to withstand the "dynamic pressure effects of 3.0 psi." Applicant's Ex. 8 at 2. Staff witness Ferrell stated that "we evaluated the Applicant's postulated explosion of all three tanks and agree that the resulting overpressure would be significantly less than the value the safety structures are designed to accommodate." Ferrell Testimony at 2.

49. In response to a request from the Board, the Staff submitted as Staff's Exhibit 7, the affidavit of Harold E. Polk on September 12, 1978, providing us with additional information about its analysis.[7] Staff determined that the

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[6]Lighter and more volatile petroleum products, such as gasoline, are not planned for the tank farm.

[7]Staff's Ferrell Testimony led us to believe that they had evaluated, *inter alia*, the basis for Applicant's statement that the plant could withstand an overpressure of 3.0 psi. We were unable, however, to confirm the basis for this value in the record (including the PSAR §3.8 which had been referenced by witness Spink). Consequently, in a telephone conversation on August 31, 1978, we asked the Staff to provide us with detailed information on how it reached its conclusion supporting Applicant's position. In its response, Staff indicated that it began with the fact that the plant would be designed to withstand tornado winds of 360 mph, and calculated from this value that the structures would be able to accommodate an overpressure of 2.3 psi. In addition, Staff confirmed Applicant's calculation that the postulated explosion would cause an overpressure less than 1.0 psi at the plant.

On September 12, 1978, Staff moved that the Board reopen the record for the limited purpose of receiving Staff's Exhibit 7 into evidence. Said exhibit provides further explanation of the basis of Staff's conclusion set forth in the evidence of record and introduces no new information. Accordingly we grant Staff's motion.

We were able to act unilaterally on this matter and thus expedite the proceeding because it involved an uncontested consideration and there were no intervenors.

safety-related structures of the plant would be able to withstand an overpressure of at least 2.3 psi, which led it to the conslusion, *supra,* reached in the Ferrell testimony. *Id.*

50. We cannot accept for the purpose of reaching a decision Applicant's statement (or—more accurately—Applicant's implication) that the plant will be able to withstand an overpressure of 3.0 psi, because we have been unable to find a basis for that value in the record.[8] We do not necessarily reject it as incorrect, however. Since the plant will be designed to withstand winds of 360 mph, in conformity with Regulatory Guide 1.76 (SER at 2-9), it must be able, therefore, to withstand an overpressure of at least 2.3 psi. Given this fact, we find it conceivable that TVA has actually designed the plant to withstand an overpressure of 3.0 psi, but we have been unable to confirm this supposition. On the other hand, we have determined that Staff's calculation that the plant will be able to withstand an overpressure of at least 2.3 psi is correct, and we have no trouble accepting that value. Thus we can concur with the conclusion that the overpressure resulting from an explosion of all three tanks at the tank farm would be significantly less than the overpressure which the safety-related structures of the plant will be designed to withstand.

51. A more likely accident at the tank farm which might pose a hazard for the plant is the spillage of oil onto the water followed by ignition. It was in this regard that the Board raised questions. Applicant's analysis indicated that most of the time normal river flow would sweep a burning oil slick away from the plant. Under the circumstance of reversed river flow, which may occur occasionally after the Tennessee-Tombigbee waterway is completed, TVA estimated that the rate of river flow would be low enough to allow time for instituting oil slick and fire control measures. Applicant's Ex. 8. Staff estimated that it would take more than 8 hours for reversed river flow to carry an oil slick from the tank farm to the plant, and agreed with Applicant's evaluation. Ferrell Testimony.

52. The Board asked about the effect of a northwest wind on the movement of an oil slick, and about the potential hazard to the plant if a flaming oil slick ignited the forest north of the plant. Tr. 964-5, 1038. Applicant witness Wisenburg testified that a burning oil slick on Yellow Creek embayment would probably cause a forest fire on Yellow Creek peninsula if it reached shore. Tr. 965. The Staff's analysis of this problem indicated that a burning slick driven by a northwest wind from the tank farm would impact the shore on the west side of Yellow Creek peninsula about 1.5 miles north

[8]We note that the plant will be designed to withstand an *underpressure* of 3.0 psi resulting from a tornado, as recommended by Regulatory Guide 1.76. But it would be incorrect to infer from *this* fact that the plant will also be able to withstand an overpressure of 3.0 psi.

of the plant. Tr. 1038-40, 1042. Applicant believes, and Staff agrees, that the rate of movement of a fire through the forest would provide ample time to implement fire suppression measures. Tr. 964-5, 1041. A 70-yard wide firebreak outside the security fence would stop the advance of a forest fire, and any flaming material blown into the secure area could easily be extinguished with the yard fire fighting equipment. Tr. 965, 977-79, 1041. All safety-related structures of the plant are at least 1,200 feet from the forest and would not be threatened by a forest fire. Tr. 987, 1047-8. The control room would be protected from smoke because of the distance between it and the fire and because of the ventilation system which filters out smoke and toxic gases. Tr. 966, 1048. Extensive testimony about the fire fighting capability of the plant was provided by Applicant witness Crisler. Tr. 976-92. He indicated that the plant will be capable of independently handling any fire emergency which might occur. Tr. 985-6. Nevertheless, in the event of a serious fire emergency, assistance would be summoned from outside the plant. *Id.*

53. If a burning oil slick should reach the vicinity of the intake pump house, fire fighting equipment at and in the vicinity of the pump house would be used to suppress the fire. Tr. 980. It might not be possible to protect the pump house completely from a very serious oil fire, however. *Id.* But the pump house is not a safety-related structure. *Id.* The spray ponds will provide a source of emergency core cooling water should the intake become inoperative. Tr. 961.

54. In the SER Supplement, Staff indicated that it had not received all the information needed to complete its review of the fire protection system. Nevertheless, it concluded that "the Applicant has supplied the Staff with sufficient information to permit it to make a finding, pursuant to 10 CFR 50.35(a), that the fire protection system design is adequate for the level of review necessary at the construction permit stage." SER Supp. at 9-2.

55. On the basis of the facts before us, we find that the plant would not be endangared by a detonation of oil tanks at the Yellow Creek tank farm. We find, further, that the fire protection system can be designed to adequately protect the plant from fire caused by the ignition of oil that has been spilled onto the water of Yellow Creek embayment.

56. In our Partial Initial Decision dated February 3, 1978, we found that barge traffic on the Tennessee River channel would pose no threat to the safe operation of the plant because of the separation distances involved. 7 NRC at 214. We found, also, that the likelihood of a significant hazard to the plant as a result of a barge accident in Yellow Creek embayment, after the Tennessee-Tombigbee waterway goes into operation about 1986, was sufficiently low such that no further consideration is required. *Id.* at 241-2. Subsequently, however, the Board became concerned about the possibility

that commodities which would produce a flammable gas cloud if accidently released from a barge might be shipped past the plant on the Tennessee-Tombigbee waterway. Accordingly, we requested Applicant and Staff to be prepared to answer questions on this matter during the safety hearing. Tr. 795.

57. The Board asked whether projected traffic on the Tennessee-Tombigbee waterway would carry liquid natural gas (LNG, or methane), liquid petroleum gases (LPG's, including propane, butane, butadiene, and propylene), or liquified vinyl chloride. Tr. 962, 1042. According to the Applicant, which obtained its projections from the Army Corps of Engineers, there is no expectation that any of these materials will be transported by barge on the waterway. Tr. 962-3. Applicant witness Wisenburg pointed out that fuel gases are transported primarily by pipeline in the southeastern United States. *Ibid.*[9] Staff confirmed that natural and synthetic fuel gases are transported by pipeline in the general area of the Yellow Creek Plant, and according to projections of the Department of Transportation, this practice will continue in the future. Tr. 1043-4. Staff was unable to obtain information about projected shipments of vinyl chloride, but pointed out that gaseous vinyl chloride is heavier than air. Should it be spilled on Yellow Creek embayment, it would tend to disperse up and down the river close to the surface of the water. It is unlikely that a flammable cloud of vinyl chloride would move uphill to the reactor.[10] *Id.*

58. Considering these facts, we find that there will be no threat to the plant from LNG, or vinyl chloride shipments on the Tennessee-Tombigbee waterway. Therefore Finding No. 71 in our Partial Initial Decision (7 NRC at 241-2) need not be disturbed.

F. Population Center

59. On May 11, 1978, the Applicant sent a letter to the Board advising that a recent reevaluation of population data in the vicinity of the Yellow Creek site had indicated that the population center in the year 2000 would probably shift from the Florence-Muscle Shoals-Sheffield-Tuscumbia, Alabama, complex, as originally reported in the PSAR §2.1.3.5, to Corinth, Mississippi. This change in the PSAR is reflected in Amendment 12. Applicant's Ex. 12. Corinth is located 15 miles from the Yellow Creek site. *Id.* Consequently, the requirements of 10 CFR 100.11 will still be met, since the population center will still be more than 1-1/3 times the 3-mile distance from the reactor to the outer boundary of the lower population zone.

[9]There is a gas pipeline 7.5 miles northwest of the site. 7 NRC at 241.

[10]Normal maximum elevation of water level in Yellow Creek embayment is 414 ft, and the finished grade at the reactor building will be 520 ft. PSAR, figs. 1.2-1(T) and 2.5-16(T).

60. Our Finding No. 66 in the Partial Initial Decision, wherein we stated that there was little likelihood that Corinth would have a population in excess of 25,000 during the lifetime of the plant, is altered to reflect this new information. 7 NRC at 240. Since the site continues to meet the requirements of 10 CFR Part 100, however, Conclusion No. 67 of the Partial Initial Decision is not disturbed. The Board recognizes that it may not have jurisdiction to consider this matter, but for the sake of expediency and a full record we have accepted this evidence and made these findings.

G. Technical Qualifications

61. The Applicant, who will act as architect-engineer and constructor for the Yellow Creek Plant, has had extensive experience in the design, construction, and operation of both fossil and nuclear generating facilities, including the Browns Ferry Nuclear Plant, Watts Bar Nuclear Plant, Hartsville Nuclear Plants, and Bellefonte Nuclear Plant. Personnel within TVA's Office of Power and in both its Division of Engineering Design and Division of Construction have had extensive training and experience in large-scale nuclear and conventional power production activities and are presently engaged in the design and/or construction of 14 nuclear units. TVA's experienced and trained personnel will be utilized for the proposed Yellow Creek Plant. TVA's system of managerial responsibility will help assure safe and reliable design and construction of the plant. Gilleland Testimony, pp. 1-5, following Tr. 890. The Staff concluded, based on its review of the Applicant's organizational structure, quality assurance program, and past assessment of TVA's technical qualifications, that the Applicant is technically qualified to design and construct the proposed facility. SER, Chapter 21.

62. Combustion Engineering (CE) is the designer and supplier of the nuclear steam supply system (NSSS). CE has had extensive experience in nuclear reactor design. During the period from 1955-1960, CE was a major contributor to the United States Naval Reactors Program. CE was responsible for the nuclear design and for the direction of startup and initial operation of the BONUS plant in Puerto Rico. The development by CE of pressurized water reactors for utility service dates back to 1958. A description of CE's nuclear program is contained in CESSAR §1.4. The Staff has concluded that CE is technically qualified to design the NSSS described in CESSAR. SER, App. A, Chapter 19.

63. The Board finds that the Applicant and its principal contractor, Combustion Engineering, are technically qualified to design and construct the proposed Yellow Creek Plant.

H. Quality Assurance

64. Section 17.0 of the PSAR refers to the quality assurance (QA) program description given in Topical Report TVA-TR75-1A "Quality Assurance Program Description" (Applicant's Ex. 13) and Section 17.0 of CESSAR. TVA is the Applicant, the architect-engineer, and constructor. TVA will be responsible for the total Yellow Creek Plant's quality assurance program and will be organized to control and verify the quality assurance programs of contractors furnishing safety-related equipment. SER, 17.1.

65. TVA's quality assurance/quality control organizations are sufficiently independent of the organizations whose work they verify; they have clearly defined responsibilities and authorities; they have adequately defined the qualification requirements for their supervisory personnel; they are organized so that they can identify quality assurance problems in organizations performing quality-related work; they can initiate, recommend, or provide solutions; and they can verify implementation of solutions. SER, 17.1, 17.2.

66. Based on our review of the description of TVA's quality assurance program and the Staff's analysis in SER 17.2, we find that there are adequate and well-defined procedures, a commitment to NRC's quality assurance guidance, assurance of an independent inspection program, an adequate personnel training program, a documented system of records attesting to quality, and an audit system to inform management of the effectiveness of the quality assurance program.

67. We conclude that the Applicant's quality assurance program for the Yellow Creek Plant will satisfy the requirements of Appendix B to 10 CFR Part 50.

68. Based on our review of the material contained in CESSAR Chapter 17 and the Staff's analysis in SER 17.3 (*see also* SER, App. A, Chapter 17), we conclude that Combustion Engineering's quality assurance program includes an acceptable organization and contains the necessary quality assurance provisions, requirements, and controls for compliance with Appendix B to 10 CFR Part 50, and applicable guides and standards and is acceptable for the nuclear steam supply systems for Yellow Creek Plant.

I. Preliminary Plant Organization, Operator Training, and Plant Operating Procedures

69. The TVA Office of Power has overall responsibility for the TVA power program, including power system planning, plant and site selection, plant and system operation, and transmission system design and construc-

tion. In the case of nuclear plants, it has overall responsibility for coordinating the safety analyses and licensing arrangements and preparing and submitting safety analysis reports. Gilleland Testimony at 5.

70. The TVA Division of Power Production (P PROD) is responsible for the safe operation and maintenance of each plant in compliance with the operating licenses, technical specifications, and other requirements. The Director of Power Production has the overall responsibility for recruiting and training of key staff personnel and P PROD will be responsible for operational quality assurance. The Operational Quality Assurance Program Plan will be audited by the Quality Assurance Audit Staff of the Office of Power. *Id.* at 5-6.

71. The Yellow Creek Plant will be staffed in accordance with TVA's policy for existing nuclear plants. Support in the areas of operation, maintenance, and engineering is provided by P PROD's central office staff. Consultation in other areas such as design improvements, radiological safety, and reactor physics is available from other TVA divisions. *Id.* at 6; PSAR 12.1; SER, 13.1.

72. At the time of manning Yellow Creek, TVA will have highly trained nuclear plant operating personnel at the Browns Ferry, Sequoyah, Watts Bar, Bellefonte, Hartsville, and Phipps Bend nuclear plants. These plants will be the primary source of personnel for Yellow Creek. The TVA student operator training program and replacement training at an operating TVA nuclear plant will ensure no loss of operator efficiency at those plants because of transfer of personnel to Yellow Creek. Individual training needs will be established by carefully examining the individual's experience and previous training and comparing these with the job requirements. Gilleland Testimony at 6-7; PSAR 13.2; SER, 13.2.

73. The TVA staff will operate Yellow Creek in accordance with standard practices. These practices contain adminstrative restrictions and plant requirements in conformance with industry standards established to ensure safe operation of the plants within the limits set by the facility licenses and technical specifications. They provide that plant activities will be conducted in a manner to protect the general public, plant personnel, and equipment. They will be supported by a formalized system of detailed written instructions conforming to the requirements of the operational quality assurance program which will cover all plant operations, maintenance work, tests, equipment changes, and other activities. Gilleland Testimony at 7; PSAR 13.5; SER, 13.5.

74. TVA's interrelated organizational structure assures continuity between construction and plant operation. TVA will provide adequate onsite and offsite technical and service support personnel for each operating unit. Plant personnel will have the appropriate training and experience for their

responsibilities in the operation of the plant. In addition to the plant operating procedures described in the PSAR. TVA's policy and practice is to emphasize close managerial attention to operational procedures prior to and during plant operation. Gilleland Testimony at 7-8.

75. Applicant has also submitted information on its initial testing and startup program for the facility. The Staff's review of this program included, *inter alia,* an evaluation of the scope of the Applicant's test program, including the responsibilities and qualifications of participating organizations, the general testing objectives, the division between major phases of the test program, the administrative controls governing the test program, and the extent to which the test program would verify the functional adequacy of the facility. SER, 14-1. The CESSAR-80 SER also contains a summary of the review of the CE startup and initial testing program. CESSAR 14-1.

76. We find that the Staff's review of the Applicant's preliminary plan for organization, training of personnel, and initial conduct of operations has been adequate.

J. Common Defense and Security

77. TVA, as a corporate agency of the Federal Government, has responsibility for the advancement of the national defense and the physical, social, and economic development of the area in which it conducts its operations. 16 U.S.C. 831n-4(h).

78. The activities proposed to be conducted under the construction permits will be within the jurisdiction of the United States. All of the directors and principal officers of TVA are United States citizens. TVA is not owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government. Applicant's Ex. 9 at 1-3; SER, Chapter 19. The activities to be conducted do not involve any restricted data, but the Applicant has agreed to safeguard any such data that might become involved in accordance with the requirements of 10 CFR Part 50. The Applicant will rely on obtaining fuel as it is needed from sources of supply available for civilian purposes, so that no diversion of special nuclear material from military purposes is involved. SER, Chapter 19. The Board finds that the issuance of construction permits for the facility would not be inimical to the common defense and security.

K. Research and Development

79. The research and development programs applicable to the plant, which are to be conducted by Combustion Engineering, have been described

by the Applicant and Staff. CESSAR 1.4, 1.5; SER, 1.8; SER, Appendix A, 1.4. These programs are intended to verify and confirm the capability of the nuclear steam supply system and containment designs and confirm the design margins. The Staff had concluded that the test programs outlined in CESSAR will be performed on a timely basis and, in the event the results of any of these programs are not successful, appropriate restrictions on operation can be imposed or a proven alternate design can be utilized to protect the health and safety of the public. SER, Appendix A, 1.4, and 19. The Board finds this resolution acceptable.

L. Financial Qualifications

80. TVA is a corporate agency of the United States created by the Tennessee Valley Authority Act of 1933, 48 Stat. 58, as amended, 16 U.S.C. 831-831dd (1976). The production and sale of electric power are part of TVA's resource development program. TVA supplies power at wholesale to 160 municipal and cooperative distributors and one privately owned electric system which in turn distribute power to about 2.6 million customers in parts of seven States. TVA also serves directly 48 industrial customers with large or unusual power requirements and several Federal nuclear, aerospace, and military installations. Gilleland Testimony (1977 TVA Annual Report).

81. TVA's power program is not now funded by Federal appropriations; it is self-supporting, with necessary construction and operational funds being derived from the sale of revenue bonds and notes and from available revenues from the power program. To enable TVA to finance its power system operations, Congress has given the agency specific authority to borrow funds, including bonds and notes, in the open market, from the U.S. Treasury, and from the Federal Financing Bank. TVA is now authorized by the Act to have an outstanding indebtedness of $15 billion. Its actual indebtedness as of September 30, 1977, was $5.9 billion. TVA's power bonds are considered to be prime investment quality and all of its publicly sold bonds have received a "Triple A" rating, the highest rating, by both Moody's Investors Service and Standard and Poor, the two principal bond rating agencies in the United States. Gilleland Testimony at 8; attachment (1977 TVA Power Annual Report); SER Supp., Chapter 20.

82. The current estimated total cost of the proposed facility is approximately $2.15 billion. The additional nuclear fuel inventory cost for the first cores is estimated to be $258 million. Gilleland Testimony at 8-9; Applicant's Ex. 10; SER Supp., Chapter 20.

83. During the years in which the plant is being erected, about 38 percent of the funds required for the construction of power facilities will be pro-

vided by power revenues and 62 percent will be borrowed. Gilleland Testimony at 9.

84. Section 15d of the TVA Act requires the TVA Board of Directors independent of any regulatory authority to set rates at a level that produces sufficient revenues to provide for operation, maintenance, and administration of its power system. 16 U.S.C. 831n-4; SER Supp., 20.3. Thus, as a matter of law, TVA is required to have sufficient funds to carry on its activities.

85. The record adequately describes the financial qualifications of the Applicant. Based on this record, the Board agrees with the Staff's conclusion that the Applicant possesses or can obtain the necessary funds to cover estimated construction costs and related fuel cycle costs as required by 10 CFR 50.33(f).

M. Generic Safety Problems

86. In *Gulf States Utility Company* (River Bend Station, Units 1 and 2), ALAB-444, 6 NRC 760 (1977), the Appeal Board described the Commission's procedure for the review of safety questions bearing upon a construction permit application (*id* at 764-768) and instructed licensing boards that their review of safety matters must ". . . entail an inquiry into whether the Staff review satisfactorily has come to grips with any unresolved generic safety problems which might have an impact upon operation of the nuclear facility under consideration." *Id* at 774-75. Appendix C to the SER provides a working description of unresolved generic safety problems as they pertain to this proceeding:

> These are items which the Committee [ACRS] and the Commission's Staff, while finding present plant designs acceptable, believe have the potential of adding to the overall safety margin of nuclear power plants, and as such should be considered for application to the extent reasonable and practicable as solutions are found, recognizing that such solutions may occur after completion of the plant. This is consistent with our continuing efforts toward reducing still further the already small risk to the public health and safety for nuclear power plants.

87. We are reminded that these generic items may appear in the form of problems which have been previously identified in a Technical Safety Activities Report (TSAR), Task Action Plan, an ACRS report or elsewhere. *River Bend* at 775.

88. The *River Bend* Appeal Board instructs that each SER should contain a summary description of those generic problems which have relevance to the facility under review and which have potentially significant public

safety implications. This is so that licensing boards and the public may ascertain, without resort to extrinsic documents, the Staff's perception of the nature and extent of the relationship between each such generic safety question and the eventual operation of the reactor under scrutiny. The investigative program must be described including timespan, interim measures and alternatives. Licensing boards are advised further:

> Among other things, the furnished information would likely shed light on such alternatively important considerations as whether (1) the problem has already been resolved for the reactor under study; (2) there is a reasonable basis for concluding that a satisfactory solution will be obtained before the reactor is put in operation; or (3) the problem would have no safety implications until after several years of reactor operation, and should it not be resolved by then, alternative means will be available to insure that continued operation (if permitted at all) would not pose an undue risk to the public. [Footnotes omitted.]

Id.

89. In sum we understand *River Bend* to require that, for an applicant to carry its burden, the public record with respect to the unresolved generic safety problems must contain (a) a description of the problem and its relationship to the plant under study, (b) an explanation of the program for the solution of the problem, and (c) a rational basis for the licensing or continued operation of the reactor despite the problem. In the context of an operating license proceeding, the same appeal board restated these standards, emphasizing the last requirement, in *Virginia Electric and Power Company* (North Anna Nuclear Power Station, Units 1 and 2), ALAB-491, 8 NRC 245 (August 25, 1978).

90. The SER In this proceeding did not satisfy this requirement of *River Bend;* so, at the Staff's urging, the Board kept the record open after the hearing to receive evidence on generic safety problems applicable to Yellow Creek. Exhibit 6, the Aycock, Cox, and Crocker affidavit with its Appendix A, was submitted for this purpose. Subsequently, as noted below, the Staff supplemented its evidence with Staff's Exhibit 7, a supplemental affidavit of Aycock, Cox, and Crocker with NUREG-0471 attached.[11]

91. The Staff has provided a thorough description of its extensive program for dealing with generic issues in Staff's Exhibits 6 and 7. From them, we learn that, as unresolved safety issues are identified, a high-level staff group determines whether immediate action is necessary to assure continuing safety or whether the safety significance of the issue is such that operations and licensing actions may continue while a longer term generic review

[11]The Board receives Staff's Exhibits 6 and 7 into evidence.

is underway. To date, some 133 such generic issues have been identified from various sources such as the ACRS, staff members, operating experience, and research results. The staff has screened all of these generic issues and placed them into one of four categories, A, B, C, or D, according to their potential safety significance and urgency. Of the 133 generic issues identified, 43 have been placed in Category A (warranting priority attention), 71 in B, 16 in C, and 3 in D. Task Action Plans for the resolution of each Category A issue (task) are then developed and assignments made for their execution. Staff's Exs. 6 and 7.

92. While many of the generic issues identified and categorized have to do with nuclear plant safety, others relate to environmental matters, to means of improving the regulatory process, and to the advisability of relaxing certain regulatory requirements which may be unnecessarily conservative. Moreover, not all of the generic issues which relate to plant safety are applicable to any one particular plant. In the case of the Yellow Creek Plant the Staff has determined that 24 of the 43 Category A items are both relevant to plant safety, and applicable to the Yellow Creek Plant. Staff's Ex. 6 at 11-14, Staff's Ex. 7, p. 8.

93. Staff's Exhibit 6 and its Appendix A fully discussed 21 of the 24 Category A tasks perceived by the Staff to be applicable to Yellow Creek and to have safety significance.[12] These are:

Task Number	Task Title
A-1	Water Hammer
A-2	Asymetric Blowdown Loads on PWR Primary Coolant Systems
A-4	Combustion Engineering Steam Generator Tube Integrity
A-9	ATWS
A-11	Reactor Vessel Material Toughness
A-12	Fracture Toughness of Steam Generator and Reactor Coolant Pump Supports
A-13	Snubber Operability Assurance
A-14	Flaw Detection
A-17	Systems Interaction in Nuclear Power Plants
A-18	Pipe Rupture Design Criteria
A-21	Main Steam Line Break Inside Containment—Evaluation of Environmental Conditions for Equipment Qualification
A-22	PWR Main Steam Line Break—Core, Reactor Vessel, and Containment Response

[12]Except that the Board supplements the Staff's discussion of Task A-9 below.

A-23	Containment Response
A-24	Qualification of Class IE Safety-Related Equipment
A-26	Reactor Vessel Pressure Transient Protection (Overpressure Protection)
A-29	Nuclear Power Plant Design for the Reduction of Vulnerability to Industrial Sabotage
A-30	Adequacy of Safety-Related DC Power Supplies
A-31	RHR Shutdown Requirements
A-32	Missile Effects
A-35	Adequacy of Offsite Power Systems
A-36	Control of Heavy Loads Near Spent Fuel

94. Subsequently in its supplemental affidavit in Staff's Exhibit 7, the Staff reported that it had recently elevated three previously lower ranked tasks to Category A. These are:

Previous Task Number	Task Title
B-18	Vortex Suppression Requirements for Containment Sumps
B-57	Station Blackout
C-3	Insulation Usage Within Containment

95. In its discussion of each of the 20 Category A tasks in Appendix A and the three Category A tasks in Staff's Exhibit 7, the Staff submits a detailed description of the problem, details of the plan for resolving the problem, and a thorough discussion of why it believes that licensing may proceed pending resolution of the problem. The Board has not independently evaluated the accuracy of the Staff's description of the problem, the sufficiency of the plan for resolving the problem, nor whether the basis for licensing in face of the problem is correct. We do conclude, however, that the Staff has set forth these problems, programs, and bases clearly and rationally and the public record of the proceeding now reflects the Staff's views and perception of these elements.

96. In each instance the Staff has concluded that one or more of the following bases for continued licensing applies: (a) the problem has been resolved for the reactor under study, (b) a resolution can reasonably be expected before operation, (c) there will be no safety implications until after years of operation and alternative means will exist to avoid undue risk to the public, (d) current standards are believed adequate but confirmatory studies are desirable while licensing continues, (e) a problem is so unlikely to occur as to be an incredible event, (f) the task is for the purpose of resolving

unclear, conflicting, or impractical requirements of the regulations, or (g) presently adequate criteria can be improved.

97. The Staff's handling of one of the Category A tasks, A-9, ATWS (an acronym for "anticipated transients without scram"), is somewhat different. In the SER the Staff describes the program for the solution of the ATWS problem. SER, p. 15-7, SER App., Sec. 15.6. In its Exhibit 6 affidavit the Staff reports upon Revision 1 to the Task Action Plan for A-9 and explains the bases for concluding that a construction permit for Yellow Creek may issue notwithstanding the ATWS problem. The Staff reports that there is a reasonable basis for concluding that a satisfactory solution for A-9 will be obtained before Yellow Creek is put into operation. The Staff also discusses the low probability of an anticipated transient without scram proceeding to a core melt. Ex. 6, affidavit, pp. 20-23.

98. What the Staff has failed to do, however, is to describe fully the nature of the ATWS problem so that the public and the Board may understand it without resort to extrinsic documents. While the Staff does set forth the relationship of ATWS to the reactors under consideration, it has failed to supply a definition of ATWS in the first instance, thus failing to comply with *River Bend.* 6 NRC at 775.

99. Rather than reopen the record in this uncontested proceeding to fill this void, the Board borrows and officially notices the following definition of ATWS from WASH-1270, *Technical Report on Anticipated Transients Without Scram for Water-Cooled Power Reactors,* USAEC, September 1973:

> The first part of ATWS, "anticipated transients," is concerned with various events that may happen during the operation of a water-cooled reactor power plant. These deviations from normal operating conditions are called "anticipated transients," and might occur one or more times during the service life of a plant. They are thus distinguished from "accidents," which have a much lower likelihood of occurence. There are a number of anticipated transients, some of quite trivial nature and others that are more significant in terms of the demands imposed on plant equipment. Anticipated transients include such events as a loss of electrical load that leads to closing of the turbine stop valves, a load increase such as the opening of a condenser bypass valve, a loss of feedwater flow, and a loss of reactor coolant flow. Nuclear power plants are designed with various safety and control systems to preclude adverse effects from these and other anticipated transients.
>
> The other part of ATWS, "without scram," is concerned with the reactor protection system. The reactor protection system, or shutdown system, involves numerous instruments, cables, amplifiers, switching de-

vices, alarms, trips, control rods, and drive mechanisms, etc. The protection system is arranged to detect off-normal conditions in the plant and to institute automatically whatever safety action is needed. If plant conditions indicate there is a potentially damaging situation, the automatic reaction of the protection system is to cause the control rods to move rapidly into the reactor core to shut down the nuclear reaction. This most drastic form of automatic response of the protection system, which results in a very rapid shutting down of the reactor, is called the "scram." In some of the anticipated transients, shutting down the nuclear reaction and hence rapidly reducing the amount of heat being generated by the reactor core, is an important step in assuring that no damage to the plant or risk of accident occurs. If such a transient should occur and if, in spite of all the care built into the reactor shutdown system, a scram should not result, then an ATWS event would have occurred.

Id., pp. 1-2.

100. With this definition and the Staff's discussion, we conclude that the record with respect to ATWS satisfies the requirements of *River Bend.*

101. The ACRS reports to the Commission on the generic safety issues which it has identified. The most recent ACRS reports are dated February 24, 1977, and November 15, 1977. Also, the Staff responds to the ACRS with its report on the status of progress toward resolution of the generic issues identified by the ACRS, for example, Staff letter of October 25, 1977.[13]

102. In addition, ACRS letters to the Commission reporting on its safety review of individual licensing applications generally include a list of those generic issues previously identified by the ACRS which it considers pertinent to the application at hand. In the case of the Yellow Creek application, the ACRS identified 25 generic issues which it stated should be dealt with by the Staff as solutions are found. ACRS letter dated January 13, 1978, App. A to SER Supp.

103. While the ACRS and the Staff use different numbering systems, it is possible to determine by using a cross-index in Board's Exhibit 4 that the Staff has assigned 11 of these generic issues to Category A, 8 to B, 4 to C, and 2 to D. Also, we are assured by the Staff that its presentation on generic problems has included those listed by the ACRS. Exhibit 6, affidavit, p. 7; Staff proposed finding 64, pp. 26-27.

104. As noted above, the Category A problems are those of the highest

[13]On its own motion, the Board receives into evidence the Staff's letter of October 25, 1977, as Board's Exhibit 4 and the ACRS letter of November 15, 1977, as Board's Exhibit 5.

priority. Remaining to be considered are Categories B, C, and D generic safety problems. They have been defined by the Staff as follows:[14]

Category B:

> Those generic technical activities judged by the staff to be important in assuring the continued health and safety of the public but for which the staff perceives a lesser safety, safeguards, or environmental significance than Category A matters.

Category C:

> Those generic technical activities judged by the staff to have little direct or immediate safety, safeguards or environmental significance, but which could lead to improved staff understanding of particular technical issues or refinements in the licensing process.

Category D:

> Those proposed generic technical activities judged by the staff not to warrant the expenditure of manpower or funds because little or no importance to the safety, environmental, or safeguards aspects of nuclear reactors or to improving the licensing process can be attributed to the activity.

105. The Staff did not deal with the B, C, and D category problems in its Exhibit 6 responding to *River Bend* explaining that:

> Of those Categories B, C, and D tasks that are related to plant safety and are applicable to the Yellow Creek facilities, we can identify none that could not be resolved either by system alterations using available techniques and equipment or by operational modifications in the event that the staff's review of the issue revealed that current requirements required upgrading during construction or operation. On this basis and the Steering Committee's judgment that the Categories B, C, and D issues are of lesser safety significance than Category A issues, detailed information on these tasks is not necessary. Accordingly, we have not included any such information in this affidavit.

Exhibit 6, affidavit, pp. 15-16.[15]

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[14]Exhibit 6, affidavit, Table 1.

[15]The Staff cautioned however, that this may not be its final word regarding the relative safety significance of the various generic tasks and that some lower priority tasks may be elevated because of an evaluation then underway. This evaluation resulted in the addition of three Category A items as noted in paragraph 94, *supra*.

106. By their definitions, Categories C and D matters need not be considered here. But we may not so easily dispose of the Category B generic problems. First we note that they are "important," some are safety-related, and the category contains eight of the items identified by the ACRS. Paragraph 103, *supra.* By their titles and descriptions it can be seen that many more of the Cateogry B items have relevance to Yellow Creek.[16]

107. The record with respect to Category B items did not comply with the literal requirements of *River Bend.* The problems and the relationship to Yellow Creek were not sufficiently described. The programs for the solutions to the problems are not discussed. The Staff justified partially its omission of Category B items on the basis that they are ". . .of lesser safety significance than Category A issues. . . ." Staff's Ex. 6, affidavit, pp. 15-16.

108. The trouble with "lesser" is that it is a term of comparison and is not bounded. Category B items could be only a scintilla less significant then A items, although we would expect that this is not the case. In any event these "important" safety-related B items, as far as we knew, may have the ". . .potentially significant public safety implication" referred to in *River Bend.* 6 NRC at 775.

109. Therefore on September 28, 1978, the Board provided the parties with a draft of our proposed findings on generic safety problems, inviting them to comment.

110. On November 16, 1978, the Staff commented in the form of its "Supplemental Proposed Findings of Fact and Conclusions of Law Related to Unresolved Generic Safety Items" and Staff's Exhibit 7, the supplemental affidavit of Aycock, Cox, and Crocker. Counsel for TVA reported it would have no additional comments on this issue.

111. Staff's Exhibit 7 also informed the Board of Staff's recently completed draft, risk-based evaluation of the generic issues which, as we noted above, resulted in adding three tasks to Category A. *Id.,* p. 8.

112. The Staff also identified five additional Category B tasks that have greater potential risk significance than other Categories B and C tasks and greater than originally judged. Three of these, B-30 Design Basis Floods and Probability, B-34 Occupational Radiation Exposure Reduction, and B-64 Decommissioning of Reactors, have relevance to Yellow Creek, and were discussed by the Staff in terms of the requirements of *River Bend.* The Staff did not, however, elevate these tasks to Category A. The Staff described tasks B-30, B-34, and B-64, explained the programs for their resolution, and assigned to each of them one of the seven bases found acceptable

[16]All 73 (now 71) Category B tasks are identified by title in Exhibit 6, affidavit, Table 2, and described in NUREG-0471, attached to Staff's Exhibit 7.

by the Board for continued licensing. *Id.*, pp. 8-16.[17] We find that with respect to risks B-30, B-34, and B-64, the Staff has complied with *River Bend.*

113. Although there are many other Category B tasks which relate to Yellow Creek the Staff did not provide all of the information required by *River Bend.*[18] But the Staff has provided important additional information about the nature of the Category B tasks and why, unlike Category A tasks, the Staff believes them to be beyond the purview of *River Bend.* While the Staff still does not define the term ". . .lesser safety significance" which has troubled the Board in assessing the relative safety significance of Category B items, it does explain the criteria used in allocating priorities between Category A and Category B. The Staff reports:

> In addition to developing the Priority Category definitions, the Task Foce [Staff] developed a set of criteria to be used to test each identified activity for assignment to the proper category. The intent was that an activity, meeting one or more of the test criteria for a given category, would be assigned to that category. The tests for Category A are:
>
> 1. Resolution could remedy significant deficiencies in facility design or operation.
> 2. Early resolution of issue could significantly improve the existing regulatory process.
> 3. Other activities that are judged to require high-level management attention and oversight.
>
> The tests for Category B are:
>
> 1. Issue is important to safety, safeguards, or environmental protection, but of smaller scope that does not require NRR-wide coordination to obtain timely resolution.
> 2. Resolution needed to confirm adequacy of previous staff judgments.
> 3. Issue has potential of becoming a Category A issue.
>
> *From these tests it is important to note that any issue whose resolution is needed to "remedy significant deficiencies in facility design or operation" would be assigned to Category A.* Although some issues "Impor-

[17]Two tasks, B-55 and B-63, were also given *River Bend* treatment but these tasks do not relate to Yellow Creek. *Id.*, pp. 12-15.

[18]In NUREG-0471 attached to Staff's Exhibit 7, the Staff complies with one of the important requirements of *River Bend* by describing the B, C, and D category tasks, but does not report a program for the resolution of the tasks.

tant to safety" could be assigned to Category B, the intent was clearly not to assign issues that met the first Category A test to Category B. Issues that are judged to meet the first Category A test are those that have the "potentially significant public safety implication(s)" referred to in *River Bend.* Since no such issues are assigned to Category B, it is not necessary to meet all of the informational requirements of the *River Bend* decision for Category B, or lower category generic issues. [Emphasis added.]

Staff's Ex. 7, supplemental affidavit, pp. 4-5.

114. The Staff's approach to resolving its problem with *River Bend* is simply to redefine Category B tasks as not having the "potentially significant public safety implication(s)" referred to in that decision. This is a conclusion of law and fact. Normally such conclusions are to be made by the adjudicating boards based upon the evidentiary record. In this instance, however, we accept the Staff's conclusion because it is also a working conclusion which must be made by the Staff in the discharge of its responsibilities. It is within the Staff's, not the Board's, discretion to determine the priorities of its generic safety tasks, and to determine in the first instance which tasks require resolution before others and whether licensing may safely proceed without a program for resolution of the tasks. In its Exhibit 7 supplemental affidavit the Staff reports that no Task Action Plan has yet been approved by the Technical Activities Steering Committee for Category B, C, or D tasks. *Id.,* n. p. 9. This Board cannot require the Staff to present a Task Action Plan in obedience to *River Bend* where no plan exists.

115. The Board concludes that the Staff's evidence on generic safety problems is not inconsistent with *River Bend.* The evidentiary record demonstrates that Category B tasks can be resolved, *if necessary,* by system alterations using available techniques or operational modifications. Staff's Ex. 6, pp. 15-16. The record also demonstrates that no Category B task requires resolution to remedy significant defects in facility design. Staff's Ex. 7, supplemental affidavit, p. 5. While no plan for the resolution of Category B items has been explained, because none exists, the Staff has thoroughly explained its program for the review of the generic tasks to determine whether a plan is required. And most important, the Staff has explained why licensing can safely proceed in the face of the problem. With these elements, the Staff has met the substantive requirements of *River Bend.*

116. This is nothing with respect to the generic safety problems in either Category A or B which prevents this Board from finding under 10 CFR 50.35a that the proposed Yellow Creek facility can be operated and constructed without undue risk to the health and safety of the public as we have concluded in this initial decision.

