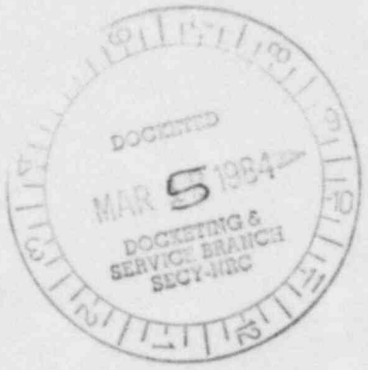

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Appeal Board

In the Matter of	)	
	)	
LONG ISLAND LIGHTING COMPANY	)	Docket No. 50-322 (OL)
	)	
(Shoreham Nuclear Power Station, Unit 1)	)	
	)	

LILCO'S REPLY BRIEF

March 2, 1984

Hunton & Williams
707 East Main Street
Richmond, Virginia 23212

DS03

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INTRODUCTION

The Shoreham operating license proceeding has involved constant, complex activity since its beginning eight years ago.[1] The proceeding has

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[1] See generally Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), LBP-83-57, 18 NRC 445, at unpublished Appendix A, "Background of the Proceeding" (1983) [unpublished Board Findings of Fact and Appendices will be cited as Partial Initial Decision or PID]. Suffolk County (SC or County) states in its brief that there was "a hiatus of several years" in the proceeding, ending in March 1982. Suffolk County Brief in Support of Appeal of Licensing Board Partial Initial Decision at 88 (Dec. 23, 1983) [hereinafter cited as SC Brief]. There was, however, no such "hiatus." Rather the County's current counsel simply became involved in the case in 1982, then becoming the third group of lawyers to represent SC since 1976. The period in question was actually one of intense discovery, discussion, negotiation, and settlement among the parties. See, e.g., PID, Appendix A, at A-13 to -15.

been characterized by far more discovery and settlement than is typical of NRC litigation; of the hundreds of issues raised since 1976, the great majority have been resolved by the exchange of information among the parties, negotiation, and compromise.[2]

The proceeding has also been characterized by far more intense litigation of the remaining issues than is typical of NRC proceedings. The litigated issues covered by the present Partial Initial Decision were grouped into eleven sets of contentions,[3] of which Suffolk County has appealed aspects of all but one group. The record covered by SC's appeal is extremely large and complicated.

The County's brief, however, makes very little use of this record, even though most of it is the product of cross-examination conducted by SC. Nor is the County fastidious in the use that it does make of the record.[4]

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[2] See, e.g., PID, Appendix A, at A-11, -13 to -15, -26 to -27; Appendix B.

[3] See PID, Appendix C.

[4] Cf. the Licensing Board's frustration with the County's mistreatment of the vast QA record:

> Once again, the Board, in reaching its conclusions on these contentions, is faced with a massive record, based on 55 days of hearing, extensive written testimony and exhibits, and voluminous proposed findings of fact and opinions by the parties that are disparate, at least. The difficulty of our task, trying to be objective in consideration of each of the parties' submissions, is further compounded by the County's misrepresentation of the complete record -- by omission, selective citations and distortion of recorded testimony.34/

34/ Our view of the County's performance is strictly our

(footnote cont'd)

Perhaps the County disregards the record because its real complaint is with the results reached by the Licensing Board rather than with the legality of the results. Thus, SC repeatedly asks this Board to make new law, so as to alter results on the merits it dislikes, even though they are well rooted in the record. The issue here, however, is whether Shoreham has satisifed existing requirements, not whether these requirements should be rewritten in the County's image.

The organization of this brief tracks that of SC's Brief of December 23, 1983; accordingly, LILCO's response to each County position can be readily found. LILCO's reply to Governor Cuomo's brief of December 20, 1983 appears during the discussion below of a low power license.

I. CONTENTIONS 7B (CLASSIFICATION AND SYSTEMS INTERACTIONS) AND 12-15 (QUALITY ASSURANCE/QUALITY CONTROL)

A. LILCO HAS PROVIDED QUALITY ASSURANCE FOR STRUCTURES, SYSTEMS AND COMPONENTS COMMENSURATE WITH THEIR FUNCTIONS

(footnote cont'd)

own. Our conclusion, however, is not without independent, if biased, corroboration. LILCO, on its own initiative, took the trouble of analyzing all 732 proposed findings of the County. It found 365 (50%) of them inaccurate, for 439 reasons (157 out of context, 100 with no citation, 105 with unjustified inference and 67 refuted on the record).

18 NRC at 579; accord, e.g., id. at 513, 545; PID at 403 (G-21), 428-29 (H-21 & -22), 757 (J-788). LILCO corrected in detail the County's misuse of the record; see LILCO's Proposed Findings of Fact and Reply Findings, dated January 17, February 22, March 28, April 25, May 2, and May 24, 1983 (2970 pages in total).

1. Overview

Suffolk County claims that there must exist a full-fledged 10 CFR Part 50, Appendix B quality assurance program, or something akin to such a program, for structures, systems and components (SS&Cs) that are important to safety but not safety related. SC is wrong. First, the concept "important to safety but not safety related" does not have regulatory significance. The terms "safety related" and "important to safety" have been used synonymously for purposes of the QA requirements in Appendix B and General Design Criterion 1. Thus GDC 1's reference to SS&Cs that are "important to safety" means SS&Cs that are "safety related," and only these safety related SS&Cs are subject to full-fledged Appendix B quality assurance.

Second, even if "important to safety" in GDC 1 were read to include SS&Cs beyond the safety related set, Suffolk County would still be wrong in claiming that the law requires Appendix B QA for such non-safety related items; the language of Appendix B and GDC 1 does not compel the result SC wants, and past NRC practice in applying the regulatory language flatly precludes it. Indicatively, the County cites no prior NRC ruling, Staff guidance document, or informal Staff request supporting its claim. There is none to our knowledge. SC is simply asking this Board to make law.

Finally, all non-safety related structures, systems and components at Shoreham -- not just those that might have been included on one list or another, but all non-safety related SS&Cs at Shoreham -- have received quality assurance commensurate with their significance to the plant's safe and reliable operation.

2. "Safety Related" Equals "Important To Safety"

Reasons for concluding that these terms have the same regulatory meaning have already been put before this Board in briefs filed on December 23, 1983, by LILCO and the Utility Safety Classification Group. Nothing needs to be added here except to say that the so-called "givens" listed on pages 2-3 of SC's brief have never been "givens" in this proceeding. LILCO has clearly and consistently disputed and refuted each of them throughout the litigation. See, e.g., 18 NRC at 546, 555, 558, 570; PID at 548-49 (J-234 & -235), 568-69 (J-291), 593 (J-358), 630 (J-471). Indeed, Suffolk County itself, on pages 15-17 of its brief, disproves its own alleged "givens" by noting that the NRC Staff in years past, when reviewing LILCO's FSAR commitments to GDC 1 and Appendix B, did not question LILCO's interpretation of "safety related" and "important to safety" or otherwise challenge the Company's QA commitments on the ground that they allegedly misconstrued the scope of GDC 1; nor, as SC points out, did I&E question LILCO's interpretation during its inspections of Shoreham.

3. Even If "Safety Related" Doesn't Equal "Important To Safety," The Quality Assurance Given To Non-Safety Related SS&Cs Need Not Be Of Appendix B Dimensions

At the outset, it does not appear that Suffolk County's current legal claim that Appendix B governs non-safety related SS&Cs can be squared with SC's prior assertions. Before filing its present brief on December 23, 1983, the County agreed that NRC regulations do not require the application

of Appendix B to non-safety related SS&Cs. SC Proposed Opinion, dated May 9, 1983, at 39; 18 NRC at 561; PID at 562 (J-271). The County also concluded that GDC 1 does not dictate any particular QA requirements. SC Proposed Opinion at 47. And SC agreed that the NRC Staff has never had any comprehensive guidance on QA programs for items important to safety but not safety-related, id. at 47-48 -- an inexplicable gap in NRC guidance if Appendix B quality assurance had really been thought to govern both these items and the safety related set.

The County's pre-December views to the contrary, SC now argues that the term "QA program" in GDC 1 means the same as "QA program" in Appendix B.[5] SC Brief at 5-6. But other than the fact that the words quality assurance program appear in both GDC 1 and Appendix B, the language of the regulations provides no basis to conclude that Appendix B's quality assurance for safety related items is the same as GDC 1's quality assurance for non-safety related items. If "important to safety" and "safety related" are not synonymous, the language is ambiguous at best.

Past NRC practice, on the other hand, does directly answer the question. No authoritative voice -- not the Commission, the Appeal Board, a Licensing Board, NRR, I&E, no one at the agency -- has said that GDC 1 requires that nuclear plants have Appendix B QA programs for non-safety related SS&Cs. To the contrary, the Staff's position is that Appendix B applies only to safety related items. PID at 562 (J-270).

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[5] In the alternative, the County argues that LILCO must have a separate QA program akin to its Appendix B program for items important to safety but not safety related. SC Brief at 6-8. LILCO's arguments apply to this suggestion with equal force.

Thus, it is not surprising that the NRC Staff has yet to define the set of SS&C's it now considers "important to safety but not safety related." E.g., 18 NRC at 561; PID at 560 (J-265), 576 (J-310). Nor does the Staff have criteria to be used in preparing or reviewing a quality assurance program for non-safety related items, and the applicant is not now required to describe specific programs for them. E.g., 18 NRC at 561; PID at 552-53 (J-244), 565 (J-282), 579 (J-320). In fact, the Staff testified that, although Appendix B could be used to provide criteria to judge the adequacy of QA programs applied to items important to safety but not safety related, Appendix B has not yet been so used or applied. PID at 561-62 (J-268); see also id. at 560-61 (J-265). Moreover, experienced NRC I&E inspectors testified that they had neither observed use by utilities of the concept "important to safety but not safety related" nor inspected applicants' QA programs for non-safety related equipment. I&E did not believe applicants were bound to such programs by regulatory commitments. PID at 560 (J-264), 576-78 (J-311 to -319).

In short, the present state of the law is simply not what Suffolk County wants. If the County is seriously unhappy with this reality, its remedy is to petition the Commission for rulemaking, not to ask this Board to rewrite the regulations.

4. QA For Non-Safety Related SS&Cs At Shoreham

Finally, SC argues that LILCO cannot have met GDC 1 as the County would now have it read because LILCO did not identify and list all features "important to safety but not safety related." Without such a list, SC argues,

it is impossible to be sure that all SS&Cs important to safety receive appropriate QA. SC Brief at 10-11. But as the Board ruled and the record makes clear, LILCO has applied quality assurance commensurate with each item's contribution to plant safety and reliability to every structure, system and component at Shoreham, whether safety related or not. E.g., 18 NRC at 546, 569-70; PID at 588-93 (J-347 to -354, -357). This has necessarily included any items that the County might have wanted on a list, plus other items that might have been overlooked when making any such list.[6] Numerous allegations about the adequacy of Shoreham's non-safety related QA were raised by SC during the hearings and laid to rest by LILCO. The County failed to show by example that any structure, system or component at the plant had not received QA treatment commensurate with its function. 18 NRC at 569. The record is extensive -- far transcending the Construction Site Inspection Manual -- that the LILCO QA program, including the programs of Stone & Webster and General Electric, satisfactorily addressed the non-safety related features of Shoreham despite the fact the applicant and its contractors believed this to be a requirement of sound engineering practice rather than regulatory fiat. E.g., PID at 588-93 (J-347 to -354), 599-601 (J-375 to -384), 603-05 (J-389 to -395), 613-19 (J-421 to -437), 837-41 (J-982 to -992).

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[6] Staff witnesses testified about the dangers of undue emphasis on lists, which can prove to be incomplete. PID at 742-43 (J-755)

B. THE BOARD'S LICENSE CONDITION IS NOT "INADEQUATE" -- TO THE CONTRARY, IT IS UNNECESSARY AT BEST

The County argues that the license condition imposed by the Board, that LILCO adopt the new definition of "important to safety," is inadequate. To the contrary, the license condition is unnecessary at best for reasons set out on pages 50-54 of LILCO's brief to this Board of December 23, 1983. In short, without any license condition,

(1) LILCO has already complied with all applicable design and quality assurance requirements for Shoreham. Further, LILCO has committed to continued compliance after the plant goes on line.

(2) Use of the terminology imposed by the license condition is not necessary to avoid future communication difficulty between LILCO and the Staff and may in fact cause such difficulty.

(3) The condition is not required to assure proper access for NRC I&E inspectors to Shoreham.

(4) Nor is the condition required to ensure that LILCO will meet its future reporting obligations to the NRC.

(5) And the condition is not required to confirm the scope of NRC regulatory authority.

In arguing that the license condition is inadequate, the County claims that (1) LILCO did not comply with GDC 1, (2) misclassification of equipment was shown below, (3) Mr. Conran's inability to cite definitionally-induced errors is insignificant, and (4) NRC Staff review of non-safety related SS&Cs at Shoreham was insufficient. SC Brief at 11-17.

As shown in Section I.A above, the Board correctly concluded that Shoreham has met the requirements of GDC 1, even as the Board interpreted the term "important to safety."

As to alleged misclassification, SC cites the Turbine Bypass System (TBS) and the Rod Block Monitor (RBM) as examples that LILCO classified equipment as non-safety related when it should have been classified important to safety. The Board disagreed, relying on substantial evidence. 18 NRC at 553; PID at 559 (J-259), 560 (J-265), 640 (J-497), 644 (J-510 & -511), 648 (J-525), 651 (J-531 & -533), 652 (J-534).

The County, however, says the Board erred in framing the issue as whether the TBS and RBM examples should have been classified safety related because, the County argues, it did not so urge. Rather, the County states it was providing examples of the need for a meaning of important to safety broader than safety related. SC Brief at 13-14. In fact, County witnesses testified that both the Turbine Bypass System and the Rod Block Monitor should be classified as safety related. 18 NRC at 562; PID at 637 (J-489), 648 (J-525); Goldsmith et al., ff. Tr. 1114, at 40. The County continued to urge the Board to find these examples should be safety related:

> The TBS at Shoreham has been classified by LILCO as nonsafety-related, although in apparent recognition of its important role, some upgraded QA requirements have been imposed. This classification is in apparent contradiction to other decisions where equipment relied upon in Chapter 15 has been classified as safety-related. There appears to be no real justification for classifying the TBS differently.

SC Proposed Opinion, dated May 9, 1983, at 79-80.[7]

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[7] The County moved closer to its current position only when it stated in its Proposed Opinion, dated May 9, 1983, at 80 (emphasis added):

> The Board notes that it does not hold that the TBS needs to be classified as safety-related, <u>although a systemmatic review of the TBS functions might result in such a classification</u>.

The County's argument about misclassification also ignores the fact that no particular classification jargon is required by regulation. 18 NRC at 560, 569. SC also disregards the fact that the Staff, under its new view of "important to safety," would include in that category all SS&Cs in which the Staff has any interest. E.g., PID at 544 (J-223), 551-52 (J-242), 559-60 (J-261). Thus, all the items in an FSAR are important to safety in the Staff's new view, both the safety related and the non-safety related. It follows that the set of non-safety related features described in the FSAR would necessarily be equivalent to the "important to safety but not safety related" set -- just as the County wants. The name of this set is not significant. What is important, whatever the classification jargon used, is that the treatment of structures, systems and components must be and is commensurate with their function. See, e.g., 18 NRC at 569.

In this regard, the County tries to use the Turbine Bypass System and the Rod Block Monitor to challenge the Board's determination that the intervenors failed to provide any examples of SS&Cs that had received inadequate QA due to terminological differences over safety related/important to safety. But again, the record makes clear that appropriate quality assurance has been accorded such SS&Cs at Shoreham, consistent with LILCO's policy that quality assurance be applied to all non-safety related SS&Cs commensurate with their functions. 18 NRC at 563, 564, 569-70; PID at 637-45 (J-489 to -512), 648-53 (J-525 to -539), 706-07 (J-668), 707 (J-669).

The County argued, further, that there is no significance to Mr. Conran's inability to produce even one example of a safety problem resulting from LILCO's definition of important to safety. SC Brief at 14. First, while

the Board recognized Mr. Conran's inability to identify a problem, PID at 780-81 (J-843), 786 (J-851), it did not seem to rely heavily on this fact. Findings J-843 and -851 were not cited elsewhere in the decision. The Board did state, however, that no Staff witness was aware of any substantive problem that had resulted from LILCO's definition of important to safety. 18 NRC at 564; PID at 713 (J-692), 723-24 (J-714 & -715), 743 (J-758). In addition to Mr. Conran, nine Staff witnesses testified on Contention 7B.[8] PID at 462-63, 464 (J-6 to -8). Several of these witnesses had been directly and extensively involved in the Shoreham review. Id. That none of these witnesses identified a single deficiency caused by definitional confusion, either during their review of the plant or during their preparation of testimony on Contention 7B, is telling.[9]

As to the adequacy of the Staff review of non-safety related SS&Cs, the record demonstrates that the Staff review did cover such SS&Cs at Shoreham. E.g., 18 NRC at 562, 564; PID at 565 (J-281), 581-82 (J-325 to -327), 840-41 (J-991 & -992).[10] In any event, as the Board observed:

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[8] Seven more Staff witnesses testified on what the County considers to be the companion quality assurance contentions. PID at 851 (K-6).

[9] The County suggests that the nature of the Staff review questions masks any definitionally-induced problems upon subsequent reexamination of previously reviewed areas. SC Brief at 14 n.7. But some Staff witnesses actually participated in the initial review, and all Staff witnesses had the expertise and opportunity to probe previously reviewed areas with sufficient rigor to unearth any definitionally-induced difficulties.

[10] The County still complains that Shoreham FSAR Chapter 17 does not address a QA program for non-safety related SS&Cs. SC Brief at 16. No applicant has been required to put such a program in the FSAR. E.g., PID at 565 (J-282), 579 (J-320). Nonetheless, LILCO has modified its FSAR, including Chapter 17, to incorporate a commitment to maintain during the operation of Shoreham the safety significance already given to non-safety relat-

(footnote cont'd)

> An intervenor in an operating license proceeding may not proceed on the basis of allegations that the Staff has somehow failed in its performance (at least when the evidence showed that any such allegedly inadequate Staff review did not result in any inadequacies in the analyses and performance of the applicant).

18 NRC at 565 n.29, citing Pacific Gas and Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-728, 17 NRC 777, 807 (1983).

Finally, the County wants LILCO to identify the structures, systems and components that are important to safety but not safety related and to document their safety significance. To reiterate, LILCO has already considered all SS&Cs at Shoreham, and included appropriate ones in the FSAR, Technical Specifications and Emergency Operating Procedures, documenting them and treating them as their functions dictate. See, e.g., PID at 559-60 (J-261), 719 (J-703), 724 (J-716), 725 (J-718). The County also says that LILCO must modify plant documentation to evidence a QA program for non-safety related equipment. But the fact that LILCO has already properly treated all structures, systems and components at Shoreham, e.g., 18 NRC at 564; PID at 714 (J-694), indicates that the plant documents, procedures and QA programs are already adequate. See also PID at 733-34 (J-736), 739-40 (J-747), 742 (J-755).

(footnote cont'd)

ed features in the FSAR, the Technical Specifications and the Emergency Operating Procedures. PID at 773 (J-825); LILCO Ex. 70, ff. Tr. 20,654.

C. LILCO HAS ADEQUATELY TAKEN SYSTEMS INTERACTIONS INTO ACCOUNT

1. SC Failed To Identify Any Serious Systems Interaction That Was Not Properly Considered During Shoreham's Design

The County argues that the "Michelson concern" was a serious systems interaction that was not properly identified, considered, or adequately precluded during Shoreham's design. SC Brief at 19-20. The facts are otherwise.