N. The Radon-222 Issue

117. In Finding No. 32 of our Partial Initial Decision issued Febraury 3, 1978, we found that the environmental impact of the nuclear plant, including health effects, would be less than that of a coal-fired plant and that the nuclear plant is a more desirable alternative. 7 NRC at 227-28. This finding was based on our determination that we were bound by 10 CFR 51.20 and Table S-3 therein, even though we had been apprised that the accuracy of values in that table were being reevaluated by Staff. *Ibid.*

118. Subsequently, on April 11, 1978, the Commission issued an amendment to 10 CFR 51.20 eliminating the values for radon-222 releases in Table S-3. 43 Fed. Reg. 15613 (April 14, 1978). The Commission directed Appeal Boards to reopen the records of cases pending before them to receive new evidence on radon releases and on health effects resulting from radon releases. *Id.*, p. 15616. In ALAB-480 the Appeal Board established a procedure for further consideration of the radon-222 matter in 17 cases pending before it, including the proceeding on the Yellow Creek facility. *Philadelphia Electric Company, et al.* (Peach Bottom Atomic Power Station, Units 2 and 3), ALAB-480, 7 NRC 796 (May 30, 1978). The Appeal Boards in 16 other proceedings joined in ALAB-480.

119. The Appeal Boards in ALAB-480 (a) directed that the evidentiary record on the radon issue in the *Perkins*[19] proceeding be served on the parties to each of the 17 proceedings and that the record in each of those 17 proceedings be reopened for receipt of the *Perkins* record as evidence; (b) authorized each party to request the Appeal Board to receive additional written evidence, call for a further hearing, or consider objections to any aspect of the *Perkins* radon proceeding; and (c) directed that the Licensing Board's decision on the radon question in *Perkins* be served on every party and authorized each party to file a memorandum addressed to two specified questions:

> . . .(a) whether the *Perkins* evidentiary record supports the generic findings and conclusions of the [Perkins] Licensing Board respecting the amount of the radon emissions in the mining and milling process and resultant health effects; and (b) whether the radon emissions and resultant health effects are such as to tip the NEPA balance against construction (or operation) of the particular facility in question. . .[footnote omitted).

7 NRC 796, 806.

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[19]*Duke Power Company* (Perkins Nuclear Station, Units 1, 2, and 3), Dockets 50-488, 50-489, 50-490.

120. The *Perkins* record was closed on June 29, 1978, and on July 10, 1978, the NRC Staff served that record on the parties to the 17 proceedings. On July 18, 1978, the NRC Staff served corrected copies of certain portions of the *Perkins* record. No party to this proceeding requested the Appeal Board to receive additional written evidence, call for a further hearing, or consider objections to any aspect of the *Perkins* radon proceeding.

121. On July 14, 1978, the Licensing Board in the *Perkins* proceeding issued a partial initial decision on the environmental consequences of the uranium fuel cycle deciding the radon issues (hereinafter "*Perkins* PID"). Applicant and the NRC Staff on August 10, 1978, and August 14, 1978, respectively, presented their positions on the questions specified in ALAB-480. Both agreed that (a) the *Perkins* evidentiary record amply supported the generic findings and conclusions of the *Perkins* Licensing Board respecting the amount of the radon emissions in the mining and milling process and the resultant health effects, (b) the radon emissions from mining and milling were clearly so small in comparison with the fluctuations in background as to be completely undetectable, and (c) the resultant impact would be insignificant and could not alter the NEPA benefit-cost balance already determined in this proceeding.

122. On September 26, 1978, the Staff filed a motion to the Appeal Board requesting that the radon issue be remanded to us for consideration along with the remaining construction permit issues. This motion was granted on September 27, 1978.

123. On October 10, 1978, the Applicant filed supplemental proposed findings of fact and conclusions of law concerning radon emissions. The NRC Staff filed supplemental proposed findings of fact and conclusions of law on the radon issue on November 2, 1978.

124. The posture of the radon-222 issue before us is somewhat unusual. The Appeal Board in ALAB-480 recognized that independent consideration of this generic issue by 17 licensing boards is impractical, and proposed, in substantial part, to adjudicate the matter by reviewing whether the *Perkins* evidentiary record supports the generic findings and conclusions of the *Perkins* licensing board on the radon-222 issue. 7 NRC at 803, 806. We, of course, are a hearing board, ordinarily without review jurisdiction. The remand to us is for the purpose of "considering and deciding the radon issue." Order of September 27, 1978.

125. Therefore this board initially approached the remanded radon issue by independently reading and considering the *Perkins* record on radon emissions[20] from which we would arrive at our own findings and conclusions.

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[20]The Yellow Creek record was reopened by the Appeal Board to receive into evidence the *Perkins* record on radon emissions. 7 NRC at 805. This Board has received no additional

(Continued on next page.)

126. In the meantime, the Commission, by its memorandum and order of November 6, 1978, in *Consumers Power Company* (Midland Plant, Units 1 and 2) authorized the licensing board in that proceeding to consider the radon issue either by accepting the *Perkins* Board's generic findings or by its own analysis of the record.

127. Considering the Commission's *Midland* order and ALAB-480, we believe that we have at least the implied authority to decide this issue as if upon review of *Perkins* and have elected to do so in the interest of consistency. The *Perkins* Partial Initial Decision is, in our view, complete, well-reasoned, and its conclusion well supported by the evidentiary record which we have thoroughly reviewed. Except in certain instances where we believe the *Perkins* Board was excessively conservative or where we wish to discuss our considerations in some detail, we agree with the analysis of the *Perkins* Board and adopt their findings and conclusions as applicable to this proceeding.

1. Radon Source Terms

a. Radon From Mining

128. The amount of radon-222 released to the atmosphere during the mining of uranium ore depends on whether the ore is taken from underground mines or from surface (open pit) mines. With regard to underground mines, the *Perkins* Board accepted the estimate by Staff, which was unchallenged, that the total radon emissions resulting from the production by underground mines of ore for one annual fuel requirement for a 1,000 MWe reactor (AFR) would amount to 4,060 Ci. *Perkins* PID at 6. We have reviewed the record and concluded that it supports this finding by the *Perkins* Board. Therefore we accept the *Perkins* Board's finding with regard to radon emissions from underground mining.

129. The total radon emissions which would result from the production of one AFR from surface mines depends on how long the pits remain open to the atmosphere. The *Perkins* Board arrived at two estimates of total radon per AFR emitted from surface mines. For the first estimate it assumed that an open surface mine produces enough ore to supply one nuclear plant and that the mine is reclaimed (filled or otherwise stabilized) at the end of 20 years of operation. *Id.* at 8. Using the maximum estimate of rate of emission which was contained in the record, 200 Ci/AFR-yr

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(Continued from previous page.)

evidence and all references in this section are to the *Perkins* evidentiary record. The *Perkins* transcript is indicated as "P.Tr." followed by the page number.

(estimated by the *Perkins* applicant), the *Perkins* Board calculated a total of 4,000 Ci/AFR for the surface mine. *Id.* On the other hand, that Board concluded "that reclamation will likely occur within 100 years after mining has ceased" and on the basis of this conclusion arrived at a second, "upper limit" estimate. *Id.* at 9. In calculating total radon emissions for pits open for 100 years, the *Perkins* Board used an emission rate of 100 Ci/AFR-yr, which it had arrived at by assuming that half of the uranium for the *Perkins* plant would come from surface mines. *Id.* at 7-8, 9. This second estimate amounted to 10,000 Ci/AFR. *Id.* at 9. On the basis of the record in the *Perkins* case we can accept the first estimate, but we do not accept the second. The analysis of the record and the considerations which lead us to these findings is explained below.

130. The record shows that four out of five western States in which significant amounts of uranium is mined have reclamation requirements for uranium mines. P. Tr. 2556, 2639. While the record does not contain full information on the requirements of these States, it does tell us that Colorado requires reclamation within 5 years after work ceases, and Wyoming requires that the site be recontoured and restored to a purpose at least equal to that for which the land was used before mining. *Id.* Recontouring will require the refilling of the open pit, presumably with stockpiled overburden. Restoration to former use will require stockpiling topsoil, for redistribution after the overburden has been replaced and recontoured. We do not believe that it would be feasible to stockpile topsoil for more than a few years, because to do so would increase the risk of loss by erosion and result in deterioration of soil quality. Consequently, we believe that it will be general practice to reclaim surface mines contemporaneously with mining activity, with reclamation being carried out in portions of the pit as soon as possible following cessation of active mining in those portions.

131. We think it appropriate for us to note, at this point, the Surface Mining Control and Reclamation Act of 1977, which relates to coal mining, but in which the Congress found a need to regulate surface mining of minerals other than coal. 30 U.S.C. 1201. Additionally, this Act states that one of its purposes is to "assure that adequate procedures are undertaken to reclaim surface areas as contemporaneously as possible with the surface coal mining operations." 30 U.S.C 1202 (e). We believe this law foretells a national policy which will deal with all surface mining operations. Consequently, we believe it is very unlikely that any uranium surface mines will lie unreclaimed for as long as 100 years. We even think it rather unlikely that pit mines will remain unreclaimed for as long as 20 years, because of the considerations which we outlined above. Thus, we do not accept the *Perkins* Board's finding that an upper limit for radon emissions from surface mine

is 10,000 Ci/AFR.[21] In the interest of conservatism, however, we can accept the estimate of 4,000 Ci/AFR. We believe the record supports that estimate and that the estimate is conservative because it is unlikely that a mine will remain unreclaimed for 20 years.

132. We find that the total radon emissions resulting from mining will be about 4,100 Ci/AFR. This finding is based on the estimate of 4,060 Ci/AFR if the ore comes from an underground mine or 4,000 if it comes from a surface mine, and is, of course, applicable to any proportionate combination of underground and surface mined ore.

B. Radon From Milling

133. After being mined uranium ore is processed at a mill where the principal releases of radon come from (1) the milling process itself and (2) the mill tailings which are left as a waste product from the milling process. With regard to the milling process, the Staff estimated that the radon released would amount to 30 Ci/AFR. Magno Affidavit (Magno) at 2-3, following P. Tr. 2369; P. Tr. 2560. This release would occur during the few days required for crushing and leaching the ore. P. Tr. 2560. The Staff estimate was not challenged in the record and apparently was accepted by the *Perkins* Board, although that Board's acceptance was not explicit. *Perkins* PID at 10-11. We find the estimate reasonable and accept it.

134. The *Perkins* Board accepted Staff estimates of radon released from tailings prior to stabilization of the piles. Perkins PID at 12. These estimates were 750 Ci/AFR during the period of active mill operation, and 350 Ci/AFR during a 5-year period following close of operation, while the tailings are drying out and are being stabilized. *Id.* at 11-12. We have reviewed the *Perkins* record and determined that it supports the finding of the *Perkins* Board. Therefore we accept their finding with regard to radon releases from tailings during mine operation and for 5 years thereafter.

135. The total amount of radon emitted subsequent to the period just discussed, *i.e.,* during the years or centuries into the indefinite future as the tailings piles sit idle, depends on what action has been taken to stabilize the tailings. Different witnesses who testified in the *Perkins* proceedings made different assumptions about stabilization. Staff witness Magno assumed that the piles would be stabilized and covered to reduce radon emissions to the range of 1-10 Ci/AFR-yr. Magno at 2. He indicated, however, that in the absence of stabilization emissions would be 100-110 Ci/AFR-yr. *Id.* at 9-10. Staff witness R. L. Gotchy assumed that tailings would be stabilized but that erosion would decrease the effectiveness of stabilization in the

[21]Even if we accepted the extremely conservative upper limit found by the *Perkins* Board, however, it would not change the decision which we reach *infra.*

future. He assumed that the piles would emit 1 Ci/AFR-yr for the first 100 years, 10 Ci/AFR-yr for the next 400 years, and then 100 Ci/AFR-yr for periods beyond 500 years (corrected for radioactive decay). Gotchy Affidavit (Gotchy) at 4, following P. Tr. 2369. *Perkins* Intervenors' witness C. Kepford assumed that there would be no stabilization of tailings piles and that the piles would emit radon at the rate of 110 Ci/AFR-yr. Kepford Testimony (Kepford) at 2-3, following P. Tr. 2820.

136. In an effort to resolve this conflicting evidence, the *Perkins* Board solicited additional testimony from the Staff concerning the NRC Branch Technical Position with regard to the stabilization of mill tailings. Witness H. Miller testified that applicants for a uranium mill license are now required to commit themselves to a stabilization plan that will reduce emissions from tailings to twice background or less and that will require no ongoing maintenance of the stabilized piles.[22] P. Tr. 2394-8. Witness G. W. Kerr testified that the Agreement States, where mills are not regulated by the NRC, have provided the NRC with commitments to impose stabilization requirements which are equivalent to those stipulated by the NRC Branch Technical Position. P. Tr. 2477-80.

137. The *Perkins* Board concluded that the evidence did not warrant the assumption that tailings piles would not be stabilized. *Perkins* PID at 15-16. It also opined that Gotchy was being "excessively conservative" in assuming that the stabilization required by NRC standards would erode in a few hundred or few thousand years. *Perkins* PID at 16-17. That Board said

> We see no reason for piling uncertainty on top of uncertainty. There may be another period of glaciation within the next 10,000 years, but we do not have to assume it to project radon emissions into the future. If all the stabilization is destroyed by some catastrophic event, then radon will be a minor problem.

Id. at 17.

The *Perkins* Board found that the new NRC standards for uranium mill licensees would assure that tailings piles would be stabilized sufficiently to reduce radon emissions to only 1 Ci/AFR-yr. *Id.* at 16. We believe the record supports that finding, and we concur.

138. In making its finding the *Perkins* Board noted that "the situation with respect to tailings piles has changed greatly within the past year." *Id.* at 15-16. We can now note that the situation has changed greatly since the *Perkins* Board issued its Partial Initial Decision on July 14, 1978, *viz.*, the 95th Congress passed the Uranium Mill Tailings Radiation Control Act of 1978 (Mill Tailings Act), and the President has signed the Act into law. Act

[22]According to Staff witness Magno the release rate required to meet these objectives is estimated to be less than 1 Ci/AFR-yr. Magno at 6-7.

of October 14, 1978, Pub. L. No. 95-604. The Mill Tailings Act provides, *inter alia,* that the NRC shall require adequate tailings management by uranium mill licensees, and that Agreement States shall abide by standards at least as stringent as the NRC's.[23] In our view this new law eliminates most of the uncertainties with regard to mill tailings stabilization which were expressed during the *Perkins* proceeding. It makes us even more confident that the *Perkins* Board made a correct finding.

139. We find that the radon released by milling the ore for one AFR would amount to 30 Ci from the milling process, 750 Ci from tailings during the milling process, 350 Ci from tailings after cessation of active milling but prior to stabilization, and then 1 Ci/yr thereafter from the stabilized tailings piles.

2. Radon Releases From Yellow Creek Plant Fuel Cycle

140. The Yellow Creek Plant will consist of two units each of which will have a 1,300 MWe output at the rated core power level. Thus the radon releases resulting from preparation of fuel for Yellow Creek will be 2.6 times greater than those determined for the reference reactor. Assuming that the Yellow Creek Plant will operate for 30 years, the plant will require about 78 AFR's during its lifetime. On this basis, we have calculated that mining and milling fuel for Yellow Creek will release about 4×10^5 Ci prior to stabilization of the tailing piles (about 3.1×10^5 Ci from mining and 0.9×10^5 from milling and tailings storage). This radon will be released over a period of time that will depend on the precise mining and milling operations carried out. The period may range from about one to about five decades. As will be seen in the discussion below, the cost that we must consider is a function of the amount released rather than of the release rate. Following stabilization of the tailings pile, the tailings from the Yellow Creek fuel will release about 80 curies per year. To determine the total amount released during this phase, and the consequent health effects, we must decide how long into the future we can reasonably predict the impact potential of that radon and how far into the future we should attempt to predict the effects of present actions for the purposes of NEPA. We turn now to that task.

3. Radiological Impact of Radon Emissions

a. Projection of Impact Into the Future

141. Radon-222 is a natural product of the radioactive decay of

[23]The Mill Tailings Act also provides for remedial action to eliminate hazards associated with inactive tailings piles left from past milling operations, a matter to which the *Perkins* Board gave attention. *Perkins* PID at 15.

uranium-238, which has a half-life of 4.5 billion years. Other long-lived isotopes in the decay chain leading to radon are thorium-230, with a half-life of 80,000 years, and radium-226, with a half-life of 1,600 years. Radon in tailings is produced in secular equilibrium with these long-lived precursors, principally Th-230. Thus the emission of radon from mill tailings will continue for many millenia. How far into the future should we attempt to project the potential effects of the radon released into the atmosphere from tailings produced by the milling of ore to provide fuel for the Yellow Creek Plant? How far into the future can such predictions reasonably be made?

142. The *Perkins* record provides us with three different points of view about projecting potential effects of radon into the future. Intevenors' witness Kepford calculated emissions from unstabilized piles for billions of years into the future. Kepford at 2 and Table 1. He deliberately avoided "the unquantifiable problems, such as famines, plagues, nuclear wars, major technological advances, the collapse of technologies, ice ages, and a myriad of other unknowns," because he thinks that considering them adds nothing to our discussion. *Id.* at 2. At the same time Dr. Kepford acknowledges that "[t]hese problems make any attempt at an accurate prediction of what our society will resemble 20, 50, or 100 years from now sheer fantasy." *Id.* Rather than attempting to confront this problem Dr. Kepford assumed, in making his calculations, that our present society will remain unchanged throughout all future time. *Id.* at 1.

143. Staff witness Gotchy argued that it is unreasonable to calculate health effects beyond a few thousand years because uncertainties make such predictions meaningless. Gotchy at 11-13; Gotchy Supplemental Affidavit (Gotchy Suppl.), §IV.3.1. Dr. Gotchy discussed the major uncertainties in projecting future releases of radon in some detail. *Id.* Among these uncertainties are climatic changes which would affect the long-term stability of mill tailings piles. One prediciton which is supported by a number of scientists is that the "greenhouse" effect of fossil fuel combustion, slash and burn agriculture, and loss of forests will change world temperature and rainfall patterns and thus influence erosion of tailings piles. *Id.* at IV-7 to IV-8. Another prediction which is well documented in the scientific literature is that another ice age will occur within the next 10,000 years. Glaciers could cover the tailings piles, leaving the piles either more deeply buried or redistributed when they recede. Over the mean life of thorium-230 (about 125,000 years) there could be five or six glacial periods. *Id.* at IV-9.

144. Additional uncertainties are associated with population changes in the future. Gotchy Suppl., §IV.3.2. Population dose commitments and subsequent cancer induction and genetic effects are proportional to the population at risk. *Id.* at IV-10. Climatic changes such as a decrease in rain-

fall which would reduce agricultural production, or an increase in temperature which would melt the polar ice caps and flood coastal areas, or glaciers which would cover the continental divide region of North America, all would result in population redistribution or reduction, or both. *Id.* at IV-11 to IV-12. Changes in population age structure and in life expectancy associated with environmental changes such as the foregoing would also influence the health effects of radon. *Id.*

145. From these considerations Dr. Gotchy concluded that "a reasonably defensible estimate of health effects from Rn-222 releases based on current NRC licensing practice for new mills" could be calculated for the next 1,000 years. *Id.* at IV-13. In making his calculations Dr. Gotchy assumed that (a) the "greenhouse" effect over the next 1,000 years is minimal, (b) the U.S. population stabilizes at 300 million, (c) cancer and genetic research is unproductive during the next 1,000 years, and (d) mortality rate in the U.S. population does not change for the next 1,000 years. *Id.* In addition, Dr. Gotchy assumed that the tailings piles would be stabilized but that erosion would decrease the effectiveness of stabilization during the first 500 years (see ¶135, *supra*).

146. The third point of view regarding the projection of potential effects of radon into the future was expressed by Applicant witness L. D. Hamilton. Dr. Hamilton, while finding Dr. Gotchy's estimates to be reasonably conservative, nevertheless considered extrapolations into the distant future to be misleading. Hamilton Testimony at 1, following P. Tr. 2266; P. Tr. 2275. Dr. Hamilton's opinion was that the question should be addressed in terms of the increase over natural background radon to which an individual is exposed. P. Tr. 2275. He calculated that radon emitted as a result of the mining and milling of ore to operate a 1,000 MWe nuclear plant for one year at a capacity factor of 0.65 would result in an increase of 1.5×10^{-7} of the annual natural background dose. *Id.* at 227, 2656. Dr. Hamilton said, "I find it very difficult to believe that there's anything sound or reasonable in taking this very tiny dose and multiplying it out for thousands of years into the future by billions of people over the world." *Id.* at 2322.

147. Our independent review of the record in this case leads us to some conclusions not explicitly stated by the *Perkins* Board. To begin with, we are convinced that major climatic changes are very likely to occur in the next 10,000 years. We believe that these changes will probably affect both the stabilized tailings piles left from the fuel cycle for the Yellow Creek Plant and the North American population which is impacted by the radon from those piles. We do not, however, believe that it is possible to predict *how* these climatic changes will affect the radiological impact of radon emitted from tailings piles. Consequently, we find Dr. Kepford's projections out

to 10^{10} years to be meaningless.[24]

148. Dr. Gotchy's projections out to only 1,000 years are, we believe, much more reasonable. Even in this case, however, some of the assumptions made are probably invalid. We think it unlikely that cancer and genetic research over the next 1,000 years will be unproductive. Nor do we believe it likely that the mortality rate will remain unchanged during that span of time. Thus we are again confronted with uncertainties, although they are not of the magnitude of those associated with Dr. Kepford's projections. Thus, while we do not reject Dr. Gotchy's projections, our confidence in them is not great.

149. The *Perkins* Board made three findings with regard to assessing future impacts of radon. First, it concluded that it was obligated to assess the effects of today's action on future generations. Second, it decided that any known effects on immediate successors should be considered as important as effects on those now living. Third, adverse impacts on descendants who may follow a million years from now should not weigh as heavily as benefits to the present population. *Perkins* PID at 28. We believe that the *Perkins* Board has correctly seen its obligations to the present and future public, and we concur, but with one reservation. We do not believe it is possible to assess the impacts of radon from the fuel cycle for Yellow Creek on descendants who may follow us a million years hence.

150. To conclude, we have rejected Dr. Kepford's projections and we have said that we do not have great confidence in Dr. Gotchy's projections. How do we find with respect to Dr. Hamilton's suggestion that we assess the impact of radon in terms of the increase in exposure over the natural background that an individual experiences from the nuclear fuel cycle? We are led to the same conclusion reached by the *Perkins* Board:

> [T]he best mechanism available to characterize the significance of the radon releases associated with the mining and milling of the nuclear fuel for the Perkins Facility is to compare such releases with those associated with natural background. The increase in background associated with Perkins is so small in comparison with the fluctuations in background, as to be completely undetectable. Under such a circumstance, the impact cannot be significant.

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[24]To place projections such as Dr. Kepford's in some perspective, it is useful to look to the past. For example, anthropology tells us that man evolved from ape-like ancestors on the order of 10^6 years ago, and we know from archeology that our ancestors were in the midst of the stone age only 10^4 years ago. If we project backwards in time 10^{10} years, as Dr. Kepford would have us do into the future, we find that we predate the Archeozoic, the most ancient era known to geology. The profound changes which are known to have occured during a relatively few thousands of years in the past presage, in our view, the magnitude of changes which we can expect in the future.

Perkins PID at 29.

b. Health Effects of Radon Emissions

151. The *Perkins* record shows that radon emissions from mining and milling of uranium would contribute an extremely small increment to the natural background radiation. Dr. Gotchy provided estimates of the comparative population exposures from radon emanating from the nuclear fuel cycle as compared to naturally occurring exposures, for periods out of 10,000 years. Gotchy at 12, 14-18, following P. Tr. 2396. Applicant witness M. I. Goldman compared background dose commitments as a function of housing accommodations, energy conservation practices, and the mining and use of phosphate fertilizer. Testimony of Goldman (Goldman) at 8-12, following P. Tr. 2266. Dr. Hamilton estimated the increase in dose to the bronchial epithelium that would result from the operation of his hypothetical 1,000 MWe reactor. Hamilton at 2-3, following P. Tr. 2266. The *Perkins* Board concluded that the increase in exposure from radon resulting from the fuel cycle for the *Perkins* plant would be so small in relation to background that its impact cannot be significant. *Perkins* PID at 29. We have carefully reviewed the *Perkins* record and believe that it fully supports this finding. We agree.

152. The *Perkins* Board gave careful attention to the health effects of such low-level exposures to radiation. *Perkins* PID at -21. It considered the evidence which supports the hypothesis that health effects are linearly related to dose, versus the hypothesis that repair mechanisms may result in there being a threshold dose below which damage is less than would be predicted by linearity. *Id.* at 19-21. The Board concluded, "We are of the opinion that the linear hypothesis provides a conservative estimate of potential deaths due to small doses of radiation to large populations." *Id.* at 21. We believe that the *Perkins* record supports this finding. See P. Tr. at 2270-71; also Lewis Testimony at 3-4, following P. Tr. 2266; in addition see Gotchy at 7 and Table 4, following P. Tr. 2396, and Kepford at 3, following P. Tr. 2820. We agree that the linear hypothesis provides a reasonable basis for calculating potential deaths caused by small radiation doses.

153. Both Dr. Gotchy and Dr. Kepford offered calculations of cancer deaths based on the linear hypothesis. Gotchy at 7, following P. Tr. 2396; Kepford, Table 4, following P. Tr. 2820. Dr. Kepford calculated health effects out to 10^{10} years. We found earlier that projections that far into the future are meaningless, and we also rejected Dr. Kepford's short-term estimates of radon emissions from tailings piles because he assumed that the

piles would not be stabilized. Therefore we must also reject his estimates of cancer deaths.

154. We found Dr. Gotchy's estimates out to 1,000 years to be reasonable, but we have reservations about his assumptions relating to rate of release of radon after 100 years (see ¶137, *supra*). Additional uncertainties are associated with his long-term estimates because of certain simplifying assumptions he made (see ¶148, *supra*). If Dr. Gotchy's assumptions should hold, however, the nuclear fuel cycle would result in 0.11 deaths in 100 years and 1.2 deaths in 1,000 years per AFR. Gotchy at 19, following P. Tr. 2396. In terms of the Yellow Creek Plant, which we have found will require about 80 AFR's during its operational life, there will be about eight deaths in 100 years and 96 deaths in 1,000 years attributable to radon released from mining and milling of uranium. While we believe, for the reasons set forth above, that these are inflated, we shall nevertheless use them as a conservative basis for reassessing the cost-benefit balance for the Yellow Creek facility.

4. Alternatives to the Proposed Plant

155. This Board has previously found that a coal-fired power plant is the only viable alternative to the proposed nuclear plant. 7 NRC 226. We also found that the environmental impact of a nuclear plant, including health effects, would be less than the environmental impact of a coal plant. *Id.* at 227-8. Health effects of both types of plants are set forth in the FES at Tables 9.10 and 9.11. These tables do not, of course, include the effects of radon as determined above. We have again compared the health effects of a nuclear plant with those of a coal plant, and we find that the addition of eight deaths in 100 years to 96 deaths in 1,000 years resulting from radon released in the fuel cycle for the nuclear plant will still be less than the disease-related deaths caused by the coal plant. Consequently our earlier finding is not altered.[25]

5. Reassessment of Cost-Benefit Analysis

156. In our February 3, 1978, Partial Initial Decision (Limited Work Authorization) we weighed the environmental, economic, technical, and

[25]The *Perkins* Board considered the health effects of radon from the ash piles of a coal-fired plant and compared them to the health effects of radon from the fuel cycle of a nuclear plant; it concluded that the difference is not important. *Perkins* PID at 27. We have not made such a comparison because we believe that we must make our evaluation on the basis of a total cost-benefit analysis, including the new information on radon from nuclear fuel cycle.

other benefits of the proposed Yellow Creek facility against the environmental and other costs based upon the evidence of record at that time. 7 NRC 215. We have reconsidered that cost-benefit balance in light of radon emissions from mining and milling, as set forth in the *Perkins* record. We find that our previous finding, "that the benefits to society from licensing Yellow Creek Plant outweigh the costs, and these benefits will be maximized by construction which will allow operation on the projected dates," remains correct. 7 NRC at 238.

III. CONCLUSIONS OF LAW

157. Based upon our review of the entire record in this proceeding, the Board concludes as follows:

A. The application and the record of the proceeding contain sufficient information, and the review of the application by the Staff has been adequate to support the foregoing findings and the following conclusions and order.

B. In accordance with the provisions of 10 CFR 50.35(a):

(1) The Applicant has described the proposed design of the facility, including, but not limited to, the principal architectural and engineering criteria for the design, and has identified the major features or components incorporated therein for the protection of the health and safety of the public.

(2) Such further technical or design information as may be required to complete the safety analysis, and which can reasonably be left for later consideration, will be supplied in the final safety analysis report.

(3) Safety features or components, if any, which require research and development have been described by the Applicant, and the Applicant has identified, and there will be conducted, a research and development program reasonably designed to resolve any safety questions associated with such features or components.

(4) On the basis of the foregoing, there is reasonable assurance that (a) such safety questions will be satisfactorily resolved at or before the latest date stated in the application for completion of the proposed facility; and (b) taking into consideration the site criteria contained in 10 CFR Part 100, the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public.

C. The Applicant is technically qualified to design and construct the proposed facility.

D. The Applicant is financially qualified to design and construct the proposed facility.

E. The issuance of permits for construction of the facility would not be inimical to the common defense and security or to the health and safety of the public.

F. The Board has fully considered the radon-222 issue pursuant to the Commission's order dated April 11, 1978, and the order dated September 27, 1978, of the Atomic Safety and Licensing Board. The Board concludes that its previous conclusions concerning the National Environmental Policy Act of 1969, set forth in paragraph 103. a., b., and c. of its Partial Initial Decision of February 3, 1978 (7 NRC 251), remain valid and in effect.

IV. ORDER

158. On the basis of the Board's findings and conclusions in its Partial Initial Decision and this Initial Decision, and pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's rules and regulations, IT IS ORDERED that the Director of Nuclear Reactor Regulation is authorized to issue permits to the Tennessee Valley Authority to construct the Yellow Creek Plant consistent with the terms of the Partial Initial Decision and this Initial Decision.

159. IT IS FURTHER ORDERED, in accordance with 10 CFR 2.760, 2.762, 2.764, 2.785, 2.786 (1977), as amended, 43 Fed. Reg. 17798 (1978), that this Initial Decision shall be come effective immediately and shall constitute, with respect to the matters covered therein, the final action of the Commission forty-five (45) days after the date of issuance hereof, subject to any review pursuant to the Commission's Rules of Practice. Exceptions to this Initial Decision may be filed by any party within ten (10) days after service of this Initial Decision. Within thirty (30) days thereafter (forty (40) days in the case of the Staff) any party filing such exceptions shall file a brief in support thereof. Within thirty (30) days of the filing of the brief of the Appellant (forty (40) days in the case of the Staff), any other party may file a brief in support of, or in opposition to, the exceptions.

IT IS SO ORDERED.

THE ATOMIC SAFETY AND
LICENSING BOARD

Oscar H. Paris, Member

Lester Kornblith, Jr., Member

Ivan W. Smith, Chairman

Issued at Bethesda, Maryland,
this 24th day of November 1978.

[Appendix A has been omitted from this publication but is available in the NRC Public Document Room, 1717 H Street, N.W., Washington, D.C.]

Cite as 8 NRC 649 (1978) ALJ-78-3

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ADMINISTRATIVE LAW JUDGE

Samuel W. Jensch

In the Matter of **BML No. 37-02607-02**

PITTSBURGH-DES MOINES STEEL COMPANY
Grand Avenue, Neville Island
Pittsburgh, Pennsylvania 15225 **November 24, 1978**

The Administrative Law Judge denies Licensee's request for mitigation of the civil penalties imposed by the Commission's Staff and affirmed in ALJ-78-1, 6 NRC 693 (1977).

RULES OF PRACTICE: CIVIL PENALTIES

A licensee may not avoid responsibility for violations because its employees or agents failed to comply with the Commission's rules, regulations, or license conditions. *Virginia Electric and Power Company* (North Anna Power Station, Units 1 and 2), LBP-75-54, 2 NRC 498, 503 (1975), ALAB-324, 3 NRC 347, 357 (1976).

RULES OF PRACTICE: CIVIL PENALTIES

Section 234 of the Atomic Energy Act, as amended, sets forth the standard civil penalty and permits the NRC to assess a lesser amount. The implementing regulation (Section 1.64 of the regulations for the Office of Inspection and Enforcement) permits the exercise of judgment and discretion when determining the amount of a civil penalty. The amount cannot be overturned unless there is a showing of arbitrariness or abuse.

INITIAL DECISION DENYING AND REJECTING CLAIM FOR MITIGATION OF CIVIL PENALTIES

Appearances

Nancy Jane Palmer, Esq., Leon G. Krasinski, Esq., for Pittsburgh-Des Moines Steel Company, Licensee

Karen D. Cyr., Esq., James Lieberman, Esq., James P. Murray, Jr., Esq., for the Staff of the U. S. Nuclear Regulatory Commission

Pittsburgh-Des Moines Steel Company (Licensee), holder of By-product Material License No. 37-02607-02, has filed a claim or request for mitigation of the civil penalties in the amount of $2,000 imposed by the Commission's Staff and affirmed by the Order Affirming Imposition of Civil Penalties, issued on October 13, 1977 (ALJ-77-1, 6 NRC 693).

The matter is submitted upon the basis of an agreed statement of facts. Significant items in that statement are that at approximately 2:00 a.m. on November 12, 1976, in the course of radiography of certain pipe welds, Licensee's employee received excessive exposure due to a failure to return a source tube to the projector. Before approaching the projector to disconnect the source tube, no survey meter was used to measure levels of the radiation present. When the employee unscrewed the source tube and pulled it away from the projector, he discovered that the source remained approximately 1 foot outside the projector. By the use of the hand crank assembly, the source was retracted into the projector. The employee-radiographer utilized approximately 17 seconds disconnecting the source tube with his hand touching the source tube approximately 1/4 inch from the actual source. Thereafter, the projector was duly locked and placed in secured storage. The employee then left the plant.

The net result of this process was the overexposure (*i.e.*, the employee received a dose in excess of the maximum dose measured by 10 CFR 20.101(a), calculated to be 37 rem to the hands and 3.08 whole body exposure) and the recognition that a survey meter was not utilized, as required by 10 CFR 34.43(b). In addition, prompt reporting to the Com-

mission of the incident was not made by the Licensee. The employee reported the incident to his supervisor at 8:00 p.m. on November 12th, having returned to duty at 4:00 p.m. The division radiation safety officer was notified at 11:45 p.m.

The principal basis for the claim or request for mitigation of the penalties is that the Licensee's management has relied upon the full, complete, and accurate performance of instructions and duties by the radiographer. The Staff concedes that all of the required training programs had been carried out and the conditions of the license had been fulfilled by the management. Licensee emphasizes that the employee had 20 years of experience in the work and had never been involved before the time of this incident in any violation. The Staff asserts that serious violations of vital safety requirements, as expressed in the regulations, have occurred and the civil penalties which have been imposed in lesser amounts than the maximum have been based upon the judgment of the Director of the Office of Inspection and Enforcement (OIE) that the specified levels were sufficient for purposes of deterrence of similar incidents. A recent Commission decision has indicated that a licensee may not avoid responsibility for violations because its employees or agents failed to comply with the Commission's rules, regulations, or license conditions. *Virginia Electric and Power Company* (North Anna Power Station, Units 1 and 2), LBP-75-54, 2 NRC 498, 503 (1975), and ALAB-324, 3 NRC 347, 357 (1976).

The Licensee has argued that absolute liability is not the rule for violations of safety regulations. That issue, of course, was decided in this proceeding in the Order Affirming Imposition of Civil Penalties. This phase of the proceeding relates solely to the evidence the Licensee desired to produce to lessen the amount of the penalties.

The Licensee has not undertaken any effort to show an abuse of discretion in the determination of the amount of the penalties. The policy of that amendment to the Act permits the consideration of several variant factors, some of which may be the record of previous violations by the Licensee, the assignment of a task in radiography which occurred at or about 2:00 a.m., and which was apparently in 2 hours of overtime (which may have lessened the alertness and care that would be evident during regular hours of employment) and apparently a lack of a check-off list that might have been given to an employee about to embark on radiography. The Commission does not specify the details by which a licensee shall carry out its responsibility to protect the health and safety of the public. While the Commission may approve procedures for health and safety submitted by a licensee, such approval is not a measure of the limit or

extent of procedures that may be required for adequate protection of employees.

Radiography at 2:00 a.m. in apparent overtime would seem to require some guides to overcome a lack of alertness or recollection of each step to be undertaken to protect health and safety. The Licensee replies that a second person or auditor would have to accompany each radiographer for such tasks, and these costs would be horrendous. Perhaps other solutions can be devised to assist the radiographer; it would seem clear that check-off lists, and training in their use, and easy availability of such lists would be of material assistance. The selection is for the Licensee, and it does not behoove the Licensee to claim it could not do more. It is concluded that the culpability or involvement by an employer rests in part upon the circumstances surrounding the performance by the employee, such as time of occurrence, lack of guidance lists, extra help in the overtime, etc.

In any event, these considerations may well have been a part of the endeavor by the Director of OIE to assess penalties which would serve as a deterrent against future violations as occurred here. The record contains insufficient evidence to support the Licensee's claim for a mitigation in the amount of the penalties, and therefore the claim is denied and rejected.

During the course of the consideration of the contentions herein, reference was made to a presentation made in another and unrelated proceeding, to a statement that the Commission had not formally approved the criteria by which the amount of the civil penalty is determined. Briefs on this matter have been filed by both the Licensee and the Office of Inspection and Enforcement (OIE) regulatory staff. The analysis made of the statutory and regulatory framework by which the amounts of civil penalties are determined confirms the Staff position that Commission approval is not necessary for the guidelines or criteria utilized by the Staff for such determinations, and utilized following the Commission's formal statement of considerations to be entertained in the assessment of civil penalties.

Section 234 of the Atomic Energy Act, as amended (the Act), provides in part, as follows:

> Any person who (1) violates any licensing provision . . . or any rule, regulation, or order issued thereunder, or any term, condition, or limitation of any license issued thereunder, or (2) commits any violation for which a license may be revoked under Section 186, shall be subject to a civil penalty, to be imposed by the Commission, of not to exceed $5,000 for each such violation: *Provided*, That in no event shall the total penalty payable by any person exceed $25,000 for all violations by such person occurring within any period of thirty consecutive days . . . .