The potential interaction in question falls within Shoreham's design basis and is bounded by the analyses in Chapter 15 of the FSAR. PID at 661 (J-553), 663 (J-558). A break or leak in a sensing line (reference leg) of the water level measurement system might result in a reduction of reactor vessel water level, thus requiring protective action. But in all cases, including those with an additional single failure, automatic scram would result. In some cases, automatic ECCS actuation would result. In the worst case, manual actuation of cooling systems would be required, but sufficient time would be available for operator action; effective procedures exist to guide the operators, and they are fully trained to respond. PID at 675-76 (J-585), 679 (J-594). Shoreham's use of symptom-based Emergency Operating Procedures provides additional assurance that the plant could respond safely to such an event. PID at 679 (J-594); see also Tr. 5375-76, 5379-80 (McGuire). Further, the General Electric evaluation of acceptability did not depend on the probability of occurrence since it assumed the occurrence of the event and

then demonstrated that adequate protective features exist to assure safe recovery.[11]

The NRC Staff does not consider a Michelson-type event to be particularly troublesome from a safety standpoint, even taking into account the possible need for manual action. PID at 661-62 (J-555). Thus, the Michelson concern is not the serious sytems interaction that the County claims.[12]

Further, this potential interaction was properly identified and treated during Shoreham's design process. General Electric identified and considered the interaction's potential in the water level indication design in the 1960s. PID at 674-75 (J-583). Subsequent Shoreham-specific analyses confirmed General Electric's previous conclusion that the design was adequate. E.g., PID at 661 (J-555), 674-75 (J-583). The design largely precludes the potential interaction because the sensing lines themselves are conservatively designed, PID at 677 (J-589),[13] and the combination of events that might impair protective functions is unlikely, PID at 683 (J-599).

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[11] The County notes that LILCO has committed, pursuant to a settlement agreement, to modify the water level measurement system. SC Brief at 21 n.10. Agreement to further reduce the interactions potential, and to settle issues in litigation, does not alter the fact that the system without modification was adequate and in accord with regulatory requirements.

[12] The Michelson Memorandum concluded that the interaction was not an immediate concern for boiling water reactors. PID at 671-72 (J-577). In response to this memorandum, NRR decided that no immediate licensing action was needed. Id. The County states, however, that at least five BWR events of the Michelson kind have occurred since 1973. But these five events were considered in the Michelson Memorandum and by NRR during its review of the memorandum. See PID at 671 (J-577), 680-82 (J-597). These five events have also been analyzed for Shoreham and do not exceed the acceptable worst case analysis. PID at 680-82 (J-597).

[13] In fact, with respect to classification, the water level reference legs are safety grade. Tr. 7694 (Kirkwood).

The County's position, though variously stated, seems to hinge on the notion that a potential interaction is never adequately addressed unless all conceivable steps have been taken to minimize it, preferably to prevent the interaction wholly. It is apparently not acceptable, in SC's view, to identify the potential interaction, show that its occurrence is largely precluded, and establish that its consequences, even if they were to occur, could be accommodated by the plant. The latter approach, however, satisfies the demands of common sense and regulation. See, e.g., 18 NRC at 550-52; PID at 478 (J-45).

2. Part 50, Appendix A, And North Anna As Applied To Unresolved Safety Issues A-17 And A-47 Do Not Require That Systems Interactions Be Treated As SC Wants

a. SC's Views Are Contrary To NRC Precedent

Suffolk County wants this Board to find that "there is a requirement under the NRC's regulations that applicants systematically assess their reactor design for potential adverse systems interactions." SC Brief at 25 (emphasis in original). The Licensing Board correctly held, however, that "[t]here is no direct, explicit NRC regulatory requirement to perform a systematic systems interaction analysis for Shoreham." 18 NRC at 549.[14] It was

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[14] Accord Pacific Gas and Elec. Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-728, 17 NRC 777, 810-11 (1983). LILCO objected to the admission of a systems interactions contention in the proceeding. LILCO's Opposition to SOC Contention 7.B, dated Dec. 18, 1981, at 4-5; LILCO's Response to Proposed County Contentions 1 to 31, dated Feb. 18, 1982, at 2-3; Tr. 164-166. The Board reworded the proposed systems interactions conten-

(footnote cont'd)

also the Staff's view that there is no such requirement. Spies et al., ff. Tr. 6357, at 35-36; Mattson et al., ff Tr. 20,810, at 3-5.

The County seeks support from 10 CFR Part 50, Appendix A's introductory language, which suggests that the GDCs establish "minimum requirements;" SC also says that the GDCs are not static, and that applicants must consider matters not specifically defined in them. These observations, however, fall far short of a showing that there exists a specific requirement for systems interactions studies. And, as the Licensing Board recognized, LILCO has gone well beyond any minimum requirements for systems interactions actually imposed by the GDCs. See 18 NRC at 550, 553.

Nor do GDCs 22, 24, 26 or 29 provide a basis for the County's view. Certain of the NRC's regulations do require the consideration of certain systems interactions. 18 NRC at 549; PID at 472 (J-30). The Licensing Board properly concluded that compliance with those regulations is sufficient to ensure that plants are adequately protected from systems interactions. 18 NRC at 549; PID at 473-74 (J-31 & -32). But specific regulatory requirements for consideration of specific systems interactions do not give rise to an additional obligation to conduct a systems interactions analysis of the type

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tions, however, and admitted them. Tr. 493-94. Another Licensing Board rejected a similar contention, stating that there is "[no] requirement in the regulations for this kind of comprehensive study." Pacific Gas and Elec. Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), LBP-81-27, 14 NRC 325, 331 (1981). Such a contention was also rejected by the Licensing Board in Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2), LBP-82-76, 16 NRC 1029, 1034 (1982). The Seabrook Board noted the admission of a systems interactions contention at Shoreham but elected instead to follow Diablo Canyon.

sought by the County. The Appeal Board has already rejected a similar argument:

> As the Commission has stated "[g]eneral design criteria (GDC), as their name implies, are 'intended to provide engineering goals rather than precise tests or methodologies by which reactor safety [can] be fully and satisfactorily gauged.'" And, the design criteria cited by the joint intervenors [GDC 2, 3, 4, 22 and 24] have never been found by the Commission to require the specific systems interaction study called for by contention 15 & 16 [concerning a comprehensive systems interactions analysis].

Pacific Gas and Elec Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-728, 17 NRC 777, 811 (1983) (footnotes omitted).

Finally, there is nothing to the County's suggestion that either the occurrence of systems interactions events at other plants[15] or the existence of unresolved safety issues relating to systems interactions (A-17 and A-47) create the regulatory requirement SC wants. Predictably, the County cites no authority to support its view. In fact, as will be noted below, the purpose of unresolved safety issue A-17 is to confirm that existing NRC requirements are adequate to deal with systems interactions. E.g. PID at 469 (J-18), 511 (J-142), 512 (J-145).[16]

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[15] Only passing reference was made on this record to systems interactions at other plants. PID at 471 (J-27). It is impossible to draw any conclusions about the exact nature of these incidents from the Shoreham record. In at least one instance (Browns Ferry 3) there was evidence to suggest that a systems interaction was only one of several possible causes of the problem in question. PID at 502 (J-112).

[16] Nor does USI A-47 provide any support for the County's view; it deals with one limited aspect of systems interactions. PID at 469 (J-19), and is also confirmatory in nature, see Section D.2.b below.

Thus, there is ample support for the Licensing Board's conclusion that NRC regulations do not require a systems interactions study of the sort SC wants. Moreover, there is strong reason to believe systems interactions issues were improperly admitted in the Shoreham proceeding in the first place.

b. Shoreham's Consideration Of Systems Interactions Meets Or Exceeds All NRC Requirements

The County objects to the Licensing Board's conclusion that "LILCO has far exceeded any regulatory requirements for systems interaction analysis," 18 NRC at 553. First, SC says that LILCO's systems interactions studies "do not constitute systematic analyses performed for the purpose of identifying potential adverse systems interactions . . . ." SC Brief at 25 (emphasis in original). The County cites, without explanation, PID at 156-158, 475, 481-82, and 484-505. SC Brief at 25-26.[17] All but one of these references (PID at 475) catalogue in great detail the extensive evidence

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[17] The County also cites its Proposed Findings, dated Jan. 31, 1983, at 215-40. In "Suffolk County Response to LILCO Motion to Strike Certain References in Suffolk County's Brief" dated Jan. 11, 1984, at Attachment 1, the County stated that the citation of its proposed findings was not an incorporation by reference but rather a "helpful reference to permit the ALAB to know what was argued before the ALAB [sic]." The County noted that its brief contained detailed citations to the PID. Apparently, the County believes the PID citations adequately support its position, and thus LILCO need only address these PID citations. If, however, the Appeal Board elects to review the cited portions of the County's findings, it should also review LILCO's reply to them, which details the unacceptable manner in which the County mischaracterized, misrepresented or flatly ignored the record. LILCO's Reply, dated May 24, 1983 (revised), at 319-49.

concerning LILCO's studies and show how they did consider systems interactions. For example, LILCO's pipe failure and internal flooding analysis studied the spatial interactions effects of pipe failures on the plant's capability to shutdown safety. PID at 484-85 (J-55 to -62). LILCO's cable separation study used an "advanced," "powerful" and "comprehensive" methodology to study spatial and functional interactions concerning safety related cable and the associated plant components. PID at 488-90 (J-69 to -76). And LILCO's control system failures study was conducted to identify functional interactions between power sources and supplied components and the effect of those interactions on the plant. PID at 492-94 (J-84 to -89). While only three of the seventeen studies or programs discussed in these Board findings are considered here, the others similarly support the Board's conclusion that LILCO had adequately considered systems interactions.

The only citation that provides any comfort to the County, PID at 475, is not persuasive. Presumably, SC is referring to Board Finding J-37, which notes that SC's prefiled testimony claimed that LILCO had not systematically identified potential systems interactions and that LILCO's systems interactions studies were inadequate. No basis for these claims was given. In the face of overwhelming evidence to the contrary, see, e.g., PID at 484-505 (J-55 to -125), SC's prefiled testimony is unpersuasive.[18]

The County's second argument is that LILCO's systems interactions studies should be ignored because two of them failed to identify a water level

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[18] The record also indicates that the County witnesses had only limited knowledge of some of the studies and were wholly unfamiliar with others. See Tr. 1283-93 (Hubbard, Minor).

reference leg break interaction identified in the Michelson Memorandum. SC Brief at 26. But as indicated in Section I.C.1 above, the Michelson concern was accommodated by Shoreham's design. Thus, even if the County's arguments were correct, LILCO's systems interactions studies did not fail to detect a condition that could pose a significant risk. The record shows that LILCO's systems interactions studies were, on the whole, quite wide-ranging and comprehensive, see PID at 484-510 (J-55 to -141), 812-33 (J-904 to -965),[19] and that they were conducted in a thoroughly professional manner, PID at 553.

Moreover, formal systems interactions studies were only one feature of the pertinent design process for Shoreham. Such interactions were also considered (a) as a result of the structure and experience of the design organizations, PID at 478 (J-46), 480 (J-49 & -50); see also Burns et al., ff. Tr. 4346, at 8-26; Tr. 4632, 4635, 5033-36, 5487, 5488-92 (Ianni), (b) as a result of the design review process itself, PID at 541 (J-219),[20] (c) in the preoperational and startup test program for Shoreham, PID at 498-500 (J-101

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[19] It has never been LILCO's position that systems interactions studies can detect all potential interactions. See LILCO's Reply, dated May 24, 1983 (revised), at 69-70. But certainty in any endeavor as complex as the design and construction of a nuclear power plant is not required; the standard is one of reasonable assurance.

[20] See also Tr. 5035 (Ianni) (separation of safety related and non-safety related systems in design process), 5077-78 (Dawe) (consideration of missiles in design process), Tr. 5094 (Dawe) (human interactions considered in fire protection design), Tr. 5281 (Kascsak) (non-safety system impact considered in design of safety related scram discharge system), Tr. 7519-30 (Conran, Thadani, Kirkwood) and LILCO Ex. 11 (FSAR), ff. Tr. 7526 (consideration of non-safety related systems in seismic design process); Tr. 5171 (Dawe) (consideration of heavy loads).

to -105), and (d) in programs LILCO has in place to analyze systems interactions during operation, PID at 496-98 (J-95 to -100). This defense in depth approach makes it unnecessary for any one element of the program to identify all systems interactions. The fact that a potential interaction may not have been identified in a particular study does not justify ignoring the results of that and other studies. This is particularly true where, as at Shoreham, a defense in depth approach to systems interactions has been used.

Then the County attacks LILCO's PRA.[21] SC's argument that the PRA should be rejected because it was not undertaken for the purpose of identifying potential adverse systems interactions is frivolous. First, regardless of the formal purpose of the study, there is substantial, uncontroverted evidence that the Shoreham PRA did, in fact, go to great lengths to consider systems interactions. See, e.g., PID at 535 (J-197), 820-24 (J-929 to -943). Second, a PRA need not be called a systems interactions study to address adequately systems interactions. As LILCO experts testified, by its nature a PRA takes into account systems interactions in a comprehensive manner in order to be an effective risk assessment tool. PID at 818 (J-922), 827-29 (J-951 to -954). Third, as SC witness Hubbard conceded, the methodology used in the Shoreham PRA is the "type of methodology that we [County witnesses] thought was appropriate for a system interaction analysis." Tr. 1303-04.

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[21] The Licensing Board's systems interactions conclusions do not depend on the Shoreham PRA. The Board found that current regulatory requirements and procedures provide adequate assurance that the public health and safety is protected. 18 NRC at 553. Since PRAs are not required by regulation, id. at 574, LILCO's PRA efforts go beyond what is necessary to protect the public health and safety.

SC also asserts that the Shoreham PRA was deficient because it did not consider certain external initiating events. But the exclusion of certain initiating events has nothing to do with the methodology employed in performing the PRA. Thus, the exclusion has no bearing on whether the PRA provides valuable information on the interactions it did consider. Moreover, the three external initiating events in question -- fires, floods and earthquakes -- were excluded for good reason. External events were not deemed to be dominant contributors to risk. 18 NRC at 574. And the techniques for assessing external events in PRAs are still being developed. The PRA Procedures Guide does describe methods for considering fires and earthquakes, but there may be large uncertainties associated with the assessment of even these accident sequences. Tr. 5658 (Burns). In light of these considerations and the fact that a number of studies concerning external events had already been conducted for Shoreham, LILCO's consultants found that an adequate PRA could be done for the plant without including certain external events. Tr. 5653-54 (Burns); Burns et al., ff. Tr. 4346, at 92.

The County alleges further that the walkdowns conducted for the Shoreham PRA were not adequate to identify systems interactions. But the testimony of Dr. Burns -- a PRA expert with significant experience in the field -- provided persuasive evidence that the walkdowns conducted for Shoreham were adequate to do so. Tr. 5663 (Burns); Burns et al., ff. Tr. 4346, at 102-03. Staff witnesses who had raised some questions about the walkdowns proved to be unfamiliar with the Shoreham PRA and thus could not offer an opinion on their adequacy. See, e.g., Tr. 6655 (Thadani). And the walkdowns at Diablo Canyon and Indian Point relied upon by SC were

undertaken for specific purposes not necessarily useful at other plants. PID at 831-32 (J-961); Tr. 6117-18 (Joksimovich).

Finally, the County argues that the LILCO PRA review process was inadequate because it focused on unusual risk outliers, accident sequences, and probabilities at Shoreham that are not common to other similar plants. To the contrary, the ability of the PRA to identify risk outliers or dominant accident sequences makes it superior to other systems interactions techniques. See PID at 820 (J-928), 828-29 (J-953 to -955). In short, Shoreham's PRA provides additional assurance beyond regulatory requirements that systems interactions have been adequately considered for the plant.

D. THE COUNTY'S VIEWS ON NORTH ANNA ARE INCORRECT

1. The County Has Misread North Anna

The County's arguments are premised on the erroneous notion that the NRC Staff must demonstrate that Unresolved Safety Issues (USIs) A-17 and A-47 are adequately resolved for Shoreham and that the Board must so find. Despite repeated references to North Anna and River Bend,[22] the County inexplicably fails to acknowledge a recent Appeal Board decision that definitively construes them for present purposes.[23] In Pacific Gas and

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[22] Virginia Elec. and Power Co. (North Anna Nuclear Power Station, Units 1 and 2), ALAB-491, 8 NRC 245 (1978); Gulf States Util. Co. (River Bend Station, Units 1 and 2), ALAB-444, 6 NRC 760, (1977).

[23] The omission is particularly surprising since counsel for the County participated in the briefing and oral argument in this recent case. See Diablo Canyon, 17 NRC at 783.

Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-728, 17 NRC 777, 806 (1983), intervenors had argued, much as the County does now, that North Anna and River Bend "require that the staff inter alia, describe the plan, method and schedule for resolution of this safety issue for the applicant's facility."

The Appeal Board categorically disagreed, explaining that the obligations of a licensing board in a construction permit proceeding such as River Bend are different from those of a licensing board in an operating license case such as North Anna. In an operating license proceeding, the board's findings are limited to issues placed in controversy by the parties. The board, however, has discretion to raise serious safety or environmental matters. Thus, in North Anna, the Appeal Board asked the Staff to address unresolved safety issues in future SERs to assist boards in exercising their discretionary review. Id. at 806-07. It follows that:

> the "obligation" we placed on the staff to aid adjudicatory boards runs to the boards and is not an obligation that is enforceable by a party to the operating license proceeding.

Id. at 807 (footnote omitted).

An alleged failure to meet the North Anna standard, accordingly, does not support a County attack on the Licensing Board's decision. As the Diablo Canyon Appeal Board noted, intervenors are free to challenge directly the subject matter of an unresolved safety issue, but not the adequacy of the Staff's performance. Id. Consequently, resolution of SC/SOC Contention 7B on its merits, which touches on the systems interactions issues raised by A-17 and A-47, is all that is required for this proceeding. North Anna does not provide independent grounds for the County's appeal.

2. USIs A-17 And A-47 Are Resolved For Shoreham

Beyond the County's misreading of North Anna, which by itself is dispositive of SC's present claims, stands the fact that A-17 and A-47 have been resolved for Shoreham.

a. USI A-17

First, the County urges this Board to ignore the confirmatory nature of A-17. But there is ample support in the record for the Licensing Board's conclusion that "the action plan for A-17 is different than most USI's in that it is looking for undetected problems rather than a solution to a specific problem." SC Brief at 29-30, citing PID (slip op.) at 162.[24] In fact, USI A-17 is and always has been regarded as confirmatory by the Staff.[25] PID at 469 (J-18), 511 (J-142), 512 (J-145), 520 (J-159), 530 (J-181); Mattson et al., ff. Tr. 20,810, at 5; Tr. 20,815 (Thadani), Tr. 20,862-63, 20,879-80 (Thadani). Equally important, the Staff has always concluded that existing regulations provide a sufficient basis for continued licensing pending the ultimate disposition of USI A-17. PID at 473-74 (J-31 & -32), 541-43 (J-220 & -221); Mattson et al., ff. Tr. 20,810, at 5-8; Tr. 20,813-14 (Thadani).

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[24] The County's suggestion on page 30 of its brief that this fact should be ignored merely plays on words. Although a detailed "Action Plan" for generic resolution of A-17 may not exist, as shown below the record fully supports the Board's conclusion.

[25] Confirmatory status is an acceptable basis for resolving a USI. Pacific Gas & Elec. Co. (Diablo Canyon Nuclear Plant, Units 1 and 2), LBP-81-21, 14 NRC 107, 110 (1981).

Second, the County's insistence that there must be a particular rate of progress toward resolution of Task A-17 inherently conflicts with its status as a confirmatory item. The County's position was refuted by the testimony of the Staff experts responsible for resolving the issue. They stated that in their technical opinion, the pendency of A-17 should not impede the issuance of an operating license for Shoreham even if A-17 were finally resolved on a schedule substantially longer than currently predicted. See Mattson et al., ff. Tr. 20,810, at 8; Tr. 20,813-14, Tr. 20,862-63, 20,877-78 (Thadani), 20,878-79 (Coffman). Significantly, the Staff's own perception of A-17 has altered over time; events and additional information since the designation of the issue have increased Staff confidence in the efficacy of current requirements and in the likelihood of a satisfactory resolution of the issue. Tr. 20,862 (Thadani), 20,863-65 (Mattson); Mattson et al., ff. Tr. 20,810. at 5; see Tr. 20,917-18 (Goldsmith).