The statute has determined the standard civil penalty with a provision also made for assessment of a lesser amount. The Commission has then established a regulatory framework now designated by Section 1.64 of the regulations for the Office of Inspection and Enforcement (OIE) to administer the responsibilities of Section 234. In addition, the Commission has issued two formal public notices respecting the considerations which are basic to the assessment of civil penalties, the first, a notice (35 Fed. Reg. 19122) of proposed items for consideration and the second (issued (36 Fed. Reg. 16894) after a comment period), which is a formal ruling setting forth the considerations which are applicable. The Staff criteria are implementations, which have been given formal public distribution, following the Commission's ruling setting forth the fundamentals for civil penalty assessment. The criteria established by OIE have the general effect of determining whether the statutory top limit of the $5,000 civil penalty limit of the Act should be imposed or some lesser amount. That provision permits the exercise of judgment and discretion that cannot be overturned unless there is a showing of arbitrary action or abuse of the power granted. Licensee here has not presented any basis to establish an arbitrary or abusive use of the power granted by the statute.

The Licensee's principal argument respecting the criteria is that, while not positively required by Section 553 of the Administrative Procedure Act, a notice and comment period should have been extended by the Commission before use should be made of the OIE Staff's criteria. The basis of this argument appears to be that some measure of culpability must be established in the criteria. This position is negated, however, by the further provision of Section 234 of the Act, which directs the Commission to afford an opportunity for a hearing to a licensee on whom a notice has been given of an alleged violation. That hearing then embraces all of the safeguards of due process guaranteed by strict adherence by personnel specified by and conforming to the provisions of the Administrative Procedure Act. That hearing thus provides every licensee the full opportunity to present facts in support of a mitigation of the penalty proposed to be imposed, including whatever extent of culpability or involvement by a licensee's management with the personnel committing the alleged violation. Those provisions for hearing fully suffice for the due process contended by the Licensee to be necessary in this proceeding.

The Licensee here, in seeking the hearing for mitigation of the amounts assessed, urges that only a $1 amount be the limit of the penalty. That suggestion appears to rest upon the argument that no liability should attach to Licensee for the incident; this determination has already been made in the initial Order Affirming Imposition of Civil Penalties.

WHEREFORE, IT IS ORDERED, in accordance with the Atomic Energy Act, as amended, and the Rules of Practice of the Nuclear Regulatory Commission, that the claim or request by Pittsburgh-Des Moines Steel Company, Licensee of Byproduct Material License No. 37-02607-02, for mitigation of civil penalties imposed in the amount of $2,000 is denied and rejected.

IT IS FURTHER ORDERED, in accordance with 10 CFR Sections 2.760, 2.762, 2.764, 2.785, and 2.786, that this Initial Decision shall become effective within thirty (30) days after the date of issuance, and shall constitute, with respect to the matters covered therein, the final action of the Commission thirty (30) days after the date of issuance hereof, subject to any review pursuant to the Commission's Rules of Practice. Exceptions to this Initial Decision may be filed by any party within ten (10) days after service of this Initial Decision. Within thirty (30) days thereafter (forty (40) days in the case of the Staff) any party filing such exceptions shall file a brief in support thereof. Within thirty (30) days of the filing of the brief of the Appellant (forty (40) days in the case of the Staff), any other party may file a brief in support of, or in opposition to, the exceptions. This enumeration of appeal provisions is subject to the complete schedule in that regard made by the regulations of the Commission which are controlling and to which reference has heretofore been made in the ordering clause.

FOR THE NUCLEAR
REGULATORY COMMISSION

Samuel W. Jensch
Administrative Law Judge

Issued:
November 24, 1978
Bethesda, Maryland

Cite as 8 NRC 655 (1978) ALJ-78-4

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ADMINISTRATIVE LAW JUDGE

Samuel W. Jensch

In the Matter of BML No. 29-13613-02

RADIATION TECHNOLOGY, INC.
Lake Denmark Road
Rockaway, New Jersey 07866 November 24, 1978

The Administrative Law Judge affirms in part and denies in part the imposition of civil penalties by the Office of Inspection and Enforcement.

RULES OF PRACTICE: CIVIL PENALTIES

Section 234 of the Atomic Energy Act reflects the general Federal program for civil penalties. The upper limit is $5,000 for a single violation and $25,000 for all violations within a 30-day period. The statute also permits the Commission to assess civil penalties in lesser amounts.

RULES OF PRACTICE: CIVIL PENALTIES

Violations for exceeding permissible levels of radiation cannot be supported to the extent they rest on the unverified accuracy of readings made by NRC regulatory staff of levels of radioactivity.

INITIAL DECISION AFFIRMING THE IMPOSITION OF CIVIL PENALTIES IN THE AMOUNT OF $3,300

Appearances

Radiation Technology, Inc., Licensee, by **Dr. Martin A. Welt**, President

James Lieberman, Esq., Karen D. Cyr, Esq., Colleen P. Woodhead, Esq., James P. Murray, Jr., Esq., on behalf of the Regulatory Staff of the U.S. Nuclear Regulatory Commission

Radiation Technology, Inc. (Licensee), is a Licensee by virtue of being the holder of Byproduct Material License No. 29-13613-02, which was issued following the filing of an application Form AEC-313 for a license on August 25, 1970. The facility to be operated was described as a commercial irradiator which would utilize cobalt-60. The source of this radiation would contain a maximum of 300,000 curies ± 10 percent which would be doubly encapsulated in sealed sources. The purpose of use of the byproduct material was described for an industrial cell irradiator and in a pool irradiator. The products to be radiated were described as materials of various density including radiation of medical, cosmetic, and enzyme materials and production of radiation-induced polymeric materials.

The application was accompanied by several supplements which described the facilities as well as the procedures to be followed for the proposed operation. The President of the Licensee is a former employee of the Atomic Energy Commission and is familiar with many phases of the care and handling of radioactive materials. The source material for the radiation was procured from a Canadian source and had been previously utilized at St. Hilaire, Quebec, by some employees or associates of the present Licensee. One of the serious problems in the present Licensee's operations appears to have developed from a leak in one of the pencil-like containers which held some of the radioactive material which had been shipped from Canada. This leaking container proved to be singly encapsulated rather than doubly encapsulated as projected in the application for a license.

The proposed procedures for the contemplated operation were designed to be in full compliance with the Commission's regulations, including 10 CFR Part 20. The cobalt-60 irradiator was described to be a filled, stainless steel tank installed in the ground with the fixed cobalt source under water. This type of irradiator had been used at the St. Hilaire facility for processing a wood-plastic parquet flooring. The application described the duties of the personnel to be employed; one employee would be the radiation safety officer whose varied duties would include supervision of the source installation, initial radiation survey, and periodic leak tests. The safety officer would be obligated to maintain a log on all radiation detection instruments, surveys, plus records on the exposure history of all personnel. Certain plant protection procedures were described with references to film badge requirements, pocket dosimeters, and use of portable survey meters. In addition, the prospective Licensee stated that a permanent printed metal sign in standard colors and symbols "Caution Radiation Area" would be displayed at the entrances of the Research and Development Room. Another sign "Caution Radioactive Materials" would also be displayed in the room, and an area monitor would be placed near the ceiling of the room to sound an alarm in the event of a high radiation level.

The license was issued to permit operations to be underway in early 1971.

Several inspections were made from time to time and certain items in the inspection reports were occasionally characterized as either in non-compliance or unresolved.

The inspections that led to the proposed imposition of civil penalties were made October 27 and November 1, 1976.[1] Following those inspections, the following Notice of Violation was issued:

NOTICE OF VIOLATION

Based on the results of an NRC investigation conducted on October 27 and November 1, 1976, it appears that certain of your activities were not conducted in full compliance with NRC regulations and the conditions of your license as indicated below.

1. License Condition 13A requires that leak rate tests be made of your sealed cobalt sources and Condition 13B specifies the methods and procedures for conducting the tests. Condition 13C requires that a report be submitted to the NRC Region I Office within 5 days of any test that reveals the presence of 0.05 microcuries or more of removable contamination in any 100 milliliter test sample.

   Contrary to the above, as of November 1, 1976, you failed to report to the NRC Region I Office the results you obtained on September 11, 1975, of leak tests taken on September 2 and 3, 1975, which revealed the presence of 0.13 microcuries of removable contamination in one sample.

   This is an infraction.

   (Civil Penalty $500)

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[1]Considerable hearing time was absorbed in discussions respecting the events leading to the October 27 inspection. Events developed prior to October 27 included, what later proved to be completely groundless, charges made by a newspaper reporter that excessive radiation was present in Licensee's facility, that personnel were overexposed, cancer had developed in some employees, etc. After determining that these charges were false, the Office of Inspection and Enforcement personnel decided nevertheless to undertake a thorough inspection, to be additional to an inspection made in June 1976. The inspectors stated that the October inspection was made because of "public concerns reported to the Commission." No identification was given of public concerns except the false reporting made by [illegible] newspaper representative. At the hearing, the October 27 inspection was also described as a stepped up schedule based upon the June NRC inspection. The Licensee argued that previously condoned, if not approved, practices were suddenly determined to be violations; that the October 27th inspection served to be a part of the newspaper reporter's vendetta against any nuclear facilities in the county, and that the NRC inspectors were personally biased against the Licensee. During the hearing, the charge of bias by NRC inspectors was ruled to be without support, even though one inspector stated that he had a "personality conflict" with the President of the Licensee.

2. 10 CFR 20.403(b)(3), "Notification of incidents," requires that you notify by telephone and telegraph, mailgram, or facsimile, the NRC Region I Office within 24 hours of any incident involving licensed material which may have caused or threatens to cause the loss of 1 day or more of the operation of any facilities affected.
   Contrary to the above, as of November 1, 1976, you failed to notify the NRC Region I Office of the incident involving cobalt activity in the R&D pool which resulted in the loss of pool operations for the period of September 2 to September 10, 1975.
   This is an infraction.
   (Civil Penalty $500)

3. 10 CFR 19.12, "Instructions to workers," requires that all individuals working in a restricted area be instructed in the precautions and procedures to minimize exposure to radioactive materials, in the purposes and functions of protective devices employed and in the applicable provisions of the Commission's regulations and licenses.
   Contrary to the above, as of October 27, 1976, you had failed to provide adequate instructions to at least two employees working in the R&D room, in that the employees were not aware of the radiation and contamination levels in the area, and did not know the proper method for utilizing personnel monitoring equipment.
   This is an infraction.
   (Civil Penalty $500)

4. 10 CFR 20.105(b), "Permissible levels of radiation in unrestricted areas," requires that radiation levels in unrestricted areas be limited so that if an individual were continuously present in the area, he could not receive a dose in excess of 2 millirems in any 1 hour or in excess of 100 millirems in any 7 consecutive days.
   Contrary to the above, on October 27, 1976, radiation levels in excess of that permitted existed at several locations in the unrestricted area outside of your facility, including the following:
   a. 95 mR/hr on the surface of a steel container of contaminated resin located outside the door leading into the mechanical room.
   b. 40 mR/hr on the surface of a 55-gallon drum containing contaminated recirculation water located outside the overhead door leading into the warehouse connected to the office building.
   We note that this infraction is of the same basic requirement as one which was brought to your attention in our letter of July 2, 1976.
   This is an infraction.
   (Civil Penalty $750)

5. 10 CFR 20.207(a), "Storage and control of licensed materials in unrestricted areas," requires that licensed materials, stored in an unrestricted area, be secured against unauthorized removal from the place of storage. 10 CFR 20.207(b) requires that licensed materials in an unrestricted area and not in storage must be under the constant surveillance and immediate control of the licensee. As defined in 10 CFR 20.3(a)(17), an unrestricted area means any area, access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials.

   Contrary to the above, on October 27, 1976, radioactive material described in Item 4 existed in the unrestricted area outside of your facility and was neither secured against unauthorized removal nor under constant surveillance and immediate control.
   We note that this infraction is similar in nature to one brought to your attention in our letter of July 2, 1976.

   This is an infraction.

   (Civil Penalty $750)

6. 10 CFR 20.203(b), "Caution signs, labels, signals, and controls," requires that each radiation area be conspicuously posted as such. 10 CFR 20.203(c) requires that each high radiation area be conspicuously posted as such, and if it has existed for more than 30 days, that access control be established by one of the following methods: (1) equip each entrance or access point with a control device which shall cause the level of radiation to be reduced below that at which an individual might receive a dose of 100 millirems in 1 hour upon entry into the area; or (2) equip each entrance or access point with a control device which shall energize a conspicuous visible or audible alarm signal in such a manner that the individual entering the high radiation area and the licensee or supervisor of the activity are made aware of the entry; or (3) maintain the area locked except during periods when access to the area is required, with positive control over each individual entry.
   a. Contrary to the above, on October 27, 1976, the east side double doors leading into the R&D room and the east and west doors leading into the receiving pool room were not posted as a radiation area.
   b. Contrary to the above, as of October 27, 1976, access was not controlled to the high radiation area which existed in the receiving pool since approximately November 12, 1975, and the area was not posted as a high radiation area.

   This is an infraction.

   (Civil Penalty $500)

7. 10 CFR 20.203(f), "Caution signs, labels, signals, and controls," requires that each container of licensed material which meets specified requirements bear a label identifying the radioactive contents.

   Contrary to the above, on October 27, 1976, the containers of radioactive material located in the receiving pool room and the containers of material located in the unrestricted area discussed in Items 4.a and 4.b, were not labeled to identify the radioactive contents.

   This is a deficiency.

   (Civil Penalty $50)

8. 10 CFR 20.201(b), "Surveys," requires that you make surveys as may be necessary for you to comply with all sections of Part 20. As defined in 10 CFR 20.201(a) "survey" means an evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radiation under a specific set of conditions.

   a. Contrary to the above, as of October 27, 1976, you failed to make such surveys of the radiation levels in your unrestricted areas as were necessary for you to assure compliance with 10 CFR 20.105, "Permissible levels of radiation in unrestricted areas." Specifically, the surveys which were made were inadequate in that they failed to detect actual levels in excess of those permitted as noted in Items 4.a and 4.b.

   b. Contrary to this requirement, as of October 27, 1976, you failed to make such surveys as were necessary to assure compliance with 10 CFR 20.101(a), "Exposure of individuals to radiation in restricted areas." Specifically, there were no surveys made to determine the radiation exposure to individuals in the restricted area, including two individuals who removed the film from their film badge holder, discarded the holder, and placed the film in their billfold.

   c. Contrary to this requirement, as of October 27, 1976, you failed to make such surveys of the radioactive material that had been discharged in liquid effluents to the unrestricted area as were necessary for you to assure compliance with 10 CFR 20.106, "Radioactivity in effluents to unrestricted areas." Specifically, there were no surveys made of contaminated water discharged via the floor drain in the R&D pool room to the leaching field in the unrestricted area outside your facility.

   d. Contrary to this requirement, as of October 27 and November 1, 1976, you failed to make such surveys as were necessary to assure compliance with 10 CFR 20.301, "Waste disposal—General requirement." Specifically, surveys were not made of material disposed

of by placing them in a container (dumpster) in the unrestricted area for subsequent disposal as normal trash.

This is an infraction.

(Civil Penalty $500)

9. License Condition 12 requires that byproduct material be used by or under the supervision of certain specified individuals.

   Contrary to the above, it was determined on October 27, 1976, that byproduct material had been routinely used by and under the supervision of an individual other than those designated by the license condition.

   We note that this infraction is of the same basic requirement as one which was brought to your attention in our letter of January 23, 1975.

   This is an infraction.

   (Civil Penalty $750)

A prehearing conference was held in Newark and 8 days of evidentiary hearings were had in Morristown, New Jersey. The Licensee appeared through its President, Dr. Martin A. Welt, who is not a lawyer but is a Ph.D. in physics and highly trained in the technical phases of the operations. The Regulatory Staff appeared at the hearings through James Lieberman, Esq., and Karen D. Cyr, Esq. Both parties have presented data reflecting extensive and thorough effort in preparation. The Staff has submitted an excellent legal and factual analysis submitted to answer Licensee's contentions which necessarily were in layman's language.

Two substantial considerations pervade the entire controversy. The first is the extent and necessity of formal Commission action respecting the assessment of civil penalties. The second concerns the accuracy of the Commission Staff's instrumentation to measure the levels of radioactivity alleged as partial bases for the violations and civil penalties involved. These considerations are presented in that order.

The Congress, in its enactment in 1969 of the now designated Section 234 of the Atomic Energy Act, provided as follows:

SEC. 234. CIVIL MONETARY PENALTIES FOR VIOLATIONS OF LICENSING REQUIREMENTS.—

a. Any person who (1) violates any licensing provision of sections 53, 57, 62, 81, 82, 101, 103, 104, 107, or 109 or any rule, regulation, or order issued thereunder, or any term, condition, or limitation of any license issued thereunder, or (2) commits any violation for which a license may be revoked under section 186, shall be subject to a civil penalty, to be imposed by the Commission, of not to exceed $5,000 for each such violation: *Provided*, That in no event shall the total penalty payable by any person exceed $25,000 for all violations by such person

occurring within any period of 30 consecutive days. If any violation is a continuing one, each day of such violation shall constitute a separate violation for the purpose of computing the applicable civil penalty. The Commission shall have the power to compromise, mitigate, or remit such penalties.

b. Whenever the Commission has reason to believe that a person has become subject to the imposition of a civil penalty under the provisions of this section, it shall notify such person in writing (1) setting forth the date, facts, and nature of each act or omission with which the person is charged, (2) specifically identifying the particular provision or provisions of the section, rule, regulation, order, or license involved in the violation, and (3) advising of each penalty which the Commission proposes to impose and its amount. Such written notice shall be sent by registered or certified mail by the Commission to the last known address of such person. The person so notified shall be granted an opportunity to show in writing, within such reasonable period as the Commission shall by regulation prescribe, why such penalty should not be imposed. The notice shall also advise such person that upon failure to pay the civil penalty subsequently determined by the Commission, if any, the penalty may be collected by civil action.

c. On the request of the Commission, the Attorney General is authorized to institute a civil action to collect a penalty imposed pursuant to this section. The Attorney General shall have the exclusive power to compromise, mitigate, or remit such civil penalties as are referred to him for collection.

The issue respecting the necessity of formal Commission action in the establishment of civil penalties arose from references made to the criteria used by the Regulatory Staff in determining the level of the civil penalties. The Staff had stated at the hearing that the Commission had not formally approved the criteria utilized. The impression was gained that while the Commission had been informed of the Staff's criteria, no formal action had been taken to approve them. Discussion was had at the hearing directed to the necessity of formal standards to either be expressed in the legislation or in formal Commission action. No references were made at the hearing to either the legislative history preceding the enactment of Section 234 or the Commission action taken after the effective date of the statute.

Briefly, the legislative history reflects the agreement by the Congress with the Commission's recommendation that something more was needed in aid of enforcement of the Commission's safety regulations than remonstrances or assistance to licensees who failed to comply, and yet something was needed which was short of suspension and termination of licenses

which had been violated. Section 234 reflects the general Federal program for civil penalties. The statute determines the standard for the upper limit of a single violation, *i.e.*, $5,000, and a limit of $25,000 for all violations within a 30-day period. If the statute contained no more than that, the Licensee's argument for specificity in standards would be definitely answered. The statute, however, grants discretion, in effect, to the Commission to establish civil penalties in amounts less than the statutory standard. The process for the imposition of civil penalties includes a notice of violation and opportunity for response procedure, followed by a hearing if requested by the licensee. All of the statutory procedures have been followed in this proceeding.

After the effective date of Section 234, the Commission by formal action established detailed procedures and considerations to be undertaken in the assessment of civil penalties. By notice of proposed rulemaking published on December 17, 1970 (35 Fed. Reg. 19122), the Commission announced the factors which would be governing in the establishment of penalties, and again by formal Commission action (36 Fed. Reg. 16894), the Rules of Practice were amended to include the factors which will determine the assessment of civil penalties. Those two formal actions by the Commission fulfill the legal requirements for standards utilized in civil penalty proceedings. The criteria formulated by the Regulatory Staff are guidelines and have been given to all licensees by way of notice of specific procedures which the Staff follows. The statutory provision for hearings and consideration of the violations, the civil penalties, and the amount thereof, provide the mechanisms whereby the licensees can present evidence on all items at issue, including the amount of the penalties. The hearing procedures provide for a record of evidence prepared in accordance with the Administrative Procedure Act and available for review by the Commission after issuance of the initial decision.

The net effect of the combination of legislative and Commission action provides the full protection of due process in the establishment of civil penalties.

The second consideration pervading the contentions and violations alleged concerns the thorough attack made by the Licensee on the accuracy of the instrumentation used to measure the asserted levels of radioactivity at the Licensee's facility. The expertise of the Licensee's President was clearly evident in these phases of the hearing.

The monitoring devices used by the Regulatory Staff were Geiger Müeller detection instruments. Calibration was given quarterly to these devices at the Brookhaven Laboratory. After completion of these periodic calibrations, Brookhaven returned the instruments in the most abundant of packing materials and handled with extreme care, with the apparent

objective to avoid any bumping or jarring around that would maladjust the accuracy established. When the instruments were received at the Inspection's Regional Office, they were placed in a shelving arrangement which was apparently a closed container. Each instrument carried a "sticker" or label which designated the date when again the instrument should have further calibration, presumably again 3 months after a completed calibration.

The evidence is that the practice followed by inspectors in undertaking an inspection would be to go to the shelving arrangement and procure the monitoring devices desired. Two instruments were generally procured, and each would be "turned on" by the battery source of power to activate the measuring activity; if the needles moved, it was assumed that the instruments were workable. This practice was carried out for the inspection in particular question here, *i.e.*, on October 27, 1976.

The Staff in its proposed finding no. 55 at page 31, stated: "Mr. Smith testified that he used a check source prior to the October 27, 1976, inspection on the two instruments he signed out." The transcript references of Tr. 410, 412 do not substantiate that statement. The evidence regarding the procurement of the two monitoring devices is that one of low range was procured, and another of a high range. Both instruments were compared to the extent of their ranges.[2] At Tr. 411, the question was propounded[3] which included the following: Q. "When you take your instrument . . . do you take that instrument, and do you have a little check source right there before you leave the Materials Branch?" The answer was: "Yes, there are check sources." That question and answer do not state that calibration was made of the two instruments with an identified and measurement-determined source of radioactivity. Rather, the answer gives the impression that while there were check sources there, either none was used or accuracy was not determined, and merely that the needles on the monitoring instrument moved and were not stuck. It may be, however, that the answer intended to convey the thought that if two instruments had needles that moved, that process constituted as using a check source. The need for accuracy to measure the level of radioactivity for assessment of a civil penalty requires more than ambiguity.

Additional questions and answers are shown on Tr. pages 411 and 412 as follows: Q. "Do you take another instrument . . . and you run some sort of—just to make sure the two needles are reading, and things like

[2]At Tr. 418, the witness answered the question: Q. ". . . how many ranges do you check through?" A. "Just to see that the instrument responds."

[3]Many of the questions propounded by the Licensee were inordinately long, sometimes involved and sometimes inclusive of more than one item. The questions were often repeated in aid of clarification to a witness.

that?" A. (Tr. 412) "Yes, I take two instruments." The answer limits the scope of the question to just the taking of two instruments. Again (Tr. 412): Q. "Well, the procedures you just described in taking an instrument out, and *your acceptance of a calibration*, et cetera, and that's it." (Emphasis added.) A. "Yes, I believe that is proper." This answer gives the impression that the witness accepted the calibration made by the Brookhaven Laboratory and did not verify a present condition of accuracy of a monitoring instrument by a known and measured source of radioactivity. Further: Q. (Tr. 412) ". . .it would be possible that your instrument was wrong in terms of absolute reading?" A. "It could be possible."

A long involved question followed that answer which includes (Tr. 412, 413): Q. "It could be possible that your instrument was wrong. You *had no direct control over the absolute calibration of your instrument prior to, let's say, a given survey* [emphasis added]. . . . Do you . . . believe . . . that the procedures you are now following are in any way, shape or form, competent?" A. "Yes." On Tr. 415 is the following: Q. " . . . do you believe that the procedure . . . where you take an instrument that say was calibrated 3 or 4 or 5 months ago, you rely strictly on the sticker . . . . *He goes out with a meter that he now knows he did not personally calibrate* [emphasis added]—you have testified that the meter may be in error . . . you have said, that the existing procedures are perfect?" A. (Tr. 416) "No, I don't say the procedures are perfect. I say they are workable. When I use two instruments, and they both read the same *I rely that the group who has the responsibility for seeing that the instruments are maintained and calibrated, I rely on that situation.*" (Emphasis added.) Tr. 416 has a question that includes the statements: Q. ". . . *You're relying on other people's calibration. You don't do a verification before . . . .*" (Emphasis added.) A. (Tr. 417) ". . . to reduce the possibility of obtaining misreadings this could be improved if instruments were calibrated daily, every hour, at some more frequent interval."

The conclusion from the foregoing evidence and related discussions reflected in the transcript is that the instruments utilized for both the October 27th and November 1st inspections cannot be certified or assured for accuracy. The calibration organization at Brookhaven used by the Staff has indicated the method of care that should be followed in transporting the monitoring devices, *i.e.*, much packing material to prevent any maladjustment of the calibration. The evidence in this proceeding is that the instruments used had a label that designated when another Brookhaven calibration should be made; how near to the next date were the instruments used for the inspection of Licensee is not known. The monitoring devices, when received by the Regional NRC Offices, are carried in an automobile with no packing around them; and whether bounces in the roads or pot-

holes, prior to the October or November inspection trips, affected the calibration is not shown, but accuracy must be established by the NRC. It would seem from the Brookhaven care in shipment that loose handling or rough roads would lessen the accuracy. A premise for one of Licensee's questions (Tr. 413) was that Highway State Troopers must verify the accuracy of their instrumentation to support their charges of speeding. It is further concluded here that verification of accuracy cannot be given for the monitoring devices used for the OIE inspections of the Licensee on October 27th and November 1st, and thus the violations asserted which rest upon the limits of radioactivity measured cannot be supported. The Staff had identified the violations which rest upon such measurements of radioactivity as 4, 5, 6, 7, and 8[4] (proposed finding number 68). However, upon a consideration of the allegations, those enumerated items do not

[4]The Staff has requested that official notice be taken of certain documents and treatises dealing with the care and calibration of monitoring devices (Eberline Instrument Corporation, *Technical Manual, Geiger Counter Model E-120/E-120G* (Santa Fe, New Mexico), 1972; Radtke, Robert, "Personnel Monitoring," *CRC Handbook of Radioactive Nuclides,* Wang, Yen, ed. (Chemical Rubber Company, Cleveland, Ohio), 1969; Evans, Robley D., *The Atomic Nucleus* (McGraw-Hill, New York, N.Y.), 1955; International Commission on Radiation Units and Measurements, *Radiation Protection Instrumentation and Its Application—ICRU Report 20* (ICRU, Washington, D.C.), 1971; American National Standards Institute, *Proposed ANSI Standard N323—Radiation Protection Instrumentation Test and Calibration,* Final Draft, June 1975). Those items have been examined. Official notice is taken of those references cited by the Staff. The following quotations from these items of official notice are interesting reading:

F. *Periodic Performance Test*

To assure proper operation of the instrument between calibrations, the instrument shall be tested with the check source periodically and prior to each intermittent use. [P. 16.]

3. *Performance Test Frequency*

A performance check shall be made prior to each use, during intermittent use conditions and several times a day during continuous use. [P. 18.]

American National Standards Institute, *Proposed ANSI Standard N323—Radiation Protection Instrumentation Test and Calibration,* Final Draft, 1975.

None of that testing has been done for this assessment of penalties. In addition, is the following:

The frequency and scope of subsequent calibrations is governed by the rate at which components in the instrument age or become damaged. Unless there is evidence or experience to suggest that more frequent calibrations are desirable, yearly intervals are usually sufficient. . . .

International Commission on Radiation Units and Measurements, *Radiation Protection Instrumentation and Its Application,* p. 36.

The instruments used for measurements for this proceeding are stated to be calibrated quarterly. This variance from the suggested yearly calibration may indicate that rough usage in the inspectors' travel and use warrant more frequent calibration. In any event, in none of these references is there support for the proposition that instrumentation that cannot be verified for accuracy and which may be in error can be used to establish the certainty needed for assessment of civil penalties.

depend solely upon measurements of radioactivity; and, those items depend only in part upon instrument readings made by the OIE. Meter readings made by the Licensee, on the other hand, are accepted as reliable, probative, and substantial evidence in the form of admissions. Upon the basis of the foregoing, and as the order herein will provide, the violations are dismissed only to the extent that they rest upon the unverified accuracy of readings made by OIE of the levels or radioactivity.

Other violations asserted to have occurred by Licensee related principally to labelling and reporting requirements contained within 10 CFR Part 20. The evidence respecting these matters appear to have been developed from familiar legal procedures of confession and avoidance. The Licensee agreed with many of the instances cited, but argued that either the regulation was unclear or that some substitute arrangement devised by the Licensee fulfilled the requirements. The ingenuity reflected in this phase of the proceeding does not fulfill the specifics of the regulations nor the conditions of the license.

One of the initiating events for the OIE inspections was the level of radioactivity in the R&D pool on September 2, 1975. The requirements of the license specified that the pool be shut down. This was done, but no report of the cessation of operations was made to the Commission as required. The excuse given was that the determination made that one of the pencil-like containers of radioactive material was causing a leak of the radioactivity did not constitute an incident which requires a reporting. Such an excuse is not logically supported by a reasonable interpretation of the regulations and is rejected.

Item No. 1 of the asserted noncompliance is supported by an analysis of Conditions 13A, B, and C of the license, which in A requires leak tests of the sealed cobalt sources, and in B specifies the methods and procedures for conducting the tests, and in C requires reporting to the Commission within 5 days of any test if the test reveals the presence of 0.05, or more, microcuries of removable contamination. The tests performed for the Licensee revealed the presence of 1.3×10^{-3} microcuries per milliliter. No report was made of this test, the Licensee contending that since only pool water was tested, and not water from the pipe containing the pencil leaker, no report was necessary. The importance of the reporting requirement is to ascertain the presence of radioactivity, whether in the pool water, or in the pipe containing water around the pencil-leaker. Item No. 1 is supported by reasonable, probative and substantial evidence and the civil penalty of $500 is approved.

Item No. 2 outlines the reporting requirement for cessation of facility operations for 1 day or more. The R&D pool was kept out of operation from September 2, 1975, to September 10, 1975, and no report was made.

The Licensee argues that no "incident" occurred since the circumstances surrounding the occurrence were abnormal (*i.e.*, no leaking was expected at any time, so, its occurrence was abnormal), and that is not construed by the Licensee to be an incident. To err on the side of excessive reporting, even if terms are misunderstood, did not seem a guideline for the Licensee. The argument for the Licensee is that lack of clarity in the R&D pool water led to the shutdown of the facility, and this was not pool activity cessation. Furthermore, the argument goes, that no person was overexposed because of this higher level of radioactivity in the pool water. The important aspect of this noncompliance is that there was a cessation of R&D pool operations—and that required the reporting. Item No. 2 is supported by reasonable, probative, and substantial evidence, and the civil penalty of $500 for this violation is approved.

Item No. 3 of noncompliance asserts that at least two employees working in the R&D room were not aware of radiation and contamination levels in the area and did not know the proper method for utilizing personnel monitoring equipment.

The aspect of training programs and responsiveness of employees to instructions involves the element of continuous review. It is not enough to hand an employee a training manual and expect complete reading and understanding. Whatever they be called, test drills are generally regarded as effective to learn the employee's understanding and compliance. The details of this Licensee's training programs are not reflected in the record; the data submitted with Licensee's application indicated that a training program would be conducted. A measure of the effectiveness of this Licensee's program can be made from the admitted facts that the President of the Licensee did not know that two of his employees carried film badges inside their wallets located in their back pockets. That alone should indicate a complete failure of the training program for which the Licensee must assume responsibility. Without knowledge by employees of the radioactivity to which they may be exposed, protective measures cannot be taken to avoid overexposure. This facility utilized a radioactive source of substantial force which should require extra care in training. The Staff objects to lack of instruction in the Licensee's safety manual on how to handle activities involving contamination. That objection would have more force if the Staff of the Commission had anticipated that possibility in approving the application for license which contained expected procedures for all activities and events. The 20-20 vision is not as helpful as it might be.[5] This

[5]The evidence cited by the Staff of inquiries of safety officer Haram appears to be responsive to perhaps a leading question for affirmance: "And were you concerned about lack of procedures and training for events involving contamination." There is no evidence Mr. Haram ever raised the subject to Licensee's management.

item of asserted noncompliance rests more upon the lack of training as shown by the fact that the employees placed film badges within their wearing apparel and wallets, which of course, prevented accurate survey readings. This sort of responsiveness by employees to an asserted training program reflects a total failure to properly instruct and test the understanding of employees to justify the imposition of $500 civil penalty. This item of violation is supported by reasonable, probative, and substantial evidence.

Item No. 4 asserts noncompliance with Commission regulations based upon survey meter readings stated to be 95 mR/hr on the surface of a steel container of contaminated recirculation water located outside the overhead door leading into the warehouse connected to the office building. This alleged noncompliance rests upon a survey meter whose accuracy has not been established,[6] and thus there is not reasonable, probative, and substantial evidence to support the proposed civil penalty of $750 and this amount is not assessed against the Licensee.

Item No. 5 asserts noncompliance by violation of regulations 10 CFR 20.3(a)(17) in that radioactive material " . . . described in Item 4 . . ." existed in the unrestricted area outside of your facility and was neither secured against unauthorized removal nor under constant surveillance and immediate control. If this Item No. 5 is intended to convey that a steel container emitting 95 mR/hr is the object to be considered, as in Item 4, then acceptance cannot be given to that level of radioactivity as concluded above. However, if this Item 5 is strictly related to surveillance and control aspects in reference to the container, this item may be considered as if trash material of low-level activity was in an unrestricted area. The Licensee contested the surveillance and control contentions of the Staff by the argument that a continuous watch of the container was not intended by the regulation nor would it be reasonable. The circumstances for constant surveillance and immediate control must be measured by several factors, nearness of personnel, frequency of passing near by personnel, whatever routines were generally present in reference to a container with radioactive material. The transcript pages 303-304 given by the Staff in proposed findings 77 and 78 refer to a drum of material with an asserted measure of radioactivity of

[6]The lack of accuracy by the survey meter is not overcome by a statement in a question (Tr. 241, 2) that the steel container had been moved outside the mechanical room ". . . only because they knew it contained a radiation level that you wouldn't want to have a man working in proximity to for a number of hours." The Staff's duty here is to prove the accuracy of the meter reading of 95 mR/hr. The additional statement in that question is: ". . . it (the container) was moved outside because the company knew it had irradiation content, or it was emitting *some* radiation." (Parentheses and emphasis added.) (Staff statement in proposed finding no. 77 about a survey of a "drum" submits transcript references 303, 4 which refer to a survey of a *room.)*

40 mR/hr; Item No. 4, which is cited as reference to the material for which there is an alleged lack of surveillance and control, describes a steel container which gave a surface reading of 95 mR/hr (with the meters not shown to be accurate). The civil penalty allegation by its reference to the steel container necessarily limits the analysis to that container. Without a substantiation of the accuracy of meter readings, and with the consideration of the material as trash is the question whether ownership or leasing with exclusive occupancy of the building presumes control.[7] If something more than general control is needed, the regulation should be amended to state it specifically. Certainly, the Licensee had the power to exclude the general public from the building and the yard around it. Employees likewise are generally presumed to be under the control of management and, for whose protection, instruction on safety could be readily given. In addition, an employee witness testified (Tr. 306-314) that he occupied a glass-enclosed area which permitted him to see the object containing some radioactive material at all times. These controls over the place and the personnel permissible in the area operate to prevent unauthorized removal of the radioactive material from the place of storage. The Licensee contended that the inspectors in their work interfered with the process of moving this material, trash or otherwise to a different location, and that obstruction to Licensee's activity should not be the basis of an alleged violation. Item 5 is not proven by reliable, probative, and substantial evidence that there was a lack of constant surveillance and immediate control by the Licensee and the proposed civil penalty of $750 is not approved.

Item No. 6 alleges a violation of 10 CFR 20.203(b)(c) by a lack of proper caution signs, labels, signals, and controls and a failure to conspicuously post each radiation area. Two instances are cited: (1) the east side double doors leading into the R&D room and the east and west doors leading into the receiving pool room were not posted as radiation areas; and (2) access was not controlled to the high radiation area which existed in the receiving pool and the area was not posted as a high radiation area.

Item No. 6 concerns radiation levels in areas which the evidence clearly establishes were of a high and potentially dangerous level. Licensee's

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[7]In the glamour of modern technology, there appears to be a tendency to overlook the legal fundamentals, which are followed by the courts and which are most explicitly expressed in early cases, *viz.*:

> . . . one who has no right to control, handle, or dispose of a thing cannot be considered its owner, for the essential attributes of property, real and personal, are the rights in the owner to control, handle, and dispose of the thing owned. *Converse* v. *Kellogg*, 7 Barb. (N.Y.) 590; *Hill* v. *Cumberland Valley Mut. Protection Co.*, 59 Pa. (9 P.F.Smith) 474 . . .

Harding v. *Empire Zinc Co.*, 148 Pac 306, 310 (1915).

witnesses recognized the high level activity in these designated areas. The principal issue respecting this item concerns the adequacy of the signs and whether they were readily observable. The Licensee contends that signs on the sides of doors which were not readily viewable when the doors were open are adequate for the regulatory requirement for the doors, especially since, in addition, a sign at the doorway stated "Authorized Personnel Only." The Licensee also emphasizes that when the doors were open, an adequate sign "Caution—Radiation Area" could be seen on the far wall of the R&D room.

The Staff has made an extensive presentation respecting the need for caution signs and the intention of the regulation to prevent people, including employees, from entering into a high radiation area without the prescribed warnings. It is clear that the "avoidance" evidence from the Licensee does not fulfill the requirements of the regulation.

The evidence is somewhat contradictory about the double doors into the R&D room, whether they were open most of the time, in which event, the proper signs could not be observed. There was evidence that the doors could not be easily closed. As to the east and west doors leading into the receiving pool room, there were not any of the proper caution signs. Inherent in the regulations is the purpose that caution signs be conspicuously posted. No purpose is served if signs are not readily observable, and signs might well be placed on both sides of doors to render them easily seen. That should not be any great burden.

The caution requirement is also present in reference to the receiving pool which needs signs and a controlled access. Specific procedures had been formulated for protection in this area: a control device to cause a reduction of the level of radiation below 100 mR/hr upon entry, or a control device that will energize visible or audible alarm to alert a person entering the area, as well as the supervisor of the activity, or finally, a locked prevention-of-entry device which would require positive control over each entry. The outside surveillance possibility by one of Licensee's employees is not adequate for this area where radiation levels were admittedly far in excess of permissible levels for a time period longer than 30 days.

The Item No. 6 violation is supported by reliable, probative, and substantial evidence and the imposition of civil penalty in the amount of $500 is approved.

Item No. 7 concerns an alleged violation of 10 CFR 20.203(f) labelling requirements on each container so that there is an identification of the radioactive contents. There were containers in the receiving pool room that Licensee concedes were not labelled with caution signs, labels, etc. The Licensee contends that a radiation sign propped up against a drum of radioactive material was adequate, and that other canisters in that room with

grease pencil markings were adequately marked. The regulation is more specific and requires a durable label on the container, and the exceptions to that requirement are not applicable here.

Item No. 7 is supported by reliable, probative, and substantial evidence and the imposition of a civil penalty in the amount of $50 is approved.