Finally, notwithstanding the status of a generic resolution for A-17, North Anna can be met if a particular USI can been resolved for the reactor in question. Diablo Canyon, 14 NRC at 118. As the Licensing Board found, Shoreham has met all regulatory requirements regarding systems interactions. 18 NRC at 553; see Mattson et al., ff. Tr. 20,810, at 4-6; Tr. 6659, 6779-80, 20,831 (Thadani), 20,822-23 (Rossi), 20,831-32 (Mattson). And the Staff has consistently stated that, when plants such as Shoreham meet the current regulatory requirements, they provide reasonable assurance that potential adverse systems interactions present no undue risk, and that no additional systems interactions requirements need be imposed. PID at 473-74 (J-31 to -33), 795-96 (J-876 & -877); Mattson et al., ff. Tr. 20,810, at 10-14; see Tr.

20,822-23 (Rossi), 20,831-32 (Mattson). Moreover, the Board recognized that LILCO has gone beyond NRC regulations in addressing systems interactions. 18 NRC at 553, 575; PID at 794-95 (J-873).

In short, USI A-17 is a confirmatory item; the existing regulatory standards are adequate for licensing while work is completed on A-17; and Shoreham more than meets present requirements.

b. USI A-47

Task A-47 involves potential control systems interactions and is a subset of the overall systems interactions issue. It is similar in thrust to A-17 because it is also a "confirmatory" USI. It calls for review of the existing regulatory criteria to ensure that they adequately address potential control system interactions. Tr. 7436-37 (Rossi); Staff Ex. 2A, at B-15; Spies et al., ff. Tr. 6357, at 44-45; see Tr. 6504, 7436-37, 7455-56 (Rossi). In the Staff's view, the existing regulatory requirements, coupled with two confirmatory studies being undertaken by LILCO, will adequately ensure that control system interactions of the type included in A-47 will not pose an undue risk at Shoreham. Spies et al., ff. Tr. 6357, at 44-45; Tr. 7444 (Rossi). In fact, the NRC Staff knows of no specific control systems failures at Shoreham or any other plant that would lead to undue risk to public health and safety. PID at 493 (J-85).

The extensive testimony by LILCO witnesses about how systems interactions are taken into account in Shoreham's design process provides an additional basis for concluding that existing practice is adequate. See, e.g.,

18 NRC at 551-52; PID at 478-83 (J-46 to -53); see also PID at 494 (J-89) (other analyses of control systems conducted during design process). This testimony is particularly germane since control system interactions are avoided by ensuring separation of control and safety systems in the design process. The Staff reviews the design for proper separation of control and safety systems and for appropriate use of isolation devices. Spies et al., ff. Tr. 6357, at 43; Tr. 7450-1 (Rossi). Also, the record indicates that General Electric conducted a generic study of control system failures very similar to one requested by the NRC Staff. The GE study showed that control system interactions had been adequately considered in the BWR design. PID at 493 (J-86 to -88). The Shoreham PRA is yet another reason for concluding that A-47 has been resolved for Shoreham. The PRA gave extensive consideration to systems interactions. Preliminary results from the PRA indicate that failure of non-safety related control systems is not a dominant contributor to risk. See PID at 826-28 (J-950 & -952). Thus, there is adequate basis for allowing Shoreham to operate while Task A-47 is completed.

The County's complaint that the record should not have closed without all the details of the A-47 studies being available disregards the basic thrust of SC/SOC Contention 7B. It alleges inadequate systems interactions methodologies were used for Shoreham.[26] PID at 456 (J-1). But as already

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[26] While the County essentially concedes that SC/SOC 7B deals with systems interactions methodologies, SC Brief at 42, it claims that the Board found A-47 relevant to the contention and, therefore, all aspects of the issue must be resolved before the record closes. The conclusion does not follow. Because A-47 may be relevant to whether a proper methodology was used does not mean that all aspects of the USI, including the detailed results of studies, are relevant.

noted, there is ample evidence in the record to conclude that the systems interactions methodologies at Shoreham consider control systems interactions of the type covered by A-47, and there was ample evidence concerning LILCO's confirmatory studies to conclude that the methodology employed was adequate. See PID at 492 (J-84).

E. LILCO'S APPENDIX B PROGRAM COMPLIES WITH CRITERION XVIII

SC claims that Criterion XVIII of Appendix B cannot be met unless an audit program employs random sampling statistical methodology, and thus LILCO's Appendix B QA program is defective.[27] SC Brief at 43-48. This novel claim is squarely refuted in the record; it is, as the Licensing Board correctly found, directly contrary to longstanding and well established NRC and industry interpretation of, and practice under, Criterion XVIII. See PID at 921-30 (K-186 to -204).

Criterion XVIII requires, in pertinent part, that

> [a] comprehensive system of planned and periodic audits shall be carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program.

LILCO's effectively implemented audit program met this requirement. PID at 949-57 (K-249 to -265), 978-79 (K-311), 983-84 (K-321).[28]

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[27] Significantly, the County has abandoned its arguments, advanced unsuccessfully below, that both the I&E inspection program (an audit program) and the Torrey Pines independent verification of Shoreham were required to employ statistically based methodology.

[28] Indeed, an experienced NRC inspector, commenting on one aspect of the audit program, termed the LILCO field QA audit program one of the bet-

(footnote cont'd)

Typically, SC tries to avoid the law and record by asking this Board to rewrite Criterion XVIII to require that audits employ statistical methodology so as to permit statistical extrapolations from a statistically random sample. SC's argument misreads Criterion XVIII and misconceives its purpose.[29] It misreads the criterion by arguing incorrectly that the requirement that audits must "verify compliance with all aspects of the Quality Assurance Program" means that audits must inspect or otherwise verify that every single item or record meets every quality requirement. This is a mistaken reading of the phrase "all aspects of the Quality Assurance Program." The "aspects" referred to are not individual items such as records, welds, calculations or the like; rather, "aspects of the quality assurance program" refer to the procedures and activities which collectively comprise a QA program established in accordance with Appendix B. In this correct sense, LILCO's audit program did verify all of the aspects of the QA program. PID at 923-24 (K-192), 949-71 (K-249 to -291).

(footnote cont'd)

ter ones he had encountered during his inspections of a number of plants. PID at 950 (K-254).

[29] SC's claim also founders, at the outset, on an incorrect factual assertion. Thus SC asserts that "LILCO does not audit 100 percent of Shoreham's QA records and activities." SC Brief at 43 (emphasis added). According to SC, this statement comes from "PID at 259, 921." SC is wrong on the facts and wrong in its PID reference. As the PID clearly reflects, all activities were audited by LILCO's QA program and in many areas each was audited at least annually. PID at 923-24 (K-192), 957-62 (K-266 to -275), 965-66 (K-281), 968 (K-285 to -288), 970-71 (K-293 & -294). Moreover, "PID at 259, 921," cited by SC, refers only to "QA items and records," not also to activities, as the County incorrectly states. As the PID finding cited by SC makes clear, auditing does not review 100 percent of the items because auditing is a higher level activity aimed at the process, i.e., the program and its procedures. PID at 921-22 (K-186).

SC's argument that an audit must "extrapolate from a sample to the total population" reflects a misunderstanding of the difference between the audit and inspection functions. They are distinct.[30] The inspection function (which is not the subject of Criterion XVIII) exists for the purpose of product acceptance and, in appropriate cases, may involve statistical sampling techniques. The County's argument that statistical methodology should be used to extrapolate from a sample to the total population might be valid if the objective were to determine within a specified degree of confidence the actual percentage of defects in a homogeneous population. The Criterion XVIII auditing function, however, has a vastly different purpose: it provides assurance that all aspects of the QA program are being properly managed and implemented and that the program is effective.[31] PID at 921-22 (K-186 to -188), 949-57 (K-249 to -265), 978-79 (K-311), 983-84 (I-321). Statistical methodology is neither used in auditing, nor is it necessarily appropriate for such use. PID at 922-24 (K-189 to -194).

SC has not and cannot offer any precedent to support its view of Criterion XVIII; none exists. Once again, the County would have this Board

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[30] The misconception also reflects a fundamental failure to recognize that Criterion XVIII and the auditing it requires are but one aspect of an Appendix B QA program. PID at 856 (K-19), 977 (K-307). Appendix B consists of 18 criteria that must be considered as a whole. PID at 978 (K-311). As noted below, QA program activities other than auditing (e.g. inspections, engineering reviews) exist for the purpose of accepting products or records. Auditing is intended to complement not duplicate these activities.

[31] Contrary to the County's claim, the Board did not recognize the validity of SC's position. See SC Brief at 45. Rather, the Board stated that audits "are not intended to provide the mathematical rigor that the County would like to see . . . ." 18 NRC at 584.

make law. To do so, however, would be to invalidate Appendix B audit programs throughout the industry. See, e.g., PID at 923-24 (K-190 to -193), 1359-60 (K-1236 to -1238).

SC also argues that a statistically based audit program is feasible. The record overwhelmingly refutes this argument. The County relies solely on its witness Samaniego (SC Brief at 47-48) who, as the Licensing Board correctly noted, was a qualified statistician but had no knowledge or experience in nuclear power plant construction and QA programs. 18 NRC at 620. The Board accepted instead the testimony of a number of highly qualified witnesses in the area of nuclear construction and quality assurance who stated that statistical methodology had been considered and rejected for audit programs because it was inappropriate and unsuited to the complex activities to be audited. 18 NRC at 619-20; PID at 922-23 (K-189), 924 (K-193), 925-30 (K-197 to -204), 1359-60 (K-1236 & -1237); LILCO Ex. 21, Attachment 3. This conclusion alone precludes SC's desire that Criterion 18 audits employ statistical methodology. But even if such a methodology were feasible, the County's claim would still fail; longstanding and well established NRC and industry interpretation of, and practice under, Criterion XVIII confirm that statistical methodology is not required.

F. LILCO'S QA/QC PROGRAM HAS BEEN PROPERLY IMPLEMENTED

The quality assurance litigation in this proceeding has been sweeping in its scope and intense in its scrutiny. There has been extensive discovery, over 50 days of hearings, and minutely detailed cross-examination,

with the County constantly urged to develop its best claims of QA/QC inadequacy. See pages 58-59 below. Against this background, the quality assurance complaints that the County raises on appeal (presumably the most damaging that it has to offer) are particularly unimpressive. In an attempt to buttress these modest offerings the County seeks as usual to make new quality assurance law; SC asks this Board, contrary to precedent and good sense, to rule that "[t]here is no such thing as a 'minor' or 'insignificant' QA/QC deficiency," SC Brief at 49, and that "a failure to comply with a requirement of a manual, procedure or other document implementing a portion of the Appendix B QA program is a noncompliance with Appendix B" itself, id. at 59. The radical expansion of QA law urged by SC speaks eloquently about the weakness of the County's position under existing law.

1. Not Every QA/QC Discrepancy Has Safety Significance

As to SC's desire that no "QA/QC deficiency" be deemed "minor" or "insignificant," the County would have this Board rule that such "deficiencies" are material to the question of QA/QC compliance even when they are not linked to an actual or potential safety defect, e.g., SC Brief at 50, 55, 57. SC argues that any deviation from a quality program indicates management's failure to ensure proper implementation, id. at 52-53. The County's conclusions are inconsistent with 10 CFR Part 50, Appendix B, NRC precedent, and the record below.[32]

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[32] The County's arguments are also inconsistent with its own brief. First, SC acknowledges that even a good QA program will not eliminate all errors, but rather will reduce errors wherever possible and detect those which

(footnote cont'd)

Appendix B recognizes that identified conditions will be of varying significance. Thus, Criterion XVI requires that the cause be identified and preventive action taken only for "significant conditions adverse to quality." (Emphasis added.) This is direct indication that some deficiencies, deviations, nonconformances or defects may not be significant.

NRC precedent says the same. The Appeal Board has held that:

> Although a program of construction quality assurance is specifically designed to catch construction errors, it is unreasonable to expect the program to uncover all errors. In short, perfection in plant construction and the facility construction quality assurance program is not a precondition for a license under either the Atomic Energy Act or the Commission's regulations. What is required instead is reasonable assurance that the plant, as built, can and will be operated without endangering the public health and safety.

Pacific Gas and Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-756, 18 NRC ___, slip. op. at 7 (Dec. 19, 1983) (emphasis added); see also Union Electric Co. (Callaway Plant, Unit 1), ALAB-740, 18 NRC 343, 346 (1983):

(footnote cont'd)

occur. SC Brief at 53-54 n.23. The County cites an Indian Point decision, which says that a QA program can

> provide substantial assurance that the number of faults will be greatly reduced and that they will not be of such magnitude as to jeopardize the health and safety of the public.

Consolidated Edison Co. (Indian Point Station Unit No. 2), LBP-73-33, 6 AEC 751, 756 (1973) (emphasis added). Second, the County recognizes that the purpose of Appendix B is to ensure that a facility can be operated safely. SC Brief at 56. Finally, SC has previously acknowledged that the final determination as to whether particular deficiencies are sufficient to constitute a failure to meet Appendix B depends upon the facts and circumstances of the specific conditions examined. SC Proposed Opinion, dated April 7, 1983, at 28-29.

> It would therefore be totally unreasonable to hinge the grant of an NRC operating license upon a demonstration of error-free construction. Nor is such a result mandated by either the Atomic Energy Act of 1954, as amended, or the Commission's implementing regulations. What they require is simply a finding of reasonable assurance that, as built, the facility can and will be operated without endangering the public health and safety. . . . Thus, in examining claims of quality assurance deficiencies, one must look to the implication of those deficiencies in terms of safe plant operation.[33]

Similarly, two Licensing Board decisions have held that intervenors have the burden of showing that alleged QA/QC deficiencies led, or might have led, to some safety defect in the plant or, alternately, had or might have had some import for the proper construction of the plant. Philadelphia Electric Co. (Limerick Generating Station, Units 1 and 2), LBP-82-43A, 15 NRC 1423, 1517-18 (1982); Cleveland Electric Illuminating Co. (Perry Nuclear Power Plant, Units 1 & 2), LBP-81-24, 14 NRC 175, 212 (1981).[34]

The County would have this Board decline to follow these rulings because NRC precedent also stresses the need for full compliance with Appendix B requirements. SC Brief at 54-55. No one disagrees with the County about the importance of a well implemented quality assurance program; nor is

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[33] These cases also note that a pervasive failure to carry out a quality assurance program -- a programmatic breakdown -- might stand in the way of the requisite safety finding. Significantly, SC has abandoned the term "breakdown" in both its Proposed Opinion, dated April 7, 1983, and in its present brief. But see PID at 847 (K-1) (SC/SOC Contention 12 alleging QA/QC breakdowns).

[34] To the extent SC believes the context in which these rulings were made (admissibility of contentions) lessens their applicability to the instant proceeding, it is instructive that the "significance" standard applied as well in Diablo Canyon (reopening the record) and Callaway (appeal of a litigated contention), as discussed above.

there any dispute that NRC cases stress the importance of QA. But these conclusions are not at odds with the "significance" standard just discussed. It is telling that each case cited by SC, in addition to stressing the importance of QA, also focuses on the NRC's responsibility to determine whether there is reasonable assurance that the plant has been properly constructed and will not have safety problems. See Duquesne Light Co. (Beaver Valley Power Station, Unit 2), ALAB-240, 8 AEC 829, 833-34, 839-40 (1974); Duke Power Co. (William B. McGuire Nuclear Station, Units 1 & 2), ALAB-128, 6 AEC 399, 408 (1973); Vermont Yankee Nuclear Power Corp. (Vermont Yankee Nuclear Power Station), ALAB-124, 6 AEC 358, 362 (1973); Consumers Power Co. (Midland Plant, Units 1 and 2), ALAB-106, 6 AEC 182, 184 (1973); Consolidated Edison Co. (Indian Point Station, Unit No. 2), LBP-73-33, 6 AEC 751, 755-56 (1973); Virginia Electric and Power Co. (Surry Power Station, Unit No. 1), 4 AEC 825, 827-28 (1972). In light of all pertinent precedent, it is apparent that the Shoreham Licensing Board applied the proper standard in deciding the QA/QC issues before it. See 18 NRC at 579-80, 580-81, 581-82, 586, 599, 601[35] Indeed, throughout its consideration of QA matters, the Board was properly guided by the intent of the NRC regulations: that QA requirements assure no undue risk to the public health and safety. As the Board observed:

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[35] SC complains the Licensing Board never directly addressed the County's significance arguments. SC Brief at 50. The Board did consider and reject them, stating it was not about to become involved in "a numbers game of counting beans," but rather in an inquiry into whether there is reasonable assurance that the public health and safety are adequately protected. 18 NRC at 579-80.

> We seek a solid foundation for finding reasonable assurance of adequate protection of the health and safety of the public. We do not seek evidence of a sterile application of ritualistic methodology.

18 NRC at 579-80. The County apparently seeks the latter.

Finally, SC makes a number of essentially factual arguments. First, the County recites the importance of management involvement in QA, arguing that QA/QC deviations at Shoreham are indicative of management's failure to ensure proper program implementation. SC Brief at 52-53. But the record shows that management, even for detailed administrative requirements, has fully supported all procedural requirements at Shoreham. For example, management was involved in training to achieve proper implementation, PID at 994-95 (K-347), 1056-61 (K-501 to -513), and in housekeeping, PID at 1158 (K-747), 1162-63 (K-758 & -759); management was involved in stop work orders, PID at 955 (K-262), resolution of E&DCR problems, PID at 1038 (K-452), voluntary initiation of the Torrey Pines review, PID at 1333 (K-1183 & -1184), development of corrective action plans for Torrey Pines' findings, PID at 1369 (K-1255 & -1256), and the implementation of QA programs and procedures beyond those required by regulation, PID at 930-45 (K-205 to -242).[36] The Staff in its 1982 SALP report for Shoreham specifically found management involvement in assuring quality. 18 NRC at 608.

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[36] The County argues management should establish fully achievable program requirements and rigorously enforce them so as not to condition people to believe QA compliance is unimportant. SC Brief at 53. That no one was so conditioned at Shoreham is evidenced by LILCO's aggressive audit program, resulting observations and associated corrective action requirements, as well as by NRC I&E activities. See, e.g., PID at 973-77 (K-301 to -306); see also note 62 below.

Second, the County states it is wrong to wait until a safety problem exists or is imminent before raising questions about the adequacy of QA implementation.[37] SC Brief at 55. Obviously it is wrong to wait, but the record shows LILCO did not wait. The LILCO audit program was effective in promptly identifying potential problems and initiating corrective action before the problems became significant, e.g., PID at 949-50 (K-251), 950 (K-253 -254), 973-74 (K-301 to -303), 1044 (K-473), 1055-56 (K-499), 1087 (K-573).

Third, SC argues that it may be difficult to determine whether a specific QA deficiency did result or might have resulted in a safety concern. SC Brief at 56. The record shows that LILCO understood this difficulty and took it into account by identifying and correcting all observed conditions, including conditions that were not, but might have become, significant. E.g., PID at 950 (K-253), 971-72 (K-297 to -299), 973-74 (K-301 & -302), 1004-06 (K-366 & -367), 1044 (K-473), 1055-56 (K-499). Further this difficulty did not relieve the County of its burden to link QA/QC discrepancies to at least potential safety defects. During the hearings, audit observations were categorized and characterized in order to distinguish their relative safety significance and put them in perspective. The Company's witnesses did indicate the relative safety significance of each category and, where appropriate, the safety significance of individual observations. See, e.g., PID at

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[37] In support of its "don't wait" argument, SC cites the Federal Register notice of an order imposing a penalty on Wisconsin Public Service Corp. (Kewaunee Nuclear Power Plant). SC Brief at 55 n.25. Although this notice states that a QA violation may be considered significant even if it had no actual adverse effect on public health and safety, the notice also states that the violation in this instance had the potential to adversely affect public health and safety. 48 Fed. Reg. 37,106-107 (1983).

996 (K-350), 997 (K-353), 1001-05 (K-362 to -366), 1007 (K-370), 1008-0[illegible] (K-375), 1011 (K-380), 1016 (K-393), 1018-20 (K-398, -400 to -403), 1021-22 (K-407), 1024 (K-416), 1027-28 (K-423), 1044-46 (K-472 to -477), 1232-33 (K-929). The record shows that none of the conditions covered by the observations introduced by the County had any impact on the integrity of the design, or the actual safety, of the plant. PID at 971-72 (K-296 to -300). SC simply ignores this voluminous evidence.