Item No. 8 involves alleged violations of survey requirements set forth in 10 CFR 20.201(b) and as defined in 10 CFR 20.201(a). There regulations demand an analysis of conditions, and the level of radioactivity that may be present must be recorded, but compliance does not depend upon the particular level that may be determined. The regulation is important to have a process of analysis undertaken. None was done by the Licensee in the unrestricted areas, nor in the restricted areas, including therein the two individuals who removed the film from their film badge holders, discarded the holders and placed the film in their wallets. In addition, no adequate survey was made in reference to radioactive material that had been discharged in liquid effluents, as well as in reference to waste material placed in a dumpster container for disposal as normal trash.

The levels of radioactivity involved in this item of noncompliance were acknowledged as correct by Licensee in reference to two containers which had been overlooked by Licensee's Vice-President. An additional container, not accurately measured to have 95 mR/hr was believed by the *Licensee* to have been surveyed but reliable evidence was not adduced to support this belief.

The film badge evidence is sought to be excused by the Licensee that no undue exposures occurred. Assuming the accuracy of that statement, the issue is whether a survey was made. The evidence is clear that it was not.

The release of radioactive liquid effluents to the floor drain likewise was not accompanied by a survey. There was dispute between the Licensee and the inspectors as to the level of the material released, but the survey issue remains unanswered in view of the generally recognized high level of radioactivity in the effluent when the pool water on September 2, 1975, was at a concentration of 1.3×10^{-3} microcuries per ml.

The release of radioactive material for a dumpster waste disposal method was at a level of excess recognized again by a Vice-President of the Licensee. The Licensee nevertheless contested the reading which had been admitted by its officer.

Item No. 8 is supported by reliable, probative, and substantial evidence and the imposition of civil penalty in the amount of $500 is approved.

Item No. 9 involves an admitted violation of regulation respecting authorized users of the licensed material. The Licensee only contends that the notice of the violation in this regard was defective. However, no request was made by the Licensee to add the name of employee Andreano to the list

of authorized users until after the inspection which was made on October 27, 1976. Item No. 9 is supported by reliable, probative, and substantial evidence and the imposition of civil penalty in the amount of $750 is approved.

All motions not heretofore specifically considered and determined are denied for lack of presentation of reliable, probative, and substantial evidence in support thereof.

WHEREFORE, IT IS ORDERED, in accordance with the Atomic Energy Act, as amended, and the Rules of Practice of the Nuclear Regulatory Commission, that civil penalties in the total amount of $3,300 are assessed and imposed upon the Licensee, Radiation Technology, Inc.

IT IS FURTHER ORDERED, in accordance with 10 CFR Sections 2.760, 2.762, 2.764, 2.785, and 2.786, that this Initial Decision shall become effective within thirty (30) days after the date of issuance, and shall constitute, with respect to the matters covered therein, the final action of the Commission thirty (30) days after the date of issuance hereof, subject to any review pursuant to the Commission's Rules of Practice. Exceptions to this Initial Decision may be filed by any party within ten (10) days after service of this Initial Decision. Within thirty (30) days thereafter (forty (40) days in the case of the Staff) any party filing such exceptions shall file a brief in support thereof. Within thirty (30) days of the filing of the brief of the Appellant (forty (40) days in the case of the Staff), any other party may file a brief in support of, or in opposition to, the exceptions. This enumeration of appeal provisions is subject to the complete schedule in that regard made by the regulations of the Commission which are controlling and to which reference has heretofore been made in the ordering clause.

FOR THE NUCLEAR
REGULATORY COMMISSION

Samuel W. Jensch
Administrative Law Judge

Issued:
November 24, 1978
Bethesda, Maryland

Cite as 8 NRC 675 (1978) CLI-78-20

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Joseph M. Hendrie, Chairman
Victor Gilinsky
Richard T. Kennedy
Peter A. Bradford
John A. Ahearne

In the Matter of **Docket No. 70-2738**
License No. XSNM-1222

EDLOW INTERNATIONAL COMPANY

(Agent for the Government of India on Application to Export Special Nuclear Materials) **December 8, 1978**

The Commission orders a public hearing on a written basis on the application for export of low-enriched uranium for use at the Tarapur Atomic Power Station in India. The Commission defers its decision on whether to conduct oral hearings until it has had the opportunity to review the written comments.

ORDER

I. BACKGROUND AND SUMMARY

On February 13, 1978, the Natural Resources Defense Council, the Sierra Club, and the Union of Concerned Scientists filed two motions with the Commission. The first requested the Commission to resume the hearings the Commission held in July 1976 on exports of low-enriched uranium to India.[1] The second requested that the Commission consolidate consideration of applications XSNM-1060 and XSNM-1222, two applications for low-enriched uranium to be used at the Tarapur Atomic Power Station in

[1]See CLI-76-6, 3 NRC 563 (1976), and CLI-77-20, 5 NRC 1358 (1977), for a description of these hearings.

India. On March 6, 1978, the Commission granted Petitioners' request that license application XSNM-1222 be consolidated with XSNM-1060. CLI-78-4, 7 NRC 311. On April 24, 1978, the Commission denied the motion requesting a further public hearing on XSNM-1060, and deferred its decision on whether a hearing should be held on XSNM-1222 until it had received the views of the Executive Branch on that license application. CLI-78-9, 7 NRC 455.

On September 15, 1978, the Executive Branch provided its views on XSNM-1222, recommending that the Commission issue XSNM-1222. Petitioners responded to this submission on October 31, 1978, by filing a supplemental memorandum renewing their earlier request for a hearing. On November 14 and 15, the Commission's Staff and the Executive Branch filed responses to Petitioners' motion opposing further hearings.

The Commission has reviewed these submissions and finds that further public proceedings on a written basis will be in the public interest and will assist the Commission to make the statutory determinations required by the Atomic Energy Act.[2] 42 U.S.C. 2155a, 10 CFR 110.84(a). Part II of this Order establishes the framework for a hearing consisting of written comments under §110.85 of our rules, and announces the schedule which will govern this proceeding. This order will also be published in the FEDERAL REGISTER. The Commission will consider whether an opportunity for oral presentations to the Commission is warranted, after reviewing written comments received.

II. NOTICE OF HEARING CONSISTING OF WRITTEN COMMENTS

Petitioners' February 13, 1978, motion and supplemental pleading of October 31, 1978, request the Commission to order a public hearing. Based on this request, we are ordering a hearing focusing on four topics: (1) the sufficiency, for purposes of the Nuclear Non-Proliferation Act (NNPA), of Indian Prime Minister Desai's assurances that "he will not authorize nuclear explosive devices or further nuclear explosions"; (2) the adequacy, for purposes of the NRC's determination under the NNPA, of the safeguards applied by the International Atomic Energy Agency at the Tarapur facility, and of U.S. government information on those safeguards; (3) the status of U.S.-India negotiations regarding the return of spent fuel from Tarapur to the United States for storage; and (4) the need for the fuel requested.

The NRC Staff, the Petitioner and the Department of State will be participants in this proceeding. The Commission also invites interested mem-

[2]Chairman Hendrie and Commissioner Gilinsky voted against conducting further public proceedings.

bers of the public to submit written comments on issues raised by Petitioners or any other issues pertaining to the proposed export of nuclear fuel to India and which relate to statutory determinations the Commission must make under the Atomic Energy Act of 1954, as revised by the Nuclear Non-Proliferation Act of 1978. Written comments should be submitted to the Secretary, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Chief, Docketing and Service Branch, by January 11, 1979. Participants may file responses to comments submitted by other participants. These reply comments should be submitted by January 22, 1979. This public proceeding will be deemed to be completed on January 29, 1979, unless the Commission has, by that date, ordered presentations. If the Commission orders oral presentations, they will be held 14 days after the Commission orders them. In that instance, the public proceeding shall be deemed to be completed at the conclusion of the parties' oral presentations.

Further instructions regarding participation in this hearing consisting of written comments are set forth in 10 CFR Part 110, Subparts I and J.

It is so ORDERED.

For the Commission

Samuel J. Chilk
Secretary of the Commission

Dated at Washington, D.C.,
this 8th day of December 1978.

SEPARATE VIEWS OF COMMISSIONER GILINSKY:

I would have preferred to see the Commission act on this application. I believe sufficient information is available to make a decision. It seems to me that written submissions from the public are not likely to so change this situation as to justify the time spent in the proceeding.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARDS*

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Michael C. Farrar
Richard S. Salzman
Dr. W. Reed Johnson
Jerome E. Sharfman

In the Matters of

PHILADELPHIA ELECTRIC COMPANY, et al. **(Peach Bottom Atomic Power Station, Units 2 and 3)**	**Docket Nos. 50-277 50-278**
METROPOLITAN EDISON COMPANY, et al. **(Three Mile Island Nuclear Station, Unit No. 2)**	**Docket No. 50-320**
VIRGINIA ELECTRIC AND POWER COMPANY **(North Anna Power Station, Units 1 and 2)**	**Docket Nos. 50-338 50-339**
PUBLIC SERVICE ELECTRIC AND GAS COMPANY **(Hope Creek Generating Station, Units 1 and 2)**	**Docket Nos. 50-354 50-355**
FLORIDA POWER AND LIGHT COMPANY **(St. Lucie Plant, Unit No. 2)**	**Docket No. 50-389**

*Every Appeal Panel member is on one or more of the Boards hearing the captioned proceedings; their collective designation is simply a convenience in issuing this joint order.

CAROLINA POWER AND LIGHT COMPANY (Shearon Harris Nuclear Power Plant, Units 1, 2, 3, and 4)	Docket Nos. 50-400 50-401 50-402 50-403
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, et al. (Seabrook Station, Units 1 and 2)	Docket Nos. 50-443 50-444
KANSAS GAS AND ELECTRIC COMPANY KANSAS CITY POWER AND LIGHT COMPANY (Wolf Creek Generating Station, Unit No. 1	Docket No. STN 50-482
NORTHERN STATES POWER COMPANY (MINNESOTA) NORTHERN STATES POWER COMPANY (WISCONSIN) (Tyrone Energy Park, Unit No. 1)	Docket No. STN 50-484
ROCHESTER GAS AND ELECTRIC CORPORATION, et al. (Sterling Power Project, Nuclear Unit No. 1)	Docket No. STN 50-485
DUKE POWER COMPANY (Cherokee Nuclear Station, Units 1, 2, and 3)	Docket Nos. STN 50-491 STN 50-492 STN 50-493
THE TOLEDO EDISON COMPANY, et al. (Davis-Besse Nuclear Power Station, Units 2 and 3)	Docket Nos. 50-500 50-501
WASHINGTON PUBLIC POWER SUPPLY SYSTEM (WPPSS Nuclear Project No. 4)	Docket No. 50-513

TENNESSEE VALLEY AUTHORITY (Hartsville Nuclear Plant, Units 1A, 2A, 1B, and 2B)	Docket Nos. STN 50-518 STN 50-519 STN 50-520 STN 50-521
PUBLIC SERVICE COMPANY OF INDIANA, INC. (Marble Hill Nuclear Generating Station, Units 1 and 2)	Docket Nos. STN 50-546 STN 50-547
TENNESSEE VALLEY AUTHORITY (Phipps Bend Nuclear Plant, Units 1 and 2)	Docket Nos. 50-553 50-554 December 1, 1978

The Appeal Board modifies the procedure set out in ALAB-480, 7 NRC 796 (1978), for resolving the issue of the health effects of radon-222 emissions in pending appeal board proceedings and calls for the submission of further written memoranda.

APPEAL BOARD: SCOPE OF REVIEW

The Appeal Board has the obligation to review the record of a proceeding *sua sponte,* independently of the parties' positions.

MEMORANDUM AND ORDER

Earlier this year, the Commission held incorrect the value it had assigned in Table S-3 (10 CFR Part 51) to the emissions of radon-222 expected to occur as a result of the mining and milling of uranium. 43 Fed. Reg. 15613 (April 14, 1978). At that time, it told us to reopen the records in pending licensing proceedings "to receive new evidence on radon releases and on health effects resulting from radon releases." *Id.* at 15615-16. In implementing that directive in some 17 separate proceedings (*Philadelphia Electric Company* (Peach Bottom, Units 2 and 3), ALAB-480, 7 NRC 796 (1978)), we decided it would be to the parties' and boards' advantage to begin with the record being made before the Licensing Board in yet another proceeding, *Perkins.*[1] Accordingly, we called upon the parties to frame their positions in terms of the *Perkins* record and the Licensing Board's subse-

[1] *Duke Power Company* (Perkins, Units 1, 2, and 3), Docket Nos. STN 50-488, STN 50-489, and STN 50-490.

quent decision therein.[2] 7 NRC at 804-06.

We have studied carefully the papers the parties have submitted.[3] They involve a variety of matters. A number of parties are dissatisfied with either the record or the decision in *Perkins,* or both.[4] Intervenors in several proceedings wish us to consolidate those proceedings. Under normal circumstances, the next step would be a prehearing conference at which we could explore with all the parties not only the best procedure to follow but also—in order to clarify exactly what contentions the parties wish to pursue—the precise nature of the issues which are controverted.

Owing to the number and scattered location of the parties involved, however, it is not practicable to hold a prehearing conference at this point. Instead, we will attempt to accomplish the same purpose by calling for the submission of further written memoranda.

In this connection, two areas seem to call for attention now. First, we need to clarify the extent to which particular parties are dissatisfied with *Perkins* insofar as it deals with rates of radon release or levels of radon concentration from either natural sources or nuclear fuel cycle activities (as distinguished from the health effects of any resulting exposure). Second, if *Perkins* is accurate on emission rates and concentration levels, it seems appropriate to examine at the threshold the Licensing Board's *de minimus* theory, *i.e.,* its conclusion that the nationwide health effects attributable to radon released in fueling nuclear power plants must be deemed to be insignificant because those emissions are extremely low in relation not only to natural radon background but also to fluctuations which occur in the background.[5]

1. Radon Emissions

In establishing the format under which *Perkins* would be used as the starting point for considering the radon issue in other proceedings, we

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[2]That decision is reported as LBP-78-25, 8 NRC 87 (1978).

[3]In one uncontested proceeding, which was also pending before a licensing board, we granted the parties' request for a remand so that the board below could consider the radon issue. It has since done so. See our unpublished order of September 27, 1978, in *Tennessee Valley Authority* (Yellow Creek, Units 1 and 2), and LBP-78-39, 8 NRC 602 (November 24, 1978).

[4]Our use of the shorthand notation "*Perkins*" elsewhere in this order should be taken, unless the context requires otherwise, as referring to both the record and the decision in that proceeding.

[5]Certain parties have emphasized in their papers the question of radon-induced health effects felt by those living close to uranium mines and mills. Different considerations may be relevant where nearby impacts are concerned. See generally our recent decision in *Rochester Gas and Electric Corp.* (Sterling, Unit 1), ALAB-507, 8 NRC 551 (November 17, 1978).

observed that "[o]bviously, nonparticipants in *Perkins* cannot be held bound by the record adduced in that proceeding." ALAB-480, *supra,* 7 NRC at 805. As it turned out, a number of parties filed objections with us about one aspect or another of the *Perkins* record. Most such objections, however, went to the adequacy of that record on the question of health effects. That is, most parties seemed willing to accept without further ado both the evidence and the decision in *Perkins* on the levels of radon emissions and the resulting concentrations to which the population is exposed.[6] In those respects, then, as was contemplated by ALAB-480, those parties could now be held bound by the *Perkins* record.[7] In other words, we would now be free in most proceedings to go forward on the basis of the *Perkins* record alone insofar as emission rates and concentration levels are concerned.[8]

We cannot do so, however, in every proceeding: intervenors in *Sterling* and *Tyrone* have suggested that more evidence should be adduced on the question of emission rates and concentration levels.[9] Those questions reflect in general terms the topics in which the intervenors are interested. Before we can begin to decide whether to accept the *Perkins* figures as valid, we need to learn more about the objections to them.

Specifically, the intervenors in *Sterling* and *Tyrone*—Ecology Action of Oswego and Northern Thunder, respectively—are to furnish us a particularized memorandum setting forth (1) not only the respects in which

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[6]Intervenors in the *Three-Mile Island* and *Peach Bottom* proceedings did mention in general terms a need for discovery of unspecified staff documents concerning source terms. As we understand it, the current staff practice is to make much material available to the parties without the need for invocation of formal discovery procedures. Having heard no more about the matter, we assume that the intervenors' representative, Dr. Chauncey Kepford, has been given any material he asked the staff for. If we are mistaken about the accessibility of staff material relevant to this point, or if the material in question does provide a basis for objecting to this aspect of *Perkins,* any affected parties are free to seek a specific remedy from us.

[7]Any party who objects to this conclusion should tell us promptly why he believes it should not apply to him. See 10 CFR 2.752(c).

[8]It is not likely, however, that we will do so. In each proceeding, the Board has *sua sponte* responsibility, that is, the obligation to review the record independently of the parties' positions. In light of that, it seems unwise to decide either *Perkins* or the uncontested cases knowing (see pp. 683-684, *infra*) that additional evidence on this generic matter might be forthcoming in other proceedings. See *Carolina Power & Light Company* (Shearon Harris, Units 1, 2, 3, and 4), ALAB-490, 8 NRC 242 (August 23, 1978); *Virginia Electric & Power Company* (North Anna, Units 1 and 2), ALAB-491, 8 NRC 250 (August 25, 1978).

[9]As we understand their papers, the intervenors in *Marble Hill* and *Wolf Creek* are essentially content, insofar as these topics are concerned, to have their proceedings governed by what transpires in *Sterling* and in the proceedings in which Dr. Kepford is involved, respectively. As we have indicated, significant developments will, in any event, most likely have to be considered in all proceedings (see fn. 8, *supra*).

they believe the radon release data and concentration levels in *Perkins* are inaccurate or otherwise deficient, but also the basis for their assertions and the potential significance of the deficiencies (*i.e.,* the degree of impact that any corrections might have upon the *Perkins* figures); (2) whether, and if so why, they believe a hearing is necessary on those topics or whether some other procedure for considering the matter is appropriate; and (3) what evidence, either written or oral as the case may be, they are prepared to offer. The intervenors' memoranda are to be filed and served upon the other parties to the *Sterling* and *Tyrone* proceedings by Friday, January 5, 1979. After service of those papers, the other parties to those two proceedings will have 30 days to file responsive memoranda. The responses should focus, *inter alia,* on whether a hearing is necessary or whether some other procedure is appropriate.

2. Health Effects

As indicated by the preceding section, we are not now in a position to determine whether *Perkins* accurately reflects the levels of exposure to radon. If, however, at some future time we were to find the *Perkins* emission and concentration figures correct (or reasonably close to being so), we would have to come to grips with the Licensing Board's *de minimus* theory.

The *Perkins* board took the approach that, whatever else might be said about the health effects of radon,

> Based on the record available to this Board, we find that the best mechanism available to characterize the significance of the radon releases associated with the mining and milling of the nuclear fuel for the Perkins facility is to compare such releases with those associated with natural background. The increase in background associated with Perkins is so small compared with background and so small in comparison with the fluctuations in background, as to be completely undetectable. Under such circumstance, the impact cannot be significant.[10]

If we were to subscribe to that view, there would appear to be no reason to consider the question of health effects further. Consequently, we believe it appropriate to consider this aspect of the Board's decision at the outset.

Toward this end, any party in *any* of the pending proceedings who disagrees with the Licensing Board's approach should brief us fully on why the Board's views are not acceptable.[11] Those briefs should be filed and

[10]LBP-78-25, *supra,* 8 NRC at 100.

[11]In order that those briefs be most useful to us, they should accept *arguendo* the levels of exposure set forth in *Perkins.* If those levels prove to be significantly incorrect (in a direction

(Continued on next page)

served[12] within 45 days of the date of this order.[13] Responses from any party in *any* of the proceedings who supports the Licensing Board's approach will be due 30 days thereafter.[14]

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Boards

(Continued from previous page)

favorable to the intervenors' position), then the Licensing Board's premise (relating to the disparity between natural and fuel cycle-related concentrations of radon) would be faulty and its *de minimus* conclusion could not stand. The briefs called for here should focus, therefore, on the validity of the conclusion, not of the premise. The premise will be challenged in the memoranda called for in section 1 of this order.

[12]It will suffice for each party to serve only the other parties to its own proceeding. We will see to it that the parties to all the other proceedings receive copies.

[13]We stress to the parties that they may not have another opportunity to file briefs before us on the correctness of the *de minimus* theory, and that our analysis of it may turn out to be crucial in shaping the future course of these proceedings.

[14]All parties should discuss whether an analogy might be drawn to the Commission's Appendix I regulations. 10 CFR Part 50, App. I., Sec. II. Those regulations set limits upon radioactive releases during normal operation which are couched in terms of levels above background and which permit resulting doses which are small in relation to those caused by background (as is shown by 10 CFR Part 51, Table S-4, fn. 2).

Cite as 8 NRC 686 (1978) ALAB-510

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Richard S. Salzman, Chairman
Dr. John H. Buck
Jerome E. Sharfman

In the Matter of **Docket No. 50-513**

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

(WPPSS Nuclear Project No. 4) **December 7, 1978**

Upon review, *sua sponte,* the Appeal Board affirms LBP-75-3, as it pertains to the limited work authorization for WPPSS Project No. 4, and LBP-78-8, authorizing construction of that project, but reserves judgment on the environmental effect of radon emissions attributable to the mining and milling of uranium fuel for the unit.

DECISION

Washington Public Power Supply System's application for permission to construct Project No. 4 of a series of nuclear power facilities was initially considered jointly with its application to build Project No. 1. "Limited work authorizations" (LWA's) for both projects were authorized in 1975. LBP-75-3, 2 NRC 131. Later that same year a permit to build No. 1 was approved by the Licensing Board. LBP-75-72, 2 NRC 922. The decisions authorizing an LWA for Project No. 1 and construction of that project were both affirmed by us some time ago. ALAB-309, 3 NRC 31 (1976).

For reasons explained elsewhere, at the applicant's request the Licensing Board postponed consideration of Project No. 4 and we deferred review of applicant's exceptions to the decision authorizing an LWA for that project. See ALAB-309, *supra.* Some time later the applicant asked that the construction permit proceeding be reactivated. The Licensing Board did so and the matter continued as an uncontested case until, in due course, a decision authorizing construction of Project No. 4 was rendered earlier this year.

LBP-78-8, 7 NRC 254 (1978). No exceptions were taken to that decision; the time for doing so has now expired. On August 31, 1978, the applicant withdrew its exceptions to the partial initial decision authorizing the LWA for Project No. 4. Both Licensing Board decisions affecting that project are consequently ripe for this Board's review *sua sponte.*

Aside from the question of the environmental effects of radon emissions attributable to the mining and milling of uranium needed to fuel the plant, that scrutiny has been undertaken. We discern no error warranting corrective action. Final disposition of the radon question, however, must abide the completion of the procedures for dealing with that issue. See ALAB-480, 7 NRC 796 (May 30, 1978), and ALAB-509, 8 NRC 679 (December 1, 1978). Accordingly, except insofar as they involve the radon issue, the Licensing Board's decisions in LBP-75-3 (as it pertains to WPPSS Project No. 4) and in LBP-78-8 are *affirmed.*

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Richard S. Salzman, Chairman
Dr. John H. Buck
Michael C. Farrar

In the Matter of

Docket Nos. STN 50-546
STN 50-547

PUBLIC SERVICE COMPANY OF INDIANA, INC., et al.

(Marble Hill Nuclear Generating Station, Units 1 and 2)

December 19, 1978

The Appeal Board denies applicants' motion to reconsider ALAB-509, 8 NRC 679 (December 1, 1978), and to treat the radon issue in this case separately without regard to the pendancy of the same generic issue in a number of other cases.

Mr. Harry H. Voigt, Washington, D.C., for the Public Service Company of Indiana, Inc., *et al.*, applicants.

MEMORANDUM AND ORDER

For reasons we need not rehearse, the Commission directed the reopening of the records in pending licensing proceedings to take evidence on the environmental consequences of radon emissions from the mining and milling of uranium to fuel these reactors. The conclusions drawn from such evidence must be factored into the NEPA cost-benefit balance for each of them.

The problem is manifestly a generic one. We resisted the suggestion, however, that all 16 cases involved be consolidated on the ground that the resultant proceeding would be too complex and unwieldy. Instead, as described in ALAB-480 and modified in ALAB-509,[1] we are attempting to

[1]*Philadelphia Electric Company* (Peach Bottom, Units 2 and 3), ALAB-480, 7 NRC 796 (May 30, 1978), and ALAB-509, 8 NRC 679 (December 1, 1978).

use the flexibility available to us as an arm of an administrative agency to give the radon question the consideration it deserves without trying a large number of necessarily duplicative cases.

Now before us is applicants' motion to reconsider ALAB-509. Their basic contention is that, for a number of reasons, their case merits specific attention now.[2] No doubt the majority of the other applicants could come up with similar reasons why they, too, should be so singled out. The short of it is, however, that we are trying to steer between Scylla and Charybdis; to follow a course which treats all 16 proceedings fairly with reasonable expedition and minimum inconvenience. We are not surprised that our solution does not satisfy every litigant in every respect. In our judgment, however, to hear each case separately at this stage—the result which would in all likelihood follow upon a grant of the relief requested—is a cure worse than the disease.

The motion to reconsider ALAB-509 is *denied.*

It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

[2]But see ALAB-509, fn. 8 and accompanying text, 8 NRC at 683.

Cite as 8 NRC 690 (1978) ALAB-512

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARDS*

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Michael C. Farrar
Richard S. Salzman
Dr. W. Reed Johnson
Jerome E. Sharfman

In the Matters of

PHILADELPHIA ELECTRIC COMPANY, et al. **(Peach Bottom Atomic Power Station, Units 2 and 3)**	**Docket Nos. 50-277 50-278**
METROPOLITAN EDISON COMPANY, et al. **(Three Mile Island Nuclear Station, Unit No. 2)**	**Docket No. 50-320**
VIRGINIA ELECTRIC AND POWER COMPANY **(North Anna Power Station, Units 1 and 2)**	**Docket Nos. 50-338 50-339**
PUBLIC SERVICE ELECTRIC AND GAS COMPANY **(Hope Creek Generating Station, Units 1 and 2)**	**Docket Nos. 50-354 50-355**
FLORIDA POWER AND LIGHT COMPANY **(St. Lucie Plant, Unit No. 2)**	**Docket No. 50-389**

*Three members of the Appeal Panel constitute the Appeal Boards in the two proceedings in which the motions discussed herein were made. Because of the order's impact on the other proceedings, however, each panel member was consulted with regard to it; each one agreed that the proceedings on which he is sitting should be governed by it.

CAROLINA POWER AND LIGHT COMPANY (Shearon Harris Nuclear Power Plant, Units 1, 2, 3, and 4)	Docket Nos. 50-400 50-401 50-402 50-403
PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, et al. (Seabrook Station, Units 1 and 2)	Docket Nos. 50-443 50-444
KANSAS GAS AND ELECTRIC COMPANY KANSAS CITY POWER AND LIGHT COMPANY (Wolf Creek Generating Station, Unit No. 1)	Docket No. STN 50-482
NORTHERN STATES POWER COMPANY (MINNESOTA) NORTHERN STATES POWER COMPANY (WISCONSIN) (Tyrone Energy Park, Unit No. 1)	Docket No. STN 50-484
ROCHESTER GAS AND ELECTRIC CORPORATION, et al. (Sterling Power Project, Nuclear Unit No. 1)	Docket No. STN 50-485
DUKE POWER COMPANY (Cherokee Nuclear Station, Units 1, 2, and 3)	Docket Nos. STN 50-491 STN 50-492 STN 50-493
THE TOLEDO EDISON COMPANY, et al. (Davis-Besse Nuclear Power Station, Units 2 and 3)	Docket Nos. 50-500 50-501
WASHINGTON PUBLIC POWER SUPPLY SYSTEM (WPPSS Nuclear Project No. 4)	Docket No. 50-513
TENNESSEE VALLEY AUTHORITY	Docket Nos. STN-50-518 STN 50-519

(Hartsville Nuclear Plant, Units 1A, 2A, 1B, and 2B)	STN 50-520 STN 50-521
PUBLIC SERVICE COMPANY OF INDIANA INC. (Marble Hill Nuclear Generating Station, Units 1 and 2)	Docket Nos. STN 50-546 STN 50-547
TENNESSEE VALLEY AUTHORITY (Phipps Bend Nuclear Plant, Units 1 and 2)	Docket Nos. 50-553 50-554
	December 21, 1978

The Appeal Board grants motions to modify the schedule and procedures adopted in ALAB-509, 8 NRC 679 (December 1, 1978), for filing of papers on the radon issue in pending appeal board procedures.

MEMORANDUM AND ORDER

In ALAB-509, 8 NRC 679 (December 1, 1978), we called for the filing of certain papers in these radon proceedings. We now have before us motions from the intervenor in *Tyrone* (which plans to join forces with the intervenor in *Sterling*) and the applicant in *St. Lucie.* These motions seek modifications in the schedule and procedures we adopted but do not challenge the basic format we laid down.[1] For good cause shown, both motions are *granted.* Because this action will affect the parties in other proceedings, we outline below what its impact on the original schedule will be.

The schedule we established in ALAB-509 gave the intervenors in *Sterling* and *Tyrone* until January 5, 1979, to file papers on the question of radon emission rates and concentration levels. We are granting to both the requested extension to February 19, 1979. In addition, we are acting favorably on the *St. Lucie* applicant's suggestion that, upon receipt of those papers, we serve them upon the parties to all the other proceedings. That applicant is correct in pointing out that this will enhance the opportunity for others (if they wish to do so) to seek at an early stage to participate *amicus curiae* on the *Sterling-Tyrone* issues—an option that ALAB-509 was in no way intended to foreclose.

In a discrete step, ALAB-509 also called upon *all* the parties in *all* pro-

[1]Compare *Public Service Company of Indiana* (Marble Hill, Units 1 and 2), ALAB-511, 8 NRC 688 (December 19, 1978).

ceedings to brief us on the *de minimus* question. The first briefs were to be due on January 15, 1979. The *Tyrone* intervenor has requested that that date also be extended to February 19, 1979. In granting that request, we are making it applicable to all the proceedings; that is, all parties challenging the *Perkins* Licensing Board's *de minimus* approach will have until February 19th to file their briefs. The 30-day time for responses set out in ALAB-509 will, of course, not begin to run until then.

It is so ORDERED.[2]

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

[2]Just before we were ready to release this opinion, we received from the *Sterling* intervenor a motion formally joining in the *Tyrone* intervenor's motion for an extension of time. Following close on its heels came an opposition from the *Sterling* applicant. That response correctly notes that the *Sterling* motion itself supplies insufficient reason for the requested extension. However, the *Tyrone* motion in which it joins—but which the *Sterling* applicant apparently had not seen—gives ample justification for the requested delay. And, as our opinion indicates, we had already decided that in the circumstances the *Tyrone* extension should apply as well to the papers due from the *Sterling* intervenor on the first issue involved, and to all parties on the *de minimus* issue. We can think of no reason at this point to discourage those intervenors from filing a joint presentation of their views if they so desire. *Cf.* 10 CFR 2.715a and ALAB-509, *supra*, 8 NRC at 683, fn. 8.

Cite as 8 NRC 694 (1978) ALAB-513

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Michael C. Farrar

In the Matter of **Docket Nos. 50-443**
50-444

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, et al.

(Seabrook Station, Units 1 and 2) **December 21, 1978**

The Appeal Board denies intervenor's motion to reopen the record of this construction permit proceeding for further consideration of the financial qualification of the applicant.

RULES OF PRACTICE: PETITION TO REOPEN THE RECORD

The Appeal Board lacks authority to reopen the record on an issue which has already been decided once the time for *all* appeal has run.

RULES OF PRACTICE: AUTHORITY OF APPEAL BOARD

That the Appeal Board has retained jurisdiction over one issue in a license proceeding does not mean that it has likewise retained jurisdiction over other, different issues which have already been fully litigated.

RULES OF PRACTICE: SHOW-CAUSE PROCEEDING

If new evidence arises after an issue has been finally litigated, a party is not necessarily without a remedy; the party remains free to request the Director of Nuclear Reactor Regulation to institute a show-cause proceeding to modify, suspend, or revoke the applicable license.

Messrs. John A. Ritsher, Thomas G. Dignan, Jr., and **Robert K. Gad III,** Boston, Massachusetts, for the applicants, Public Service Company of New Hampshire, *et al.*

Mr. Robert A. Backus, Manchester, New Hampshire, for the intervenor, Seacoast Anti-Pollution League.

Mr. Lawrence Brenner for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

The Seacoast Anti-Pollution League (SAPL) has moved to reopen the record of this construction permit proceeding to allow further consideration of the issue whether the applicants are financially qualified to construct and operate the Seabrook facility. The motion is grounded essentially upon certain recent political developments in the State of New Hampshire which, in combination with statements assertedly made by representatives of the lead applicant[1] in the wake of those developments, are said to bear adversely upon applicants' financial qualifications.

We are constrained to dismiss the motion for lack of jurisdiction to grant the relief sought therein. The financial qualifications issue was determined favorably to the applicants in the Licensing Board's 1976 initial decision authorizing the issuance of construction permits for the Seabrook facility. LBP-76-26, 3 NRC 857, 867-68, 916-17. On the appeal taken by SAPL (among others) from that disposition of the issue, we affirmed. ALAB-422, 6 NRC 33, 73-82 (1977). Our decision was in turn affirmed first by the Commission[2] and then by the Court of Appeals for the First Circuit.[3] No petition for certiorari having been filed in the Supreme Court within the prescribed period for doing so, finality has now attached to the resolution of the question in this proceeding. Accordingly, we have no authority to reopen it.

These conclusions are not altered by the fact that we still have before us an entirely discrete issue raised in the proceeding; *viz.*, whether there is an alternate site in New England which would be "obviously superior" to the Seabrook site were use of a closed-cycle cooling system to be required at the latter site. Neither our decision last April calling for a further exploration of

[1]Public Service Company of New Hampshire.

[2]CLI-78-1, 7 NRC 1, 8-23 (1978).

[3]*New England Coalition on Nuclear Pollution* v. *NRC*, 582 F.2d 87, 93 (1978).

that issue[4] nor the Commission's directive in June that we (rather than the Licensing Board) conduct the exploration[5] purported to preserve our jurisdiction over other, unrelated questions. To the contrary, it is plain to us from what the Commission said that it regarded the alternate site matter to be all—apart from the generic radon question[6]—that remained open for adjudication in this proceeding.

We need add only that the unavailability at this juncture of the relief which SAPL seeks from us does not mean that that party perforce is without a remedy. SAPL remains free, should it be so inclined, to request the Director of Nuclear Reactor Regulation to institute a show-cause proceeding looking to the modification, suspension, or revocation of the Seabrook construction permits. See 10 CFR 2.202, 2.206. We need not and do not here consider whether the assertions in the motion before us might be sufficient to warrant the granting of such a request. That will be for the Director to determine in the first instance (subject to possible later Commission review); it is enough for our purposes that SAPL is now in the wrong forum.

The motion to reopen the record is *dismissed* for want of jurisdiction. It is so ORDERED.

FOR THE APPEAL BOARD

Margaret E. Du Flo
Secretary to the Appeal Board

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[4]ALAB-471, 7 NRC 477, 499-513.

[5]CLI-78-14, 7 NRC 952, 956-57.

[6]The radon question was not raised by any of the parties but is before us for consideration by reason of a Commission instruction applicable to this and a number of other proceedings. See ALAB-480, 7 NRC 796 (1978).

Cite as 8 NRC 697 (1978) ALAB-514

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Richard S. Salzman, Chairman
Alan S. Rosenthal
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)

December 22, 1978

The Appeal Board denies certification of the Licensing Board's ruling that intervenor's prospective witness was not qualified to evaluate the Diablo Canyon security plan.

RULES OF PRACTICE: CERTIFICATION

The Appeal Board grants directed certification sparingly.

RULES OF PRACTICE: CERTIFICATION

It is the Appeal Board's policy not to monitor the day-to-day conduct of licensing proceedings by directing certification of interlocutory rulings.

Messrs. John C. Morrissey, Malcolm H. Furbush, and Philip A. Crane, Jr., San Francisco, California, and Arthur C. Gehr and Bruce Norton, Phoenix Arizona, for the applicant Pacific Gas and Electric Company.

Messrs. Paul C. Valentine, Palo Alto, California, and Yale I. Jones, San Francisco, California, for the intervenor San Luis Obispo Mothers for Peace.

Mr. Marc R. Staenberg for the Nuclear Regulatory Commission staff.

MEMORANDUM AND ORDER

Opinion of the Board by Mr. Rosenthal and Dr. Johnson:

Once again we have before us the controversy over whether the security plan for the Diablo Canyon facility should be made available under protective order to David Dinsmore Comey, a prospective witness for the intervenor San Luis Obispo Mothers for Peace in this operating license proceeding concerning that facility. In an unpublished order entered on September 5, 1978, the Licensing Board resolved that question against the intervenor, ruling that Mr. Comey was not qualified to evaluate the plan within the meaning of our decision in ALAB-410, 5 NRC 1398, *Commission review declined,* CLI-77-23, 6 NRC 455 (1977). On the intervenor's petition for directed certification of that ruling,[1] we determined that the Licensing Board had not sufficiently developed the basis for its conclusion regarding Mr. Comey's lack of acceptable qualifications. ALAB-504, 8 NRC 406 (October 27, 1978). We accordingly vacated the September 5 order and remanded to the Licensing Board for prompt reconsideration and "a full explication of the reasons underlying whatever result that Board might reach upon such reconsideration." *Id.* at 412. On November 3, the Licensing Board entered a new order in which it adhered to its prior ruling. LBP-78-36, 8 NRC 567. The intervenor has now returned to us with a petition that we review that order by way of directed certification.

The petition is denied. As we stressed in ALAB-504, 8 NRC at 410, our directed certification authority is exercised most sparingly. We further made it clear in that opinion that we were setting the September 5 order aside only because of its failure satisfactorily to illume its underlying basis. As we explained:

> It is one thing to defer appellate review of an adequately developed interlocutory ruling until the initial decision is rendered—irrespective of whether on a preliminary look the ruling appears to be right or wrong in result. But it is another matter to let pass until the end of the case a ruling of obvious crucial importance which has no reasoned basis assigned for it. Indeed, as we see it, our failure to intercede in the situation at bar would constitute an abdication of the oversight responsibilities vested in us by the Commission.

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[1]See 10 CFR 2.718(i); *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-271, 1 NRC 478 (1975).

Id. at 412.

The November 3 order does not suffer from the same infirmity. Whatever might be said regarding the correctness of the analysis contained in it, the Licensing Board has laid bare each of the ingredients of that analysis. There thus is no longer any doubt as to either what the Board decided or how it arrived at its decision. Moreover, the order confirms that, at bottom, the question which the intervenor asks us to decide at this interlocutory stage is essentially one of "the application by the Licensing Board of the guidelines laid down in ALAB-410 to the specific facts of record in this case as they pertain to the qualifications of Mr. Comey as a security expert." See ALAB-504, *supra,* 8 NRC at 410. But questions of that stripe do not normally warrant our scrutiny prior to the rendition of the Licensing Board's initial decision.