2. Noncompliance With Internal QA Procedures Is Not A Per Se Violation Of Appendix B

The County argues the Board erred in rejecting SC's view that any noncompliance with the internal procedures of a QA program represents a violation of Appendix B. SC Brief at 58. The County says that an Appendix B violation exists regardless of whether the pertinent QA noncompliance is detected by the licensee's internal audit program or by an NRC I&E inspection and regardless of whether corrective and preventive action is taken. See id. at 60 n.27.[38]

The County seeks a novel and unwarranted interpretation of Appendix B, one which the Licensing Board properly rejected. 18 NRC at 581-82. The record reflects that both Appendix B and the NRC Staff anticipate noncompliances within a QA program; therefore Appendix B includes requirements (e.g., Criteria XVI and XVIII) for the licensee to identify and

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[38] This position conflicts with prior SC recognition that some QA errors are inevitable and that a well planned and implemented QA program will detect and correct inevitable errors. SC Proposed Opinion, dated April 7, 1983, at 28; see also note 32 above.

correct such failures. PID at 856 (K-21), 857 (K-22), 978-79 (K-311), 1220 (K-903).

NRC I&E policy reflects this reality. If the licensee identifies and corrects a problem or deficiency in the implementation of its own program that is less than a severity level II, then no violation of Appendix B exists; rather, the NRC views such results as evidence that the licensee's program is working. PID at 978 (K-310), 1227 (K-916).

The County cites three examples, in all of which deficiencies were identified, not by LILCO, but by NRC I&E and consequently cited as Appendix B violations. SC Brief at 59-60; PID at 1107 (K-619), 1147-48 (K-722), 1169-70 (K-773 to -775). These examples show only that noncompliance with LILCO procedures may violate Appendix B if the noncompliance is not detected or corrected by LILCO's own program. See, e.g., PID at 977-79 (K-307 to -311), 982-83 (K-319),[39] 982-83 (K-321).

The County pushes its untenable reading of Appendix B one step further, arguing that areas identified by NRC I&E inspectors, even when not cited as violations, should nevertheless be defined as violations of Appendix B. SC Brief at 60-61 & n.28. The County offers two examples involving

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[39] Board Finding K-319 seems to contain a typographical error; several lines appear not to have been printed. The finding was adopted from LILCO proposed finding QA-191. On page 393 of the PID, line 3 should be followed by:

> , where important concerns were identified LILCO and Stone & Webster management took action consistent with Criterion XVI

and then line 4. LILCO Proposed Findings, dated March 28, 1983, at 277-78 (QA-191).

conditions identified by the NRC "CAT" inspection. The first, an "observation" dealing with electrical separation, was identified by I&E as a "weakness." It was not considered a violation of Appendix B by the Staff because work was still in progress and had not yet received final inspection by LILCO. PID at 1191-93 (K-833 to -838), 1253-54 (K-975 to -977). The second, involving the dryweli spray nozzles, was believed by I&E to be a deviation from the FSAR. The condition was not a noncompliance with LILCO design documents or procedures, but rather a question of compatability between design documents and the FSAR. PID at 1250 (K-967). The condition identified was within the plant's design basis analysis, and no FSAR or hardware changes were required. PID at 1250-51 (K-969). As the Licensing Board found, these situations neither violated Appendix B nor evidenced inadequate implementation by LILCO of its QA program. PID at 1251-52 (K-971 & -972).

3. Examples Cited By The County Do Not Reflect Ineffective Quality Assurance

The County claims that three examples -- housekeeping, calculations and electrical separation -- highlight the ineffectiveness of Shoreham's quality assurance program. In citing these examples, the County fails to apply the appropriate standard for judging the effectiveness of QA programs. That standard and its roots in recent Appeal Board decisions and NRC practice are discussed in Sections I.F.1 and I.F.2 above. The Board concluded as to all specific subjects, including the County's three examples, that:

> [d]espite the number, and acknowledging the wide diversity and relatively minor nature of the deficiencies discussed in this section, the Board concludes that the LILCO and Staff QA/QC programs as applied to Shoreham have resulted in plant design, construction and installation that will provide reasonable assurance of no undue risk to the health and safety of the public.

18 NRC at 242. The Board was clear as to the standard by which it resolved QA/QC matters. A prior quotation bears repeating:

> This Board is not about to become involved in a "numbers game" of counting beans of different colors in viewing the examples of QA failures relied on by the County. Rather, we have kept foremost in our minds the intent of the NRC requirements and the actual and practical measures taken to meet these requirements to assure no undue risk to the health and safety of the public. We seek a solid foundation for finding reasonable assurance of adequate protection of the health and safety of the public. We do not seek evidence of a sterile application of ritualistic methodology.

18 NRC at 579-80.

a. Housekeeping

The NRC Staff, in the latter stages of the Shoreham project, urged LILCO to improve the level of housekeeping at the plant to ready it for fuel load. The record clearly establishes (1) that the housekeeping conditions at Shoreham did not adversely affect plant safety, and (2) that steps were taken to ensure the proper level of cleanliness prior to construction completion. See, e.g., PID at 1144-45 (K-712 to -714), 1153 (K-735), 1157 (K-744 & -745), 1159-60 (K-749, -751 & -752), 1161-62 (K-756 & -757), 1163 (K-759). Thus, the Board had ample support for its conclusion that housekeeping problems at Shoreham were adequately resolved. 18 NRC at 598-99.

SC does not seriously challenge the validity of the Licensing Board's conclusions. The County points to instances where fire hazards were reported during construction. SC Brief at 63 n.30. But the Board was concerned with impacts on the safe and reliable operation of the plant, not on work area safety during construction. SC also attacks the Board's conclusion that the housekeeping issue has now been laid to rest because LILCO allegedly failed to correct problems in the past. As shown below, the County's characterization of LILCO's prior housekeeping efforts is inaccurate. More important, the record demonstrates that LILCO's actions after the issuance of the Corrective Action Letter were effective. PID at 1162 (K-757).[40]

The County's principal arguments focus on the mere existence of housekeeping findings, ignoring important realities about this issue. First, ongoing construction activities make it virtually impossible to avoid deficiencies in the housekeeping area. PID at 1143 (K-708), 1144 (K-710), 1146 (K-718 & -719). Second, an acceptable level of cleanliness during construction is, in large measure, a matter of judgment about which professionals may disagree. PID at 1162-63 (K-758); see, e.g., PID at 1144 (K-710). While it was the NRC witnesses' judgment that cleanliness of the plant as it neared completion[41] was not improving as rapidly as they would like, they did

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[40] The County's claim that it was prejudiced because it was not permitted to file testimony on the RAT Inspection is addressed in Section I.G.2 below. With respect to housekeeping, SC had ample opportunity to express its views; County witness Hubbard had previously been permitted to file supplemental housekeeping testimony. SC Exhibit 89D, ff. Tr. 15,382.

[41] The housekeeping issue arose only in the latter stages of the plant's construction. The NRC Staff's testimony filed in June 1982, did not highlight housekeeping as an area of concern. Staff Ex. 8.

testify that Shoreham was not significantly different from other sites. PID at 1146-47 (K-719 & -720). LILCO witnesses, including independent reviewers from Torrey Pines Technology, testified that, based on their experience, the level of cleanliness was acceptable. PID at 1143 (K-708 & -709), 1144 (K-711), 1157 (K-745), 1159 (K-750), 1160 (K-753).

Third, as the NRC witnesses testified, the Staff's housekeeping concerns reflected a philosophy of cleanliness rather than a view of LILCO's management attitude. PID at 1161 (K-755). LILCO's approach to housekeeping involved maintaining an acceptable level of cleanliness for construction until an area was essentially complete, at which time a major effort was undertaken to bring the area of cleanliness up to standards appropriate for an operating plant. PID at 1157-58 (K-746 & -747), 1159 (K-749), 1161 (K-755). In the NRC Staff's view, as a plant approaches its fuel load date, there should be a marked improvement in cleanliness throughout the plant. PID at 1146-47 (K-720 & -721). Thus, the housekeeping issue arose from this difference in philosophy, not management inattention. PID at 1153 (K-734), 1157-58 (K-746), 1161 (K-755). Indeed, the record shows that LILCO did devote substantial attention to housekeeping matters throughout the construction process. PID at 1143 (K-707 & -708), 1144 (K-711), 1144-45 (K-713), 1146 (K-718), 1157-58 (K-746). Moreover, housekeeping at Shoreham never adversely affected plant safety, and, in those areas where construction had been essentially completed, the level of cleanliness was already at or near that required for operation, even prior to implementation of improved housekeeping measures. PID at 1144-45 (K-712 & -714), 1157 (K-744 & -745), 1159-60 (K-749, -751 & -752).[42]

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[42] One Board Finding, K-1135, suggests that the level of cleanliness in completed areas may not have been satisfactory. This finding, which essen-

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Finally, the County's brief does not accurately reflect the record. For example, SC begins its recitation of alleged housekeeping problems with I&E Report 79-16,[43] suggesting that subsequent findings resulted from ineffective LILCO response to this report. But the NRC Staff witnesses testified that, although there was some similarity between this finding and subsequent ones, the Staff did not expect the actions taken in response to 79-16 to prevent the subsequent occurrences. PID at 1155 (K-741). Also, contrary to the County's assertion, LILCO's actions in response to 79-16 were effective. Staff Ex. 8 at 17-18.

Then there is the County's persistent use of the terms "widespread" and "serious" to characterize the housekeeping findings. But, again, Staff witnesses testified that the housekeeping conditions for Shoreham were not significantly worse than expected given the ongoing construction and the number of workers involved. PID at 1146 (K-719). More important, witnesses familiar with the housekeeping discrepancies at Shoreham repeatedly stated unequivocal views that the housekeeping discrepancies found at Shoreham did not affect the safe operation of the plant. E.g., PID at 1146 (K-718), 1157 (K-744 & -745), 1159-60 (K-751). In sum, the Board's conclusions on housekeeping are fully supported by the record.

(footnote cont'd)

tially adopts SC Proposed Finding QA:558, does not accurately characterize the underlying record. See Tr. 20,054-55 (Greenman). Board Finding K-752 is a more accurate summary.

[43] The County, without basis, characterizes the problems as "serious housekeeping deficiencies." In fact, the NRC Staff classified these findings as "infractions," a less serious enforcement category. Staff Ex. 8, Attachment 2.b.

b. Calculations

The County argues that audit observations concerning calculations indicate that LILCO failed to implement its QA program properly. SC Brief at 67-71. The audit program, however, detected the conditions and ensured that they were corrected, that re-audits were conducted, and that preventive action was taken, PID at 950 (K-253), 973-74 (K-301 to -303), 992 (K-341), 1005-06 (K-367). Importantly, none of the conditions in question, however, had any effect on the integrity or safety of the plant design, e.g., PID at 971-72 (K-296 & -297), 990-91 (K-339), nor was there any programmatic breakdown, e.g., PID at 994-95 (K-347).[44]

The County focuses on ready traceability. At the outset, it is well to be clear that Shoreham has very stringent requirements for identification of input sources -- requirements that are difficult to meet and that exceed Appendix B demands. PID at 994-95 (K-347). The pertinent audit observations dealt with minor administrative failures to meet these stringent requirements. Examples in the ready traceability category included such items as: reference to the author of a text, rather than complete identification of the text, when simply identifying the author sufficed to identify the text, Tr. 10,497 (Museler), reference to a memorandum based on an underlying engineering document rather than the underlying document itself, Tr. 10,647-48

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[44] SC suggests that the Licensing Board failed to come to grips with the QA/QC implications of observations related to calculations. SC Brief at 68-69. To the contrary, the Board did consider the programmatic meaning of the observations, e.g., PID at 994-95 (K-347), in addition to the potential safety impact and the corrective action taken. See also 18 NRC at 587, 601.

(Eifert), and identification of a computer program by name without identifying the version and level when the version and level were clear from the date of the calculation, Tr. 10,524 (Eifert); see also PID at 988 (K-333), 994 (K-346). Contrary to the County's view, the conditions in question were controlled, corrective action was always taken, and broad-based preventive action had management involvement. PID at 973-77 (K-301 to -304), 987 (K-332), 994-95 (K-347). Though the observations had no safety signficance, e.g., PID at 990-91 (K-339), SC Brief at 69, LILCO and Stone & Webster vigorously enforced QA program requirements,[45] see PID at 973-77 (K-301 to -303), 994-95 (K-347).

The County also alleges that "a number" of calculation-related observations had a potential to affect safety. SC Brief at 70. In fact, only five had more than the remotest capacity to affect the quality of the design if they had gone undetected. PID at 997 (K-353), 1004 (K-366). And after investigation, LILCO found there were no instances where the conditions noted would have affected the integrity or safety of the design. PID at 971-72 (K-296 & -297), 1001-1005 (K-362 to -366).[46]

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[45] These actions to enforce the ready traceability requirements clearly demonstrate management commitment to very strict requirements. This approach -- stringent requirements and constant effort to enforce them -- is preferable to the County's suggestion that requirements going beyond Appendix B be eliminated. See SC Brief at 69. The County's approach would be a clear disincentive to improved programs.

[46] SC cites Engineering Assurance Audit 34, as it relates to large bore pipe supports, as an example of a safety concern. SC Brief at 70 n.34. This situation (A/O 120) was identified by LILCO's program, and corrective action was carried out under LILCO's program. Further, the County incorrectly states that design margins were entirely eliminated in some cases, resulting in some calculation rework and support modifications. Out of approximately 10,000 large bore supports at Shoreham, 1800 support calculations were

(footnote cont'd)

The County further argues that because the audit process did not recheck all calculations, there was no assurance that other problems did not exist. This ignores uncontroverted testimony that the extent of all observed conditions, important conditions in particular, was pursued to ensure that any similar situations were identified and corrected. PID at 973-74 (K-301 to -303), 1001-1004 (K-362 to -365), 1005-06 (K-367). The evidence shows that:

(1) each discipline and each activity within each discipline were audited at least annually, see, e.g., PID at 965-67 (K-281 & -282);

(2) the same comprehensive and thorough audit program that identified the five observations categorized as miscellaneous important concerns was applied to all disciplines; similar problems were not identified elsewhere, e.g., PID at 949 (K-250), 950 (K-253), 965-67 (K-280 to -282); and

(3) audit results were used in developing subsequent audits, thereby ensuring that previously observed conditions were considered in auditing other disciplines, see, e.g., PID at 951-53 (K-257).

The Licensing Board correctly found that the LILCO QA program, as it relates to calculation control, provided reasonable assurance of no undue risk to the health and safety of the public. 18 NRC at 601.

(footnote cont'd)

redone because support dimension changes had been evaluated and approved by the pipe support group without performance of a re-analysis. Of these, only about one percent showed any reduction in design margin; these supports were modified. The modifications were made to maintain the original design margin. In no case was the design margin "entirely eliminated." And there were no cases where pipe suport failure would have occurred had this condition gone uncorrected. PID at 1000-01 (K-360), 1004 (K-365); Tr. 10,776-80 (Museler). In addition, SC makes the unsupported statement that QA/QC inspectors apparently did not question such installations. The observation in question deals with differences between calculations and issued drawings, not differences between issued drawings and installations. PID at 1004 (K-365). Thus, SC's claim is wrong because installation inspections use approved drawings.

c. Electrical Separation

The County claims the Licensing Board agreed that LILCO had no effective controls to prevent nonconforming electrical installations between 1977 and 1982,[47] and thus its decision that LILCO has complied with Commission requirements, given a lack of current problems in electrical separation, was not responsive to the QA/QC controversy. SC Brief at 71-72. The County is wrong.

As already noted, the Licensing Board concluded as to all specific subjects, including electrical separation, that the nature and significance of each QA/QC observation must be considered to assure that potential deficiencies do not and will not adversely affect overall plant performance. The record shows that electrical separation at Shoreham does not pose undue risk to the health and safety of the public. To the extent I&E inspectors had previously identified concerns in this area, they were closed by I&E Inspection Report 82-24, dated October 15, 1982, SC Ex. 109, at which time the inspectors found the electrical separation program at Shoreham to be proceeding in an appropriate manner. Tr. 16,936-37, 16,970-71 (Higgins); PID at 1195-96 (K-845), 1235 (K-935), 1254 (K-977). Moreover, even if the Board had concluded that QA/QC in this area had not been properly implemented, the obvious remedy would have been an electrical separation inspection. Under the settlement negotiated by the parties and accepted by the Board on

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[47] The Licensing Board made no such statement in its decision on the electrical separation examples. See 18 NRC at 600-01.

the electrical separation contentions, LILCO has conducted just such an inspection. Resolution of SC Contention 31/SOC Contention 19(g) -- Electrical Separation, ff. Tr. 18,596; Amendment to "Resolution of SC Contention 31/SOC Contention 19(g) -- Electrical Separation," ff. Tr. 17,818.[48]

In addition, the County's argument that LILCO did not have in place, in a timely manner, adequate QA/QC controls pertaining to electrical separation is incorrect.[49] SC (1) fails to recognize the limitations of the Staff witnesses, (2) fails to differentiate between technical and QA/QC issues, (3) mischaracterizes the extent to which separation and inspection criteria were not promptly developed, and (4) exaggerates the extent of QA/QC difficulties.

More specifically, first, the County ignores the limited knowledge of the Staff witnesses on whose testimony the Board's findings largely rest. See PID at 1190-97 (J-832 to -848). By their own admission, these witnesses were

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[48] A broader remedy, such as physical inspection of the entire plant, would not be warranted even if it had been demonstrated that widespread QA/QC problems existed in the electrical separation area. Electrical separation is a complex, technical issue not typical of other construction activities. E.g., Tr. 16,585, 17,160-62 (Higgins). Thus, QA problems in the electrical separation area, if any, cannot be extrapolated to the plant as a whole.

[49] The PID at 1190-97 contains 17 Board Findings related to electrical separation. These were adopted, essentially verbatim, from the County's proposed findings. SC Proposed Findings, dated April 7, 1983, at 329-37. In numerous instances, these findings were misleading, as indicated by LILCO in its reply to the County's findings. LILCO Reply, dated April 25, 1983, Attachment 2, at 27-29. In this regard, it is well to note that LILCO did not treat electrical separation as a discrete QA subject in its proposed findings since electrical separation was not so identified during the County's highly compartmentalized cross-examination of LILCO's and the Staff's QA witnesses. But once the County broke electrical separation out as a distinct category in its post-hearing papers, LILCO did so also in its Reply of April 25, 1983, at 54-57, 172-76.

only generally familiar with electrical separation at Shoreham. They had been involved peripherally in the inspection findings about which they were examined; they were aware of technical discussions and correspondence on electrical separation, but were unfamiliar with the details. They knew that various technical and QA/QC requirements were in place at Shoreham at various points in time, but they were not familiar with the detailed evolution of these requirements. Mr. Higgins in particular was careful to qualify the extent of his personal knowledge; he expressed concern that erroneous impressions would result, since it is difficult to grasp so complex a situation without understanding its details. Tr. 16,583, 16,585, 16,589-91, 16598, 16600-02, 16714-16, 17,160-61 (Higgins); see Tr. 16,580 (Narrow), 16,597-98 (Gallo).[50]

Second, electrical separation questions raised by I&E at Shoreham over the years were, by and large, questions concerning technical matters. Concern did not focus on QA/QC matters which include, in the larger engineering sense, timely control of the design. PID at 1235-36 (K-934 to -936); Tr. 16936, 17,160-62 (Higgins). The technical issues were being properly addressed; they have been the subject of an engineering analysis by LILCO which was submitted to the Staff, as well as continuing correspondence and several meetings between LILCO and the Staff. Staff Ex. 8, at 25; see also Tr. 16,579, 16,587, 16,599, 16,601, 16,607, 16,714-15 (Higgins), 16,592-93 (Gallo).

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[50] It is telling that, given the extensive record on quality assurance, the County finds it necessary to rely on an area which the witnesses could not discuss in detail, and which has been settled in another contention. See pages 50-51 above. Equally telling is the County's total failure to question LILCO's QA witnesses on electrical separation findings made by I&E, despite the County's exhaustive questioning in areas that it thought important. See Section I.G.1 below.