We need add only that, with due respect for the contrary view of our dissenting colleague, we perceive no exceptional circumstances which might justify a departure from our settled policy not to monitor the day-to-day conduct of licensing proceedings through the directed certification of interlocutory rulings. See ALAB-504, *supra,* 8 NRC at 410, and cases there cited.[2] In this connection, the sole reason assigned by the intervenor for seeking our involvement at this juncture was that it desired to present expert testimony respecting the adequacy of the applicant's security plan during the course of an evidentiary hearing which commenced on December 4. It is unnecessary to decide here how much weight, if any, properly might attach to such a consideration. For that hearing—which was convened primarily to explore seismic issues—is well along the road to completion. Thus, even were we now to entertain and to agree with the intervenor's claim that Mr. Comey has sufficient expert qualifications in the security area, his testimony would have to be received at a separate hearing at a later date.[3]

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[2]The policy implicitly acknowledges and accepts "the risks which attend [upon] a deferral to the time of initial decision of the appellate review of procedural rulings made during the course of trial." *Toledo Edison Company* (Davis-Besse Nuclear Power Station, Unit 1), ALAB-314, 3 NRC 98, 100 (1976).

[3]It seems most unlikely that, given the time period required for briefing and probable oral argument of the issue, we could reach a decision before late February at the earliest. Were the intervenor to prevail, at least another month undoubtedly would then be consumed by Mr. Comey's examination of the security plan and preparation of testimony based thereon. It is readily apparent from these considerations that, even had we agreed to decide the merits of the dispute in response to the first petition for directed certification, it almost assuredly still would not have been possible for the intervenor to have realized its objective to have Mr. Comey testify at the hearing commenced on December 4.

The petition for directed certification is *denied.*[4]
It is so ORDERED.

FOR THE APPEAL BOARD

Eleanor E. Hagins
Secretary to the Appeal Board

Mr. Salzman, dissenting:

The intervenor has drawn into question the sufficiency of applicant's plan to assure the physical security of the Diablo Canyon facility. The Board below ruled that none of intervenor's proposed witnesses was qualified to review that plan, thereby effectively precluding them from addressing its adequacy. Among those found "unqualified" is Mr. David Dinsmore Comey,[1] notwithstanding that he has previously reviewed and testified about security plans in other licensing proceedings before this Commission. Mr. Comey currently serves on the Nuclear Proliferation and Safeguards Advisory Panel, Office of Technology Assessment, United States Congress.[2]

Before us is intervenor's motion to have us take up at this point the

[4]As should be clear from the text of this opinion, we need not and do not intimate any present views regarding the merits of the dispute. The intervenor will be free, of course, to renew its challenge to the November 3 order in connection with any appeal it may take from the Licensing Board's eventual initial decision on the operating license applications.

[1]Only Mr. Comey's qualifications are at issue. The Board disclaimed any "reason to believe that Mr. Comey would in any way violate the restrictions of a protective order, and this factor did not enter into the Board's original disqualification of Mr. Comey." LBP-78-36, 8 NRC 567, 570, fn. 3.

[2]We are informed that other members of that panel include Frederick S. Carney, Southern Methodist University; Thomas B. Cochran, Natural Resources Defense Council; Chester L. Cooper, Institute for Energy Analysis; William A. Higinbotham, Brookhaven National Laboratory; Leonid Hurwicz, University of Minnesota; George B. Kistiakowsky, Harvard University; George Quester, Cornell University; Herbert Scoville, Consultant; Henry De Wolf Smyth, Princeton University; George J. Stathakis, General Electric Company; Theodore B. Taylor, Princeton University; Alvin M. Weinberg, Institute for Energy Analysis; Mason Willrich, University of Virginia; and Cyrus R. Vance (on leave of absence). See Office of Technology Assessment report on "Nuclear Proliferation and Safeguards," attached as Appendix "D" to *Intervenor's Petition for Directed Certification* on the instant matter, filed November 21, 1978.

question of Mr. Comey's qualifications.[3] My colleagues have voted to deny the motion. Reduced to essentials, their action rests on the grounds that Commission policy disfavors interlocutory appeals, and assuming that the witness was erroneously rejected, avenues of relief will be open upon completion of the hearing below. With all deference, I respectfully disagree.

This is an operating license proceeding. Commission rules make a licensing board decision approving the application immediately effective. 10 CFR 2.764. Thus (unless we were later to grant a stay), this plant may well commence operating without its security arrangements having received scrutiny by persons other than those who drew them up and approved them. "Outside" reviews have proved helpful before;[4] indeed, the Commission itself has stressed the usefulness of intervenor participation in this area.[5]

Assuring the adequacy of security arrangements is a very serious matter. Yet, aside from ALAB-410, it has received scant attention from either us or the Commission in the context of a specific licensing proceeding. In my judgment, the face of the decision below suggests that the important issues involved were treated mechanically at best. It demonstrates little sensitivity to what Commission regulations, controlling precedents, and analogous court decisions seem to require and, moreover, appears to have been influenced by matters outside the record. In the circumstances, the question presented is of sufficient importance to warrant taking up and deciding now.

I would therefore grant the motion for certification and calendar the matter for argument. My colleagues' refusal to do so is elaborately justified. But what it actually boils down to is that we will simply have to face the issue later—doubtless in the context of a motion to stay operation of the facility pending our ruling. This manifestly unwise course is compelled not by the Rules of Practice but by my colleagues' overly rigid application of them. I therefore respectfully note my dissent.

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[3]This is the second such motion by intervenor. On the first we vacated the decision below and instructed the Board to provide a reasoned decision why it had rejected Mr. Comey as a witness. ALAB-504, 8 NRC 406 (October 27, 1978).

[4]See ALAB-410, 5 NRC 1398, 1403 (1977).

[5]See *Consolidated Edison Company* (Indian Point, Unit 2), CLI-74-23, 7 AEC 947, 949 (1974).

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD

Alan S. Rosenthal, Chairman
Dr. John H. Buck
Richard S. Salzman

In the Matter of **Docket Nos. STN 50-566**
STN 50-567

TENNESSEE VALLEY AUTHORITY

(Yellow Creek Nuclear Plant,
Units 1 and 2) **December 27, 1978**

The Appeal Board affirms the Licensing Board's partial initial decision of February 3, 1978, LBP-78-7, 7 NRC 215, including its refusal to grant the staff's request for water quality monitoring conditions additional to those required by the Environmental Protection Agency; and also affirms LBP-78-39, 8 NRC 602 (November 24, 1978), which authorized the issuance of a construction permit for the facility. Decision on the environmental effects of the mining and milling of radon-222 is reserved.

FWPCA: EPA AUTHORITY

The Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1251, *et seq.*, significantly reduced the NEPA obligations of the NRC. The Act assigned the responsibility for water pollution control criteria and regulating polluters to the EPA and the States. The role of the NRC is one of factoring anticipated water pollution into its NEPA cost-benefit balance analyses on proposed nuclear plants.

FWPCA: EPA AUTHORITY

The NRC may not incorporate in licenses to build nuclear power plants conditions which, in actuality, call for a review of the adequacy of water quality requirements previously established by the EPA.

Mr. James F. Burger, Knoxville, Tennessee, argued the cause and, with **Messrs. Herbert S. Sanger, Jr., David G. Powell,** and **W. Walter LaRoche,** Knoxville, Tennessee, filed a brief for the applicant Tennessee Valley Authority, *appellee.*

Mr. Edwin J. Reis argued the cause and filed a brief for the Nuclear Regulatory Commission staff, *appellant.*

DECISION

I

In its partial initial decision earlier this year on environmental and site suitability matters, the Licensing Board sanctioned a limited work authorization (LWA) for the Tennessee Valley Authority's Yellow Creek facility. LBP-78-7, 7 NRC 215 (1978). In doing so, however, the Board declined to impose a license condition requested by the staff. That condition would have allowed the staff to require TVA to institute a more extensive water quality monitoring program than the Environmental Protection Agency had commanded. The Board agreed with TVA that 1972 Amendments to the Federal Water Pollution Control Act[1] placed such matters in the exclusive jurisdiction of the EPA Administrator. 7 NRC at 229-31. The staff appeals.[2]

More recently, the Board rendered its final decision on TVA's application. LBP-78-39, 8 NRC 602 (November 24, 1978). This authorized the Director of Nuclear Reactor Regulation to permit construction of the entire Yellow Creek nuclear facility. Like the earlier decision, however, it omits the water quality monitoring requirement sought by the staff as a license condition. Other than for the staff's formal exception to preserve its right to appellate review of the water quality point, the final decision has not been appealed.[3]

Thus, the entire case is now before us. We shall therefore both decide

[1]33 U.S.C. 1251, *et seq.* The full title of the pertinent legislation is the "Federal Water Pollution Control Act Amendments of 1972"; for convenience we refer to it simply as "the Water Act."

[2]See App. Tr. 3. The staff initially noted other exceptions but has now withdrawn them. *Staff Brief* at 2.

[3]We deferred hearing argument on the Water Act issue until earlier this month to abide, if possible, the event of the final decision below and the filing of any exceptions to it.

the Water Act dispute and review the remainder of the record on our own initiative, our customary practice in these circumstances.

II

The only active participants before the Licensing Board were TVA and the NRC staff. The two are in agreement on most aspects of the case; the dispute between them is confined to the respective responsibilities of the Commission and EPA in the realm of water quality maintenance. The genesis of their conflict may be found in Section 402 of the Water Act.[4] Under Section 402, TVA was required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for the Yellow Creek facility.[5] That permit is a prerequisite to the discharge of a pollutant (including heat) into the navigable waters. (Need for the permit is not in dispute.) Its issuance hinges upon an EPA determination[6] that the discharge will comply with standards established under the Act. Important to this case is the authority given the EPA Administrator by Section 402(a)(2) to include in the NPDES permit "conditions on data and information collection, reporting, and such other requirements as he deems appropriate."[7]

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[4]33 U.S.C. 1342.

[5]The objectives and regimen of the Water Act as amended in 1972 have been described fully elsewhere. See, *e.g.*, *E.I. duPont de Nemours and Co.* v. *Train*, 430 U.S. 112, 116-24 (1977); *EPA* v. *State Water Resources Control Board*, 426 U.S. 200, 202-09 (1976); *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-366, 5 NRC 39, 49, *affirmed as modified*, CLI-77-8, 5 NRC 503 (1977). Also see R. Zener, "The Federal Law of Water Pollution Control" in *Federal Environmental Law* (Env. Law Inst. 1974) at 682. (The author was formerly EPA general counsel.) For our purposes it is sufficient to note that Congress declared in Section 101(a)(1) of the Act, 33 U.S.C. 1251(a)(1), that "it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985." To that end, Section 301(a), 33 U.S.C. 1311(a), provides that "the discharge of any pollutant by any person shall be unlawful" unless in compliance with the Water Act. To regulate those discharges, Section 301(b), 33 U.S.C. 1311(b), directs the EPA Administrator to establish "effluent limitations," defined in Section 502(11), 33 U.S.C. 1362(11), as "any restriction established by a State or the [EPA] Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constitutents which are discharged" from specified sources into navigable waters. Compliance with the limitations is achieved through the National Pollutant Discharge Elimination System (NPDES) mentioned in the body of the opinion. In brief, Section 402(a)(1), 33 U.S.C. 1342(a)(1), authorizes the EPA Administrator to issue "NPDES permits" allowing the introduction of pollutants into navigable waters if the discharge meets the applicable "effluent limitations."

[6]Under Section 402(b), 33 U.S.C. 1342(b), the NPDES permit program is to be transferred to the several States under specified circumstances. No State-administered program is involved here.

[7]33 U.S.C. 1342(a)(2).

The Yellow Creek NPDES permit sets both effluent limitations and monitoring requirements with which TVA must comply.[8] The staff had no quarrel with the former. It was also satisfied that the latter were sufficient to serve as "the NRC water quality monitoring requirements for the *construction* permit phase."[9] But, in the staff's judgment, additional information might be needed to provide a basis for assessing the effect of the nuclear plant's *operations* on the ecology of the affected waters.[10] The National Environmental Policy Act of 1969 (NEPA)[11] requires the NRC to include such an assessment in balancing the project's environmental costs against its benefits when determining whether to issue an operating license. The staff therefore asked the Licensing Board to incorporate certain "preoperational monitoring requirements" as a condition of TVA's limited work authorization.[12] In essence, these would have authorized the staff to call upon TVA to perform studies of water quality in addition to those set by EPA, should the staff deem them necessary. TVA's objections to that license condition were sustained by the Board below.

The Licensing Board's refusal to impose additional monitoring conditions rested on its understanding of the Water Act in general and Section 511(c)(2)[13] in particular. Section 511(c) provides in pertinent part that

> (2) Nothing in [NEPA] shall be deemed to—
>
> (A) authorize any Federal agency authorized to license or permit the conduct of any activity which may result in the discharge of a pollutant into the navigable waters to review any effluent limitation or other requirement established pursuant to this Act. . . or
>
> (B) authorize any such agency to impose, as a condition precedent to the issuance of any license or permit, any effluent limitation other than any such limitation established pursuant to this Act.

Accepting TVA's reading of the legislation, the Board ruled that the Water Act vests primary Federal responsibility for controlling water pollu-

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[8]The NPDES permit appears in the record as Appendix C to the Yellow Creek Final Environmental Statement (FES). Although Appendix C is labelled "Draft," it has been represented to us that the relevant provisions of that permit in final form are essentially identical, *Staff Brief* at 3, fn. 2.

[9]Yellow Creek FES at 6-7 (emphasis supplied).

[10]*Ibid.*

[11]42 U.S.C. 4321, *et seq.*

[12]See, *Staff's Proposed Findings and Conclusions* at 54 (par. 84c(b)), incorporating the monitoring recommendations from section 6 of the Yellow Creek FES.

[13]33 U.S.C. 1371(c)(2).

tion in the EPA Administrator, authorizes that official to impose effluent limitations on discharges and monitoring requirements on discharges and, in Section 511(c)(2), prohibits other Federal agencies from invoking NEPA as authority for setting different limitations or requirements under the guise of license conditions.

The Board pointed out that the Commission and EPA had entered into a "Memorandum of Understanding" defining their respective roles under the Act.[14] The interagency agreement specifies that, "to the extent that there are applicable limitations or other requirements promulgated or imposed pursuant to the [Water Act], different conditions will not be imposed by the NRC as a condition to any permit or license . . . ."[15] In the judgment of the Board below, this confirms that whatever license conditions are permissible in other areas, the NRC's NEPA "authority does not extend to [water quality] matters within the jurisdiction of the Administrator of EPA." 7 NRC at 231.

The Licensing Board noted that the result it had reached did not leave the staff remediless. It merely meant that, should EPA's monitoring requirements prove inadequate, "the route to [their] improvement is through EPA." That Board below also expressed the thought that its decision accorded with Congressional directives in the Water Act calling for its implementation in a manner "drastically" minimizing "paperwork and interagency decision procedures" so as "to prevent needless duplication and unnecessary delays at all levels of government."[16] *Ibid.*

III

1. It has not escaped the notice of either the Commission or ourselves that the 1972 Water Act "significantly reduced the obligations assigned to this Commission under NEPA."[17] In essence, the legislation left to EPA (and to the States in certain circumstances) the responsibility for establishing water pollution control criteria and regulating polluters. The postenactment role of the NRC is one of factoring anticipated water pollution into its cost-benefit analyses on proposed nuclear plants.[18]

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[14]40 Fed. Reg. 60115 (1975).

[15]*Id.* at 60120.

[16]Section 101(f), 33 U.S.C. 1251(f).

[17]*Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-366, 5 NRC 39, 49 (footnote omitted), *affirmed,* CLI-77-8, 5 NRC 503, 508-09 (1977).

[18]See *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-422, 6 NRC 33, 69-70 (1977), *affirmed,* CLI-78-1, 7 NRC 1, 26 (1978), *affirmed sub nom. New England Coalition* v. *NRC,* 582 F.2d 87, 98 (1st Cir. 1978).

The NRC's authority to impose water quality monitoring conditions stems exclusively from NEPA.[19] If the right to do so has been withdrawn by Section 511(c)(2)—which begins, "[n]othing in [NEPA] shall be deemed to . . . authorize"—then the NRC may not include those conditions in its licenses.

The staff does not dispute this general reading of the legislation. It asserts, however, that Section 511(c)(2) does not bar the imposition of the disputed monitoring conditions, which it says are needed for two purposes. First, they would enable the staff to obtain information required for use in striking the NEPA cost-benefit balance at the operating license stage.[20] Second, the staff asserts that the conditions are necessary because "the NRC has a continuing obligation to monitor the actual environmental effects caused by licensed plants, so that this knowledge can be applied in performing cost-benefit analyses on future plants, and so that NRC can contribute to the EPA formulation of proper limitations and standards."[21]

The staff's basic point is that, while subsection 511(c)(2)(A) forbids a Federal licensing agency "to review any effluent limitation *or* other requirement established" (emphasis supplied) under the Water Act, subsection 511(c)(2)(B) only forbids such an agency "to impose . . . any effluent limitation . . . ." Because the Act's definition of an "effluent limitation"[22] does not cover monitoring activities, the staff reasons that the NRC is not proscribed from imposing them as license conditions. In its judgment, the Board below in holding otherwise has misconstrued the legislation and misread the Memorandum of Understanding.

2. The staff's construction of that section is not an impermissible one. At bottom, however, it rests on the canon of construction taught to generations of law students as "*expressio unius est exclusio alterious.*" This is simply legal parlance for the concept that where a given statute (or contract or other legal instrument) mentions one subject and not another, its terms may be construed to apply only to the one expressly mentioned. But those who would draw such implications have been reminded that

> [p]erhaps the most troublesome contextual ambiguity, and one of the most frequent, is the uncertainty of whether a particular implication arises. This is often true of "negative" or "reverse" implications, covered by the maxim *expressio unius est exclusio alterius.* Sometimes

[19]*Public Service Co.* v. *NRC,* 582 F.2d 77, 81, fn. 6, (1st Cir. 1978), *certiorari denied,* 47 U.S.L.W. 3403 (December 17, 1978); see also, *New Hampshire* v. *AEC,* 406 F.2d 170, 176 (1st Cir.), *certiorari denied,* 395 U.S. 962 (1969); *Calvert Cliffs' Coord. Comm.* v. *AEC,* 449 F.2d 1109 (D.C. Cir. 1971).

[20]See *Staff Brief* at 5-6.

[21]*Id.* at 16.

[22]See fn. 5, *supra.*

the maxim applies and sometimes it does not, depending largely on context, which tends to show what tacit assumptions are being made and taken account of. Unfortunately, context tends in its particulars to be unique, and therefore does not always supply a clear answer.[23]

These remarks are surely pertinent to interpreting acts of Congress. A bill is drafted, introduced, "marked up," and amended along the route to passage in circumstances that rarely allow it to emerge in language so precise that its meaning can be extracted by use of the canons of construction alone. And those who have studied the legislation now before us report that neither the Water Act generally, nor Section 511(c)(2) particularly, can lay claim to having been structured with meticulous care.[24] The fundamental obligation of any adjudicatory tribunal is to give effect to what Congress intended to accomplish. We therefore may not rest content with implications drawn from a bare reading of statutory language, but must look to its legislative history as well.[25]

Another reason for exploring the background of Section 511(c)(2) is that the implications the staff would have us draw from it are not compelled by the wording of the provision. For example, subsection (2)(A) of that provision directs Federal licensing agencies not "to *review any* effluent limitation or *other requirement*" established pursuant to the Water Act (emphasis added). TVA contends that if NRC imposes additional monitoring requirements because it deems EPA's insufficient, it will in effect be "reviewing" those requirements "under the guise of the NEPA process."[26] That charge cannot be lightly brushed aside if for no other reason than that disinterested reviewers have levelled similar criticism.[27] Certainly, where EPA has laid down specifications for monitoring water quality, it is hard to perceive how the Commission could insist that more stringent ones are needed without "reviewing" EPA's specifications—which Section 511(c)(2)(A) appears to forbid.

Our point is not that TVA's reading of the section is inherently better than the staff's. Rather, it is that the provision's terms are amenable to conflicting interpretations. This makes resort to the legislative history not merely permissible but imperative if we are to discover what Congress intended

[23]R. Dickerson, *The Fundamentals of Legal Drafting* (1965), at 26 (footnotes omitted). The author, of the University of Indiana law faculty, is an authority in this field.

[24]See, *e.g.*, R. Zener, *supra*, fn. 5, at 783-84.

[25]See, *Train* v. *Colorado PIRG*, 426 U.S. 1, 10 (1976); *Toledo Edison Company* (Davis-Besse, Unit No. 1), ALAB-323, 3 NRC 331, 335-37 (1976), and authorities there cited.

[26]*TVA Brief* at 8-9.

[27]See, *e.g.*, R. Zener, *supra*, fn. 5, at 782-84; *cf.*, *Mahelona* v. *Hawaiian Electric Co., Inc.*, 418 F. Supp. 1328, 1335-36 (D. Haw. 1976) (*dictum*).

Section 511(c)(2) to accomplish. We turn therefore to an exploration of that history.

3. The Senate took up consideration of S.2770, embodying the initial proposals to amend the Federal water pollution control legislation, late in 1971.[28] As the Senate Committee on Public Works reported out the bill, it contained no provision comparable to the present Section 511(c)(2) of the Water Act.[29] The forerunner of that section was added by an amendment offered by Senator Baker of Tennessee. His proposal (reproduced in the margin below) contemplated that "[t]he requirements of [NEPA] as to water quality considerations shall be deemed to be satisfied" by "certifications" under other provisions of the pending bill.[30]

Senator Baker explained the purposes of his amendment in remarks made on the Senate floor. After references to the Federal Water Pollution Control Act as it then stood and to NEPA, the Senator characterized his amendment as a response to the District of Columbia Circuit's then recently rendered *Calvert Cliffs* decision (which involved the predecessor to this agency).[31] Following observations about what he understood to be the gravamen of that decision—that Federal agencies must assess the economic and technical benefits of planned action on a case-by-case basis, then balance those benefits against both the environmental costs entailed and the advantages of alternate courses of action—Senator Baker observed that he "wholly concur[red]" with the court's view of NEPA's mandate.[32] He went on to urge, however[33]

> [T]hat each Federal permitting and licensing agency not be required

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[28]The House Committee on Public Works' two-volume *Legislative History of the Water Pollution Control Act Amendments of 1972*, H.R. Doc. No. 93-1, 93rd Cong., 1st Sess. (1973), contains all the relevant Congressional material. For convenience, we cite to that *Legislative History* in this opinion. Thus, the Senate bill (S. 2770, 92nd Cong., 1st Sess. (1971)), appears at *Legislative History* 1534.

[29]S. Rep. No. 92-414, 92nd Cong., 1st Sess. (1971), *Legislative History* at 1415.

[30]*Legislative History* at 1393:

> [Section 511] (d) The requirements of the National Environmental Policy Act of 1969 (83 Stat. 852) as to water quality considerations shall be deemed to be satisfied—
>
> (1) by certification pursuant to Section 401 of this act with respect to any Federal license or permit for the construction of any activity which may result in any discharge into the navigable waters of the United States; and
>
> (2) by certification pursuant to Section 401 of this Act and the issuance of a permit pursuant to Section 13 of the Act of March 10, 1899, or Section 402 of this Act with respect to any Federal license or permit for the operation of any activity which may result in any discharge into the navigable waters of the United States.

[31]*Calvert Cliffs' Coord. Comm.* v. *AEC*, *supra*, fn. 19.

[32]*Legislative History* at 825-26 and 1394.

[33]*Ibid.*

by the operation of NEPA to develop special expertise vested by the Congress in other agencies. It was, in fact, to avoid this kind of duplication that the Congress enacted Section 21(b) of the Federal Water Pollution Control Act in 1970. As I said earlier, Section 21(b) with some modification, appears as Section 401 of the pending bill.

My amendment would make it clear that for the purposes of making the kind of "balancing judgment" required by NEPA, each individual Federal permitting and licensing agency would not be required to develop its own special expertise with respect to water quality considerations. My amendment should not in any way be construed to mean that water quality considerations do not play a role in such a "balancing judgment." On the contrary, where pertinent, water quality considerations must be considered by any agency when it decides, under the NEPA mandate, whether it is in the public interest to grant a license or permit and, if so, under what conditions and stipulations.

However, my amendment would relieve any such permitting or licensing agency of the responsibility for determining on its own the standard of performance or effluent limitation that must be applied to the activity under consideration for a license or permit. That determination would be made by a State or by EPA pursuant to Sections 401 and 402 of the pending bill. Certification pursuant to Section 402 would discharge a licensing or permitting agency from any further consideration as to what specific degree of effluent control was required with respect to water quality considerations for the activity under consideration.

Senator Baker added the closing thought that his amendment "does no violence to the laudable purpose of the *Calvert Cliffs* case" but was necessary "if we are to avoid duplication which would inevitably occur."[34]

The amendment, so explained, was accepted as submitted by the bill's floor manager, Senator Muskie,[35] and promptly agreed to by the Senate itself on the basis of Senator Baker's explanation and Senator Muskie's acceptance of it.[36]

In the House, the Committee on Public Works had incorporated an equivalent to Senator Baker's amendment into the similar bill it reported

[34]*Legislative History* at 1395.

[35]Senator Muskie was also the principal author of the Water Act. *DuPont* v. *Train, supra,* 430 U.S. at 129.

[36]*Ibid.*

out.[37] Although the Committee had recast the provision into the form of present Section 511(c)(2),[38] its report represented that the "only difference between this provision in this bill and the Senate bill are editorial to conform the proposal to the terminology used in the House bill."[39] By way of explanation for including the provision, the report simply incorporated *in haec verba* Senator Baker's remarks to the Senate, just described.[40]

The differences between the Senate and House bills were reconciled in conference, essentially by substituting a compromise text drawing on both versions.[41] The conference substitute, however, retained the House redraft of Section 511(c)(2).[42] Its purpose was summarized by the chairman of the managers of the bill in the House, Congressman Robert Jones, who stated that "Section 511(c)(2) is intended to obviate the need for other Federal agencies to duplicate the determinations of the States and EPA as to water quality considerations."[43] He also provided his colleagues with a written summary of the legislation's major substantive provisions, including Section 511(c)(2). As to this, it stated that

> The conference agreement provides that nothing in the National Environmental Protection Act may be construed as the basis for establishment by other Federal agencies of more stringent controls on the discharge of pollutants than those provided under this Act, nor are such agencies authorized to review or alter effluent limitations issued under this Act.[44]

And in voicing support for acceptance of the conference report, Congressman Dingell also emphasized that "Section 511(c)(2) seeks to overcome that part of the *Calvert Cliffs* decision requiring AEC or any other licensing or permitting agency to independently review water quality matters."[45]

The Senate consideration of the conference report was in the same vein. Senator Muskie provided his colleagues with a statement of reasons why they should acquiesce in the conferees' proposals. Insofar as Section 511(c)(2) was concerned, it stressed that "EPA is the sole Federal agency

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[37]H.R. 11896, 92nd Cong., 2nd Sess. (1972), *Legislative History* at 893.

[38]*Id.* at 1086.

[39]H.R. Rep. No. 92-911, 92nd Cong., 2nd Sess. 137 (1972), *Legislative History* at 824.

[40]*Id.* at 824-26.

[41]See S. Rep. No. 92-1236, 92nd Cong., 2nd Sess. (1972) (Conference Report on S.2770), *Legislative History* at 281.

[42]*Id.* at 332.

[43]*Legislative History* at 236.

[44]*Id.* at 239.

[45]*Id.* at 256. The House thereupon agreed to the conference report. *Id.* at 279.

specifically charged with comprehensive responsibility to regulate the discharge of pollutants" into U.S. waters, that the effect of the section would be to require Federal licensing agencies to "accept as dispositive" EPA's determinations respecting the discharge of pollutants, but that those agencies would continue to be required to weigh the environmental impact of the discharges in deciding whether to grant licenses or permits.[46]

Finally, in response to an inquiry about whether the predecessor of this agency would actually be barred by Section 511(c)(2) from imposing tougher water pollution standards than EPA, there ensued a colloquy in which Senator Muskie made almost painfully clear that this would indeed be the case:

> *Mr. Buckley.* It is not the intention of the conference committee to exclude the right of other regulatory bodies to impose more stringent environmental conditions on discharges?
>
> *Mr. Muskie.* Again I must say yes, we gave the authority to EPA. The whole concept of EPA is that environmental considerations are to be determined in one place by an agency whose sole mission is protection of the environment.[47]

The conference report was agreed to by the Senate,[48] but the President withheld his approval of the legislation.[49] The Congressional debates leading to the overriding of that veto, however, shed little further light on the meaning of Section 511(c)(2).[50]

4. We have set out its legislative history in perhaps fulsome detail because, in providing the following lessons, it teaches how Section 511(c)(2) applies to this case. The first is that the spread of Federal responsibility for water quality standards and pollution control among the various licensing agencies, which resulted from the reading given NEPA by the *Calvert Cliffs* court, has been curtailed. That responsibility is shifted to EPA as its exclusive province. The second is that the mandate to acquire "expertise" in

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[46]*Id.* at 183.

[47]*Id.* at 198. Mr. Muskie continued his observations by adding "[i]t did not occur to us that AEC might be more conscientious in this respect than EPA, so we have given EPA the total authority on the assumption that the risk from AEC was not of the nature described by the Senator but, rather, the opposite, as history demonstrates.

"If AEC develops a stringent environmental conscience, and I think it is developing a more stringent environmental conscience than EPA, then we can consider whether or not AEC ought not to have new authority." *Ibid.*

[48]*Id.* at 223.

[49]*Id.* at 137.

[50]See *id.* at 106, 108, and 135-36.

developing, setting, and enforcing effluent limitations and water quality standards is also given to EPA; Federal Licensing agencies are to rely on that agency when such matters are involved and not develop duplicate expertise on their own. Third, those agencies are not to "second-guess" EPA by undertaking independent analyses and setting their own standards in this area. And, finally, given the pointed Congressional comments cited, NRC, as statutory successor to the AEC, is unmistakably bound by those strictures.

To be sure, in deciding whether to license specific projects, each agency must continue to weigh any resulting degradation of water quality in its NEPA cost-benefit balance. Section 511(c)(2) does not change this obligation. Rather, its intendment is to limit those agencies' NEPA roles to that balancing, leaving the substantive regulation of water pollution in EPA's hands.

We think it follows from what we have said that the Board below was right; TVA's construction of Section 511(c)(2) is the preferred one. This Commission may not incorporate in licenses to build nuclear power plants conditions which, in actuality, call for a "review" of the adequacy of water quality requirements previously established by EPA. There can be no dispute that the staff's proposed license conditions would do precisely that. As we described earlier, they would give the staff discretion to demand that TVA perform water monitoring operations at Yellow Creek above and beyond those specified by the EPA permit allowing the discharges. In short, the staff contemplates doing nothing less than judging the adequacy of EPA's monitoring requirements and imposing its own if it deems them unsatisfactory. But under Section 402(a) of the Water Act, it is EPA's duty, not the staff's, to decide what discharges are permissible and to "prescribe conditions . . . to assure compliance . . . including conditions on data and information collection [and] reporting." If the legislative history of Section 511(c)(2) makes anything clear, it is that "second-guessing" of this kind is forbidden.

Nor can the proposed conditions be justified on the staff's alternate ground, *viz.*, that the "NRC has a continuing obligation to monitor the actual environmental effects caused by licensed plants, so that this knowledge can be applied in performing cost-benefit analysis in future plants, and so that NRC can contribute to the EPA formulation of proper limitations and standards."[51] This is simply another way of saying that the staff must become water pollution experts. But, as the Commission has itself recognized, "the legislative history of the [Water Act] indicates that agencies such as NRC should *not* develop expertise 'with respect to water quality

[51]See fn. 22, *supra*.

considerations.' " *Seabrook, supra,* CLI-78-1, 7 NRC at 26 (emphasis by the Commission).

5. Nothing we have just said is inconsistent with the NRC-EPA "Second Memorandum of Understanding."[52] Indeed, we read that interagency agreement as adopting the position we do here. In our judgment, Appendix A to that document, the NRC's own "Policy Statement on Implementation of Section 511 of the Federal Water Pollution Control Act," makes this clear. For, as the Board below correctly noted (2 NRC at 230-31), except in circumstances not present here, paragraph 3 of that "Policy Statement" declares that

> [I]f and to the extent that there are applicable limitations or other requirements promulgated or imposed pursuant to the [Water Act], different limitations or requirements will not be imposed by NRC pursuant to NEPA as a condition to any permit or license.. . . [Emphasis added.]

Paragraph 2a of that statement defines "other requirements" to include, *inter alia,* conditions imposed by EPA under Section 402 of the Water Act, the provision which establishes the NPDES permit system and expressly authorizes the EPA Administrator to set specifications for monitoring affected waters. See 33 U.S.C. 1342(a)(1) and (2).[53]

We think the NRC Policy Statement means exactly what it says in committing this agency not to impose different monitoring requirements where EPA has acted. That reading is consistent with the legislative history of the Water Act; to allow inconsistent requirements would not be.

6. It became apparent at oral argument that the staff is not concerned primarily with EPA. Indeed, it concedes that, thus far, EPA has not proven uncooperative in setting monitoring requirements satisfactory to the Commission's needs.[54] Rather, the staff is uneasy because the NPDES permit program may eventually be transferred entirely to the States. It is to ensure its ability to obtain water quality information in the event of such a transfer that the staff is pressing its position now. The short answer is we have been shown no evidence that the States are likely to be less cooperative than EPA

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[52]See fn. 15, *supra.*

[53]At oral argument, staff counsel told us that, by omitting any reference to Section 308 of the Water Act in its definition, the Memorandum of Understanding intended to exclude water monitoring requirements from reach of paragraph 3 (App. Tr. 18-19). To be sure, Section 308, 33 U.S.C. 1318, does deal with monitoring generally. But we are concerned here with monitoring pursuant to NPDES permits, and this is covered specifically by Section 402 of the Water Act and expressly referred to in the NRC's policy statement. In the circumstances, the inference which staff counsel urges we draw is highly unlikely; certainly it is not compelled.

[54]App. Tr. 7, 11.

in these matters. We also think it inappropriate for a Federal agency to indulge in such a presumption. When, as and if such problems arise, we can address them against the backdrop of actual practice; in the abstract they are unripe for adjudicatory consideration.

7. Finally, what we hold here comports with what the Commission decided and the court of appeals affirmed in *Seabrook.*[55] That case involved how the NEPA cost-benefit balance for that nuclear plant was to be struck. This agency chose to place in the balance, as the aquatic impact attributable to the Seabrook facility, findings made by EPA in the course of contested proceedings that were properly before it and at which all the interested parties were represented. What we have held here—that NRC may not undercut EPA by undertaking its own analyses and reaching its own conclusions on water quality issues already decided by EPA—is not inconsistent with anything there said or done.

IV

The question of the environmental effects of radon emissions attributable to the mining and milling of uranium to fuel the plant to one side, the review on our own initiative of the unchallenged portions of the February 3 partial initial decision and of the totally unchallenged November 24 final initial decision disclosed no error requiring corrective action. We did take particular note of the Board's findings in the former decision that a portion of the exclusion area will be open to the public for fishing and pleasure boating. Paragraph 62, 7 NRC at 239-40. It appears from the record, however, that, should TVA deem an emergency situation to exist, it will be free to assume immediate control over the movement of people within the exclusion area without first seeking the approval of the State (Mississippi) having general jurisdiction over the area. Preliminary Safety Analysis Report, §2.1.2.1. On this understanding, we conclude that there is sufficient compliance with the exclusion area requirements found in 10 CFR 100.3(a).

Final disposition of the radon question, however, must abide the completion of the procedures for dealing with that issue. See ALAB-480, 7 NRC 796 (May 30, 1978); ALAB-509, 8 NRC 679 (December 1, 1978); and ALAB-512, 8 NRC 690 (December 21, 1978). Accordingly, except insofar as they involve the radon issue, the Licensing Board's decisions are *affirmed.*

It is so ORDERED.

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[55]See fn. 5, *supra.*

FOR THE APPEAL BOARD

Romayne M. Skrutski
Secretary to the Appeal Board

Cite as 8 NRC 717 (1978) LBP-78-40

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Marshall E. Miller, Chairman
Kenneth A. McCollom
Hugh C. Paxton

In the Matter of Docket No. 50-344 SP

PORTLAND GENERAL ELECTRIC
COMPANY, et al.

(Trojan Nuclear Plant) December 21, 1978

The Licensing Board authorizes amendment to license permitting interim operation subject to specified conditions of the Trojan Nuclear Plant prior to modifications that will bring the unit into substantial compliance with the license.

NEPA: ENVIRONMENTAL IMPACT STATEMENT

A license amendment which permits interim operation does not require either an environmental impact statement or an environmental impact appraisal and negative declaration unless the amendment alters the ultimate NEPA balance struck in prior initial decisions.

TECHNICAL ISSUES DISCUSSED: Seismic design criteria; safe shutdown earthquake; operating basis earthquake.

PARTIAL INITIAL DECISION

(Interim Operation)

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I. PRELIMINARY STATEMENT

A. Issues

This Partial Initial Decision involves the issue of whether interim operation of the Trojan nuclear facility should be permitted, pending the approval and completion of certain modifications to the Control Building required to meet the seismic design criteria of the Final Safety Analysis Report (FSAR). Interim operation of the facility with the Control Building in its as-built condition would require an amendment to Operating License No. NPE-1 for the Trojan plant. This facility operating license would have to be modified to waive certain Technical Specifications concerning seismic design criteria during interim operation, provided that such operation would be in accordance with specified conditions.

The Trojan plant is located 42 miles northwest of Portland, Oregon, on the Columbia River. The design of its Control Building was completed in

1970, and a construction permit was issued on February 9, 1971. Construction of the building, including the major composite shear walls, was completed in late 1972. The facility operating license was issued on November 21, 1975 (PGE Exh. 13, pp. 1-2).

While the plant was shutdown for refueling in April 1978, the Bechtel Power Corporation studied the feasibility of cutting an opening and installing a security window in a wall of the Control Building.[1] During this evaluation of the shear walls of the building, Bechtel identified a potential nonconformance with the design criteria stated in the FSAR (PGE Exh. 13, p. 2). This potential nonconformance was promptly reported to NRC's Office of Nuclear Reactor Regulation, which obtained further information and evaluated its significance (PGE Exhs. 6, 7).

On May 26, 1978, the NRC's Director of Nuclear Reactor Regulation issued an Order for Modification of License, directing the Licensees[2] to perform modifications to the Control Building to bring it into substantial compliance with the requirements of the operating license.[3] That order set forth findings that several design errors with respect to the shear walls reduced the seismic capability of the Control Building. It further found that the originally intended seismic capability and safety margins should be substantially restored by modifications to that structure, and that operation of the facility with the Control Building in its as-built condition would violate the existing facility license.

The order also stated that the Control Building had adequate structural capacity to resist the licensed safe shutdown earthquake (SSE), and that the facility operating license should be deemed modified to permit operation, with conditions,[4] in the interim period prior to approval and completion of the required modifications.

The Order for Modification of License further provided that any person whose interests might be affected by the order could file a request for hear-

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[1]Bechtel was the architect-engineer for the Licensee Portland General Electric Company (PGE), and it executed the design for the Control Building and other Trojan structures.

[2]PGE, the City of Eugene, Oregon, and Pacific Power and Light Company.

[3]Order for Modification of License, May 26, 1978, published in 43 Fed. Reg. 23768 (June 1, 1978).

[4]The conditions under which interim operation would be permitted are:

(1) no modification which may in any way reduce the strength of the existing shear walls shall be made without prior NRC approval; and

(2) in the event that an earthquake occurs that exceeds the facility criteria for a 0.11g [reduced at the evidentiary hearing to 0.08g] peak ground acceleration at the plant site, the facility shall be brought to a cold shutdown condition and inspected to determine the effects of the earthquake on the facility. Operation cannot resume under these circumstances without prior NRC approval. (Order, p. 9.)

ing. The issues that could be raised by a request for hearing were (1) whether interim operation prior to the modifications required by this order should be permitted, and (2) whether the scope and timeliness of the modifications required by this order to bring the facility into substantial compliance with the license are adequate from a safety standpoint.

Pursuant to the opportunity for hearing provided by the May 26 order, timely requests for hearing were filed by the Columbia Environmental Council (CEC), Eugene Rosolie, acting in his own behalf and as representative of the Coalition for Safe Power (CFSP), and by Bonnie Hill, John A. Kullberg, Stephen M. Willingham, David B. McCoy, C. Gail Parson, and Nina Bell. A duly established Atomic Safety and Licensing Board considered these requests for hearing at a special prehearing conference held in Portland, Oregon, on July 24-25, 1978.

By an order dated July 27, 1978, the Board granted the hearing requests and intervention petitions of CEC, Eugene Rosolie and CFSP, Mr. Willingham, Mr. McCoy, Ms. Parson, and Ms. Bell. Mr. McCoy, Ms. Parson, and Ms. Bell were consolidated pursuant to 10 CFR 2.714(e) and admitted as a single party. The State of Oregon was granted leave to participate as an interested State pursuant to 10 CFR 2.715(c). Subsequently, an untimely petition filed by the Bonneville Power Administration (BPA) was granted, and BPA was consolidated with the Licensees as a party to the proceeding.

B. Evidentiary Hearing

A notice of evidentiary hearing was issued by the Board on August 1, 1978, and was published in 43 Fed. Reg. 34847 (August 7, 1978). That notice set forth the scope of the evidentiary hearing as limited to the following two issues:

(1) Whether interim operation prior to modifications required by the May 26, 1978, Order for Modification of License should be permitted; and

(2) Whether the scope and timeliness of the modifications required by the May 26, 1978, order to bring the facility into substantial compliance with the license are adequate from a safety standpoint.

By an order dated August 25, 1978, the Board granted the Licensees' motion to bifurcate the proceeding into two phases. Phase I would involve an evidentiary hearing and a decision on interim operation prior to modifications of the Control Building. Phase II would involve a consideration of the proposed modifications themselves from a safety standpoint. It was also held that stated contentions regarding the issue of interim operation were

not required as to Phase I, because the notice of opportunity for hearing set forth with sufficient precision the issue to be determined (Tr. 6584-85).

The evidentiary hearing on Phase I was originally scheduled for September 6, 1978, but it was rescheduled to October 23, 1978, after the Licensees informed the Board and the parties of additional information which became available in August 1978. This Partial Initial Decision addresses the Phase I issue of interim operation of the Trojan nuclear facility with the Control Building in its as-built condition.

The Licensees prefiled the written direct testimony of Donald J. Broehl, S. R. Christensen, Bart D. Withers, Myle Y. Holley, Jr., Boris Bresler, Richard C. Anderson, George Katanics, Theodore E. Johnson, and William H. White on October 3, 1978. The State of Oregon prefiled the testimony of Harold I. Laursen on October 6, 1978. The NRC Staff prefiled the testimony of its witnesses Kenneth S. Herring, Robert T. Dodds, and James E. Knight on October 13, 1978. Additional testimony of Mr. Herring was prefiled on October 16 and November 25, 1978.

The evidentiary hearings on the issue of interim operation were held in Salem, Oregon, from October 23-25, October 30-November 3, and December 11-14, 1978. Limited appearance statements from members of the public were heard in Portland, Oregon, on October 26-27, 1978.[5] There were 2,996 pages of transcript. Witnesses were presented by the Licensees, the State of Oregon, and the Staff. The Intervenors CEC, CSP and Eugene Rosolie, and the Consolidated Intervenors (through Ms. Bell) attended the hearing and cross-examined the other parties' witnesses, but they presented no witnesses of their own.[6] Appendix A, attached hereto, lists the exhibits which were admitted into evidence.

II. FINDINGS OF FACT (INTERIM OPERATION)

A. Description of Building Complex

1. The Control Building is composed of a structural steel framing system with steel beams and columns supporting reinforced concrete floor slabs, with shear walls designed to resist lateral seismic loading or force (PGE Exh. 10, pp. 2-4). The major shear walls are located around the perimeter of the building, and generally consist of a reinforced concrete core placed between two layers of reinforced concrete block. The two block layers generally sandwich the structural steel frame so that the reinforced concrete core is

[5]The Board also accepted all written limited appearance statements which were handed up at any time during the evidentiary hearings (Tr. 528, 632, 1516).

[6]Ms. Bell offered into evidence Consolidated Intervenors Exh. 3, which was admitted (Tr. 2018).

partially or completely interrupted by the steel frame members (PGE Exh. 6, Attachment 2, Figs. 3 and 4). Thus, the building is designed with the steel frame carrying most of the normal vertical floor load, and the block and concrete walls carry most of the lateral load caused by earthquakes (PGE Exh. 10, pp. 2-4).

2. The Fuel, Auxiliary, and Control Buildings constitute a "Building Complex" and they are interconnected by their foundation systems and floor slabs, which are continuous for the three buildings. The Auxiliary Building is located between the Fuel Building and Control Building (PGE Exh. 6, Attachment 2, Fig. 1). The Auxiliary Building is supported laterally in part by both the Control Building and the Fuel Building, with the reinforced concrete floor slabs acting as diaphragms to transfer lateral loads (PGE Exh. 10, p. 4, Tr. 738).

B. Seismic Design Criteria

3. The requirements governing the design of the Building Complex walls to resist the lateral loads arising from an earthquake, wind, or tornado were in accordance with those from the American Concrete Institute (ACI 318-63) Code for reinforced concrete (ultimate strength method) and the 1967 edition of the Uniform Building Code (UBC-67) for reinforced grouted masonry.

4. Based upon an evaluation of the maximum earthquake potential at a site, the safe shutdown earthquake (SSE) is that earthquake which produces the maximum vibratory ground motion for which certain important structures, systems, and components at a nuclear plant are designed to remain functional (PGE Exh. 10, p. 8). The SSE for the Trojan plant as defined in §2.5.2 of the Final Safety Analysis Report is 0.25g and is not in controversy in this proceeding.

5. In addition to the SSE, Appendix A to 10 CFR Part 100 also provides for the establishment of an operating basis earthquake (OBE), a lower level earthquake than the SSE. If vibratory ground motion exceeding that of the OBE occurs, shutdown of the reactor is required. Prior to resuming operation, a licensee must demonstrate to the NRC that no functional damage has occurred to those features necessary for continued operation without undue risk to the health and safety of the public. The OBE for the Trojan plant as defined in §2.5.2 of the Final Safety Analysis Report is 0.15g and is not in controversy in this proceeding.

6. The OBE for the Trojan plant controlled the actual design, rather than the SSE, although effective peak ground accelerations were designated as 0.15g and 0.25g, respectively. Because three percent greater structural damping is permitted for the SSE than for the OBE, calculated earthquake

loadings would be essentially the same except for different load factors imposed in the FSAR. When these factors are used, 1.4 for the OBE and 1.0 for the SSE, the greater factored load from the OBE imposes the more stringent design requirements (Staff Exh. 5, Footnote 2, pp. 3-4; PGE Exh. 10, pp. 20-22; Tr. 858, 1442-3).

C. Design Deficiencies in the Control Building

7. In April 1978, while the plant was shutdown for refueling, an investigation by the Bechtel engineers of the feasibility of cutting an opening and installing a security window in a wall of the Control Building disclosed a deficiency in the original design (PGE Exh. 10, pp. 4-5). By letter dated April 28, 1978, the Licensees informed the Nuclear Regulatory Commission's Office of Inspection and Enforcement and the Office of Nuclear Reactor Regulation that design errors existed with respect to the walls of the Control Building and that these walls did not conform to the design criteria set forth in the Final Safety Analysis Report for the facility (PGE Exh. 13, p. 2).

8. The nonconformances with criteria, identified as design deficiencies, fall into two major categories. First, both the horizontal and vertical reinforcing steel embedded in the inner concrete core of the Control Building shear walls is generally discontinuous, in that it is not anchored to the steel beams and columns of the Control Building's steel frame (Staff Exh. 5, p. 2; PGE Exh. 10, p. 5). Under the applicable codes and standards with which the Control Building must comply, steel reinforcement must be adequately anchored by bonds, hooks or mechanical anchors, or otherwise be anchored by being welded to or run through the steel beams and columns. The construction drawing details used to place the steel in the walls during construction failed to show the proper anchorage wherever the steel frame intersected the steel reinforcement (Staff Exh. 5, p. 3).

9. The second design deficiency resulted from misapplication of ACI 318-63 shear design formulae in combination with the applicable limiting OBE seismic loading, which resulted in less than the required amounts of reinforcing steel in the shear walls. The effect of these errors was to credit the concrete shear capacity at about 2.5 times what it should have been under the applicable design criteria. This resulted in too little steel reinforcement specified for the Control Building walls to comply with ACI 318-63 (Staff Exh. 5, pp. 3-5; PGE Exh. 10, p. 6).

10. As a result of these design deficiencies, the capacity of the Building Complex together with the contained systems and components to withstand seismic events is lower than intended. The reduction in the seismic capacity due to the design deficiencies has been estimated to range from about 30% to about 50% (Tr. 574-5, 978, 1583, 2128-29, 2183, 2291-92). The first step

in considering either restoration of the seismic capability of the Building Complex to the original design intended, or operation of the Trojan facility during the interim period, required reevaluation of the capability of the Building Complex to withstand seismic forces or loadings in the as-built condition.

D. Seismic Design and Reevaluation of the Building Complex

1. Original Evaluations and Analyses, 1970-71

11. The original seismic evaluation of the Control Building used a fixed-base, beam-stick model. The analysis applied to the Control, Auxiliary, and Fuel Buildings, but the Auxiliary Building was considered to have no lateral resistance except for a few walls. The mass considered in the analysis was based on the design dead weight and 50% of the specified floor live load. The stiffness of the structure was based on uncracked section properties. The modal analysis spectrum responses technique was used for the determination of inertia loads. The modal responses were combined using the absolute sum value technique (PGE Exh. 6, Attachment 1).

2. Reevaluation Methods and Assumptions

a. Four Analytical Studies of Seismic Capability

12. Since the original evaluations and analyses were made, and since the discovery of the design deficiencies, four additional separate seismic analyses have been performed on the Trojan Building Complex. They are (1) a reevaluation of the original spectral response analysis in April 1978, using the fixed-base, beam-stick model, estimated as-built weights, and the application of the square root of the sum of the squares method to combine the contributions of the building response modes (PGE Exh. 6, pp. 1-7); (2) an analysis by an independent consultant utilizing the TABS program in June 1978 (PGE Exh. 8, pp. A-4, A-5); (3) an analysis using a three dimensional finite element model and the STARDYNE program with flexible base to account for the effect of rocking due to the foundation flexibility, in August 1978 (PGE Exh. 8); and (4) an analysis using the same model as in (3) and the STARDYNE program with fixed-base assuming no flexibility in the foundation of the buildings, in August 1978 (PGE Exh. 8).

b. Assumptions Different From Original Analyses

13. With the specified SSE of 0.25g and the specified OBE of 0.15g in mind, the reevaluations of the lateral seismic resistance of the Building

Complex were undertaken to determine more realistic seismic loadings and to calculate the shear capacities of the individual walls using the as-built structure with the following significant changes in assumptions:

(1) The concrete strength for the Building Complex shear walls was 6,000 psi based on cylinder test results for the concrete actually used in the Control Building, rather than the value of 5,000 psi specified in the FSAR (PGE Exh. 6, Attachment 3).

(2) The minimum yield strength for the reinforcing steel was 45,000 psi based on the mill test certificates for the actual material furnished and used in construction, rather than the 40,000 psi specified in the in the FSAR (PGE Exh. 6, Attachment 3).

(3) The actual weight of the Control Building and the equipment it houses was used based on a review of the as-built conditions, rather than the design dead weight and 50% of the specified floor live load (PGE Exh. 6, Attachment 3).

(4) The capability of some interior walls in the Auxiliary Building was considered in the reevaluation studies as reducing the amount of shear force transferred from the Auxiliary Building to the Control Building (PGE Exh. 6, Attachment 3).

(5) The contributions of the building response modes were combined by the square root of the sum of the squares method rather than the absolute sum value technique (PGE Exh. 6, Attachment 3).

c. Procedure of Summing Wall Capacities

14. The procedure of the summing individual wall capacities to determine the resistance of a given wall system to the lateral loads parallel to their direction differs from the normal procedure followed in the reinforced concrete shear wall design process. In the normal procedure, the total loads resulting from a linear elastic seismic analysis would be proportioned to each wall according to its relative stiffness. Each wall would then be designed to have the ACI 318 Code ultimate strength capacity to resist the proportioned load. While this does not guarantee that each wall will reach its capacity at the same deflection, the procedure has been found to be conservative (Staff Exh. 5, p. 11).

15. With the availability of STARDYNE, the Bechtel engineers have assessed the degree to which the walls of a given system might exceed their calculated capacities. When a wall reached its capacity, its stiffness was no longer relied upon, and the wall was assumed to resist a loading equivalent to its calculated shear capacity (Staff Exh. 5, pp. 12-13, Tr. 653, 934-6).

d. Reevaluation of Wall Capacities for STARDYNE Analysis

16. The allowable code shear capacities for the walls are usually set anticipating a given level of sophistication when determining the applied loads. Neither the ACI nor the UBC codes consider the use of techniques as sophisticated as an extensive finite element analysis (Tr. 576-7, 1481, 2084). The codes, for another example, allowed for transverse tension cracks, which cannot cross walls with height less than width, such as most of the Control Building wall sections framed by the steel structure. The conservatism of the code interpretation was considered appropriate for comparison with stick model results, but unnecessary for use with more accurate STARDYNE analysis (PGE Exh. 8, §4, Appendices B and C, Tr. 922-3).

17. In view of the conservative nature of the Building Complex wall capacities in the original analysis and the accuracy of STARDYNE, Bechtel engineers developed a set of criteria to evaluate the capacities of the shear walls in a more realistic manner (PGE Exh. 8, §4). Development of the new criteria for evaluating the fully grouted hollow concrete block walls of the Building Complex, was based on two sets of test data considered applicable. Bases for the criteria were an empirical relationship derived by Schneider from tests of masonry walls he conducted at California Polytechnic College, Pomona, and the results of subsequent shear wall tests at the University of California, Berkeley (PGE Exh. 8, Appendix B, pp. 2, 3, 4). The new criteria obtained by Bechtel engineers are referred to as Modified Schneider Criteria. Cyclic degradation was included in the criteria by comparison with cyclic tests. The composite strength is higher in all of the walls at Trojan than the strength of the blocks used in the Berkeley and Schneider tests. In addition, comparisons to Portland Cement Association's (PCA's) reinforced concrete shear walls tests, with transverse members at both ends acting as flanges, confirmed that the Modified Schneider Criteria results were conservative as applied to walls of the Building Complex (PGE Exh. 8, Appendix B, pp. 5, 6).

18. The Modified Schneider Criteria correlate very well with both the Schneider and Berkeley tests in terms of resistance capacity. All test specimens had vertical restraint that prevented failure by bending, but permitted failure by shear or lateral displacement. In general, bending failures of a structure are prevented by constraints due to separation into stories or by the application of fixed or dead loads. The Trojan Building Complex satisfies both of these conditions. The major walls have significant dead load or can mobilize it by small movements that would lead to transfer of load from the steel columns to the shear walls. Floor diaphragms provide further bending constraints. Thus the conditions

on which Modified Schneider Criteria are predicated are satisfied in the Control Building Complex (Tr. 594-7, 837-9).

19. In the Building Complex shear walls, the masonry blocks that sandwich a concrete core have about one-half of their volume filled with concrete grout. Thus, for a typical wall, appreciably less than one-half is masonry and the remainder is concrete. Both the Berkeley masonry tests and the PCA reinforced concrete tests had shear strains in about the same range when the maximum capacities of composite walls, based on masonry strength values for both materials, was reasonable (PGE Exh. 8, Appendix C).

20. From the experimental supporting evidence described above and the development of the Modified Schneider Criteria, the Bechtel engineers recalculated all shear wall capacities for the Building Complex. Although the resulting shear wall capacities for use with the STARDYNE analysis were higher than those used with the stick model, the Bechtel engineers concluded that these were both realistic and still conservative for use with the more sophisticated finite element analysis techniques.

3. Reevaluation Using the Stick Model

21. The beam-stick model employed in the original analysis and in the initial reevaluation study consists of lumped masses, sticks, and beams. In this model, all the mass associated with each of the floors in the Control Building, the Auxiliary Building, the Holdup Tank enclosed structure, and the Fuel Pool is lumped into one concentrated mass. These concentrated masses are interconnected by vertical sticks and horizontal beams representing the stiffness characteristics of the walls and floors, respectively (PGE Exh. 10, pp. 14-15).

22. The initial reevaluation using the stick model was completed by Bechtel engineers with the assumptions listed in paragraph 15 above. Use of the recalculated loads resulted in a 13% reduction from the original design loads (later reevaluated as an 8% reduction for the STARDYNE analysis). Compared to the original stick model analysis, the total recalculated base shears for the critical north-south direction SSE were reduced about 30% for both the Control Building and the Fuel Building. The actual shear capacity of the walls with the new assumptions increased by 10% over that of the original design value. The comparison of these predicted loads with calculated capacities of the shear walls of the Building Complex led Bechtel engineers to conclude that the ground motion associated with the SSE was acceptable. However, the OBE criterion as specified in the FSAR was not met, but rather an effective OBE of

0.11g ground acceleration appeared to be appropriate based on the recalculation (PGE Exh. 6, Attachment 3).

23. As part of the reevaluation study, the Control Building structure was also examined by completely disregarding the concrete shear strength and considering only the resistance of the reinforcing steel and the embedded steel columns. This analysis was done to provide additional confidence as to the adequacy of the Control Building, although the technique is not normally required or performed in typical seismic design for buildings (PGE Exh. 10, p. 12; Staff Exh. 5, pp. 14-15, 27). This evaluation demonstrated that the structure had a minimum shear resistance capacity approximately 1.4 times the required SSE capacity at a given elevation, giving further confidence in the capability of the structure to resist SSE loadings (PGE Exh. 10, pp. 12-13).

4. Independent Evaluation Using the TABS Program

24. The second reevaluation of the seismic capability of the building structure was performed using the TABS program (*T*hree-dimensional *A*nalysis of *B*uilding *S*ystems) by an independent consultant. The model idealizes the Building Complex as an assembly of a system of independent plane frame and shear wall elements, interconnected by floor diaphragms that are rigid in their own plane. The masses of the structure are lumped for each floor at the center of mass of that floor. Since shear walls are treated as independent plane elements, the flange effect of cross walls or the beam-like behavior of box-type shear wall systems cannot be modeled completely. The outputs of the TABS program are shear forces on the walls and combinations of forces tending to rotate the walls. The total base shears for the north-south SSE indicated internal loads lower than the first reevaluation (PGE Exh. 8, Appendix A, §2.3), providing confirmation of the reasonableness, even though the model was not considered as completely appropriate (Tr. 642-6, 920-1).

5. Reevaluation Using the STARDYNE Program

a. Description of the Model

25. The third method used to reevaluate the seismic capability of the Building Complex, and the most sophisticated in its complexity, was the three-dimensional finite element model as developed in the STARDYNE program. The Building Complex here is represented by approximately 460 nodal points tied together by 685 plate elements representing walls

and floors and 56 beam elements. This model provides an excellent representation of the actual mass and stiffness distribution within the complex. The program solves simultaneously approximately 600 equations of motion which describe the dynamic response of the complex (PGE Exh. 10, p. 15).

26. The STARDYNE program was used assuming both a flexible base and a fixed base. The flexible base was to account for the effect of rocking due to the foundation flexibility. However, the total shear obtained from the fixed-base analysis differs from that of the flexible-base analysis by only 3%, indicating that the foundation flexibility effect using measured experimental data for the Trojan Nuclear Plant foundation is negligible (PGE Exh. 8, pp. A-5, 7, Tr. 797).

b. Results of Analyses Using STARDYNE Program

27. Because the STARDYNE analysis for the Building Complex used linear elastic properties, the resulting forces, force distributions, and accelerations are upper limits (PGE Exh. 12, p. 3; Tr. 850-2). In the critical north-south direction, the total base shear that would be applied to the Control Building by an SSE is about 20% greater than that predicted by the initial reevaluation using the stick model (PGE Exh. 10, p. 15; Staff Exh. 6, p. 8, Tr. 639-41). On the other hand, the STARDYNE-predicted base shear for the Fuel Building decreased by 28% (Staff Exh. 6, p. 8; Tr. 639). A comparison of the total seismic loads from the STARDYNE analysis and the initial reevaluation study for the Building Complex as a whole indicates that the base shear summations for the Building Complex models do not differ greatly (Staff Exh. 6, pp. 2-3, 7; PGE Exh. 8, Appendix A, pp. A-7, A-8; PGE Exh. 10, p. 15).

28. The STARDYNE analysis predicted greater torsional or rotational contributions to the loading of the Control Building than did the stick model. The STARDYNE analysis predicted a twisting mode, with the Building Complex pivoting about the more rigid Fuel Building, and with greater modal deflection at the Control Building end in the north-south direction. This resulted in an increase in the total base shear for the Control Building in the north-south direction of about 20% compared to the initial reevaluation, while the predicted Fuel Building base shear decreased (PGE Exh. 8, Appendix A, p. A-6; PGE Exh. 10, p. 15; Staff Exh. 6, p. 8).

29. Using the Modified Schneider Criteria (described in paragraphs 16 through 20, above), the new computed wall capacities were compared to the loads derived from the STARDYNE linear elastic analysis. Since some loads exceeded wall capacities, the Building Complex was studied to determine the ability to redistribute the loads, in the event that some

walls yielded (PGE Exh. 8, pp. 7-1, 7, Tables 7-1, 13; Tr. 657-64, 929-30, 934-6, 2192-5).

30. According to the resulting analysis for an SSE in the north-south direction, six small walls would have elastic loads greater than capacity. After redistribution of forces among the walls when the capacities of walls are exceeded, the capacity of the most limiting major wall in the Control Building exceeds the loading by more than 15% (Staff Exh. 6, p. 10; PGE Exh. 12, p. 6; Tr. 2191-2). As a result of load redistribution, the ultimate strength of no wall would be exceeded enough to degrade its load-carrying capacity (Tr. 657-64, 1526-8, 1745, 2191-6).

31. All of the evaluations of the structural capacity of the as-built Control Building show that the structure has adequate capacity to safely withstand the licensed SSE of 0.25g. However, the analyses also indicate that the design deficiencies have reduced the capacity of the structure in such a manner that it does not meet the license criteria for an OBE of 0.15g (PGE Exh. 10, p. 20). There is some conflict in the testimony as to the level at which it would be appropriate to require that the plant be shut down and inspected, should an OBE level earthquake occur during interim operation. Licensees presented testimony demonstrating the ability of the building structure to meet an OBE criterion of 0.11g, based on both the stick model and the STARDYNE program analysis (PGE Exh. 6, pp. 2-3; PGE Exh. 8, p. 2-2; PGE Exh. 10, p. 20; PGE Exh. 13, p. 3). The Staff testimony, on the other hand, indicates that nonlinear behavior in the most highly loaded major shear wall (the west wall of the Control Building) will begin to occur at an equivalent earthquake with 0.087g acceleration (Staff Exh. 6, pp. 11-12; Tr. 2271-3). The Staff thus recommended that for interim operation, the level at which the facility must be shut down and inspected should be set at the onset of nonlinear behavior in a major shear wall, conservatively set at 0.08g (Staff Exh. 6, p. 12).

c. Evaluation of Structural Displacements

32. In addition to determination of actual building structure strength to resist seismic forces, consideration was given to the effects of structural displacements on ability to bring the facility to the safe shutdown condition in the event of an SSE. Excessive building displacements may cause problems by buildings striking each other. Displacements between buildings (interstructure) and between floors of a building (interstory) may also affect equipment such as piping and cable trays, within a building or running from one building to another (PGE Exh. 12, pp. 10-13).

33. The maximum amount of interstructure and interstory displacements where interconnections occur were estimated using the stress results from the STARDYNE elastic analysis for the west wall of the Control Building, and a shear stress vs. strain curve derived from concrete and masonry test data (Staff Exh. 6, p. 4). The maximum interstructure displacements from the analyses reduced the 3-inch gap by 2.4 inches and 2.49 inches between the Control and Turbine Buildings in the north-south and east-west directions, respectively, at the top of the Control Building, and about 0.75 inch between the Control Building and Containment at elevation 77' (Staff Exh. 6, p. 5; Tr. 1755). Similarly, the maximum additional separation relative to the nominal separation between the Control Building and Containment, considering maximum building deflections, is 0.76 inches (Staff Exh. 6, p. 5). The maximum interstory displacement would be 0.53 inches in the north-south direction between elevations 45' and 61' in the Control Building (Staff Exh. 6, pp. 4, 13; PGE Exh. 10, p. 30). Since there is a 3-inch gap between these buildings at the place of maximum displacement, no building contact will occur (PGE Exh. 12, p. 12).

6. Conservatisms in Analyses

34. Confidence in the structural integrity of the Control Building and the ability of the building structure to withstand safely the SSE is supported by consideration of a number of factors of conservatism inherent in the evaluations and analyses.

35. The "damping" characteristic is the ability of a structural system to dissipate vibratory energy, an inherent property of any structural system. The analyses used those damping values specified in the FSAR, in particular, a five percent damping for the SSE event. However, for masonry shear walls, subjected to large fractions of their computed capacities, substantially higher damping percentages are deemed to be appropriate. Such higher damping would lead to smaller predicted forces, representing an unaccounted for conservatism in all the analyses (PGE Exh. 10, p. 25; PGE Exh. 12, p. 9).

36. The analyses did not take advantage of the ability of a building structure to deform inelastically before reaching ultimate capacity. In the event of a severe earthquake, this ability to deform inelastically will increase the ability of the structure to dissipate vibratory energy (PGE Exh. 10, p. 26; Staff Exh. 5, p. 28; Staff Exh. 6, p. 11; Tr. 2348).

37. The steel frame of the Control Building is designed to carry the weight of the building while the shear walls provide structural resistance to seismic forces (Tr. 738). The steel frame would contribute significantly

to the structural integrity of the Control Building by resisting building collapse, an effect not utilized in the analyses (Staff Exh. 6, p. 11). The steel structure can be expected to prevent building collapse even in a postulated earthquake substantially in excess of the designated 0.25g SSE (PGE Exh. 12, p. 10; Tr. 1469).

38. Other conservative assumptions underlying the analyses include use of static strength rather than greater dynamic strength, and neglect of the difference between concrete and masonry strengths (Staff Exh. 5, pp. 17-27; Tr. 598, 911-2, 976-7).

7. Independent Checks on the Design

39. Some concern was expressed by Intervenors at the hearing that the same engineering firm (Bechtel) which made the original design errors, performed the reevaluation of the Control Building walls. Licensees presented the expert testimony of Myle J. Holley, Jr., and Boris Bresler, professors at MIT and Univeristy of California, Berkeley, respectively. Both of these experts engage in teaching and research in the structural engineering field. Their testimony was submitted in the form of a study report entitled "Response of Trojan Nuclear Power Plant Control Building to Specified SSE Event" (PGE Exh. 12). As a result of their study and investigation, Professors Holley and Bresler concluded that the Control Building, in its as-built condition, can withstand the specified SSE for Trojan with no consequences that could interfere with safe shutdown (PGE Exh. 12, p. 16; Tr. 1035). On the basis of their extensive relevant background and experience, their demonstrated knowledge of the Building Complex and their reasoned responses to numerous questions by the parties and the Board, we find that substantial and convincing evidence was presented supporting the credible testimony of the Bechtel engineers and the PGE expert witnesses.

40. The State of Oregon, appearing as an interested State, presented testimony by Harold I. Laursen, Professor of Structural Engineering at Oregon State University. This credible evidence further confirmed the ability of the as-built Building Complex to withstand the specified SSE event of 0.25g ground acceleration. Professor Laursen based his testimony on his review of the extent to which sound engineering principles were applied in analyzing the seismic capacity of the existing shear walls. As a result of his analysis of the initial reevaluation, Professor Laursen prepared a report to the Oregon Department of Energy in which he concluded that there was reasonable assurance that the Control Building shear walls could withstand a 0.25g SSE (State Exh. 1). Dr. Laursen also reviewed the information developed in the STARDYNE analysis.

He concluded that the Control Building walls would experience only limited cracking at the SSE level of earthquake, and that the structure has a significant safety margin above the SSE (Tr. 2097-9, 2105, 2109-10). We find that Professor Laursen was a knowledgeable and convincing expert witness.

8. Conclusions on Seismic Capability of the Building Structure

41. The Board finds that the Control Building in its as-built condition and the Control Building, Auxiliary Building, and Fuel Building Complex, have adequate structural capacity and strength to withstand safely the licensed SSE of 0.25g during a period of interim operation (Tr. 661-2, 688, 1035, 1474-1, 2105; PGE Exh. 12, p. 6; Staff Exh. 5, pp. 27-28; Exh. 6, pp. 11, 16; State Exh. 1, pp. 9, 12). Gross failure or collapse of the Control Building or the shear walls therein is not a credible consequence of earthquakes up to and including the SSE (Tr. 668; 687-8; 1469; 1471-2; 1527-8;1548-50; 1756; PGE Exh. 12, pp. 10, 13). There is agreement in the testimony of the qualified structural experts that the Control Building can safely withstand an earthquake at least 50% higher than the licensed SSE (Tr. 1474-6; 2110; 2291; PGE Exh. 10, p. 28).

42. On the other hand, the evidence shows that the facility was not designed to withstand an OBE of 0.15g as specified in the FSAR, and as required by the facility license. Although the Licensees' testimony justified the selection of 0.11g or higher during interim operation as the point where the plant should be shut down for inspection as required by the regulations for an OBE, the Staff favored the selection of 0.08g as the appropriate cold shutdown level (PGE Exh. 8, p. 2-2; Staff Exh. 6, pp. 11-12, 16, Tr. 2255-7). Although the latter value may be overly conservative, the Licensees have agreed and the Board concurs that the 0.08g or higher seismic event should require shutdown and inspection for the interim operation period (Tr. 1807-08).

E. Seismic Effects on Equipment

1. Effects of Structural Displacement

43. Comprehensive surveys by the Licensees' personnel and consultants and by the Staff were conducted to evaluate the effect of interstructure and interstory displacements on safety-related equipment. The conclusions reached were that displacements between floors and ceilings as large as one inch in any given part of the Control Building would not adversely affect pipes and electrical cables, all of which were found to be flexible

and insensitive to the postulated displacements (Tr. 803-5; 949-50; PGE Exh. 10, p. 31; Exh. 11; Staff Exh. 7, pp. 3-5).

44. Cables and cable trays and all but one pipe running between buildings in the facility were found to be sufficiently flexible to withstand the potential displacements between buildings in the event of an SSE of 0.25g. The single rigidly attached pipe supplies cooling service water to air-conditioning units in the switchgear room in the Turbine Building, and will not influence the ability of the plant to shut down safely after an SSE event (Staff Exh. 7, p. 4; Tr. 2206-10).

45. The potential for concrete spalling or falling as a result of a seismic event was also investigated. The evidence indicates that even for a 0.25g seismic event, spalling of walls and ceilings in the Control Building would not occur (Tr. 554-5; 558-9; 565-6; 628; 834; 874-5; 2106-70; 2138; 2169). Any spalling that might occur would be minor in nature and would result in pieces of concrete blocks falling close to the wall. An inspection by the Licensees evaluated the effect that such spalling might have on all equipment within 3 feet of any wall in the Control Building, and found little or no possible effect on safety-related equipment (Tr. 555-8; 565; 835-6; PGE Exh. 11, p. 2).

2. Effects Using Floor Response Spectra

46. The effects of earthquake-induced vibratory displacements and accelerations on the ability of safety-related equipment, components, systems, and piping to remain functional were also evaluated. When an earthquake occurs, the vibratory ground motion input at the base of the structure is amplified or modified throughout the structure, so that the vibratory response of floors (floor response spectra) above grade level differs from that input at the foundation by the earthquake. Equipment, piping, and components in the structure will thus be subjected to varying floor response spectra depending upon their locations (Tr. 2356).

47. In the reevaluation using the stick model, Bechtel engineers concluded that seismically qualified equipment, piping systems, and components within the Control Building were unaffected by the design deficiencies (PGE Exh. 9B, Question 10; Tr. 2337, 2350-1). Following completion of the STARDYNE analysis, however, Bechtel engineers reexamined the effects on safety-related equipment in the Building Complex using the greater detail available from this more sophisticated technique.

48. To evaluate the effects on equipment of a structure's response to a seismic event, acceleration is established as a function of frequency. The relationship between these variables is called a "response spectrum,"

and is used to qualify equipment seismically. In the reevaluation, Bechtel engineers prepared a new acceleration-time history for ground motion and obtained horizontal response spectra based on the results of the STARDYNE analyses. This included consideration of stiffness reduction of the structures and materials actually used in construction. The new acceleration-time history resulted in a ground spectrum that enveloped the design ground spectrum in the FSAR (PGE Exh. 19, p. 3; Tr. 2342-44). The vertical responses were not regenerated since the original vertical spectra would not be affected by the design deficiencies in the Control Building (Tr. 2381; PGE Exh. 20, Question 6, pp. 1, 2).

49. When the STARDYNE analysis was performed, certain differences between the stick model analysis and the STARDYNE analysis floor response spectral shapes were identified (Staff Exh. 6, p. 15). The peak frequencies of the STARDYNE floor response spectra are higher than those of the stick model, and STARDYNE predicts the existence of a second and third spectral peak for earthquakes in the north-south direction (PGE Exh. 19, pp. 5, 6).

50. The differences between the results from the two models stem from the fact that the more sophisticated STARDYNE model is able more accurately to represent the Building Complex than the simpler stick analysis can. Consequently, the more realistic STARDYNE analysis was able to predict additional higher frequency peaks which the original stick model could not (Tr. 2354-5; Tr. 2379; PGE Exh. 19, pp. 5, 6).

51. The STARDYNE finite element model, using a fixed base and linear elastic uncracked stiffness properties, was subjected to the time-history input at the base of the building complex, and the resulting time-history for various parts of the buildings was determined for an SSE in the north-south and east-west directions (PGE Exh. 19, pp. 2, 3; Tr. 2344-5). In accordance with FSAR criteria, five percent damping for structures was assumed (PGE Exh. 19, p. 2). From this, the horizontal floor response spectra for five points on each floor slab at each elevation above 45' for each building were derived (PGE Exh. 19, p. 4). These spectra were then enveloped to arrive at the horizontal floor response spectra for each floor slab at each elevation for each building (Tr. 2345-6). This then constituted the base set of linear elastic horizontal floor response spectra (PGE Exh. 19, p. 2) and, because elastic behavior with uncracked properties was assumed, it resulted in upper-bound frequencies (Tr. 2338, 2347).

52. For the north-south direction, the floor response spectra were broadened on the low frequency side to account for inelastic behavior of the Control Building under the SSE (PGE Exh. 19, pp. 2, 5, 20; Response to Question 4, p. 1; Tr. 2337, 2348). The effect of Control

Building inelastic behavior on the Auxiliary Building's floor response spectra was also examined and shown to be negligibly small (PGE Exh. 20; Response to Question 4, p. 3).

53. All adjusted floor response spectra peaks were further broadened to account for variations of materials, mass and other parameters, and for calculational uncertainties (PGE submittal of November 22, 1978, p. 4). Finally, since earthquakes of magnitudes lower than the SSE would result in less structural stiffness degradation than the SSE, the effects of lower level earthquakes on the floor response spectra were examined and accounted for (PGE Exh. 21, p. 5). These further analyses and adjustments resulted in some additional widening of east-west floor response spectra peaks at certain elevations in the Fuel and Auxiliary Buildings (PGE Exh. 21, pp. 4, 5; Exh. 22).

54. The analyses described above generated a set of floor response spectra for the Building Complex with reasonable assurance that both the high and low frequency ends of actual floor response spectra are bounded for earthquakes up to and including the 0.25g SSE (Staff Exh. 9, p. 3; PGE Exh. 22, p. 507). This set of floor response spectra was then used to determine whether the safety-related equipment, components, piping, and systems above elevation 45' remain qualified (PGE Exh. 19, pp. 6, 7; Tr. 2348, 2372-5).

55. It was determined that the electrical and mechanical equipment and components as well as cable trays remain qualified under the new floor response spectra (PGE Exh. 19, letter of D. Broehl, p. 1; Exh. 19, p. 7; Exh. 20, Question 7, p. 1; Tr. 2339, 2340). For safety-related piping systems, a dynamic analysis was performed to determine frequencies and mode shapes, and by imposing the floor response spectra, stresses and deflections in the piping systems were computed and compared to code allowable values (Tr. 2375-6). From this, it was determined that some pipes may be overstressed under earthquake conditions and that additions and modifications of a limited number of pipe supports or pipe restraints are required (Tr. 2340-1, 2349; PGE Exh. 19, letter of D. Broehl, p. 1; PGE Exh. 19, p. 7; Exh. 20, Question 7, p. 1). The Licensees are performing the required modifications (Tr. 2386-7; PGE Exh. 21, p. 5; Exh. 9G, pp. 3, 4).

56. In response to concerns expressed in a written limited appearance statement by Robert D. Pollard on December 12, 1978 (Tr. 2655-91), the Board asked both the Licensees and the Staff to provide further information on the seismic qualifications of equipment and on the fire protection system in the Building Complex (Tr. 2716-20, 2723-9, 2736, 2742-4).

57. The Licensees provided an additional panel[7] whose testimony included a comprehensive review of safety-related equipment in the Building Complex. The procedures, standards, criteria, and methods used both in the original seismic qualifications and in the current reevaluation of piping, cable trays, mechanical equipment, and electrical equipment were reviewed in depth (PGE Exh. 33; Tr. 2759-94). From questions by the Board, the original seismic qualifications together with the design characteristics of various items of safety-related equipment were examined by the panel and compared to seismic characteristics that would result from current standards (Tr. 2798-2831). Also as a result of Mr. Pollard's concerns, the Board asked a second Licensees panel to review the status of fire protection in the Building Complex and to provide their judgment as to the capability of the fire protection system to survive an SSE and to function, if required (Tr. 2856-69).