Third, the County greatly overstates the extent to which separation and inspection criteria were not promptly developed. SC Brief at 72, 74 n.38, 75. The record shows that during the construction of Shoreham the standards for electrical separation became more stringent. Regulatory Guide 1.75, one of these evolving standards, was adopted by LILCO, although it was not required to do so. This commitment required backfitting, which in turn resulted in technical difficulties. These technical difficulties were the sort any plant would have encountered in backfitting to meet Regulatory Guide 1.75 -- for instance, late resolution of final criteria, PID at 1253-54 (K-976). As the standards for electrical separation evolved, the criteria for installation and inspection also had to evolve. Various technical and QA/QC requirements were in place at any point in time. See Tr. 17,338-39 (Higgins). The County misleadingly states that, at the time of the CAT inspection, the procedures and inspection criteria for inspectors were not developed. The statement accurately applies to only a narrow area of separation criteria, the separation of safety related from non-safety related cable in transition in free air. E.g., Tr. 17,425 (Higgins). And there in fact were criteria (established in an E&DCR) in place at the time of the CAT inspection. SC Ex. 89B, at 4-21 to 4-22; Tr. 17,338 (Higgins). What was not clear was whether, from a technical standpoint, cables in free air were even required to be separated. Subsequent resolution of this technical question resulted in revision to the Shoreham separation criteria in place at the time of the CAT inspection. Tr. 16,601, 17,338-39 (Higgins); see also PID at 1254 (K-976).

Fourth, while from time to time I&E has found a few QA discrepancies in the electrical separation area at Shoreham, the County exaggerates them. The NRC witnesses testified that these I&E findings were of a type and number expected at any plant, Tr. 17, 160-62 (Narrow, Higgins), 16,969-70 (Gallo),[51] and again, that the concern was more technical in nature than QA/QC.

G. QA/QC PROCEDURAL MATTERS INVOLVE NO ERROR

1. The Licensing Board Neither Abused Its Discretion Nor Improperly Interfered With SC's Cross-Examination

In factual context, the County's claims of improper interference and limitation are palpably absurd. Consider these facts:

1. Fifty-five hearing days were devoted to the County's QA/QC contentions. 18 NRC at 579.

2. County cross-examination of LILCO witnesses consumed over seven weeks.[52]

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[51] The Licensing Board concluded that the Staff witnesses were divided on whether the electrical separation problems at Shoreham were greater than those at the average site. PID at 241; SC Brief at 74 n.38. In a proposed finding accepted by the Board, compare SC Proposed Findings, dated April 7, 1983, at 336 (QA:344) with PID at 601, 1196 (K-846), the County characterized Mr. Gallo's testimony as being that Shoreham had a greater problem than the average site, when he actually said only that the problem appeared a "little bit higher," Tr. 16,969-70 (Gallo). Given the testimony of Messrs. Higgins and Narrow, and the "little bit" higher of Mr. Gallo, it seems that the Staff witnesses were not meaningfully split; they agreed that Shoreham was basically average as regards electrical separation problems. See also note 49 above.

[52] The County's reference to five weeks (SC Brief at 78) ignores the additional two weeks County lawyers took cross-examining a LILCO panel on the conclusions of the Torrey Pines independent verification that the LILCO QA

(footnote cont'd)

3. Seventy-three County exhibits were marked for identification during the course of the 55-day QA/QC hearings.[53]

4. The fifty-five days of hearings resulted in 9,619 pages of transcript.[54]

These facts make clear that the County's QA/QC contentions were afforded full and generous consideration -- more extensive consideration than has been given such contentions in other operating license proceedings.[55]

(footnote cont'd)

program for construction was satisfactory and that it had been effectively implemented over the duration of the project. PID at 1367-68 (K-1252 & -1253); LILCO Ex. 56, Attachment 2, at 5-1 to 5-3; Tr. 17,586-18,875 (County cross-examination of LILCO Torrey Pines witnesses). The County reference to five weeks also ignores the additional week SC spent cross-examining the Staff panel on QA/QC issues. See Tr. 16,238-17,065; 17,404-17,533. (County cross-examination of Staff witnesses.) Both the seven week and five week time periods stand in stark contrast to the County's estimate (in a joint schedule proposal submitted to the Board) that it expected to complete cross-examination of the LILCO QA/QC panel in two weeks. Schedule Proposal, ff. Tr. 9,959, at 1.

[53] A number of these exhibits were quite voluminous, some containing parts or all of 20 to 40 or more LILCO and Stone & Webster audits. See, e.g., SC Ex. No. 65.

[54] These pages constitute almost one-half of the entire transcript for the hearings addressed in the PID.

[55] Relevant, too, is the extensive prehearing discovery afforded the County. QA discovery was conducted over a period of years and all LILCO and S&W audits of the project were produced. The County was permitted to review this mountain of documents and select those it wished to copy. Also, SC filed interrogatories and was given the opportunity to take depositions, but for its own reasons, chose not to do so. Tr. 252-53, 262-63, 265-66, 270-75. See generally, PID at App. A, A-11, A-26 to -28. The County was permitted additional discovery over LILCO's objections after the filing of testimony on the contentions. Tr. 9333-446.

CERTIFICATE OF SERVICE

In the Matter of
LONG ISLAND LIGHTING COMPANY
(Shoreham Nuclear Power Station, Unit 1)
Docket No. 50-322 (OL)

I hereby certify that copies of LILCO's Reply Brief on Appeal were served this date upon the following by first-class mail, postage prepaid.

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The County paints a picture of the Board coercing and mandating it to pursue a course of cross-examination to its prejudice. This is simply not what happened; the record reflects instead that, after a day of highly general foundation examination by SC, the Board urged the County to consider proceeding immediately to the essence of its QA/QC contentions, i.e., that allegedly LILCO's audits showed a pattern of QA breakdowns and that LILCO's QA program had not been effectively implemented.[56] In the Board's view, any necessary foundation matters could be pursued most profitably in the context of exploring the specific alleged "breakdowns." Tr. 10,259-62. The Board did not, as the County asserts, direct SC to cease broad foundation questioning and proceed immediately to the "QA/QC breakdowns" alleged in the contentions. Rather, the Board indicated its preference for this shift in focus and then took a recess to give the County time to think about the Board's suggestion. Tr. 10,262. After the recess, the County asked

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[56] See PID at 847 (K-1). There can be no serious doubt that QA implementation was the focus of SC's prefiled testimony. Thus the major argument headings in the County's prefiled testimony refer to "Deficiencies In The Implementation Of The Shoreham QA/QC Program" and failure "To Verify That LILCO's QA/QC Program . . . Has Been Effectively Implemented." The testimony further reflected the focus on implementation:

> LILCO has previously presented, on paper, a description of its QA program for design and construction of Shoreham. However, the adequacy of that program cannot be judged by the words therein but only by examination of the program's actual implementation.

SC Ex. 89A, at 16 (emphasis added); see also id. at 8-10, 15. Given this emphasis in SC's testimony, the Board's interest in the facts of QA/QC program implementation, the "nitty gritty," was quite understandable; the County invited it. See also Tr. 10,265. Small wonder, then, that the Board expected the County to focus its cross-examination on this "nitty gritty."

whether the Board's suggestion was mandatory and was told it was unnecessary to reach that issue until the County responded. Tr. 10,263-64. The County then indicated that, while it disagreed with the suggestion, it would make no formal objection, did not wish to argue with the Board and, in essence, accepted the Board's encouragement to proceed to the heart of the matter. Tr. 10,264-66; see also PID at 853 (K-10). Specifically, SC counsel stated that:

> If you want me to go to the nitty gritty, to go through these audits and some other things that establish the pattern, which I am willing to do, I'm not prepared to do so immediately. I think I can be prepared to do so tomorrow morning . . . .

Tr. 10,265 (emphasis added). SC counsel agreed that foundation testimony could be dealt with as suggested by the Board. Tr. 10,268.

By no means did the County assert then, as it does now, that it strenuously objected to the Board's proposal as an improper, prejudicial interference and abuse of discretion. It would appear that SC's current objection is a post hoc invention born of disappointment over the result.

As indicated, after acquiescing in the Board's suggestion to proceed to the "nitty gritty," SC counsel stated he would be prepared to go forward the following morning if he could have the remainder of the day to rearrange his cross-examination. Tr. 10,265-66. The Board granted this request. Tr. 10,272.[57] These circumstances did not prejudice SC. The

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[57] The County had already sought and obtained a two-week delay in the commencement of the hearings, ostensibly to ensure that it would be fully prepared to complete its cross-examination in two weeks. Schedule Proposal, ff. Tr. 9,959, at 1. Beyond this, the County had had literally months to prepare for the QA hearings; the pertinent contentions were admitted in their final form on March 10, 1982, but hearings on them did not begin until September 14, 1982.

absence of prejudice was confirmed by the County's two subsequent offers of proof on QA issues. Neither contained any reference to the general foundation matters the County was pursuing when encouraged by the Board to get to the heart of the matter. One referred only to issues relating to operational QA procedures that were ultimately settled. See Suffolk County Offer of Proof (OQA), dated Nov. 9, 1982. The second referred, not to foundation matters, but to more audits and alleged pattern evidence, i.e., more "nitty gritty." See Suffolk County Offer of Proof, dated Nov. 5, 1982.

Equally specious is the County's claim that the Board imposed "sharp limitations" on SC's cross-examination. The County claims it was required to inquire into each audit finding. This is not true; the Board permitted SC to introduce audit findings in groups so long as the County asked questions about one or more of the findings in the group to establish their significance and relationship as a group. Tr. 10,261-62, 10,613-15.[58] See also Tr. 11,318-23, 11,537-41. Also, LILCO was asked to and did agree, where appropriate, that certain findings were related and could properly be grouped. See, e.g., Tr. 11,636-54, 11,661-63, 11,728-55, 11,849-57.

The only other "sharp limitation" the County raises is that it was not permitted to cross-examine LILCO's witnesses for more than a total of seven weeks.[59] By no stretch of the imagination can this fairly be labeled a

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[58] The Board recognized that audit findings, without some explanation, were neither meaningful nor probative. See Tr. 10,451-56, 11,360, 11,412-13, 11,417. Significantly, none of the many LILCO audit findings used by SC on cross-examination were referred to in the County's direct testimony.

[59] See note 52 above.

"sharp limitation." Under all the circumstances (including numerous admonitions to the County to pursue its best points first, e.g., Tr. 10,261-62, 11,320-21), the limitation was exceptionally generous and fully justified under pertinent law. See 10 CFR Part 2, Appendix A, at V; Statement of Policy on Conduct of Licensing Proceedings, CLI-81-8, 13 NRC 452, 457 (1981); Public Service Co. of Indiana (Marble Hill Nuclear Generating Station, Units 1 and 2), ALAB-459, 7 NRC 179, 188 (1978); Southern California Edison Co. (San Onofre Nuclear Generating Station, Units 2 and 3), ALAB-212, 7 AEC 986, 991 (1974); see also Consolidated Edison Co. of New York (Indian Point, Unit No. 2), Power Authority of the State of New York (Indian Point, Unit No. 3), ASLBP 81-446-03-SP, slip op. at 7 (Oct. 24, 1983) (time limitations to prevent unduly extensive yet plausibly relevant cross-examination); MCI Communications Corp. v. Am. Tel. & Tel. Co., 85 F.R.D. 28 (N.D. Ill. 1979) (district court has authority to impose reasonable time limits on examination of witnesses), SCM Corp. v. Xerox Corp., 77 F.R.D. 10 (D. Conn. 1977).

In sum, there is no support in law or fact for SC's claim that the Licensing Board wrongfully interfered with and limited its cross-examination. Indeed, as here, where the record discloses (1) that the hearing on the QA/QC contentions lasted 55 days, requiring over 9600 transcript pages and consideration of 73 SC exhibits, (2) that the County was permitted to cross-examine for a total of seven weeks on QA/QC matters, (3) that the Board repeatedly urged the County to pursue its best points first, and (4) that SC has made no concrete showing whatever of prejudice, SC's claim of Board abuse of discretion is, to repeat, palpably absurd.

2. The Licensing Board Did Not Abuse Its Discretion In Denying SC's Request To Testify On RAT

Denial of the County's request to testify on the Readiness Assessment Team (RAT) inspection was justified under the circumstances. The RAT inspection, yet another in the long line of NRC I&E inspections at Shoreham, was completed in January 1983. By that time, marathon hearings on SC's QA contentions were drawing to a close and the Board

1. had already received three pieces of County prefiled testimony on the QA contentions totaling 406 pages,[60] including 180 pages relating to more than 60 I&E inspections.

2. had already listened to lengthy SC cross-examination of LILCO and NRC witnesses on the QA contentions, including numerous previous I&E inspections (SC Exs. 70, 91-109; see Section I.G.1 above) and

3. had already listened to cross-examination of SC's consultant that disclosed his lack of knowledge regarding the facts and significance of I&E inspections.[61]

Thus, at the time of the RAT inspection, the Board had already afforded the County more than ample opportunity to use over one hundred I&E inspections[62] and hundreds of LILCO audits to advance its position on the QA

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[60] Prepared Direct Testimony of Richard B. Hubbard on Behalf of Suffolk County Regarding Suffolk County Contentions 12, 13, 14, and 15, Quality Assurance/Quality Control with attachments, June 29, 1982. SC Ex. 89A, 89B. Supplemental Direct Testimony of Richard B. Hubbard in Response to Board Question, Undated. SC Ex. 89D. Direct Testimony of Richard B. Hubbard and Dr. Francisco J. Samaniego Regarding Torrey Pines Technology's Inspection of Shoreham Nuclear Power Station, ff. Tr. 19,068.

[61] See Tr. 15,454-61, 15,516-40 (Hubbard).

[62] The I&E program at Shoreham during the period April 1973 - June 1, 1982 included 146 inspections and three investigations, the results of all of

(footnote cont'd)

contentions. Against this background, the Board reviewed the RAT inspection report and properly concluded that SC testimony was not required for an inquiry into "what the Staff found and what LILCO's explanation, if any, is for these [RAT] matters." Tr. 19,534 (Brenner, J.).[63] These facts, the Board correctly concluded, were within LILCO's and the NRC Staff's knowledge, but not the County's. In reaching its decision, the Board noted that it had already "had extensive testimony" and would therefore be able to apply the facts of RAT to that testimony. Tr. 19,534. In other words, after weeks of SC cross-examination of LILCO and Staff witnesses and hundreds of pages of SC testimony (not to mention exhibits), the Board was aware of the County's theme with respect to I&E inspection findings and could apply the facts of RAT to these theories. Additional SC testimony, therefore, would have been unduly repetitious. Further, SC was afforded full opportunity to cross-examine NRC and LILCO witnesses on RAT matters. This permitted SC to attempt to relate the facts surrounding the RAT findings to matters covered earlier and to propose findings to argue its position. SC did propose such findings, some of which were accepted by the Board. E.g., PID at 1276-78 (K-1040 to -1044), 1292-94 (K-1083 to -1088).

(footnote cont'd)

which were available to the County for use in the preparation of its prefiled testimony and for purposes of cross-examination. PID at 1203 (K-866). The RAT inspection was at least the 153rd I&E inspection in the series and there have been a number since that date.

[63] LILCO objected to any testimony on the RAT inspection on the ground that there had already been extensive testimony on I&E inspections of all types. Tr. 18,818, 19,423-28. The Board overruled LILCO's objection and decided to require additional testimony by LILCO and NRC Staff focused narrowly on the facts of certain RAT inspection results. Tr. 19,010-12, 19,445.

SC's assertion that its expert's opinion was important is refuted by the record. This expert elected to focus his prefiled testimony on the results of the I&E Construction Assessment Team (CAT) inspection. Yet cross-examination demonstrated repeatedly that his opinion testimony on this subject was not well founded; he lacked working knowledge of the facts of the I&E findings or their significance, beyond what was stated in the CAT inspection report itself. Another Appeal Board has also noted that this witness lacked familiarity with construction work in general and that his opinion was entitled to little weight.[64]

In light of all the circumstances -- the already extensive record on the County's QA contentions, the ample opportunity already afforded the County to make its case, the lack of County knowledge concerning the facts of the RAT inspection, and the County consultant's lack of familiarity with

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[64] Both the joint intervenors and the Governor rely on the expert opinion of Richard B. Hubbard to support their position that the deficiencies in the applicant's design quality assurance program portend similar deficiencies in the construction quality assurance program. In like fashion, they depend upon Mr. Hubbard's opinion for support of most of their other arguments. Voir dire and cross-examination of Mr. Hubbard, however, established that he lacked experience and familiarity with construction work in general and with the Diablo Canyon construction quality assurance program. Tr. 39-42, 92-95, 105-110, 161-62. In the circumstances, Mr. Hubbard's opinion is entitled to little weight and it does nothing to enhance the movants' arguments.

Pacific Gas and Elec. Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-756, slip op. at 10 n.10. (Dec. 19, 1983).

construction work and with the RAT inspection -- the pertinent ruling fell easily within the Licensing Board's discretion. See 10 CFR Part 2, Appendix A, at V(d)(5).

Moreover, SC has made no showing whatever of any prejudice, nor has it made any offer of proof.[65] And the County did accept the Board's invitation to argue the significance of the RAT results in its proposed findings; as indicated above, some of these SC findings were adopted. Given all this, the County's complaint lacks merit.

H. OPERATIONAL QUALITY ASSURANCE: LILCO MEETS APPENDIX B

Criterion I of Appendix B requires that a quality assurance organization have sufficient organizational freedom, including freedom from cost and schedule concerns when opposed to safety concerns, to perform its functions. The meaning of this independence requirement was clarified by the Commission in 1975. In the early 1970s several Appeal Board decisions had interpreted Criterion I to prohibit personnel performing quality assurance functions from reporting to field project managers or superintendents who had responsibility for cost and schedule matters. See Commonwealth Edison Co. (La Salle County Nuclear Station Units 1 and 2), ALAB-153, 6 AEC 821,

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[65] Failure to make an offer of proof is fatal to SC's claim in this instance. See, e.g., Southern California Edison Co. (San Onofre Nuclear Generating Station, Units 2 and 3), ALAB-673, 15 NRC 688, 697-98 (1982); see also Cleveland Electric Illuminating Co. (Perry Nuclear Power Plant, Units 1 & 2), slip op. at 1-2 (Aug. 30, 1983); Louisiana Power and Light Co. (Waterford Steam Electric Station, Unit 3), ALAB-732, 17 NRC 1076, 1096 (June 29, 1983).

821-22 (1973); Consumers Power Co. (Midland Plant, Units 1 and 2), ALAB-147, 6 AEC 636, 640 (1973). As a result of these decisions, the Commission held a rulemaking to clarify that the organizational requirements of Criterion I do not mandate complete independence from cost and schedule considerations. 39 Fed. Reg. 13,974 (1974) (proposed rule); 40 Fed. Reg. 3210C (1975) (final rule).

The rulemaking changed Criterion I to emphasize the need for flexibility in organizational structure, adding the following sentence:

> Because of the many variables involved, such as number of personnel, the type of activity being performed, and the location or locations where activities are performed, the organizational structure for executing the quality assurance program may take various forms provided that the persons and organizations assigned the quality assurance functions have this required authority and organizational freedom.

40 Fed. Reg. 3210D (1975); see also 39 Fed. Reg. 13,975 (1974). Thus, so long as the organizational structure ensures the ability of QA personnel to perform their functions, they may report to managers with cost and schedule responsibility.

LILCO and the Staff witnesses agreed that LILCO's organizational structure provides adequate assurance that the OQA section can successfully perform its required functions. See PID at 882 (K-88), 886 (K-99); Tr. 14,842 (Muller), 20,201-03 (Gilray); Staff Ex. 2B, Supp. 1 (SER) at 17.6.

The County's argument that, in essence, the operational quality assurance engineer (OQAE) will be totally controlled by the plant manager has two flaws.[66] First, the plant manager is responsible for the safe operation of

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[66] Suffolk County's reliance on the earlier separation of the Quality Assurance Department from the Nuclear Project Manager as an indication of the

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Shoreham. PID at 947-48 (K-247). This duty necessarily implies that the plant manager must balance safety considerations with cost and scheduling concerns in the operation of the station. In fact, the plant manager is specifically delegated responsibility for QA at the plant. Id. Also, direct responsibility for cost and scheduling, like operational quality assurance, has been delegated to people reporting directly to the plant manager. Tr. 20,175-76 (Gilray).

Second, while the plant manager is authorized to review the performance of the operating quality assurance engineer, the checks and balances[67] contained in LILCO's organizational structure help to ensure that this authority will not be abused. Tr. 20,170 (Gilray).[68]

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inherent weakness of LILCO's operational quality assurance structure is similarly misplaced for the reasons stated below.