58. The Staff provided an additional panel[8] whose testimony covered criteria and standards used in reviewing seismic qualifications of equipment and the way in which they were applied to equipment in the Building Complex (Staff Exh. 10; Tr. 2886-2994). This panel discussed alleged shortcomings of equipment seismic qualification noted by Mr. Pollard, and in each case described their satisfactory resolution. The nature of resolution was replacement of deficient relays by rotary switches, review and acceptance of a report covering qualification of specific equipment (WCAP-7821), dismissal of four other reports as inapplicable (WCAP-7744, 7672, 7705, and 7819), and requalification of electrical components to comply with updated standards where appropriate (Tr. 2902-7, 2940-1, 2947-55).

59. A member of the Staff's panel of witnesses described updated fire protection requirements of the NRC, their application to the Trojan plant, and satisfactory response by the Licensees. He testified that adequate fire protection would be available in the Control Building after an SSE (Tr. 2910-12, 2915, 2921, 2991-2).

60. The Board finds from the evidence that fire protection equipment in the Building Complex would survive the SSE and remain functional in the event of a fire. Upon review of the testimony concerning seismic qualification of equipment in the Building Complex, the Board finds that the allegations of deficiencies in these categories are without merit (Tr. 2856-9, 2759-2831, 2886-2994). There are no unresolved safety issues,

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[7]The panel consisted of William H. White, Richard C. Anderson, John L. Frewing, Theodore E. Bushnell, Kenneth M. Cooke, and R. E. Shippley (Tr. 2753-2856).

[8]This panel consisted of Kenneth Herring, Charles Trammell, Vincent Noonan, Henry George, and D. McDonald.

whether generic or plant-specific, which have any bearing on the safety of interim operation of the facility (Tr. 2925, 2927, 2930-2).

3. Conclusions on Seismic Capability of Safety-Related Equipment

61. Based on the evidence with regard to the floor response spectra and the seismic qualification of safety-related equipment, components, systems, and piping, the Board finds that the resulting floor response spectra were properly derived, are appropriately conservative, and adequately bound both the low and high frequency responses that may result from earthquakes up to and including the SSE. The Board also finds that the safety-related equipment, components, and systems necessary for safe shutdown, as well as the safety-related piping after modification, are adequately qualified to withstand the SSE (pge Exh. 21, pp. 7-10; Staff Exh. 9, pp. 1, 2; Tr. 2929).

F. Instrumentation and Operation to Assure Safe Shutdown

1. Instrumentation to Measure Seismic Events

62. The location and function of the three independent seismic instrumentation systems in operation at the plant are:

(a) a triaxial multi-element response spectrum recorder with peak shock annunciator,
(b) five triaxial time-history recording accelerographs, and
(c) seven triaxial peak recording accelerographs.

The orientation of the instruments is on the three principal axes (north-south, east-west, and vertical). System (a) provides a permanent record of peak response accelerations of measurable ground motions in the three directions, and is connected to the peak shock annunciator to provide essentially instantaneous visual indication in the control room of any earthquake in excess of preset acceleration level at which shutdown is required, typically the OBE. System (b) provides data allowing a determination of frequency, amplitude, and mode shapes for establishing the seismic responses of Trojan Category I structures, and is activated at a ground acceleration of 0.01g. System (c) provides additional data for the evaluation of the effect of an earthquake on structures and equipment (PGE Exh. 15, pp. 1-3). The seismic monitoring instrumentation is not connected in any way into the reactor control system to achieve an automatic action as a result of any seismic event, but rather requires operator reaction to initiate reactor control inputs.

2. Operational Procedures to Respond to a Seismic Event

63. In the event of an earthquake exceeding the setting for a level requiring shutdown, the peak shock annunciator of System (a) would provide an immediate visual indication to the plant operators. If the time-history recorder of System (b) is also triggered (0.01g level), the operator will start the reactor shutdown sequence. In addition, if the operator observes the peak shock annunciator and feels the tremor himself, he will initiate the reactor shutdown procedure (Tr. 2051-4).

64. Under these initiating circumstances, the plant's emergency procedures direct that the plant be brought to a cold shutdown and inspected to determine the effects of the earthquake. In the process of achieving cold shutdown, the operators monitor plant instrumentation to assess plant status and the presence of any abnormal condition. They conduct an overall plant inspection to identify any potential problem. This is followed by a more detailed inspection focusing primarily on any identified problems. Trojan technical personnel are called to the plant to process the information recorded by the seismic instrumentation, which is then used for a detailed evaluation of the earthquake (PGE Exh. 16, pp. 1-2; Tr. 2049-54, 2058-9).

3. Capability to Shut Down in Case of an SSE

65. The evidence demonstrates that actual failure of the Control Building due to an SSE is not a credible event (PGE Exh. 10, pp. 16-17; Exh. 12, p. 10; Tr. 678-9, 687-8, 1032-3, 1471, 1527-9, 1565, 1572-5, 1581-2, 1600-1, 1751-2, 1756). The ability to achieve safe shutdown, assure integrity of the reactor coolant system, and prevent or mitigate consequences of serious accidents, would not be affected by estimated displacements during an SSE (PGE Exh. 12, pp. 15-6; Tr. 1034, 1475, 1603). The evidence shows further that the reactor could even be shut down without any use of equipment in the Control Room, although with difficulty (Tr. 666-76, 1968, 2174-5). Any reduced capacity of the Control Building walls will not adversely affect safety-related equipment within the Building Complex sufficient to prevent safe shutdown in the event of an SSE.

4. Conclusions on Ability to Shut Down Safely

66. The evidence has clearly established that the facility's seismic instrumentation is adequate to provide both an immediate indication of

an earthquake of 0.01g or above and an annunciator warning to the operator at a setting of 0.08g level of seismic activity.

67. The Board finds that the procedures for actions to be taken during and subsequent to a seismic event requiring shutdown are appropriate and adequate to assure that the facility will be brought safely to the cold shutdown condition (Tr. 2049-54, 2058-9).

G. NRC Staff Inspection and Evaluation Following a Seismic Event

1. Procedures for Notification of NRC by Licensees

68. The Technical Specifications for the Trojan Nuclear Plant operation require that a written report be made within 10 days if the seismic instrumentation should be activated for any reason. The Technical Specifications in §6.9 moreover, require immediate reporting to the NRC within 24 hours of acts of nature which result in the plant being shut down, including results of seismic events (Tr. 1873-4). The plant superintendent further confirmed that "immediate reporting" would take place after assuring safe conditions at the plant and that notification of the NRC by the plant superintendent or the assistant superintendent would be a priority action (Tr. 1876-7). Normally, this would be within one to two hours following a seismic event requiring shutdown, the actions being in accordance with the licensees' emergency procedure (PGE Exh. 16, p. 1).

2. Procedures for Inspection of the Facility

69. If the setting of the seismic instrumentation corresponding to the OBE or similar requirement were exceeded, the plant operation would not resume without prior approval of the NRC (PGE Exh. 15, p. 4; Exh. 16, p. 3). Subsequent to achieving cold shutdown, the Licensees would undertake a detailed investigation and evaluation of the seismic instrumentation data. Furhter, the Licensees would conduct inspections to determine the extent of the effects of the earthquake on the facility (PGE Exh. 15, p. 4; Exh. 16, pp. 2-3).

70. Immediately upon notification, the NRC's Office of Inspection and Enforcement would activate headquarters and regional response teams depending on the severity of the event (Staff Exh. 1, pp. 11). Inspectors would be dispatched to the plant who, in combination with the NRC's resident inspector, would verify the status of the plant and determine the nature of radiological releases, if any (Staff Exh. 1, pp.

13-14). A detailed visual inspection would be conducted of joints between structures, steel frames, beams and columns, wall penetrations, ductwork, piping, cable trays, pipe restraints, walls, floors, hatches, and doors for shifting, deformation, breakage, spalling, cracking system leaks, and the like to determine if any damages were caused by the earthquake (Staff Exh. 1, pp. 13-15; Tr. 1669-71, 1674-5, 1708-12). Based on this inspection and an evaluation of the Licensees' analyses, a determination would be made as to whether resumption of operation should be authorized by the NRC or whether additional inspections, testing, analysis, or repair of structures, systems, and components would be required (Staff Exh. 1, p. 15; Tr. 1683-4, 1715-23, 1726-7).

3. Conclusions on Assuring Adequate Notification and Inspection

71. The Board finds that the Licensees' procedures for actions to be taken subsequent to a seismic event requiring shutdown are appropriate and adequate to provide for prompt notification so that NRC actions could be initiated in a timely manner. The evidence also shows that the NRC Staff procedures in combination with those of the Licensees' personnel for inspection of the facility following shutdown after an earthquake are adequate to maintain safe conditions at the facility, and resumption of operation would not be authorized until the safety of resumed operation was demonstrated.

H. Preliminary Activities Relating to Later Plant Modifications

72. During the hearing, the Board inquired into the effects on interim operation of plant modifications that might be undertaken before the Control Building is strengthened. The Licensees described their standard procedures, which require that any requested design change be reviewed to assess potential impact on the plant, particularly from the standpoint of plant safety. These standard procedures provide assurance that no design change or modification is approved unless a determination has been made that it does not require revision of Technical Specifications nor constitute an unreviewed safety question. If such a review, which is documented and the record kept on file, indicates that a proposed modification could reduce the strength of the shear walls, the modification would not be made without prior NRC approval (PGE Exh. 13, pp. 3-4, and Attachment 1; Tr. 2045-6).

73. The Licensees are also providing to the Licensing Board and all parties in this proceeding an identification and description of all proposed

work which might potentially affect the Control Building shear walls (PGE Exh. 13, Attachment 1, p. 2; PGE Exhs. 2, 3, 4 and 5).

74. Based on our review of this evidence and on the fact that prior to the time that major modifications to strengthen the Control Building are undertaken, such modifications and their effects on interim operation will be fully assessed (Staff Exh. 6, p. 17), the Board is satisfied that adequate procedures are being used to assure that the safety of interim operation will not be adversely affected by plant modifications.

I. Environmental Considerations

75. Since the evidence establishes that the Control Building even with its design deficiencies will safely withstand the SSE without gross failure or collapse of the structure or walls therein, and because the facility can safely be brought to the cold shutdown condition after the occurrence of any earthquake up to and including the SSE, it is clear that authorization of interim operation will not result in environmental effects or impacts that differ in any way from those previously evaluated for this facility at the construction permit and operating license stages (Staff Exh. 8, p. 1; Tr. prehearing conference of August 14, 1978, pp. 6552-8; Tr. 2126). There is nothing that would indicate that interim operation would involve environmental impacts other than those previously considered and evaluated in the prior initial decisions.[9] Consequently, we find that authorization of interim operation does not require the preparation and issuance of either an environmental impact statement or an environmental impact

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[9]In a written limited appearance statement submitted by Doreen L. Nepom dated October 25, 1978 (Tr. 1516), the argument was made that under the Commission's regulations, any license amendment permitting interim operation must, *per se*, be accompanied by such an environmental impact statement as would be required for the initial issuance of an operating license. This argument is contrary to the requirements of the National Environmental Policy Act and the Commission's regulations. In an amendment proceeding, a Licensing Board may not:

> . . . embark broadly upon a fresh assessment of the environmental issues which have already been thoroughly considered and which were decided in the initial decision. Rather, the Board's role in the environmental sphere will be limited to assuring itself that the ultimate NEPA conclusions reached in the initial decision are not affected by such new developments . . . .

Georgia Power Company (Alvin W. Vogtle Nuclear Plant, Units 1 and 2), ALAB-291, 2 NRC, 494, 415 (1975). *See also Detroit Edison Company* (Enrico Fermi Atomic Power Plant, Unit 2), LBP-78-11, 7 NRC 381, 393 (1978); *Northern States Power Company* (Prairie Island Nuclear Generating Plant, Units 1 and 2), ALAB-455, 7 NRC 41, 46 at n. 4 (1978). Ms. Nepom's arguments are thus without merit.

appraisal and negative declaration pursuant to 10 CFR 51.5(b) and (c) (Staff Exh. 8, p. 1).

J. Concerns of Intervenors and Limited Appearances

76. Many of the concerns articulated by Intervenors and persons making limited appearance statements involve matters beyond the scope of issues to be considered in the hearing on interim operation. For example, a request was made for an overall safety audit of the Trojan facility (Tr. 467-8). However, our jurisdiction in this phase of the proceeding is limited to determining whether interim operation of the as-built Control Building and the related equipment can be authorized with reasonable assurance that such operation will not endanger the public health and safety. We are not authorized to examine matters that were explored at the construction permit or operating license stages, nor can we expand the issues beyond those related to the design deficiencies that resulted in the notice of hearing which described the issues we are empowered to consider.[10] Although a safety audit of the entire Trojan facility is beyond our authority, we did permit all Intervenors to cross-examine fully on the nature, effect, and ramifications of the identified design deficiencies, and no safety questions were left unexplored.

77. The Consolidated Intervenors also attempted to relitigate the need for power (Tr. 2572). The need for power was previously determined in the construction permit and operating license proceedings, as part of striking a cost-benefit balance under NEPA. Thus, this issue has not only been disposed of in prior proceedings, but it has no place in this proceeding because of our determination that interim operation will not have any environmental effects that differ from those previously evaluated (Section I., *supra*). The Licensees hold an operating license for the Trojan facility, and they are not required to prove again a need for power, provided that interim operation can be conducted safely in view of the identified design deficiencies. Safety, not need for power, is the primary issue in this proceeding.

78. Other concerns of Intervenors have already been considered and held to be without merit, including reliance on Bechtel information corroborated by other experts,[11] and the necessity of preparing an environmental impact statement regarding the proposed amendment allowing interim operation.[12]

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[10]*Public Service Company of Indiana, Inc.* (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-316, 3 NRC 167, 170-1 (1976).

[11]Section II., D., 7., pp. 734-735, *supra.*

[12]Section II. I. pp. 744-745, *supra.*

79. The limited appearance statement of Mr. Robert Pollard raised questions related to the seismic qualification of safety-related electrical equipment[13] and fire protection equipment,[14] which we previously discussed and considered satisfactorily answered by witnesses furnished by the Licensees and the Staff at the Board's request (Tr. 2716-20, 2723-9, 2736, 2742-4, 2753-2879, 2886-2994). The Staff's panel of witnesses all testified categorically that they know of no unresolved safety issues, whether generic or plant-specific, which have any bearing on the safety of interim operation of the Trojan facility, and we find such testimony to be worthy of belief (Tr. 2925, 2927, 2930-2).

III. CONCLUSIONS OF LAW

The scope of this proceeding is limited to the issue of whether interim operation of the Trojan Nuclear Plant with identified design deficiencies in the Control Building should be permitted prior to such modifications as may be required to bring the facility into substantial compliance with the license. We have thoroughly reviewed all of the evidence submitted by all parties with respect to this issue. We have also considered all of the proposed findings of fact and conclusions of law submitted by the parties. Those proposed findings not adopted in this Partial Initial Decision are herewith rejected. Based upon our evaluation of the entire record, including all exhibits admitted into evidence as well as the answers elicited from witnesses in response to questions of the Board and the parties, we conclude that:

(1) Interim operation of the Trojan Nuclear Plant should be permitted in accordance with the amendment to the operating license set forth in the order below and subject to the terms and conditions therein;

(2) There is reasonable assurance that the activities authorized by the operating license, as thus amended, and including the terms and conditions set forth in the order below, can be conducted without endangering the health and safety of the public;

(3) There is reasonable assurance that the activities authorized by the operating license, as thus amended, and including the terms and conditions set forth in the order below, will be conducted in compliance with the Commission's regulations;

(4) The issuance of this operating license amendment as set forth in the order below will not be inimical to the common defense and security or to the health and safety of the public; and

[13]Section II., E., pp. 738-740, *supra.*

[14]*Id., supra.*

(5) The issuance of this operating license amendment is not a major Federal action significantly affecting the quality of the human environment, and it does not require the preparation of an environmental impact statement under the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321, *et seq.*), and Part 51 of the Commission's regulations (10 CFR Part 51), or the preparation of an environmental impact appraisal and negative declaration under Part 51 of the Commission's regulations.

IV. ORDER

Wherefore, it is ORDERED, in accordance with the Atomic Energy Act of 1954, as amended, and the regulations of the Nuclear Regulatory Commission, and based on the findings and conclusions set forth herein, that the Director of Nuclear Reactor Regulation is authorized to make appropriate findings consistent with this Partial Initial Decision in accordance with the Commission's regulations, and to issue the appropriate license amendment to Facility Operating License No. NPF-1, authorizing interim operation of the Trojan Nuclear Plant. This license amendment shall contain the following provisions and conditions:

(1) Upon the effective date of this amendment to Facility Operating License No. NPF-1, and until further order of the Atomic Safety and Licensing Board issued in conjunction with the decision on the scope and timeliness of modifications from a safety standpoint required by the Order for Modification of License of May 26, 1978, Facility Operating License No. NPF-1 is modified by waiver of those portions of Technical Specification 5.7.1 and the FSAR criteria referenced therein which are not complied with because of the identified design deficiencies in the Control Building shear walls, including:

(a) the requirement that the Control Building meet an OBE capacity of 0.15g using 2% damping as required by FSAR Table 3.7.1;

(b) the requirement that the Control Building meet an OBE capability of 0.15g and an SSE capability of 0.25g using a yield strength for reinforcing steel of 40,000 psi in accordance with ASTM minimum values as required by FSAR §3.8.1.3.3; and

(c) the requirement that the masonry portions of the Control Building walls meet Uniform Building Code requirements for reinforced grouted masonry as specified in FSAR §3.8.1.4.

(2) During the term of this amendment, the facility shall be operated in accordance with the following conditions:
   (a) no modification which may reduce the strength of the existing shear walls shall be made without prior NRC approval; and
   (b) in the event that an earthquake occurs that exceeds the facility criteria for a 0.08g peak ground acceleration at the plant site, the facility shall be brought to a cold shutdown condition and be inspected to determine the effects, if any, of the earthquake. Operation cannot resume under these circumstances without prior NRC approval.

(3) Operation of the Trojan facility pursuant to this amendment may commence only after completion of such additions and modifications of pipe supports and pipe restraints, as are necessary to assure that piping systems within the Control, Auxiliary, and Fuel Building Complex required for safe shutdown and to maintain offsite doses from accidents to within the guidelines of 10 CFR Part 100, are qualified to withstand earthquakes up to and including the 0.25g SSE.

It is further ORDERED, in accordance with 10 CFR 2.760, 2.762, 2.764, 2.785, and 2.786, that this Partial Initial Decision shall be effective immediately and shall constitute the final action of the Commission forty-five (45) days after the issuance thereof, subject to any review pursuant to the above-cited Rules of Practice. Exceptions to this Partial Initial Decision may be filed within ten (10) days after service of this Partial Initial Decision. A brief in support of any such exceptions must be filed within thirty (30) days thereafter (forty (40) days in the case of the NRC Staff). Within thirty (30) days of the filing and service of the brief of the Appellant (forty (40) days in the case of the NRC Staff), any other party may file a brief in support of, or in opposition to, the exceptions.

IT IS SO ORDERED.

THE ATOMIC SAFETY AND
LICENSING BOARD

Dr. Kenneth A. McCollom, Member

Dr. Hugh C. Paxton, Member

Marshall E. Miller, Chairman

Dated at Bethesda, Maryland,
this 21st day of December 1978.

[Appendix A has been omitted from this publication but is available in the NRC Public Document Room, 1717 H Street, N.W., Washington, D.C.]

Cite as 8 NRC 750 (1978) LBP-78-41

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Sheldon J. Wolfe, Chairman
Dr. E. Leonard Cheatum
Ralph S. Decker

In the Matter of **Docket Nos. 50-516 CP**
50-517 CP

LONG ISLAND LIGHTING COMPANY
NEW YORK STATE ELECTRIC
AND GAS CORPORATION

(Jamesport Nuclear Power
Station, Units 1 and 2) **December 26, 1978**

Upon reevaluation of the probable health effects associated with the operation of the Jamesport plant and the fuel cycle which supports it, including the health effects of radon-222, the Licensing Board reaffirms its conclusion that the plant is needed and that the benefits to be derived from it outweigh all associated costs.

TECHNICAL ISSUES DISCUSSED: Health effects of nuclear fuel cycle; health effects of coal fuel cycle; characteristics of radon-222; radon released from mining; radon released from milling; transport and radiological dose of radon and daughters; health effects of radon.

INITIAL DECISION
(Construction Permit)

Appearances

W. Taylor Reveley III, Esq., Case Whittemore, Esq., Jeffrey Futter, Esq., and **Edward J. Walsh, Esq.,** for the Applicant, Long Island Lighting Company, and **Frederick H. Lawrence, Esq.,** for Applicant, New York State Electric and Gas Corporation.

Irving Like, Esq., Werner J. Zumbrunn, Esq., for Intervenor, County of Suffolk; **Jean H. Tiedke, Shirley Bachrach, Adelaide Flatau, Laetitia Bradley, Mari Quint,** and **Jean E. Marriner,** for Intervenor, League of Women Voters; **Joseph E. Cramer, Esq.,** and **William Chapek,** for Intervenor, International Brotherhood of Electrical Workers, Local 25, AFL-CIO: **Sandra Caron, Esq.,** and **Jeffrey Cohen, Esq.,** Counsel for Intervenor, New York State Energy Office; **Donald E. Brown, Esq., Jonathan Sinnreich, Esq.,** and **Bruce Coolidge, Esq.,** for Intervenor, Town of Riverhead; **Anthony J. Montenigro** for Intervenor, Environmental Protection and Progress Committee, Local 25; **Dr. Caryl R. Granttham** and **Ann Carl** for Intervenor, Concerned Citizens of Suffolk County.

Bernard M. Bordenick, Esq., Richard Goddard, Esq., Lawrence J. Chandler, Esq., Harry H. Glasspiegel, Esq., William Massar, Esq., Lawrence Brenner, Esq., and **Richard K. Hoefling, Esq.,** for the United States Nuclear Regulatory Commission.

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I. PRELIMINARY STATEMENT

In Item V.F.2 of the attachment to our order of June 25, 1976, this Board requested testimony on how Table S-3 of 10 CFR Part 51, which summarizes the environmental effects of the uranium fuel cycle, is applied in licensing cases such as the present. Subsequently, in an order of March 15, 1977, we asked whether the revised "interim" Table S-3 values, 42 Fed. Reg. 13803,[1] would tilt the cost-benefit balance aganist *Jamesport.* Thereafter, in response to an Appeal Board decision in another case,[2] the Staff and other parties to this proceeding embarked, with Board approval, on a detailed comparison of the environmental/health effects of comparable nuclear and coal plants, taking into account their respective fuel cycles.

Before the Board reached an initial decision, Table S-3 was amended to delete the value for radon-222 (radon). 43 Fed. Reg. 15613 (April 14, 1978). The reason for removing the radon value was that "new estimates of releases have been devised that require upward revision of the value for radon in Table S-3" (*id.* at 15614.) The Commission directed that, in proceedings pending before licensing boards, the record on NEPA issues should be reopened for the limited purpose of receiving new evidence on radon releases and on health effects resulting from radon releases (*id.* at 15616.)

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[1]The effectiveness of the interim Table S-3 values was recently extended to March 14, 1979. 43 Fed. Reg. 41373 (September 18, 1978).

[2]*Tennessee Valley Authority* (Hartsville Nuclear Plant, Units 1A, 2A, 1B, and 2B), ALAB-367, 5 NRC 92 (1977).

Because of the Commission directive, this Board declined in its *Jamesport* decision of last May to deal with radon, other environmental/health effects related to the coal and nuclear fuel cycles, and ultimate cost-benefit issues. See *Long Island Lighting Company* and *New York State Electric and Gas Corporation* (Jamesport Nuclear Power Station, Units 1 and 2), 7 NRC 826 (1978) (hereinafter cited as *Jamesport* Partial Initial Decision or PID).

In further implementation of the Commission's directive, the Board ordered that the *Jamesport* record be reopened "for the limited purpose of receiving new evidence on radon releases and on health effects resulting from radon as well as the other gaseous and liquid effluents listed in Table S-3" (Board Order of June 1, 1978, at 2-3). The parties responded by submitting to the Board a Stipulation Relating to Procedures and Schedules Regarding Board Consideration of Radon-222 and Associated Health Effects (Stipulation), dated July 27, 1978. The Stipulation provided that (a) the record compiled on radon and its health effects in *Duke Power Company* (Perkins Nuclear Station, Units 1, 2, 3), Docket Nos. STN 50-488, 50-489, 50-490, would be incorporated, with this Board's approval, into the *Jamesport* record to the extent that it was admitted as evidence in *Perkins,* and (b) further evidence on those matters would be offered by parties to this proceeding at a deposition on July 27, 1978. In an order dated July 31, 1978, we approved the procedures and schedules set out in the Stipulation.

On September 11, 1978, Staff submitted its proposed supplementary findings. On September 26, 1978, the Applicants, the County of Suffolk, and the League of Women Voters respectively filed proposed supplementary findings of fact and conclusions of law. Thereafter, the Staff filed a reply dated October 11, 1978.

We do not address separately the original Board questions on how Table S-3 is applied in licensing cases nor whether the values in interim Table S-3 tilt cost-benefit balances previously struck. These questions are encompassed within broader matters raised subsequently to which we now turn.

II. FINDINGS OF FACT

A. Health Effects of the Coal and Nuclear Fuel Cycles

1. Before considering the new testimony on radon presented pursuant to our order of June 1, 1978, we will first discuss the evidence adduced on comparative health effects of the coal and nuclear fuel cycles before the record was reopened on the radon matter.

2. Appearing for the Staff was Dr. R. L. Gotchy (written testimony fol. Tr. 8687, pp. 1-12, and attached Appendix A). Applicants introduced Ex.

18 comprising testimony presented previously by them in the Siting Board (Article VIII) proceeding on *Jamesport*[3] (Tr. 8310-8311, 8978-8980). Suffolk County introduced as its Ex. 52, testimony presented by several witnesses sponsored by the County, the Long Island Farm Bureau, and other parties in the Article VIII proceeding[4] (Tr. 9195-9198, 9208). The Board admitted SC Ex. 52 with the qualificaiton that the other parties at the time of submitting their proposed findings could object to portions of the testimonies as being irrelevant and/or constituting challenges to the NRC regulations (Tr. 8316-8318).

3. In his testimony on health effects of the nuclear and coal fuel cycles, Dr. Gotchy explained the bases for his analysis (pp. 1-2) and in Appendix A, set forth the assumptions affecting his evaluation of effects, presented four tables summarizing the results of his evaluations, and provided a list of literature cited containing 39 references.

4. Dr. Gotchy defined health effects to mean excess (*i.e.*, effects occurring at a higher than normal rate) mortality, morbidity, and injury among occupational workers and the general public as a result of routine operations at the facilities. His primary source of information for the uranium fuel cycle analysis was Table S-3 from 10 CFR Part 51. Table S-3 lists the amounts of radioactive and nonradioactive materials that are released to the environment as a result of routine operations at uranium fuel cycle facilities. The radioactive effluents listed in Table S-3 were used to calculate the 50-year dose committment to the U.S. population and then estimated the human health effects from those doses using risk estimators set out in NUREG-0002, *Final Generic Environmental Statement on the Use of Recycle Plutonium in Mixed Oxide Fuel in Light Water Cooled Reactors* (GESMO I), and WASH-1400, *Reactor Safety Study.* He also used the occupational doses that appear in Table S-3 and GESMO I to determine the health effects for fuel cycle workers. The doses from transportation of material among the fuel cycle facilities were taken from Tables S-3 and S-4. The same risk estimators were used to convert these doses into health effects. Dr. Gotchy's assessment of health effects, including those from routine operations and accident conditions was based on the generic assessments in GESMO I and WASH-1400. His estimates of health effects from nonradioactive causes relied on several Brookhaven National Laboratory reports and Table S-4 (*id.* pp. 1-2.)

5. Dr. Gotchy calculated uranium fuel cycle effects for the general

[3]In summary, Applicants' Ex. 18 consists of direct testimony of seven witnesses (approx. 210 pages) and 3,200 pages of cross-examination.

[4]SC Ex. 52 consists of approximately 1,500 pages of testimony by eight witnesses including their cross-examination.

public in the U.S. and fuel cycle workers in two situations: (a) an all-nuclear case assuming that electrical power used in fuel cycle facilities would be generated at nuclear power plants, and (b) a mixed case assuming that the electricity for nuclear fuel cycle facilities would come from coal-fueled power stations (*id.* at p. 2, Tables 1, 2.) In contrast to this, for the coal fuel cycle, the health effects for the general population were estimated only for those living within 80 km (50 miles) of the coal facilities (*id.*, Appendix A, p. 2; Tr. 8802), even though there is evidence that significant health effects do occur at distances beyond 80 km (Tr. 8805). The reason for this difference is that the uncertainties associated with projecting fuel cycle health effects become much greater for coal than uranium at distances of more than 80 km from the source of the effluents (Tr. 8805-06).

6. The results of the Staff analysis are set out in the following table, which combines the occupational and general public columns from Dr. Gotchy's Tables 1 and 2 from Appendix A.[5]

	Fatalities	Diseases/Injuries
Nuclear fuel cycle: all nuclear[a]	0.48	14
Nuclear fuel cycle: mixed	1.1-5.4	17-24
Coal fuel cycle[b]	15-120	57-210
Ratio of coal to nuclear:		
All nuclear	31-250	4.1-15
Mixed	14-22	3.4-8.8

[a]For U.S. population.
[b]For population within 80 km of facility.

7. In its Ex. 18, LILCO presented its analysis of the health effects of uranium and coal fuel cycles and reached conclusions similar to those of the Staff though its methodology differed in some respects. For example, instead of analyzing two separate nuclear fuel cycle cases, LILCO made a single nuclear assessment. Relying on the fact that nearly all of the electricity required to power the uranium fuel cycle facilities is used during the enrichment process, LILCO included in the enrichment step of its nuclear assessment the health effects caused by the coal-fueled generation of electricity. It did not, however, include the health effects associated with the other coal fuel cycle operations, such as mining and transportation.

Thus, the upper bounds of health effects reflected in LILCO's nuclear assessment were slightly lower than those of the Staff's mixed nuclear case. Relying on several sources, especially the Report of the Biological Effects of

[5]Table 1, Excess Mortality Summary per 0.8 GWy(e), and Table 2, Excess Morbidity and Injury Summary per 0.8 GWy(e).

Ionizing Radiation Committee of the National Academy of Science, LILCO used risk estimators that were somewhat higher than the NRC Staff's, which were based on GESMO I and WASH-1400. The results of LILCO's analysis are given in the following table which combines routine operations and accidents:

	Fatalities	Diseases/Injuries
Nuclear fuel cycle	0.38-4.82	7.87-11.87
Coal fuel cycle	5.32-112	166-332
Ratio of coal to nuclear	14-23	21-28

.8. We have studied the testimony of all eight witnesses as presented in SC Ex. 52 and we concur with the Applicants' and Staff's evaluation that the great bulk of Ex. 52 either is not relevant to a comparison of fuel cycle health effects, or challenges NRC regulations in a manner prohibited by 10 CFR 2.758. In the following paragraphs we briefly describe the testimonies of the eight witnesses, and rule on those parts of each which we find admissible or inadmissible as the basis of findings of fact on fuel cycle health effects:

(1) The testimonies of Messrs. Bridenbaugh (Siting Board Tr. 25173, *et seq.*) and Pollard (*id.* at Tr. 25909, *et seq.*) were mainly an attack on the adequacy of the Commission's health and safety regulations and NRC enforcement of existing regulations. As such the Bridenbaugh and Pollard testimonies are inadmissible as being an attempt to challenge in the wrong forum the adequacy of Commission regulations and performance.

(2) Part of the testimony of Dr. Marvin Resnikoff (Tr. 25432-38) discussed the state of fuel reprocessing facilities and their future uncertainties, the uncertainties in future nuclear fuel costs, political and economic questions relating to plutonium recycle, and the status of high-level waste solidification technology. He also commented on the economics of plant decommissioning (Tr. 25446-47). We concur with Applicants and Staff and rule that these portions are irrelevant and thus inadmissible. Dr. Resnikoff stated that "far and away" the largest environmental cost is due to radon-222 from uranium mill tailings. He cited R. O. Pohl (study published in 1976) who integrated health effects over the full life of some of the radioactive materials released from fuel reprocessing including krypton-85, tritium, and carbon-14, and Rn-222, from thorium-230 in mill tailings. In the case of carbon-14, and Rn-222, health effects were calculated for the world population, and assumed that tailings piles would remain uncovered (Tr. 25439-45). We admit in evidence his calculations of health effects from carbon-14 and Rn-222 and will discuss his underlying assumptions (similar to those of Dr. Tamplin) in these calculations when we discuss testimony in

the reopened record, *infra.*

(3) Dr. Irwin D. J. Bross (Tr. 27038-50) focused primarily on statistical evidence from his Tri-State Study which he claimed indicated that health effects from low-level radiation were underestimated by the Applicants who followed the BEIR Committee's use of the linear hypothesis in calculating health effects from ionizing radiation. Dr. Bross asserted these effects mainly consisted of cumulative genetic degradation resulting in various manifestations of disease, and increased incidence of leukemia in children of 5-10 years of age who were exposed during prenatal life (Tr. 27039-41). We admit this part of his testimony as relevant to the controversy over the validity of the linear hypothesis at low-level, low-dose radiation, to be discussed below.

We reject, as inadmissible, his challenge to the Commission's radiation protection standards (Tr. 27039-41) and his discussion of the lack of reliability of both nuclear hardware and operators as elements of a mindless technology, and his recommendations for elimination of the Energy Research and Development Administration (Tr. 27044-48).

(4) Mr. William Kelleher, a witness for the New York State Department of Environmental Conservation, described the role of that department in radiation monitoring (Tr. 27163-65, 27170, 27178-80), described his views on low-level waste burial facilities (Tr. 27172-73), and status of reprocessing facilities (Tr. 27174-75). We reject this testimony as irrelevant to the health effects question.

Mr. Kelleher challenged the validity of Table S-3's value of 22.6 person-rem for the occupational dose from reprocessing and waste management (Tr. 27177-78) and challenged the Commission's assessment of the environmental impacts of transportation put forth in Table S-4 (Tr. 27174). This testimony is inadmissible.

His criticism of LILCO on inadequacy of the health effects evaluation of radon emissions associated with uranium mining and milling (Tr. 27198) is relevant in light of new evidence which we will discuss in the reopened record, *infra.*

(5) Mr. Paul A. Giardina testified that the Staff's analysis of radiation and health effects from transportation of radioactive materials to and from the *Jamesport* site was inadequate. He contended that high population densities along a substantial part of the ground transportation route rendered Table S-4, as a basis for the Staff's generic assessment, inappropriate and deficient (Tr. 26146-48). This testimony, being a challenge to Table S-4, is inadmissible.

Mr. Giardina maintained there was an inadequacy of hard data for assessing relative health effects between alternative fuel cycles. He did say, however, that it appeared occupational fatalities from coal were much

higher than from oil, gas, and uranium (Tr. 26149-50). This testimony is relevant and is therefore admissible.

He described EPA efforts to establish protective action guides in case of emergencies at a nuclear facility. In the case of *Jamesport*, he advised that a radiological emergency response plan applicable to a 9-mile radius from the plant should be considered assuming a worst case design basis accident (Tr. 26151-59). We consider this portion of the testimony to be irrelevant in that it does not bear on the health effects question.

(6) Dr. Jan Beyea's testimony as a whole dealt with the consequences of a "hypothetical catastrophic accident" at *Jamesport*, and bore on the question of site suitability and emergency evacuation beyond the low population zone (Tr. 27412-59). We find Dr. Beyea's testimony inadmissible on the health effects question because it challenges the Commission's basis for determining the values in Table S-3 which expressly excludes Class 9 accidents from consideration.

(7) Dr. Arthur R. Tamplin's testimony at the Article VIII proceedings (Tr. 27283-86) was based on evidence he presented at the GESMO I hearings (Tr. 27298). This testimony is relevant and, as supplemented and/or modified in the reopened record, is discussed in our findings, *infra*.

B. The Reopened Record

9. The witnesses offering testimony for Duke Power Company in the *Perkins* case were L. C. Dail, Leonard D. Hamilton (written testimony fol. P-Tr. 2265, pp. 1-3), Morton I. Goldman (written testimony fol. P-Tr. 2265, pp. 1-15), and Lionel Lewis (written testimony fol. P-Tr. 2265, pp. 1-7).[6] Staff witnesses presenting written affidavits (fol. P-Tr. 2369) in *Perkins* were R. L. Gotchy, Paul J. Mango, Jack E. Rothfleisch, and R. M. Wilde. A supplementary affidavit of R. L. Gotchy was also accepted into the *Perkins* record following P-Tr. 2425. Kathleen Black sponsored an affidavit originally prepared by Homer Lowenberg (also fol. P-Tr. 2369). Hubert J. Miller (P-Tr. 2393, *et seq.*), G. Wayne Kerr (P-Tr. 2476, *et seq.*), and John K. Lerohl (P-Tr. 2531, *et seq.*) also testified for the Staff in *Perkins*. Chauncey Kepford appeared for the *Perkins* Intervenors. His deposition was taken on June 3, 1978 (P-Tr. 2674, *et seq.*).

10. At the *Jamesport* deposition held July 27, 1978, the Applicants presented Leonard D. Hamilton (Tr. 9234b, *et seq.*). Staff witnesses were Ralph M. Wilde (Tr. 9269-9274) and R. L. Gotchy (written testimony fol. Tr. 9268). Written testimony of John K. Lerohl was incorporated into the

[6]Citations to "P-Tr." refer to the *Perkins* transcript as distinguished from "Tr." citations which refer to the *Jamesport* transcript.

record fol. Tr. 9268. Suffolk County presented Arthur R. Tamplin (written testimony fol. Tr. 9327, pp. 1-13).

Radioactive Liquid and Gaseous Effluents

11. The Commission notice which deleted the quantity of radon from Table S-3 also removed dose estimates and made it clear that the table did not include health effects. 43 Fed. Reg. 15613 (April 14, 1978). Therefore, as previously indicated in our order of June 1, 1978, we reopened the record for the limited purpose of receiving new evidence on radon releases and health effects resulting from radon as well as from the other gaseous and liquid effluents listed in Table S-3. In response, Staff witness Gotchy provided written testimony entitled Carbon-14 Radiological Impact Assessment (fol. Tr. 9268) which extended previous estimates for an environmental dose commitment period of 100 years out to 1,000 years. The extended value is incorporated into Dr. Gotchy's final results (Tables 1 and 2, Encl. 5, supplemental affidavit of May 10, 1978). Witness Gotchy also provided tables listing curie releases of all radioactive effluents from the nuclear fuel cycle (enclosure I to supplemental affidavit of R. L. Gotchy). Staff witness Gotchy stated that "although it would be possible to reproduce the entire listing of nuclides considered in S-3 and GESMO, that is not necessary since most of the radiological impact of the entire uranium fuel cycle is accounted for by relatively few radionuclides" (*ibid.* at p. I-1). Dr. Gotchy stated further that "the Rn-222 source term is of overriding importance in quantifying the radiological impact of the uranium fuel cycle" (*ibid.* at p. I-2). No other party provided testimony on radioactive effluents other than radon in response to our order of June 1, 1978, and the statements of Dr. Gotchy quoted above were not challenged. Consequently, we now focus on radon releases and their health effects.