[67] The checks and balances include (1) a direct communications link between the OQAE and the QA manager, Tr. 12,793-95 (Muller), 20,224 (Caphton); (2) the review of all operational quality assurance procedures by the QA manager, Tr. 12,718-19, 12,720-21, 12,727, 14,676-77 (Muller), 20,170-71 (Gilray); (3) QA Department audits of the OQA Section, Tr. 12,718, 12,796-97, 14,902 (Muller), 20,170-71 (Gilray), 20,224-25 (Caphton); and (4) the stop work authority of the OQAE, LILCO Ex. 40; Tr. 12,797-99, 14,877-94 (Muller). In addition, other checks and balances include the Review of Operations Committee, the Nuclear Review Board, the Independent Safety Evaluation Group, and the NRC Resident Inspector. PID at 883 (K-93); see also note 69 below.

[68] For example, SC's concern that the OQA engineer will be intimidated by the plant manager's authority to fire him is without merit. If the plant manager fired the OQA engineer for failing to acquiesce in some quality matter, the OQAE would then have every incentive to report this to the quality assurance manager and other upper level management. See PID at 882-83 (K-91). Thus, the plant manager's power to fire the OQAE does not hold the intimidation value ascribed to it by the County.

The County contends that the checks and balances are not effective. SC's contention that the QA manager cannot protect the OQA engineer rests on Suffolk County's view that the QA manager operates as nothing more than a messenger -- merely passing along OQA concerns to higher authorities. Nothing in the record suggests that the QA manager will so abdicate his responsibilities. In fact, NRC I&E has audited LILCO and confirmed that the Company's organizational structure provides sufficient independence. Tr. 20,217 (Caphton).

Suffolk County's suggestion that review procedures will operate only after the fact ignores a primary purpose for creating review groups, namely, breeding a concern for quality assurance matters within LILCO's managerial structure, including the plant manager. Tr. 14,686, 14,843, 14,872-73 (Muller). See generally PID at 885-86 (K-98). It also ignores the ongoing nature of some of the checks. See, e.g., PID at 902-03 (K-140 & -141).[69] And the County's comments regarding the efficacy of the operating quality assurance engineer's shutdown authority is unfounded. SC Brief at 84, 85 n.43. If the equipment or activity in question is a limiting condition of operation in the Technical Specifications, an operator's license requires him to shut down the plant. See Tr. 14,878 (Muller). Moreover, the stop work concerns raised by SC would not be resolved by having the OQAE report to the QA manager.

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[69] The County claims that reviews by the Independent Safety Evaluation Group (ISEG) and the like do not constitute safeguards from cost and schedule considerations. But the record does contain information concerning how these groups would doublecheck OQA's performance. PID at 902-03 (K-139 to -141) (ISEG); 912 (K-161) (Nuclear Review Board); see PID at 909-10 (K-156) (ROC); see also PID at 883 (K-93).

Significantly, the County's arguments ignore that LILCO's organizational structure is consistent with NRC Staff and industry guidance. NRC Staff witnesses testified that the LILCO organization is also consistent with the Standard Review Plan, the basic Staff guidance document.[70] PID at 886 (K-99); Tr. 20,153 (Gilray). LILCO meets as well Regulatory Guide 1.33, Revision 2, "Quality Assurance Program Requirements (Operation)," which endorses ANSI N18.7-1976. See Tr. 14,837-38 (Muller). In fact, the ANSI standard concludes that reporting onsite, as does LILCO's OQAE, is the preferred structure because of improved communications.[71] See Tr. 14,838 (Muller); PID at 886 (K-99).

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[70] Although now superseded by the SRP, WASH-1284, "Guidance on Quality Requirements During the Operations Phase of Nuclear Power Plants," was used by the Staff in its initial evaluation of the Shoreham operational quality assurance structure. Tr. 14,679-82 (Muller), 20,221 (Gilray). This document gives samples of acceptable organizational structures, one of which is the organizational structure used by LILCO. Tr. 14,682 (Muller). This is particularly significant since the Commission specifically endorsed WASH-1284 when it amended the Appendix B organizational requirements. 40 Fed. Reg. 3210C (1975).

[71] The advantages of the "chemistry" of being part of the plant team were detailed by witnesses Gilray and Muller, see PID at 885-86 (K-98); Tr. 14,686-87, 14,843, 14,872-73 (Muller), and serve as the basis for ANSI Report N18.7-1976's preference for the LILCO organizational structure. The potential benefits of close coordination between quality organizations and the line organizations was recognized by the Commission when it amended Criterion I. See 40 Fed. Reg. 3210C (1975). The County's suggestion that there is a conflict in Staff witness Gilray's testimony with respect to these advantages is not borne out by the record. See Tr. 20,191 (Gilray).

II. EMERGENCY PLANNING

A. OVERVIEW

Suffolk County asserts three errors in the Licensing Board's handling of "Phase I" of the emergency planning issues in this proceeding. These three alleged errors are as follows:

1. The Board should not have bifurcated the emergency planning issues into two phases. SC Brief at 91-94.

2. The Board should have admitted the intervenors' proposed Phase I contention EP 1, which alleged that LILCO's onsite emergency plan did not take into account "local conditions." Id. at 94-95.

3. The Board should not have ordered evidentiary depositions and should not have held the intervenors in default for refusing to participate in them. Id. at 96-98.

Some background is necessary to appreciate the groundlessness of these claims.

1. The Decision To Go Forward

In the spring of 1982, v rtually on the eve of the operating license hearings, the Licensing Board was confronted with the news that the local government, Suffolk County, was scrapping its past emergency planning efforts[72] and starting over, with an entirely new group of planners, to write

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[72] Up until this time the Suffolk County government had worked for years, in close cooperation with LILCO, to produce an offsite emergency plan, which was in draft at the time of the County's change in position. This

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an offsite emergency plan. This meant that there was to be a hiatus of several months before anyone outside the County government would see a County plan, even in draft.[73] Thereafter, the draft plan had to be approved by the

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cooperation had begun well before the Three Mile Island accident. After Three Mile Island and the NRC's promulgation of new emergency planning regulations, LILCO and the Suffolk County Executive signed a memorandum of understanding on December 28, 1979, outlining the revised responsibilities of the company and the County in emergency planning. On March 15, 1981, LILCO and Suffolk County officials signed a contract calling for the County to produce a revised radiological response plan within six months. In September 1981 an amended contract with substantially the same terms was submitted to the County Legislature and accepted. Work proceeded under this contract until mid-February 1982, when the County abruptly announced it would no longer comply with the contract and that it had decided instead to embark on a new planning process, one from which, as it turned out, it would completely exclude LILCO. The history recited here is all recounted, with supporting documents, in LILCO's Brief in Opposition to Suffolk County's Motion to Terminate this Proceeding and for Certification, March 18, 1983, and the attachments to it; see also Memorandum and Order Denying Suffolk County's Motion to Terminate the Shoreham Operating License Proceeding, Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), LBP-83-22, 17 NRC 608, 647-48 (1983).

[73] LILCO tried repeatedly to persuade Suffolk County to include it in the County's planning process. For example, on June 17, 1982, LILCO Vice President Ira Freilicher met with Frank Jones, Deputy County Executive, in an attempt to explore ways for the County to proceed with emergency planning. On September 17, 1982, LILCO Vice President Matthew C. Cordaro wrote Chief Deputy County Executive John Gallagher that "we are willing to meet at any time and place you suggest with the County's consultants or emergency planning steering committee . . . ." Likewise, on August 7, 1982, LILCO's counsel wrote to counsel for the County suggesting that one or two LILCO representatives be made a part of the County's emergency planning steering committee and stating that LILCO was ready to resume meetings with the County to coordinate the County's planning with LILCO's. On September 29, 1982, Dr. Cordaro invited Mr. Jones to an informational meeting to discuss the distribution of tone alerts to special facilities in the vicinity of the plant. On October 4, 1982, Dr. Cordaro wrote Mr. Gallagher and said that "we are willing and anxious to cooperate with the County in this [emergency planning] endeavor."

On October 7, 1982, W. G. Schiffmacher, Manager of LILCO's Electrical Engineering Department, wrote to Mr. Jones describing the Shoreham Prompt

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County Executive and Legislature, then submitted to the State of New York for review, then submitted to FEMA for review, and finally put into the NRC hearing process.

Already in hand, however, was LILCO's onsite emergency plan. Faced with this situation, the Board decided to begin the litigation of the onsite plan at once, without waiting for the County to complete its internal deliberations on an offsite plan.[74] Over the intervenors' objections, the

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Notification Siren System (as Mr. Jones had requested) and asking permission to proceed with the installation of communications equipment at County facilities. On October 11, 1982, Dr. Cordaro wrote to Mr. Jones, asking permission and cooperation regarding some six items involving communications among emergency personnel and the public. And, in its statement filed with the Suffolk County Legislature on January 18, 1983, LILCO expressed hope that "there will be a renewed relationship of cooperation with the County on emergency planning as a result of LILCO's participation [in the Legislature's hearings]." Long Island Lighting Company's Presentation to the Legislature of Suffolk County on the November 1982 Draft Suffolk County Radiological Emergency Response Plan, dated Jan. 14, 1983, at 27.

The Licensing Board also showed concern for integrated planning, asking the County for a report of how LILCO was being incorporated into the County's efforts. Tr. 8904-06. In response to the Board's inquiry with respect to integrated planning, SC suggested that "harmonious integration can be attempted if consideration of all emergency planning issues were deferred until after the County's plan is developed" and that "integration is impossible, as a practical matter, in the atmosphere of contentiousness in which the parties must square off to contest 'Phase I' issues." Suffolk County's Response to the Board's Inquiry with Respect to Integrated Planning, dated Aug. 20, 1982. The atmosphere, of course, stemmed from the County's own actions.

[74] This matter was discussed at the prehearing conference of March 10, 1982. At this prehearing conference the Board advised the County of the possibility of a bifurcated hearing, with part of it on just the onsite emergency plan. Tr. 451. The parties were asked to advise the Board whether contentions on onsite emergency planning might not be separately submitted and a separate schedule for litigation of them be set. Tr. 451. The possible bifurcation was also discussed at another prehearing conference held April 14, 1982. Tr. 744-803.

Board decided to go forward with those issues that could be decided without resort to an offsite plan, known as the "Phase I" issues. "Phase II" of the litigation was to commence once the County actually produced an offsite plan.

2. The "Local Conditions" Contention

The intervenors proceeded to draft contentions on the "Phase I" issues. The first of these contentions, EP 1, was that "local conditions" had not been adequately considered in producing the onsite emergency plan.

Actually this was not the first "local conditions" contention. Earlier, Shoreham Opponents Coalition (SOC) Contention 1 had alleged that the emergency planning zones (EPZs) of 10 and 50 miles failed to provide adequate consideration of certain "local conditions." Prehearing Conference of March 10, 1982, Tr. 346. The Board dismissed the SOC contention but made the dismissal without prejudice to raising more particularized contentions:

> So if you are talking about adjustments to the 10 and 50 miles, those adjustments which you allege should be made have to be tied to those particular requirements, what adjustments do you think should be made for what reasons as related to those actions which must be taken to satisfy the rule.

Prehearing Conference of March 10, 1982, Tr. 389.

Phase I contention EP 1 was originally entitled "Overall LILCO Plan Inadequacy." The parties discussed the contention in draft, the intervenors submitted it on July 6, 1982, LILCO and the Staff objected to it, and, after oral argument, the Board denied its admission because it lacked particularization and was overly broad. Prehearing Conference Order, Long Island

Lighting Co. (Shoreham Nuclear Power Station, Unit 1), slip op. at 5-7 (July 27, 1982). In response to the intervenors' petition for reconsideration, however, the Board orally reversed its ruling and ordered the intervenors further to particularize the contention.

Again the parties negotiated over the contention, and on August 20, 1982, the intervenors submitted the version of EP 1 at issue in this appeal, which again alleged that LILCO had failed to take into account "local conditions" -- such things as demographic characteristics, the layout of the roads, and the types of building materials in local houses. The Board denied this contention, again, because the intervenors still declined to specify which portions of the plan they believed were inadequate. This lack of specificity was exacerbated, the Board found, by the listing (in paragraph "D" of the contention) of broad categories of "local conditions" rather than specific conditions. Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), LBP-82-75, 16 NRC 986, 990-95 (1982). In short, the intervenors still failed to specify both (1) specific local conditions and (2) specific deficiencies in the plan.

3. The County's Default On The Phase I Issues

As the Phase I contentions were being put into final form, discovery was going forward, followed by testimony preparation. At the same time, hearings on the other issues in the proceeding were continuing. In the fall of 1982, at a time when hearings had been in progress for months and when the issues of quality assurance alone had been in hearing for several weeks,

the Board decided to adapt the hearing procedures in the hopes of better focusing the proceedings.

The Board therefore ordered the Phase I evidence on emergency preparedness to be taken in the first instance by depositions. Full cross-examination was to take place, just as in a public hearing, and the public was free to attend, just as in a public hearing. The only difference was that the Board was to read the transcripts of the depositions rather than be present at them. The Board then planned to hold a conventional public hearing to explore parts of the deposition record that still seemed to need more elaboration. At this hearing the parties were again to cross-examine witnesses, to the extent they had not been able to do so during the depositions, and the Board would be present to ask questions itself and to observe witnesses' demeanor. Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), LBP-82-107, 16 NRC 1667, 1680-83 (1982).

The intervenors announced they would not comply with the Board's order. The Licensing Board judges tried to persuade the intervenors to take part:

> JUDGE CARPENTER: I would just like to make a couple of remarks to provide some perspective on what the Board's hopes are. If we look at the administrative proceedings like this, one would like to see the record which will undoubtedly be reviewed be both comprehensive and incisive, and I think you might tend to agree with me that those are basically incompatible in a simple way, so that it is a difficult thing to produce such a record which is both comprehensive and incisive.
>
> And the reason the Board feels this initial examination to develop a comprehensive record is very useful and [there is] unavoidably much detail that must be presented. Then the Board needs to look at that detail, look at the comprehensive

> record, and then try to bring to focus all parties on the critical elements that have come from that detailed examination. So then we can proceed to examine with perspective that has been developed from the detail.
>
> So all we were suggesting is a recognition of the need to do two different kinds of things -- to get a comprehensive record with all of the technical facts put out on the table, and then to examine those facts in an incisive way. And I am trying to be responsive, Mr. Brown, to your request to understand the Board's thinking, and I am trying to express it just as simply as I can.
>
> JUDGE MORRIS: I would just like to add one comment.
>
> The Board recognizes that the subject of emergency planning is of great interest up here in Suffolk County on Long Island, and we want to be sure that we have time to reflect on the details that are developed in the proceeding, and that means hearing the parties, having time to examine the evidence, at least, prior to our conducting the final hearing process in public to ask our questions, and to allow for further questioning by the parties.

Tr. 14,721-22.

The County still refused categorically to participate in this procedure, calling it "unlawful." Tr. 14,725-26 (Brown). The other intervenors followed the County's lead. The Board offered to facilitate appellate review of the lawfulness of its proposed procedure:

> JUDGE BRENNER: Did you see our remarks on the transcript of Friday as to the appellate procedures that might be invoked if we advocate that position, that that is a normal course of appellate procedure when a trial court rules one way and a party rules another, you sometimes have to wait until the end of the proceeding for review.
>
> However, in this instance, we would be willing to assist the County in facilitating a rapid review, so long as it wasn't otherwise in default of

> its obligations before us while seeking that review. However, we have never gotten any indication from the County as to any proper appellate procedures that it wished to follow.

Tr. 14,726-27.

> We believe we have the authority to implement this quite clearly. However, trial boards have been wrong before and we would invite that kind of accelerated procedure to assure that the proceeding isn't diverted on the side trail that detracts from the substance, the very antithesis of the comprehensiveness and incisiveness that we are seeking, as Judge Carpenter just said.

Tr. 14,728-29. The intervenors persisted in their refusal to go forward, did not explain why they thought the procedure was unlawful, did not explain how they were prejudiced by it, and did not take the Board up on its offer to expedite an interlocutory review.

The County, along with the other intervenors, was therefore prohibited by the Board from contesting Phase I issues, since it had refused to do so except on its own terms. The Board felt obligated to impose this sanction:

> To allow intervenors to decline to follow our order, solely because they disagree with it, would be a particularly egregious abdication of our duty under 10 C.F.R. § 2.718 to regulate the course of this proceeding. Not only would permitting such actions be contrary to Commission precedent, but it would also likely be repeated were sanctions not imposed for this breach so as to induce future compliance with Board orders.

Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), LBP-82-115, 16 NRC 1923, 1931 (1982). Upon the County's default, the Phase I issues and the onsite plan fell solely to the NRC Staff to review. Id. at 1936; Tr. 14,748.

B. EMERGENCY PLANNING ISSUES ON APPEAL

And so we arrive at SC's appeal: three alleged Board errors stemming from the three events set out above. Each of the three wrongs of which the County complains is a self-inflicted wound; in each case SC had it within its own power to prevent the wrong it claims was done to it. The County created the situation prompting bifurcation of the issues by renouncing its contract to do an emergency plan, scrapping months of planning effort, and totally excluding the outside world from its new planning efforts -- and this so late in the day as to make it all but certain that the licensing proceeding would be delayed by months, or years. In the case of EP 1, the County could simply have drafted an admissible contention; it had many months and many opportunities to try.[75] As for its default on the Phase II issues, SC could have avoided default simply by obeying the Board's order and going forward with the litigation.

Suffolk County cites virtually no law to support its various claims. Its complaints really go to the nature of the results, not their legality. Thus, even could it show harm, which it cannot, it could not show legal harm sufficient to justify reversible error. In fact, the County's claims amount to little more than the argument that the Board should have structured the issues the way SC wanted, should have accepted Contention EP 1 the way SC wanted to state it, and should have adopted the procedures SC wanted it to

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[75] As noted above, the County had at least three separate tries at articulating its concerns, with the benefit of guidance from the Board and the views of the other parties along the way.

adopt. In short, the County is simply disagreeing with the Board's decisions in a number of matters that are largely within the Board's discretion.

1. The Licensing Board Properly Bifurcated Phase I And Phase II Issues

Suffolk County's first complaint about emergency planning is that the Licensing Board improperly bifurcated the emergency planning issues into "Phase I" (applicant's onsite plan and applicant's responsibilities offsite) and "Phase II" (everything else). The County's position is that the Board should have postponed litigation of all emergency planning issues, including those about LILCO's onsite emergency plan, until such time as there was a completed offsite plan.[76]

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[76] This approach is consistent with the County's view of the case in general, which is that the issues are all a seamless web and cannot be meaningfully separated one from another. This view is unworkable in structuring a legal proceeding. Scientists, engineers, and lawyers (the people responsible for NRC decisions) are usually of an analytical bent, and it is customary to break a problem into parts before resolving it.

The County understands, but does not acknowledge, that there is a difference between integrating the emergency plans and integrating the legal analysis of them; the Board articulated this distinction as follows:

> JUDGE BRENNER: I don't think anybody disagrees with it. That is in order to meet all those planning standard[s] in the Regulation and in terms of common sense also, all these plans ultimately have to dovetail and be coordinated. So that's not the question. The questions [sic] is, however, analytically, you litigate some issues before you litigate other issues. We would do that even if it was all available now. The question was do we have to wait a year to litigate all the issues and the answer we have concluded is no for the reasons we have indicated. That doesn't mean that when they are developed in terms of new interfaces that they don't have to coordinate very closely. Otherwise they won't work.

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The Commission appears to have decided this issue in the Catawba case:

> Here too, the basic principles urge the adoption of guidance leading to the early filing of contentions. Once an applicant has filed its on-site plan, contentions can certainly be based on those aspects that are not dependent on the off-site response plans. Moreover, to the extent that the applicant makes assumptions about those off-site response plans for the purpose of preparing its on-site plan, contentions can be raised on that basis. As for the temporary lack of such off-site response plans, UCS is correct in stating that it would be fruitless to raise that temporary lack as a contention. Differences between the actual off-site response plans and those assumed by the applicant can provide the basis for either disposing of contentions or modifying them.
>
> In conclusion, intervenors are expected to raise issues as early as possible. To the extent that this leads to contentions that are superseded by the subsequent issuance of licensing-related documents, those changes can be dealt with by either modifying or disposing of the superseded contentions.