Characteristics of Radon

12. Radon-222 is one of the natural products of the decay of uranium-238 which has a half-life of 4.5 billion years. Uranium is widespread in varying concentrations and depths throughout the continents of the worlds.[7] The precursors of radon are all solids which tend to remain within the uranium ore bed. Two of them have long half-

[7]*See,* for example, Chapter 6 of NCRP Report No. 45 issued November 15, 1975, by the National Council on Radiation Protection and Measurements. Since this document was used by the Staff and Suffolk County, the Board takes official notice of it for the purpose of providing some of the background information in this section of our initial decision.

lives—thorium-230 with 80,000 years, and radium-226 with 1,600 years. Radon is a noble gas with a half-life of 3.8 days. When radon is formed from the decay of radium, it diffuses through the ore and any soil covering the ore. Due to its relatively short half-life, some of the radon decays into solids before reaching the atmosphere. The amount of decay depends on the permeability of the soil and the depth through which the radon must diffuse. Typically, 2 feet of soil will hold up radon long enough to permit about 25% of it to decay allowing 75% to escape (Mango, written testimony at 9). As a consequence the atmosphere everywhere contains small concentrations of naturally generated radon and its daughters—mostly lead-210 and polonium-210 which are found in the atmosphere as aerosols. When soil covering uranium deposits is removed for any reason, including mining, greater than normal amounts of radon escape into the atmosphere. Conversely, if ore deposits are covered with soil, the amount of radon escaping is reduced.

Radon Released From Mining

13. Nearly all uranium is mined by either of two methods: deep mining or open-pit mining. At this time, roughly half of the uranium comes from deep mines, but this fraction is expected to increase in the future (*see* P-Tr. Lerohl, 2543; Wilde, 2551-52; Wilde, Tr. 9274).

14. Staff witness R. M. Wilde estimated that deep mining causes the release to the atmosphere of 4,060 curies (Ci) of radon per annual fuel requirement (AFR)[8] (fol. P-Tr. 2369 at 5). This estimate was made by multiplying the estimated concentration of radon in a mine's ventilation system exhaust times the volume of air exhausted from the mine during the time required to extract one AFR of ore (2.71×10^5 metric tons). Mr. Wilde testified that deep mines do not continue to emit radon because it is industry practice to seal ventilation and hoisting shafts of mines no longer producing uranium. Moreover, even if the shafts are not sealed, when the ventilation fans are shut down, radon releases stop for all practical purposes (Wilde, P-Tr. 2541-42).

15. Mr. Wilde testified that the data are insufficient to predict with certainty the radon emission rates from open-pit mines (fol. P-Tr. 2369 at 7). The absence of any value for radon releases from open-pit mines led the *Perkins* Board to request Mr. Wilde to make a rough estimate (*see generally*

[8]An AFR is either the average amount of fuel consumed by a 1,000 MWe reactor operating at an 80% capacity factor for one year or the amount of material that must be processed at any stage in the fuel cycle to produce or dispose of that amount of fuel (*see, e.g.,* Applicants' Ex. 18 at A.1).

(P-Tr. 2543-48, 2550-58). On the basis of a number of conservative assumptions, he calculated an upper bound of approximately 100 Ci per year per AFR (Ci/yr/AFR) (*see* P-Tr. 2609-13). Mr. Wilde later confirmed the accuracy of his calculation using the same assumptions (Tr. 9273-74). Witness Goldman for the *Perkins* Applicant indicated that he had made a similar calculation and estimated bounding values of 100 to 200 Ci/yr/AFR (P-Tr. 2639-40).

16. *Perkins* Intervenor Kepford used the Staff's radon release rate of 100 Ci/yr/AFR in his calculations. He assumed, however, that open-pit mines would remain open forever (P-Tr. 2788-92).

17. Whatever the radon release rate is from an open-pit mine, the total amount of radon emitted depends on the period of time that the walls and floor of the pit remain open to the atmosphere (*see* P-Tr. Gotchy, 2547). This period is a function of the applicable reclamation laws. Mr. Wilde stated that, although the NRC has no regulatory power over uranium mines, nearly every State where uranium is mined has rather stringent reclamation laws governing open-pit mines. For example, Wyoming requires that the land be returned to a condition such that it can be used for an equal or higher purpose after mining than that for which it was used prior to mining (P-Tr. Wilde, 2556; P-Tr. Goldman, 2639).

Radon Released From Milling

18. After mining, uranium ore is processed in a mill to remove most of the uranium from the ore, leaving the other materials including radon precursors thorium and radium in the tailings. Staff witness Mango estimated a release of about 30 curies per AFR (Mango, p. 2-3, P-Tr. 2559-2560). Following milling, the tailings are piled in the open within dikes. Mr. Mango estimates that approximately 750 curies of radon per AFR will be released from the tailings during the period of active mill operation which he took to be 26 years. During this period, a portion of the tailing pond is composed of wet pond area, wet sandy beach areas, and some dry beach areas. Radon is released principally from the dry beaches (Mango, p. 3-4). During the next 5 years while the tailings piles dry out, Mr. Mango estimates the release of an additional 350 curies of radon per AFR (Mango, p. 6). Thus, the total release during the period of active mill operation is about 1,130 curies of radon per AFR. This value was accepted as reasonable by the *Perkins* Applicant's witness (Goldman, p. 1) and was not challenged by Intervenors' witnesses in either the *Perkins* or the *Jamesport* proceedings.

19. Following the active peirod, Mr. Mango assumes that the tailings will be covered with sufficient overburden to reduce radon releases to about

twice natural background in the surrounding environment. This assumption is based on a recently developed NRC Staff branch position which applies to all mills licensed by the NRC. A number of mills may be located in Agreement States and would thus be subject to State rather than NRC regulatory control. However, Mr. Kerr, Assistant Director for State Agreements in NRC's Office of State Programs, testified that those Agreement States in which uranium milling activities are carried out have provided the NRC with commitments to impose stabilization requirements equivalent to those described by the Staff (P-Tr. 2477-2480, 2483, 2485; see also footnote 5 of the Commission's notice regarding radon, 43 Fed. Reg. 15613).

20. Under these stabilized conditions, Staff estimates a release of about one curie per year per AFR for the first 100 years. Then assuming some degradation of the overburden, about 10 Ci/yr/AFR for the next 400 years and about 100 Ci/yr/AFR for the next 500 years (Gotchy, Tr. 9271). In contrast, Suffolk County witness Dr. Tamplin assumed a release of approximately 100 Ci/yr/AFR based on an earlier Staff estimate given in NUREG-0002 at page IV H-24 (Tamplin affidavit at p. 1, Tr. 9271). Staff witnesses Wilde and Gotchy testified that the Staff estimates provided for *Perkins* and *Jamesport* represented revisions since the publication of NUREG-0002 which are based on the improved stabilization requirements described in the preceding paragraph (Tr. 9271-9272). Moreover, Dr. Gotchy referred to a recent report prepared by Colorado State University (not offered into evidence) which estimates that tailings piles stabilized to meet the recent NRC branch position would remain stable for about 2,000 years (Tr. 9273).[9] If so, the release would remain at about one Ci radon/yr/AFR (Tr. 9272).

21. Dr. Gotchy's testimony discusses at length his reasons for his conclusion that he cannot predict radon release rates and therefore health effects into the distant future. These reasons include the probability of drastic geological and climatic changes, shifts in population distribution, famines, plagues, wars, and advancements in cancer prevention and cure (Gotchy affidavit, p. 11-13, and Gotchy supplemental affidavit, IV-1 - IV-20).

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[9]We note the enactment of the "Uranium Mill Tailings Radiation Control Act of 1978" Act of November 8, 1978, Pub. L. No. 95-604. One purpose of the Act is to provide a program to regulate mill tailings during uranium or thorium ore processing at active mill operations as well as after termination of such milling operations in order to stabilize and control these tailings in a safe and environmentally sound manner and to minimize or eliminate radiation health hazards to the public. Said Act provides, *inter alia*, that licenses will comply with decontamination, decommissioning, and reclamation standards prescribed by the NRC and that Agreement States will comply with public health, safety, and environmental standards which are equivalent to or more stringent than standards adopted and enforced by the NRC.

Transport and Radiological Dose of Radon and Its Daughters

22. Staff uses a simple wedge model to estimate the concentration and uptake of radon (and its daughters formed from the decay of radon in the atmosphere) under the assumption of prevailing westerly winds. At any downwind distance, the model predicts a uniform concentration from the surface to an altitude of 1,000 meters.[10] Population density is assumed to increase exponentially as a function of distance downwind and to be uniform in the crosswind direction. As a consequence, population dose is independent of the wedge angle. Staff then assumes a constant U.S. population of 300 million people, uses conversion factors from NCRP-45 and determines a population dose to the bronchial epithelium of 560 man-rem per 1,000 curies released (supplemental affidavit of R. L. Gotchy, p. III-14). Similarly, the population dose to the whole lung would be ten times less, or 56 man-rem per 1,000 curies. Whole body dose would be about 26 man-rem per 1,000 curies and bone dose about 680 man-rem per 1,000 curies (*ibid.*, Table 1 fol. p. III-16; see also Table 6, Gotchy Affidavit, p. 15).

23. Dr. Tamplin makes no attempt to model the transportation of radon but simply uses figure from NCRP-45 relating naturally occurring emination rates of radon (1×10^8 Ci/yr) to individual doses of 3 mrem/yr to soft tissue and 6 mrem/yr to the gonads with higher doses to the bone and lung. He then uses and average dose of 5 mrem for this affidavit[11] (Tamplin af-

[10]In its notice amending 10 CFR Part 51 to remove from Table S-3 the quantity and effects of radon released, the Commission chose to leave this matter open to litigation in individual proceedings in part so that experience with various approaches may be gathered as a possible basis for generic rule later on (43 Fed. Reg. 15613). In this spirit, the Board offers the following observation. NCRP Report 45 states that the concentration of radon in the atmosphere diminishes with altitude, infers that it diminishes exponentially as does air density itself, and cities one investigation in which a half-depth of 700 meters was determined (para. 6.4.1, p. 81). With this information it is possible to calculate the surface concentration per unit of release and compare with that of the Staff's wedge model with a cap of 1,000 meters. Out of curiosity, we made that calculation and found that both models predicted the same surface concentration.

[11]From these figures one can compute a whole body (soft tissue) dose of 9.0 man-rem per 1,000 curies releases (0.003 rem/yr x 3 x 10^8 persons ÷ 10^8 Ci/yr). Thus the Staff's estimate for whole body is about three times higher than Dr. Tamplin's. Moreover, Staff's estimates of cancer induction are not confined to whole body dose but add to that lung and bone cancers from doses to those organs. In fact, the total number of cancers estimated by the Staff is about 5.7 times that resulting from whole body irradiation alone (Table 4, p. 8, Gotchy affidavit of March 28, 1978). We have not found that this difference was explored during cross-examination. Be that as it may, this difference is small in comparison with other factors and assumptions used by Dr. Tamplin which makes his final results much higher than those of the Staff.

fidavit, p. 2). Then assuming an initial release rate of 200 curies of radon per year which diminishes exponentially but very slowly with the half-life of the thorium parent (80,000 years), Dr. Tamplin then computes the dose to a population of 300 million people from now to infinity. The population dose thus calculated is extremely high, *viz.*, 3.6×10^5 man-rem per annual *Jamesport* fuel requirement (Tamplin affidavit, p. 2). This is equivalent to integrating at a constant release rate of 200 curies/yr for 120,000 years. Dr. Tamplin then multiplies this result by an assumed 40 years operating life for *Jamesport* and by $1,000 per man-rem to obtain a cost of 14 billion dollars.

Health Effects From Radon

24. Having estimated the quantities of radon released from mining/milling, and then estimated the population exposure per unit of radon released, the parties next turn to the estimation of health effects per unit of population exposure. In this extremely difficult matter, both Staff and Intervenor Suffolk County rely heavily on the BEIR report, at least as a point of departure.[12] Since there are no directly applicable human data in the range of interest (natural background levels), the BEIR Committee assumes that there is no threshold and that the point of no effect corresponds to the point of zero exposure. The Committee then derives risk estimators or ratios of number of effects per unit of population dose from available data at much higher levels of radiation dose. The Committee assumes that these ratios hold (remain constant) all the way down to zero exposure dose. This approach is comonly known as the linear theory. Both Staff and Intervenor Suffolk County assume there is no threshold and both take premature death due to radiation-induced cancer and genetic effects as appropriate measure of health effects. However, the numerical values of risk estimators selected by Staff and Suffolk County are markedly different.

25. Staff makes separate estimates of cancer for whole body, lung (bronchial epithelium), and bone exposures and uses estimators of 135, 22.2, and 6.9 deaths per million man-rem, respectively. It is important to note here that in this context, the word rem refers to the energy per unit mass deposited in the organ to which the risk estimator applies. Staff's cancer risk estimators were taken from WASH-1400 and GESMO (NUREG-0002)

[12] "The Effects on Populations of Exposure to Low Levels of Ionizing Radiation," Report of the Advisory Committee on the Biological Effects of Ionizing Radiation (commonly known as the BEIR report), Division of Medical Sciences, National Academy of Sciences, National Research Council, November 1972. Since both Staff and Intervenor Suffolk County rely on the BEIR report at least as a point of departure, since the subject matter is clearly within the NRC's area of expertise, and since the Board has found reference to it very helpful in understanding the evidence of record, we take official notice of the BEIR report.

and are so-called absolute risk estimators that are based on estimated latent periods followed by periods of increased risk (plateaus) (affidavit of R. L. Gotchy, p. 7). The distribution of energy deposited within the body resulting from inhalation of radon and its daughters is different than that from exposure to total background radiation from all sources. For this reason Staff computes expected number of cancers separately for each critical organ and then sums the results. Nevertheless, a direct comparison with the BEIR report can be made for whole body exposure. The BEIR Committee estimates range from 2,000 to 9,000 cancer deaths per year from exposure of a population of 200 million people to a natural background dose of 0.1 rem/year/person. The wide range results from the choice of parameters and the model used. The most probable value is stated to be 3,000 to 4,000 cancer deaths per year (BEIR report at p. 90; see also Gotchy, Tr. 9312). Stated in the same risk estimator terms as used by the Staff gives a most probable range of 150-200 cancers per million man-rem whole body exposure. This compares with Staff's figure of 135 cancers per million man-rem whole body. Dr. Gotchy states that the somewhat lower value of the Staff's estimator results in part from correction of an error in the BEIR report (Tr. 9313-14). Additional comparisons between the risk estimators from the BEIR report and from WASH-1400 as used by the Staff are discussed during the cross-examination of Dr. Gotchy by Dr. Tamplin and indicate close agreement (Tr. 9212-9216).

26. Utilizing the above-described rations for estimating exposure dose and cancer incidence per unit dose, Dr. Gotchy provides the results per AFR in Table 4 of his March 28, 1978, affidavit.

27. When applied to the proposed Jamesport facility which would require 2.3 AFR/year and operate for an assumed 40 years, the following results are obtained in terms of premature deaths from induced cancers. Total from mining and milling prior to stabilization: 10 deaths. For the first 100 years (at 1.0 cure/year/AFR) from stabilized tailings piles: 2.3 deaths. In a footnote to Table 4, Dr. Gotchy states that had EPA risk estimators been used (which are based on the relative risk model rather than the absolute risk model), the number of lung cancers would be increased by factors of about 1.6 to 2.5 depending on the assumptions used.

28. By similar methods, Dr. Gotchy also estimates the number of genetic effects from exposure to radon and finds that there is about one genetic effect for every three cancers (supplemental affidavit of R. L. Gotchy, p. IV-5, and affidavit of R. L. Gotchy, March 28, 1978, pp. 8, 9, and 10).

29. As an alternative means of gauging health effects, Dr. Gotchy also computes and compares the nuclear and coal fuel cycles in terms of expected life shortening. He finds that the risk of life shortening from coal is at least 530 times greater than for nuclear (supplemental affidavit of R. L.

Gotchy, pp. IV-16 through IV-19).

30. As a final step in comparing the health effects from nuclear and coal plants with equivalent electrical output, Dr. Gotchy incorporates his new estimates from radon exposure into previously determined effects from other nuclear fuel cycle effluents. Results given in Table 6 and Enclosure 5 to the supplemental affidavit of Dr. Gotchy clearly show that the nuclear fuel cycle is much less damaging than the coal fuel cycle. Dr. Gotchy recognizes that there are large uncertainties inherent in most of his estimates of health effects from the coal cycle. However, he points out that the impact of transportation of coal is based on firm statistics (summary and conclusions, Enclosure 5, Gotchy supplemental affidavit fol. Tr. 9268). His estimate of 1.2 deaths in the general public due to the transportation of coal (Table 1b, Gotchy supplemental testimony fol. Tr. 8687) is twice as high as his lower estimate of deaths for the entire fuel cycle (Table 1, Enclosure 5, Gotchy supplemental testimony fol. Tr. 9268). This lower estimate includes active mining and milling plus 100 years release from stabilized tailings piles (0.11 cancers from Table 4, Gotchy affidavit of March 28, 1978, plus the 0.48 deaths previously estimated and shown in Table 1 of Gotchy supplemental testimony fol. Tr. 8687).

31. In estimating health effects, SC witness Tamplin first quotes the range of BEIR estimators of 100-450 induced cancers and 30-750 genetic defects per million man-rem to the whole body. Dr. Tamplin then argues that even the upper estimate of the BEIR report for cancer induction may be too low, possible by a factor of at least ten. First, he states that the upper estimate is based on the relative risk model (rather than the absolute risk model used by the Staff) and presents his reasons for preferring the relative risk model. On the basis of his interpretation of several scientific papers (published for the most part since the BEIR report was issued in 1972), Dr. Tamplin then argues that the BEIR estimators are too low and expressed the opinion "that the cancer induction rate for low dose/low dose rate irradiation is 900-9,000 induced cancers/1,000,000 person-rem" (Tamplin affidavit, pp. 3-10). Regarding genetic effects, Dr. Tamplin expresses the belief that the BEIR estimators are low by a factor of 8 (Tamplin affidavit, p. 13). The papers to which Dr. Tamplin refers in support of his conclusions include those of Bross, Mancuso, Archer, Rotblat, and Pochin (Tamplin affidavit, pp. 6-10).

32. Testimony of Dr. Hamilton on behalf of the *Perkins* and *Jamesport* Applicants as well as that of Dr. Gotchy for the Staff reflect an entirely different view of these papers. With respect to the work of Dr. Bross and Dr. Archer, Dr. Hamilton's testimony describes certain characteristics of these works which lead him to the conclusion that they are flawed (P-Tr. 2643-2647, 2649-2651; Tr. 9250-9256). Dr. Gotchy also discusses certain

defects in the Archer paper (Tr. 9298-9307).

33. With respect to the article by Dr. Pochin, the record indicates that two witnesses, Dr. Hamilton and Dr. Tamplin, reach significantly different inferences from the article (*cf.* Tamplin affidavit, p. 10 with Tr. 9238-9242). However, Dr. Tamplin did not discuss in his testimony what materials contained in that article lead him to conclude that the article demonstrates that risk estimates based on the BEIR Committee report are inadequate. In short, the Pochin article is simply used by Dr. Tamplin as a reference without any discussion of the information contained therein upon which Tamplin draws the conclusion that the article demonstrates that the BEIR Committee report estimates are inadequate.

34. With respect to the so-called Mancuso report, Dr. Tamplin again asserts that the information in this report demonstrates that estimates based upon the BEIR Committee report underestimate the effect of low dose radiation. However, with respect to the Mancuso report, the record in this proceeding is principally one of secondary information. Dr. Tamplin asserts that the report shows to him that low dose radiation has a greater effect than that estimated from the BEIR Committee report (affidavit, pp. 7-10, Tr. 9383-9404); whereas Dr. Hamilton indicates that the report has insufficient information to lead him to any such conclusion (Tr. 9245-9251). Similarly, Dr. Gotchy indicates that further information concerning the report is needed to reach any conclusion (Tr. 9311, 9321-9323).

35. Neither the *Perkins* nor the *Jamesport* Applicants attempt to estimate health effects from radon. Rather, *Perkins* witness Hamilton, who, although agreeing that Dr. Gotchy's estimates were reasonable and conservative based upon the data he used (Hamilton testimony, page 1 following P-Tr. 2266, and Tr. 2270), felt that calculating health effects based upon such extremely low-level exposure was not truly meaningful as repair mechanisms were not taken into account (P-Tr. 2271). Dr. Hamilton also decried extrapolations of health effects into the distant future as being misleading (P-Tr. 2275). Rather, Dr. Hamilton expressed the view that the problem should be addressed in terms of increase in radon-222 that a person is going to get from the nuclear fuel cycle in terms of the fractional increase in natural background radiation from radon-222 to which every living person is exposed (P-Tr. 2275). Dr. Hamilton concluded that the average annual dose to be the bronchial epithelium from radon-222 from natural sources is 165 millirad per year (P-Tr. 2276). Dr. Hamilton calculates that one year's operation of a 1,000 MWe nuclear power plant at 0.65 capacity factor would increase natural background radon-222 by 0.15 part per million or an increased dose to the bronchial epithelium of 0.00025 millirem per year (P-Tr. 2277). Dr. Hamilton considered that increases in radon-222 of this magnitude "make an additional negligible contribution to annual

natural background radiation and consequently, a similarly negligible impact on the health effects associated with the fuel cycle" (Hamilton testimony, pp. 2 and 3 fol. P-Tr. 2266). In response to questioning by the *Perkins* Board, Dr. Hamilton testified that variations in normal living style, traveling about the country, going indoors or outdoors, result in doses that are many orders of magnitude greater than the increase in dose resulting from radon-222 emanating from tailings (P-Tr. 2322 and 2333). Dr. Hamilton concluded that these low levels of exposure are "completely insignificant and without any reality" (P-Tr. 2323). For comparison, Dr. Hamilton (P-Tr. 2322) referred to some calculations provided Dr. Goldman which compared radon exposure from natural outdoor background radiation to that from indoor background. These calculations show that the entire lung dose from radon projected for 500 years could be offset by reducing the average time spent indoors by the U.S. population by less than 10 minutes over a 500-year period (Goldman, p. 8-10 fol. P—Tr. 2266).

36. *Perkins* witness Goldman pointed out that uranium mining/milling was by no means unique either as a source of radon or an activity with very long-term associated health effects. For example, phosphate fertilizers used widely in agriculture contain small amounts of radium which are the source of some of the radon background concentrations in the United States.

III. OPINION

Health Effects of Coal

37. The Board recognizes as does the Staff that there are many areas of uncertainty associated with the estimation of health effects resulting from the coal cycle. For some of these effects, we can envision that future laws, technological advances, and improved practices may well lower Staff's current estimates. On the other hand, we note that Staff estimates do not include many sources such as the emission in stack gases of radon, radium, and other toxicants and carcinogens, their release into surface water or their leaking into ground water. In view of the fact that Staff's current estimates show that health effects from the coal cycle are much greater than for the nuclear cycle, especially when measured in terms of life shortening, we believe it quite improbable that resolution of all uncertainties would alter the final coal/nuclear comparison (Findings 29,30).

Health Effects of Effluent Other Than Radon

38. Excepting radon which we discuss below, we accept Staff's estimates for all other nuclear fuel cycle effluents including carbon-14 since they were

derived using thorough, detailed, and reasonable methods (Finding 11).

Radon Releases From Mining

39. The Board accepts the Staff's estimate of 4,060 curies of radon per AFR released from deep mines as reasonable in that (a) it is based on field measurements and experience, and (b) it is not challenged by Suffolk County (Finding 14).

We also believe that radon emissions from open-pit mines can and will be held to amounts equal to or less than that for deep mines. The evidence of record is that, during the active mining phase before recovery is accomplished, radon release will be from 100 to 200 curies per year per AFR (Finding 15). Hence, if the open-pit is filled and recovered within 20 years, the release will not exceed that from deep mines. The Board considers it highly probable that Federal and State laws and/or regulatory actions will require the reclamation of all currently active and future open-pit mines following (or concurrent with) active mining operations to a condition such that further radon releases will be effectively eliminated. The fact that most States in which uranium mining occurs already have strict reclamation laws supports this view. Moreover, we take note of the "Surface Mining Control and Reclamation Act of 1977," Section 102, 30 U.S.C. 1202, which states that one of its purposes is to "assure that adequate procedures are undertaken to reclaim surface areas as contemporaneously as possible with the surface coal mining operations." Although it pertains to coal, we believe that this act foretells a national policy which will deal with all surface mining operations. We have already noted the recent enactment of the "Uranium Mill Tailings Radiation Control Act of 1978," Pub. L. No. 95-604. Having taken this action to assure that the release of radon from tailings piles is held to acceptable levels in order to protect public health, the Congress can be expected, in our view, to assure that similar precautions are required for open-pit uranium mines. Finally, we take note of the "Resource Conservation and Recovery Act of 1976," Section 8002, 42 U.S.C. 6982. This Act requires the Administrator of the Environmental Protection Agency, *inter alia,* to conduct a detailed and comprehensive study on the adverse effects of solid wastes from active and abandoned surface mines on public health and to identify means of utilizing mining wastes to prevent or substantially mitigate such adverse effects. This Act also requires the EPA to establish and promulgate standards defining hazardous wastes and for treatment and disposal of them as may be necessary to protect human health and the environment. Until these standards are prescribed by the Administrator, it is not entirely clear whether this Act will result in a requirement for recovery of uranium surface mines. It is clear that the Congress is mindful of the

need to control mines so as to protect the public health and is not adverse to assuring that that need is met through the enactment of public law (Findings 15, 16, 17).

Radon Releases From Milling

40. Since it appears to be reasonably derived and is the sole estimate of record, the Board accepts Staff's estimate of 1,130 curies radon/AFR from active milling and from the tailings piles prior to stabilization (Finding 18). In view of the recently developed Staff requirements for the stabilization of uranium mill tailings for mills licensed by the NRC, the commitment of Agreement States to impose equivalent requirements, and the provisions of the "Uranium Mill Tailings Radiation Control Act of 1978," this Board finds that uranium mill tailings can and will be stabilized so as to limit long-term radon release to approximately one curie per year per AFR (Findings 18, 19, 20).

Population Dose

41. Once radon is emitted from mining/milling sites, the next step in determining health effects is to estimate population exposure dose. To do that, Staff has modeled separately its transport, the amounts of radon and its daughters taken up by man through various pathways, and the distribution of energy deposited within various organs of the body from the decay of radon and its daughters. In contrast, Dr. Tamplin has considered the radon released from mining/milling simply to add to that already present as natural background and to use lumped parameters to estimate population dose. Had Dr. Tamplin then used the same estimators as the Staff, his estimate of resultant cancers would have been lower by a factor of about ten as we calculate it. At this juncture, we can only conclude that Staff's approach appears to be more reliable in that it follows the process in a step-by-step fashion and, in our view, employs reasonable assumptions for each step. But as we next discuss, that difference is more than offset by the choice of risk estimators employed (Findings 22, 23).

Health Effects

42. In estimating the number of cancers and genetic effects from a given population dose, Dr. Gotchy uses risk estimators which are quite close to the midrange values of the BEIR report. For a variety of reasons, Dr. Tamplin asserts his belief that the BEIR (and thus the Staff's) estimators are much too low for low dose/low dose rate irradiation and should be in-

creased by factors from 9 to 20 (Tamplin affidavit, compare p. 2 with p. 10). Similarly, he believes the BEIR estimators for genetic consequences are low by factors of 8 to 27 (*ibid.*, compare p. 2 with p. 13).

The record before us thus consists of the opinions of a few experts testifying for Suffolk County that the BEIR estimators are too low, of an expert for both the *Perkins* and *Jamesport* Appliants who testified that the BEIR report overestimates the effect, and the expert opinion of Staff witness Gotchy who used estimators very close to those of the BEIR report. In view of these differing expert opinions, we rely heavily upon the BEIR report because (a) it was sponsored by the Federal Radiation Council, (b) the BEIR Committee expressly recognized the need to make comparisons of biological risks for nuclear plants vs. those from the combustion products from fossil fuel plants, (c) the Committee consisted of a large number of highly qualified members, and (d) finally, the BEIR report reflects that its members endeavored to ensure that no source of relevant knowledge or expertise were overlooked.

We recognize as does the BEIR Committee that important new evidence has been generated in the last 6 years, *e.g.*, additional followup studies of cancer incidence of fetuses and young children at Hiroshima and Nagasaki. We understand that the BEIR Committee is now reviewing this new information and expects to publish a new report shortly. Until that report is published, however, the Board believes that the most prudent course is to rely on the conclusions and recommendations expressed in the 1972 BEIR report. Consequently, we find the estimates of health effects presented by the Staff to be the most reliable (Findings 22-35.)

By far the widest divergence of opinion among the parties relates to the question of how far out in the future one should attempt to estimate, sum up, and charge as a cost against the proposed facility, the health effects from radon emitted from stabilized mines and mills. Both Dr. Kepford and Dr. Tamplin for the *Perkins* and *Jamesport* Intervenors integrated to infinity. Dr. Gotchy, on the other hand, believes it quite impossible to make defensible estimates beyond 1,000 years at most. In light of the extremely low individual doses, Dr. Hamilton believes the whole attempt to make such calculations is misleading and meaningless. He states that he cannot believe that such tiny individual doses have any probability of doing harm and that summing up such tiny doses over very large numbers of people and over very long periods of time is a misuse of the linear theory which produces results which are illusory and without any reality.

In considering these divergent views, the Board has found it helpful to separate the releases and health effects resulting from active mining and milling from those stemming from the slow-releases following stabilization. Moreover, we think it instructive to divide time into 50-year increments or

periods. During what we shall call the present 50-year period, the whole process of mining, milling, stabilization, and consumption of nuclear fuel occurs. Health effects attributable to that period are clearly assignable to the costs of the proposed nuclear plant. All the direct benefits from that plant are also realized during the present 50-year period. Moreover, the health effects estimated for the present 50-year period are much higher than for any 50-year period to follow. Accepting the Staff's estimate of a little over 5,000 curies of radon released during the present period, and choosing as we do a value of about 1.0 curie per year released after stabilization (as does Staff for the first 100 years), it follows that releases during successive 50-year periods are only one percent of those during the present 50-year period. Of course, there are no direct benefits (*i.e.,* electrical power) to people living during successive 50-year periods but there are indirect benefits. This is especially so, as in *Jamesport,* where the maintenance of a healthy socioeconomic structure during the present period may be difficult and quite possibly impossible without the electrical output of the nuclear plant (*see,* for example, Finding 145, p. 883, and footnote 58, p. 927, of our Partial Initial Decision, 7 NRC 826).

There is another reason for preferring to think in terms of 50-year periods. Dr. Gotchy has expressed at length the great difficulty in making health effects estimates out into the distant future (although to be conservative, he does so through 20 future 50-year periods, *i.e.,* 1,000 years). But we find it unrealistic to place reliance on forecasts out even to the end of the present 50-year period, *i.e.,* out to about the year 2030. It is our view that the current socioeconomic structure results largely from the fact that petroleum has been abundantly available and at low prices. We believe it highly probable that this underlying basis will be drastically changed in the United States before the end of the present 50-year period. But even if all reasonable precautions are taken (such as the substitution of nuclear for oil-fueled electrical generating plants and the accelerated use of solar, wind, tidal, and geothermal power), and ignoring the possibility of war over the last dwindling supplies of oil, we believe that the structure of society will change markedly. Thus, if our judgment proves correct in this respect, speculating into future 50-year periods would be extremely shaky at best.

However, to say that a health effect can be ignored simply because its prediction is difficult and unreliable is not by itself very satisfying.

But as it turns out, health effects as estimated by all parties for any 50-year period are so low following stabilization that we are not overly concerned should the future prove us wrong. Dr. Gotchy estimates that the release of 50 curies of radon, *i.e.,* one curie per year over a 50-year period, would result in about 0.01 cancers within a total population of 300 million people. Thus the individual risk per AFR is about one chance in 30 million

during a 50-year period. In terms of Jamesport, the release and effect would be about 100 times higher for a 40-year operating life so that about one premature cancer death would be expected. By contrast, as derived from Table 6 of the Gotchy supplemental affidavit, some 100 deaths from lightning strikes during the same 50-year period would be expected within the population of Long Island alone (3 million vs. a U.S. population of 300 million).

We note further that NCRP Report 45 states at page 89 that users of natural gas in the home receive a radon dose from that source of about 2% of that from radon in the natural background. Assuming that several hundred thousand persons on Long Island utilize natural gas in their homes, we compute that the dose and health effect to those people per year is considerably greater than the dose and health effect to the whole U.S. population from a 100-curie per year release which might be attributable to Jamesport stabilized mines and mills. (Over the first 1,000 years following stabilization, Dr. Gotchy uses an average of about 50 curies/yr/AFR, *i.e.*, about 100 curies/year for Jamesport. As stated above, we believe that the release would be about 2 curies/year for Jamesport.)

In summary then, this Board finds that the health effect from the slow seepage of radon from stabilized mines and mills is extremely low in comparison not only with radon in the natural background but with other low risks, both natural and manmade, which we consider negligible. For all the reasons discussed above, we conclude that attempts to estimate health effects following stabilization by summing miniscule risks over large populations for long periods into an unknown future are meaningless, misleading, and unnecessary. Thus we believe Dr. Gotchy's estimates out to 1,000 years results in an overestimate of health effects. Even so, his final comparisons with the present generation health effects from coal shows that nuclear is much less damaging. We reach this same finding (Findings 20, 21, 23, 27-30, 35).

In this connection we now consider SC's supplementary proposed findings (paragraphs 20 and 21) on health effects costs attributable to radon emissions resulting from Jamesport which are based on Dr. Tamplin's testimony (fol. Tr. 9327). First Dr. Tamplin used the Staff's outdated estimate of radon releases which have been revised downward substantially to reflect application of NRC criteria on stabilization of tailings piles (Tr. 9271). Second, he summed the radon releases over an infinite period which over the assumed 40-year life of the Jamesport reactors yielded a total dose commitment of some 1.4×10^7 person rems. Finally, he applied the $1,000/person rem value from 10 CFR Part 50, Appendix I, to calculate the monetized health effects cost of Jamesport at $14 billion.

For reasons stated above, we consider it unrealistic to integrate health

effects from stabilized tailings piles for over 50-100 years, and much more so over infinity. Furthermore, the use of the $1,000 person rem value is applicable only to isotope emissions from LWR reactors as clearly stated by the Commission when it issued Appendix I.

For these reasons we find the referenced Suffolk County supplementary proposed findings without merit (Finding 23).

IV. COST-BENEFIT BALANCE

43. In our Partial Initial Decision, we concluded for a number of reasons that the proposed Jamesport plant was needed. Alternate sites for the plant were explored and the Board found the proposed site to be the preferable choice (Finding 244, PID). We also explored several possible alternative means of generating power and found that they were not viable. These included purchased power, solar and wind power, refuse-derived power, conservation, and a combination of these possibilities (Findings 124-130, PID). An oil-fueled plant was never suggested by any party as a realistic alternative. We also found that a nuclear plant was more desirable than a coal-fired plant on the basis of economy and fuel availability (Findings 249, 250, 258, and 275, PID). Moreover, we have now determined that the health effects from the coal fuel cycle are higher than those from the nuclear fuel cycle for comparable electrical output (see Section III, *supra*). Therefore, we conclude that a coal-burning plant is less desirable on all counts. Moreover, we explored in depth alternative means of unusable heat disposal and found the proposed once-through cooling cycle to be preferable (Finding 264, PID). Costs were weighed against benefits in arriving at all of these conclusions.

44. The costs and benefits of the proposed Jamesport plant were thoroughly considered in determining the need for the plant, *i.e.*, in balancing against the alternative of not providing a new central generating plant of any kind (Findings 104-145, 284-297, PID). Having now reevaluated the probable health effects associated with the operation of the Jamesport plant and the fuel cycle which supports it, we reaffirm our conclusion that the plant is needed and that the benefits to be derived from it outweigh all associated costs (Section III, *supra*).

V. CONCLUSIONS OF LAW IN SUPPLEMENTATION OF THE PARTIAL INITIAL DECISION, 7 NRC 826 (1978)

1. The Board has considered all of the extensive documentary and oral evidence presented by the parties to this proceeding. Those proposed findings of fact and conclusions of law submitted by the parties which are not

incorporated directly or inferentially in this initial decision are rejected as being unsupported in law or as being unnecessary to the rendering of this decision.

Based upon our review of the entire record in this proceeding and the foregoing findings as well as the findings in the Partial Initial Decision, and in accordance with 10 CFR 50.10(a) and 10 CFR Part 51 of the Commission's regulations, the Board has concluded as follows: The application and the record of the proceeding contain sufficient information and that the reivew of the application by the Staff has been adequate to support the following.

2. We find that:

   A. The Environmental review conducted by the Staff pursuant to the National Environmental Policy Act of 1969 has been adequate;

   B. The requirements of Sections 102(2)(C) and (D) of the National Environmental Policy Act of 1969 and 10 CFR Part 51 have been complied with in this proceeding;

   C. The Board has weighed the environmental, economic, and other costs of the proposed facility and has independently considered the final balance among conflicting factors contained in the record of this proceeding, and having considered available alternatives in accordance with 10 CFR Part 51, the Board determines that the appropriate action to be taken is issuance of construction permits for the proposed Jamesport Nuclear Power Station, Units 1 and 2, subject to the *conditions* for the protection of the environment set out in the Staff's proposed construction permits and as extended by the Board.[13]

VI. ORDER

On the basis of the Board's findings and conclusions in its Partial Initial Decision and this Initial Decision, and pursuant to the Atomic Energy Act of 1954, as amended, the Commission's rules and regulations, IT IS ORDERED that the Director of Nuclear Reactor Regulation is authorized to issue permits to the Applicants to construct the Jamesport plant consistent with the terms of the Partial Initial Decision and this Initial Decision.

[13]Attachment A hereto is the form of the Construction Permit for Unit 1. The form of the Construction Permit for Unit 2 will be identical, except that the earliest and latest completion dates for Unit 2, specified in paragraph 3A of the permit for that unit will by July 1988 and July 1992, respectively.

IT IS FURTHER ORDERED, in accordance with 10 CFR 2.760, 2.762, 2.764, 2.785, 2.786 (1977), *as amended,* 43 Fed. Reg. 17798 (1978), that this Initial Decision shall become effective immediately and shall constitute, with respect to the matters covered therein, the final action of the Commission forty-five (45) days after the date of issuance hereof, subject to any review pursuant to the Commission's Rules of Practice. Exceptions to this Initial Decision may be filed by any part within ten (10) days after service of this Initial Decision.

Within thirty (30) days thereafter (forty (40) days in the case of the Staff) any party filing such exceptions shall file a brief in support thereof. Within thirty (30) days of the filing of the brief of the Appellant (forty (40) days in the case of the Staff), any other party may file a brief in support of, or in opposition to, the exceptions.

IT IS SO ORDERED.

THE ATOMIC SAFETY AND
LICENSING BOARD

Dr. E. Leonard Cheatum, Member

Ralph S. Decker, Member

Sheldon J. Wolfe, Esquire
Chairman

Dated at Bethesda, Maryland,
this 26th day of December 1978.

[Attachment A has been omitted from this publication but is available in the NRC Public Document Room, 1717 H Street, N.W., Washington, D.C.]

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