Duke Power Co. (Catawba Nuclear Station, Units 1 and 2), CLI-83-19, 17 NRC 1041, 1049-50 (1983) (emphasis added). In case there is any lingering doubt, the flaws in the County's argument are discussed below.

The fatal flaw in the County's position on bifurcation is this: SC has utterly failed to show any prejudice to itself, to the licensing process, or to the quality of emergency planning for Shoreham. The County's claims of how it was prejudiced consist of a single, lame paragraph:

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Tr. 810-11. In any event, there is simply no other way to approach the problem, since it is impractical to have just one contention ("the plant is unsafe") and to let all the witnesses take the stand together and talk simultaneously.

> Suffolk County and other parties have suffered continual prejudice because of the bifurcation of Phase I and Phase II issues. The dichotomy between Phase I and Phase II issues has led to disagreements because of difficulty in determining precisely what issues were appropriate for litigation in Phase I and what were appropriate for litigation in Phase II. Further, Suffolk County has been prejudiced because the Phase I/Phase II bifurcation means that the Board never has even attempted to perform an overall integrated assessment of emergency preparedness for Shoreham. Rather, it has looked at a series of small pieces, never bothering to see how they may or may not all fit together.

SC Brief at 93 (footnote omitted).

Thus, the County claims prejudice in two respects. First, there were "disagreements" about whether certain issues were Phase I or Phase II. Since "disagreements" among the parties do not constitute reversible error, we must read between the lines and infer that the County is claiming that it was prevented from litigating some issues because of doubt about whether they fell into Phase I or Phase II. Second, SC claims that the Licensing Board did not conduct an "integrated assessment." In other words, the Board was not able to review the integration and coordination of onsite and offsite emergency plans.

Put another way, the County seems to be claiming, first, that some issues could not be litigated because the County was confused about whether they were Phase I or II and, second, that other issues could not be litigated because bifurcation made it impossible to articulate them.

a. The County's Alleged Inability To Litigate Issues

The short answer to SC's first claim is that the County gives not a single specific issue it feels it was prevented from litigating. In fact only two[77] of SC's Phase II contentions[78] were denied on the ground that they should have been raised in Phase I, and the County only mentions these in passing in its brief. SC Brief at 93 n.54.

If there were some contentions that could not be litigated in Phase I because there was no offsite plan, the County knew how to deal with them, because the Board told it how:

> Where you feel that you want to indicate in the contention that, and this is typical of a contention, that information is lacking in the LILCO Plan on that subject because until the County Plan is developed that information won't be there, you should include that in the contention and we will be able to consider that point in that context.

Tr. 802.

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[77] There were 97 numbered contentions proposed for Phase II, most of them with lettered subparts. Of these, only 26.B and 47 were denied admission because they were properly "Phase I." Phase II Contention 26.B addressed the alleged inadequacy of nondedicated commercial telephone lines for notification of emergency response personnel. Phase I Contention EP 11 specifically addressed this issue. Special Prehearing Conference Order, Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), slip op. at 15-16 (Aug. 19, 1983). Contention 47, about offsite dose projections for particulates, was squarely within Phase I contention EP 14. Id. at 19.

[78] The County cannot possibly be complaining that it was prevented from litigating certain issues in Phase I, because it defaulted on all Phase I issues. Some proposed Phase I contentions were denied as more properly litigable in Phase II, but presumably the County was capable of reasserting them when Phase II actually began.

b. The Board's Alleged Inability To Consider The "Integration And Coordination" Of The Onsite And Offsite Plans

The County's claim that the Board did not do its duty to investigate the "integration and coordination" of offsite and onsite plans is, if possible, even less worthy than its claim that the intervenors were confused about whether issues should be in Phase I or Phase II. As a threshold matter, it is hard to get excited over hypothetical issues about the integration of the offsite and onsite plans when the utility is having to do both of them.[79]

More important, the Board cannot be expected to decide an issue about integration and coordination unless some party raises a contention. The County has not done so. The County has failed to suggest a single respect in which "integration and coordination" has not been achieved; even less has it suggested such an issue that cannot be litigated in Phase II. If the County had raised a contention about integration and coordination that had not been heard, that might be a different matter. But instead the County simply asserts, in the abstract, that the Board failed to conduct an inquiry into integration and coordination.

Thus the County fails to recognize that the conduct of a hearing at the operating license stage depends on contentions put into issue by the parties. LILCO agrees with the County that the onsite and offsite emergency

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[79] Arguments about integration and coordination might have made some sense when there was still hope that the County would produce an offsite plan. But now that LILCO has been forced to implement both the onsite and the offsite plan, properly speaking, the issue is moot.

plans should be integrated. But the question of how the Licensing Board should review the question of integration and coordination is quite another matter.[80] The County apparently believes that the Board should duplicate the NRC Staff and engage in a wide-ranging inquiry, without guidance from the parties, as to whether the onsite and plans are properly "integrated." This notion is at odds with NRC regulations.

Moreover, although the County complains (at page 91 of its brief) that it is "impossible" to bifurcate emergency planning issues because integration and coordination is necessary, the Commission's low-power regulation (10 CFR § 50.57(c)) clearly authorizes a decision based on a review of the onsite plan (including certain "offsite elements" of that plan).[81] The County's position that a finding under this regulation cannot be made is simply a challenge to the regulation.

c. The Reasons For Bifurcation Are Perfectly Sound

The County also claims that the Licensing Board's reasons for bifurcating the issues were inappropriate. This claim is immaterial given the County's failure to say how the intervenors were prejudiced; in any event, the claim is wrong.

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[80] Judge Brenner explained this to the County in the passage cited in note 76 above.

[81] Once LILCO filed an application for a low-power license, the County did attempt to raise contentions about what it called offsite elements, but admission of these contentions was denied by the Licensing Board. Memorandum and Order Denying Suffolk County Motion for Leave to File Contentions Regarding Onsite Emergency Planning, Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), slip op. (Aug. 5, 1983).

The Board had two reasons for going ahead with the Phase I issues. First, it wished to expedite the hearing process and avoid dead time when no issues could be litigated. Second, it anticipated it might have to make findings on an application for a low-power license.

As to the first, the Board was faced with the situation in which the County would not produce an offsite plan, even in draft, for six months or more, followed by County Executive and Legislature review, State of New York review, and FEMA review.[82] At that time LILCO estimated that the plant was about 90 percent complete. Tr. 429. At the same time, the LILCO onsite plan was ready for litigation. As the Board put it:

> Well, I'll just conclude by saying we have a responsibility where we can, to make partial findings when the information is in existence and that information is in existence. Why should we wait a year and find out that we reject portions of LILCO's Plan a year from now when we can find those defects if they exist and reject them now.

Tr. 798. The Commission has a policy encouraging prompt hearings, and the Board was squarely within that policy. Statement of Policy on Conduct of Licensing Proceedings, CLI-81-8, 13 NRC 452 (1981).

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[82] At the prehearing conference of April 14, 1982, the Board noted this problem. At this time the Board believed that the County would submit a "final draft" to the County Executive for his review in September. Tr. 744. The Board was concerned that a review by the County Executive, followed by a review by the Legislature and then by FEMA, would put the Board in a position where it wouldn't be able to issue a decision until approximately a year from the April 14, 1982, prehearing conference. Tr. 745.

This was of course optimistic. The draft County plan was not finished until early December 1982. The legislature did not make its decision about the draft until February 1983. The FEMA review of the LILCO offsite plan has taken months. And no one knows how long the State of New York review would have taken.

The second reason was that the Board anticipated it might have to make findings on a request for a low-power license under a then-proposed regulation or a then-pending federal bill. Tr. 745. Counsel for one of the intervenors disputed the Board's authority to "force" the parties to litigate issues pursuant to legislation that hadn't been passed and pursuant to proposed NRC regulations. Tr. 800. The Board responded as follows:

> JUDGE BRENNER: Well, even in the absence of those regulations we can go ahead on partial issues where the information is available indicating that those proposals, which although when I last looked, there was not an authorization act. That is, they were two separate Bills but on this point the Bills were in agreement so chances are good that the Act will be issued[.] I issued that as the reason as to why we want to go ahead and be in a position to be able to make the findings one way or the other. We would go ahead and litigate what we could to the extent it was available now.

Tr. 801. As it turned out, the Board was prescient; it was indeed called upon to make a low-power decision before the offsite issues had been completed. So the Board's bifurcation was sound administration of the hearing process, not reversible error.

2. SC Contention EP 1 Was Properly Rejected

The County's second argument is that its contention claiming that the LILCO onsite plan had failed to take into account "local conditions" was improperly denied by the Licensing Board. Nothing could be further from the truth.

In the first place, since the County defaulted on <u>all</u> Phase I contentions, it is hard to see how it was prejudiced by the Board's failure to admit an additional contention for it to default on. The issue is moot.

In the second place, the County once again does not specify how it was harmed. It does not specify which "local condition" it was prevented from litigating or suggest how that "local condition" makes the emergency plan inadequate. The County has submitted, and had accepted, dozens of contentions, both in Phase I and Phase II, that addressed various local conditions. For example, Phase I contentions addressed the location of local hospitals designated to treat contaminated injured people, traffic congestion, and the telephone communications network; the Phase II contentions, now being litigated, address just about every "local condition" one can imagine. If there are different "local conditions" that the County wanted to litigate but was unable to, it has remained silent about them.

The Board's reasons for denying admission to EP 1 are given in its Supplemental Prehearing Conference Order of September 7, 1982, LBP-82-75, 16 NRC 986, 990-95. The contention itself reads as follows:

> EP 1: LILCO'S FAILURE TO ACCOUNT FOR THE SPECIFIC CONDITIONS EXISTING ON LONG ISLAND
>
> (A) The Board should rule that LILCO's plan as a whole is inadequate under 10 CFR § 50.47(a)(1), (a)(2) and (b), in that it does not provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency, nor does the plan provide reasonable assurance that it is capable of being implemented.
>
> (B) The basis for this contention is that the LILCO emergency plan cannot "provide reasonable assurance that adequate protective measures can and will be taken" and cannot provide reasonable assurance that it is "capable of being implemented" unless the plan has accounted for local conditions in the vicinity which directly affect whether adequate protective measures "can and will be taken"

(C) In developing its emergency plan, (1) LILCO has not determined the types and sizes of radiological releases to be expected from possible accidents at the Shoreham plant; (2) it has not determined the physical dispersion of such radiological releases on Long Island and proximate areas; (3) it has not determined the populations at risk from such radiological releases; (4) it has not determined the likely reactions of such populations to notification that they are at risk; (5) it has not determined what protective actions should be recommended from such notified populations," [sic] (6) it has not determined who should give such notification and how that should be done; and (7) it has not determined what type of education is required for such populations (and for Long Island populations not significantly at risk from radiation) and when and how to provide that education.

(D) Specifically, the local conditions which LILCO has not taken into account are the following:

I. Local demographic, socio-economic and social and behavioral characteristics of the population affected by a radiological emergency, including:

   i. Where people live;

   ii. Where people work;

   iii. Whether the officials or organizations which will inform Long Island residents of an accident at the Shoreham plant are credible sources of information;

   iv. The educational level and nuclear-related knowledge and predispositions of the residents of Long Island, so as to tailor education and notification programs to their needs.

   v. How the residents of Long Island will respond to notification of a radiological emergency, particularly whether they will obey instructions to take a specific protective action or whether they will attempt to flee and, if so, how families separated by work or school will seek to unite or depart individually.

vi. How the location and perception of location of the residents in Long Island (including the East End) would affect their reactions to a radiological emergency.

vii. Whether role conflicts will reduce the size and reliability of emergency workers who would be required during an accident at the Shoreham plant.

2. What physical access and ease of access people actually have to roads, bridges, transportation facilities and other means of egress.

3. The types of materials of which local houses and other buildings are constructed and the extent to which those materials would affect the health consequences of a radioactive relese in the event that sheltering is the recommended protective action.

It is apparent that the Board was correct in ruling this contention inadmissible. Paragraphs (A) and (B) are quite vague. Paragraph (C) attempts to list matters that LILCO has not determined, but the Board found that all of them could be litigated under various Phase I contentions or during Phase II except for item (6), relating to who should notify the public. This, the Board said, lacked basis or was redundant of another Phase I contention. 16 NRC at 994-95. There was indeed a Phase I contention about the public notification system (EP 2, later designated EP 1). Moreover, there does not seem to have been anything to keep the County from litigating notification of the public in Phase II; indeed, there are Phase II contentions on that subject. See Phase II Contentions 15.E, 55-59.

Paragraph (D) of EP 1 lists categories of "local conditions." Again, the Board found that essentially all these conditions could be litigated under other rubrics. All of them the Board said might be litigated in Phase II,

except (D)(3), which has to do with building materials of houses and how they provide shelter; this Board said was redundant to EP 5 (later designated EP 4). Indeed, EP 5 (later EP 4) clearly provided room for the County to present evidence about sheltering factors:

> **EP 5: PROTECTIVE ACTIONS (SC, Joined By NSC and SOC)**
>
> Suffolk County contends that LILCO has not met the requirements of 10 CFR § 50.47(b)(10), 10 CFR Part 50, Appendix E, Item B, or NUREG 0654, Item II.J with respect to development and implementation of a range of protective actions for emergency workers and the public within the plume exposure pathway EPZ and with respect to development of guidelines for the choices of such actions in that the LILCO plan and procedures do not adequately discuss the bases for the choice of recommended protective actions (i.e., the choice between various ranges of evacuation vs. sheltering vs. other options) for the plume exposure pathway EPZ during emergency conditions. In addition, LILCO has not assessed the relative benefits of various protective actions under the particular conditions existing in the Shoreham vicinity. Thus, LILCO does not have sufficient knowledge or information to provide reliable, accurate protective action recommendations.

Moreover, there is a contention in the Phase II litigation about sheltering and how building materials affect it. See Phase II Contention 61.

In short, insofar as one can tell what the County is talking about in EP 1, every bit of it was litigable under other Phase I contentions or in Phase II. Again, SC has failed to show how it was hurt by the Board's action.[83]

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[83] The County apparently equates EP 1 with the question whether a plan can be implemented: at page 95 of its brief, SC says that the denial of EP 1 prevented litigation of the "crucial question whether the plan could be imple-

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3. Evidentiary Depositions Not Only Were Permissible, They Were A Good Idea

The County's third complaint about Phase I is that the Board erred in ordering evidentiary depositions and then finding the County in default when it defied the Board's order. The essence of the complaint seems to be that the Board's procedure was unconventional. The County says that the Board had "no authority to depart from settled adjudicatory practice." SC Brief at 96. Several responses to this claim can be made.

First, once again the County can show absolutely no prejudice stemming from the evidentiary depositions. Nor did it advise the Board of any prejudice. The fact of the matter is that the Board's procedure was eminently reasonable, and one that, had it been followed, would be expected to have inured to the benefit of the County, not to LILCO.

Now, for the first time, the County claims that the prejudice it experienced was that the procedure was a burden:

> The Licensing Board's attempted experimentation in the instant case is particularly unwarranted given the extensive use of depositions which the parties already had engaged in. During August 1982, the parties conducted more than 20 depositions. To then turn around and order further depositions, at precisely the same time that the hearing was going forward on QA/QC issues, was to impose far too great a burden.

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mented." This is utter nonsense. Both the Phase I and the Phase II Boards have entertained dozens of contentions about human behavior, traffic congestion, road networks, mobilization traffic, and many other subjects, all of which go to whether the plans can be implemented.

SC Brief at 97. But, the County does not explain why it thinks that evidentiary depositions plus a short hearing would have been more burdensome than a long hearing. The County recognizes (pages 96-97) that the Board hoped to shorten the hearing process but then apparently assumes that the actual result would have been to have lengthened it instead, an assumption that has no basis.

Second, the County cites no law except 10 CFR § 2.71a (SC Brief at 96), which cuts against its position (as can be seen by the fact that the following sentence begins with "However"). Perhaps more important, the County cited no law in support of its position to the Licensing Board.[84]

Third, the County did not take advantage of the interlocutory review of this issue that the Board offered to expedite.

Fourth, the County did not go forward with the litigation notwithstanding its disagreement with the Board's ruling. Even if the County were correct that the Board's procedural ruling were unlawful, its refusal to comply with it would justify the sanction imposed.

In short, there is so little substance to the County's argument on emergency planning that it cannot really be taken seriously. It would appear that the County's real reason for defaulting in Phase I was that it had no substance to its case, a conclusion that is reinforced by the fact that of the 35 admitted Phase I contentions (counting each lettered subpart as a separate contention), the County filed written testimony on only six (2.B, 5.A, 5.B, 10.B, 10.C, and 14).

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[84] The County did file a paper addressing the issue, but it contained "no supporting analysis and almost no explication." LBP-82-107, 16 NRC 1667, 1671; see also LBP-82-115, 16 NRC 1923, 1927 n.1.

III. CONTENTION 4: WATER HAMMER

Suffolk County says that "on the record of this proceeding, there is no basis to believe that there will be any significant improvement at Shoreham over the experience depicted in the EG&G report." SC Brief at 99. The EG&G report described 81 events caused or thought to be caused by water hammer at 26 BWR plants. Contrary to the County's assertion, the record shows that LILCO has considered, in detail, industry water hammer experience, including the experience described in the EG&G report, and that the Shoreham design program, procedures, training, and test programs contain provisions to prevent or mitigate the effects of water hammer.

The basic remedy for water hammer is to design systems that preclude it. Tr. 2315-18 (Fortier). Shoreham's design precludes water hammer or minimizes its effects (1) through general design practices, (2) by adding special systems, and (3) by performing a qualified computer-assisted time history analysis of water hammer loads, and designing a pipe-support system to accommodate those loads. 18 NRC at 469; Fortier and Hill, ff. Tr. 1935, at 4-8. Shoreham has special systems such as loop-fill for HPCI, RCIC, Core Spray, and RHR to preclude the effects of water hammer. PID at 283 (A-7). Other design features have been added to systems at Shoreham to preclude or minimize the effects of water hammer, including vacuum breakers, spargers, small bypass prewarming lines, and continuous blowdown. PID at 283 (A-7); Tr. 2019-27 (Fortier). High point vents in the RHR, Core Spray, HPCI, and RCIC are part of the design, to allow venting of voids and to allow hydrostatic testing during the construction phase. Tr. 1950-51 (Fortier). Pipes at

Shoreham are designed to withstand water hammer loads, and in-service inspection programs required at Shoreham by the technical specifications provide periodic monitoring of all piping welds to detect the potential development of fatigue. Tr. 2090, 2368 (Fortier). Stress analyses have been performed to determine that stresses are within acceptable limits of the ASME III Code. PID at 284 (A-10); Fortier and Hill, ff. Tr. 1935, at 7-9; Tr. 1954-62, 2028-40 (Fortier), 1969-71 (Hill).

The NRC Staff, in its review of the measures taken at Shoreham to minimize the effects of water hammer, found that LILCO had followed good design practices to prevent or mitigate water hammer. Tr. 1941 (Hodges). The Staff also reviewed Shoreham for the two most common causes of water hammer in the ECCS, and it concluded that LILCO had followed good practice in addressing these causes, and had provided system design features to minimize the occurrence of these types of water hammer. Hodges, ff. Tr. 1940, at 3; Tr. 1941 (Hodges).

Roughly one-half of the BWR water hammer events that have been reported can be described as procedure related, according to the data compiled by EG&G. PID at 284 (A-11); SC Ex. 3. Prevention and mitigation of water hammer is taken into account in the development of Shoreham's procedures in several ways: (1) by providing instructions, (2) by identifying proper sequencing of steps, (3) by providing key steps and phases, and (4) by providing "Precautions" and "Limitations and Actions" sections. PID at 484 (A-12); Kreps and Notaro, LILCO Ex. 45, at 1-2.

In addition, Shoreham's operator training program emphasizes the importance of minimizing or preventing water hammer events. Water hammer is discussed in lectures to Shoreham's operators concerning thermal and fluid dynamics, and is addressed in operating procedures and system operations, with emphasis on HPCI, RCIC, Core Spray, and RHR. PID at 285 (A-14); Kreps and Notaro, LILCO Ex. 45, at 7-8; Tr. 2339-49 (Fortier). The preoperational and startup testing programs provide training to the operators in the cause, effect, and mitigation of water hammer. System walkdowns, use of operating procedures, and an "established required reading list" for plant personnel that includes SILS, I&E Bulletins LERs and other documents discussing industry experience, all contribute to training on water hammer. Kreps and Notaro, LILCO Ex. 45, at 7-8.

The preoperational and startup tests verify the design of piping systems, and assure that they function properly under expected operational conditions. PID at 285 (A-15); Tr. 1977-78 (Fortier). These tests will provide verification that piping and piping restraints have been designed to withstand dynamic effects due to valve closures, pump trips, and other operating modes associated with the design operation transients. Fortier and H , ff. Tr. 1935, at 9-10; Tr. 2059, 2061-62 (Hodges).

The record shows that, in addition to the design, procedures, training, and test programs used at Shoreham to prevent and mitigate water hammer, Shoreham has an extensive program to monitor industry experience and identify problems that may arise concerning water hammer. Tr. 1997-2002, 2014-15, 2336-37 (Hill), 2011-14, 2335-F to G, 2357 (Fortier), Tr. 14,424-26 (Alexander).

During the litigation of this contention, several specific water hammer events were the subjects of cross-examination by Suffolk County. The first of these was an event in 1980 at the Millstone I plant. SC Ex. 3, at 133; Tr. 2176-77 (Fortier). The LILCO witnesses testified that this event had been reviewed at Shoreham. 18 NRC at 471; Tr. 2177-78 (Fortier, Hill). Another event discussed in the intervenor's cross-examination occurred in the Caorso plant in Italy during 1978. This event report was evaluated at Shoreham and the initiating conditions were found to be absent from the Shoreham design. 18 NRC at 471; Tr. 2000-01 (Hill). Questioning on a 1980 event at a European BWR plant revealed that GE had been aware of the event and that the design features necessary to avoid that type of an accident were included in the Shoreham design, making further consideration of the event unnecessary. 18 NRC at 471; Goldsmith, ff. Tr. 2381, at 3; Tr. 2067-71, 2074-76 (Hodges). In short, the water hammer experience at other BWR plants has been considered at Shoreham. 18 NRC at 472.

IV. CONTENTIONS SC 8/SOC 19(h): ENVIRONMENTAL QUALIFICATION

SC argues the Licensing Board erred in its decision on environmental qualification of electric equipment because (1) the Shoreham EQ program does not include any non-safety related equipment as defined in 10 CFR Part 50, § 50.49(b)(2), (2) the Staff's review of LILCO's compliance with Regulatory Guide 1.97, Revision 2 will not be completed prior to fuel load,[85]

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[85] Requirements for non-safety related and post accident monitoring (Regulatory Guide 1.97) electric equipment were newly announced and not yet ef-

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and (3) the Board did not retain jurisdiction of these matters. SC Brief at 100-106. Each of these County arguments is without merit.

First, knowledgeable Staff witnesses, PID at 438-39 (I-3), testified that for newer plants, such as Shoreham, equipment of the type identified by § 50.49(b)(2) is typically either classified as safety related or otherwise treated by design so as not to prevent accomplishment of safety functions. PID at 445 (I-15 & -16).[86] The LILCO witnesses testified that the design philosophy at Shoreham was to preclude the existence of non-safety related equipment whose failure could prevent satisfactory accomplishment of specified safety functions by safety related equipment. Equipment that would otherwise fall into the § 50.49(b)(2) category has either been classified safety related at Shoreham or been suitably isolated from safety circuits. Thus, the plant should have no equipment in this category. PID at 444-45 (I-14). The Staff witnesses agreed that the design philosophy of plants such as Shoreham could result in there being little if any equipment falling within § 50.49(b)(2). PID at 445 (I-15); Tr. 19,510-11 (Noonan, Kennedy), 19,642-43 (Noonan).[87] In any event, the Staff still required a formal

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fective at the time Contentions SC 8/SOC 19(h) were litigated. 10 CFR Part 50, § 50.49 was amended January 21, 1983, effective February 22, 1983, 48 Fed. Reg. 2729 (1983). Notwithstanding, a significant record was developed below on these matters. E.g., PID at 444-49 (I-12 to -26).

[86] This reflects the fact that the § 50.49(b)(2) category was added in response to a Staff concern that older plants, in operation for a number of years, might not have classified Class IE (safety related electric) equipment as presently is done. Thus, the new rule captured equipment in older plants that might have been considered non-safety related so as to take into account the effects of the failure of such equipment on the performance of safety functions by safety related equipment. Tr. 19,642-43 (Noonan).

[87] SC claims that no study or analysis had been performed at the time of the litigation to support LILCO's "speculation" on the extent of the

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submittal from LILCO to demonstrate the nature of its compliance with § 50.49(b)(2) once the rule became effective.[88] PID at 444 (I-13).

SC also argues there can be no basis for concluding the Shoreham EQ program complies with § 50.49 absent preparation of a list of all equipment important to safety at Shoreham[89] from which to pick equipment, if any, covered by § 50.49(b)(2).[90] SC Brief at 103-04. Such a list is unnecessary.

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§ 50.49(b)(2) set of equipment at Shoreham. SC Brief at 102. The record, however, shows that numerous analyses had been performed for Shoreham to provide assurance there were no unacceptable interactions between safety related and non-safety related electric equipment. Much of this work was discussed at length during litigation of Contention 7B. LILCO was not aware of any additional studies that might be needed to assure compliance with § 50.49. Tr. 19,650-55 (Kascsak). Similarly, the testimony of the NRC witnesses was not speculation. It was based on discussions with the author of the EQ rule, other discussions with the Staff, and the Staff's review of LILCO's compliance with Regulatory Guide 1.75, "Physical Independence of Electric Systems." Tr. 19,510-14 (Kennedy, Noonan); see PID at 445 (I-16).

[88] This requirement is wholly generic, given the promulgation of § 50.49, even though the equipment included is plant specific, Tr. 19,644-45 (Noonan). SC complains the Staff is not prepared to review such a submittal. SC Brief at 101. Given the newness of the rule, the Staff's review plan was not developed at the time of the hearings. PID at 446 (I-17). In this regard, the Staff had not yet decided whether to do audit or detailed reviews; see, e.g., Tr. 19,510-11, 19,518-20, 19,572-76 (Noonan). The Staff does have the technical understanding to conduct the review. The new rule broke major new ground only in its expansion of the term "important to safety" to describe certain non-safety related items. E.g., Tr. 19,391-93 (Noonan); see also note 86 above.

[89] See note 6 above concerning the lack of any need for such lists. SC implies the NRC Staff witnesses agreed such a list was needed in the present context. SC did attempt at length on cross-examination to induce the Staff witnesses to endorse completion and use of a list of items "important to safety" in connection with reviews under § 50.49. The most that could be dredged from them, however, was Mr. Noonan's statement that he would "suppose" such a list, "if reviewed . . . and approved by the Staff," would be "helpful," and that if such a list existed, he would use it. Tr. 19,580-84. Neither Staff witness stated such a list was necessary. The list was not advocated by anyone but SC witness Minor. See Tr. 19,709.

[90] It appears that SC's "list" argument goes only to § 50.49(b)(2) since the County has abandoned objections to the scope of the Shoreham EQ pro-

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Section 50.49 defines by its terms the electric equipment "important to safety" that it covers. Thus, equipment covered by paragraph (b)(2), if any existed at Shoreham, would be specified directly by identifying electric equipment that (1) is non-safety related, (2) is subject to a potentially harsh environment, and (3) could fail due to the environment in such a way as to prevent satisfactory accomplishment of those safety functions by safety related equipment that are specified in paragraph (b)(1) of § 50.49. No larger concept or listing of "important to safety" equipment is mandated by, or required for compliance with, § 50.49(b)(2).

The County next argues that with respect to equipment required under Regulatory Guide 1.97, Revison 2, completion of the Staff's review is a prerequisite to a determination of compliance with § 50.49(b)(3). But as the Board correctly decided, full compliance with Regulatory Guide 1.97 is not required for Shoreham prior to fuel load. Equipment not yet required to be in place need not be in the EQ program. When Regulatory Guide 1.97 is implemented in accordance with SECY-82-111, the equipment will be qualified. 18 NRC at 540; PID at 448 (I-24). LILCO has committed to satisfy the provisions of the guide and § 50.49(b)(3). 18 NRC at 540. There is adequate basis to conclude that Shoreham will comply in a timely fashion with Regulatory Guide 1.97 and will qualify the pertinent equipment in accordance with § 50.49(b)(3). See Section IX below.

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gram for safety related electric equipment, § 50.49(b)(1), and SC deals with post accident monitoring equipment, § 50.49(b)(3), in subsequent pages.

Finally, the County argues that the Board erred in not retaining jurisdiction over the EQ issue because, allegedly, it is neither minor nor procedural. SC Brief at 104-06. The County is wrong.[91] As discussed above, there is ample evidence in the record to conclude that § 50.49(b)(2) equipment comprises a small to nonexistent class at Shoreham, and LILCO will submit documentation of this to the Staff in time for review prior to fuel load and closure in an SER supplement. And Regulatory Guide 1.97 equipment is not required to be closed out by fuel load. In short, these are routine matters about which the record reveals little if any real controversy. Thus, the Licensing Board had sufficient basis to determine that any remaining aspects of the review[92] were minor and could be left for resolution by the Staff. 18 NRC at 543-44.

V. CONTENTION 11: PASSIVE MECHANICAL VALVE FAILURE

SC argues the Licensing Board erred in two main respects. First, while the Board held the record open for additional information on the detection and prevention of check valve failures,[93] the County believes this should be expanded to all valves. SC Brief at 106. Second, SC argues the Board

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[91] The pertinent legal standards for leaving matters for post-litigation Staff review are discussed in note 101 below.

[92] In addition to review of compliance with § 50.49(b)(2), the Board left to the Staff the resolution of any remaining deficiencies in justifications for interim operation (JIO) in accordance with the provisions of § 50.49(i). 18 NRC at 544. SC raised no issue on appeal in this regard.

[93] It appears that the matter has now been resolved. See Tr. 21,560-66.

erred in its interpretation of the regulations when applied to passive mechanical valve failures. This argument encompasses three claims: (a) a comprehensive valve failure analysis is required, id. at 107, (2) absent such analysis, all safety related valves should have position indicators, id. at 108, and (3) the single failure criterion requires assumption of an undetectable failure in designing against the active failure of a fluid system, id. at 109. SC's arguments are wrong.

The Board held the record open for additional information on check valve testing as a result of SC's motion to reopen because of IE Bulletin 83-03, "Check Valve Failures in Raw Water Cooling Systems of Diesel Generators" (March 10, 1983). The Board's subsequent action stemmed directly from the bulletin. 18 NRC at 476, 497, 499. The subject of the bulletin is narrow: check valves, and more specifically, the ability of in-service testing to effectively find disassembly of check valve internals. PID at 491-92. There was no basis to expand the inquiry beyond the issues raised by the bulletin.[94]

The Board correctly interpreted the regulations as they apply to passive mechanical valve failure. First, the County argues a "comprehensive valve failure analysis" is required. SC Brief at 107. It is not. SC's witness never made clear exactly what was meant by such an analysis, other than perhaps a single, integrated document reflecting all determinations previously

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[94] To the extent SC attempted after reopening to justify expansion of the issues, its arguments were no different from those presented in the hearing and addressed below. See 18 NRC at 493-97; PID at 304-05 (C-5), 334-35 (C-82).

made with respect to single failure analyses related to valve performance in fluid sytstems. See, e.g., PID at 311-12 (C-18), 328 (C-66), 335-36 (C-83 & -84); Tr. 3555-57, 3559, 3565-68 (Minor). What is clear is that the analysis suggested by SC is inconsistent with industry practice, PID at 312 (C-19), has not been required of any applicant, see Tr. 3597, 3693 (Bridenbaugh), 3600 (Minor), and has no basis in any regulatory requirement or technical papers. PID at 312 (C-21). SC simply asks this Board to make new law. Also clear is that LILCO has performed the required single failure analyses for fluid systems as part of Shoreham's system design. E.g., 18 NRC at 481; Tr. 3633-34, 3647-48, 3680, 3956 (Fortier); Fortier, ff. Tr. 3629, at 11-12.

SC roots its argument in assertions that there have been repeated valve failures. SC Brief at 107. But the record shows otherwise. E.g., 18 NRC at 483. During the hearings, SC could provide only one example of a failure of the type with which it was concerned, and it was in fact not undetectable. PID at 316 (C-31 & -32). Contrary to SC's assertion, IE Bulletin 83-03 did not alter these facts. 18 NRC at 493-94.

SC also claims that the analysis it wants is required to justify requests for relief from valve testing frequencies. SC Brief at 107-08. It is not. Valve testing is required by 10 CFR § 50.55a to satisfy ASME XI, which provides testing frequencies. ASME XI, which reflects a consensus among acknowledged experts, recognizes that deviations from the recommended frequencies may be necessary. 18 NRC at 489; PID at 322-23 (C-48). Testing is also specified by the technical specifications. PID at 324 (C-53 & -54). As required of all applicants, any LILCO request for relief must be for valid reasons related to reliability and safety and must be reviewed and approved by

the Staff. 18 NRC at 488-89; PID at 328 (C-65). Thus, there is no support for SC's would-be "analysis" in either regulation or practical necessity.

The County also argues that all safety related valves should be provided with position indicators. SC Brief at 108. Except for solenoid valves, all safety related remotely actuated motor- or air-operated valves have either position indicators or downstream pressure indication to demonstrate operation. Solenoid valves have actuation circuitry indicators since such valves cannot be designed for position indicators. PID at 317-18 (C-35). Inaccessible manual valves in essential flow streams have position indicators. The operation of other manual valves can typically be verified by observation. PID at 318 (C-36). Check valves do not readily accept installation of position indicators. PID at 318 (C-37). When valve position indication is not available, fluid system function is still monitored using system parameters such as flow. PID at 319 (C-38). LILCO has taken all required and practical steps to provide appropriate indication at Shoreham.

Finally, SC argues that LILCO, the Staff and Board misread the single failure requirements of 10 CFR Part 50, Appendix A by not assuming undetectable failures exist when imposing single active failure analysis on fluid systems. SC Brief at 109. Appendix A, however, supports the view that the single failure criterion requires fluid systems to be designed to assure that neither the single failure of any active component, assuming passive components function properly, nor the single failure of any passive component, assuming active components function properly, will result in a loss of the capability of the system to perform its safety function. PID at 309 (C-14); 10 CFR 50, Appendix A, Definition and Explanations. While note 1 in

the Appendix is imprecise, it clearly does refer to a "passive component," not a "passive failure." SC, without support, seeks to read the note as referring to passive, or undetectable, failures. LILCO's witness did not agree that passive failures should be assessed along with a single active failure, as the County claims. SC Brief at 109; Tr. 3648 (Fortier). Rather, single failure analysis requires assumption of a single active component failure or a single passive component failure, but not both at the same time. Tr. 3654 (Fortier). The passive failure of a valve, such as stem/disk separation, is evaluated as an active component failure since the valve will not function when called upon to do so. See Tr. 3677-83 (Fortier). To assume such a separation, a passive failure, plus an additional single active failure would be to enter the realm of double failure, beyond existing regulatory requirements and inconsistent with regulatory practice. 18 NRC at 482.

VI. CONTENTION 16: ANTICIPATED TRANSIENTS WITHOUT SCRAM (ATWS)

At the outset, SC's argument that the NRC Staff witness (Mr. Hodges) did not evaluate Shoreham's ATWS procedure (SC Brief at 111) is frivolous. Although Mr. Hodges did not perform the formal Staff evaluation for incorporation in the Shoreham safety evaluation report, he personally reviewed the Shoreham ATWS submittal. Tr. 8967 (Hodges). Thus, the record reflects two independent reviews of the adequacy of the Shoreham ATWS procedures, the SER review and Mr. Hodges' separate review. See Tr. 8972 (Hodges). More important, Mr. Hodges' credentials as a witness on ATWS are unquestionable; he is the NRC Staff's "principal reviewer" of the generic

guidelines for ATWS procedures developed by General Electric and the BWR Owners' Group, upon which the Shoreham ATWS procedure is based. Tr 8939, 8966 (Hodges); PID at 339-40 (D-6).

SC's complaint that the NRC's review criteria were not in the record is also unpersuasive. Staff witnesses identified the document containing the criteria, summarized the criteria and testified that LILCO's ATWS procedure met the criteria. Tr. 8971-72 (Hodges). In addition, Staff witness Hodges explained that his own review went beyond the normal criteria for ATWS procedures. Tr. 8972 (Hodges). He also amply demonstrated his familiarity with these procedures. See, e.g., Tr. 8980-83, 9060-64, 9068 (Hodges).

Next, SC's passing comment that the Staff made no assessment of the adequacy of LILCO's ATWS training is misleading. The Staff did observe the use of the Shoreham ATWS procedure at the Limerick simulator. PID at 342 (D-10). And simulator training is an important element in LILCO's training program. PID at 344-45 (D-13). Moreover, the Staff has conducted detailed reviews of LILCO's overall operator training program. Id.; see Tr. 8968, 9237 (Hodges), 9236 (Calone). In any event, without regard to the Staff testimony, there is ample testimony from LILCO's witnesses concerning ATWS procedures and operator training to support the Board's conclusions. See, e.g., PID at 339-40 (D-6), 341 (D-8), 342-45 (D-10 to -13); Tr. 8915-18, 8944-45 (Carter).

Once again, the County renews its claim that the Commission's interim ATWS measures do not compensate for lack of a redundant, automated standby liquid control system (SLCS). In ruling on LILCO's motion to strike SC's ATWS testimony, the Licensing Board stated:

> What the County has done in its testimony has ignored, to put it bluntly, our order in restating the contention and filed the same testimony it would have filed on the County's initial contention, in our view. That is, addressing ATWS in general and whether a fully automatic, fully redundant standby liquid control system should be required [.T]he Commission has made the finding that it doesn't have to be required in the interim so long as the proper measures are in place . . . .

Tr. 8529 (Brenner, J.) Once again, SC simply ignores the Licensing Board's ruling; its rationale and conclusion remain valid, however, Moreover, contrary to the County's claims, the Board did address SLCS, concluding that consideration of its automatic initiation remained premature in light of the guidance given by the Commission in the ATWS rulemaking. 18 NRC at 503.[95]

The bulk of SC's argument on appeal is that Shoreham's ATWS procedure is deficient and should be modified as suggested by the County. The argument is unpersuasive.

First, the County's "recommendations" for the Shoreham ATWS procedure have no technical basis. The County withdrew its direct testimony on the subject, Tr. 9316, and thus relies solely on its lawyers' arguments, based on snippets of the record taken out of context. "Evidence" of this sort is not a basis for modifying a complex technical procedure.[96]

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[95] The County asks the Appeal Board to take notice of the Commission's November 10, 1983, approval of an ATWS rule in support of SC's arguments that SLCS capacity should be increased from 43 gpm to 86 gpm. The County fails to mention (1) that the new rule would not require automated SLCS for Shoreham and (2) the higher capacity SLCS system will be installed on a schedule proposed by the utility and approved by the Staff. SECY 83-293, as approved Nov. 10, 1933.

[96] As an NRC Staff witness noted, procedural changes should not be undertaken lightly. Since the plant's operators have been trained on the existing ATWS procedure, something really significant would have had to be overlooked in that procedure before it would make sense to rewrite it. Tr. 8958-59 (Hodges).

Second, substantial effort has been devoted to the development of the ATWS procedure, which the County now wants to change without the support of any direct testimony. The procedure has been (a) based upon generic recommendations by General Electric and the BWR Owners Group, PID at 339-40 (D-6), 343 (D-11); (b) drafted and reviewed by qualified operating personnel, Tr. 8916-18, 8944 (Carter), Tr. 9263-68 (Calone); (c) tested in simulators and in operator training, PID at 344-45 (D-13); and (d) reviewed and approved by the NRC Staff, PID at 339-40 6); Tr. 8967 (Hodges). Thus, unless there were strong evidence to supp. the County's claims that changes are needed (and there is not) the technical judgments of the expert witnesses and Licensing Board should stand.

Finally, the substance of SC's claims is wrong. The alleged "ambiguities" in the procedure exist only because the County takes testimony out of context. SC cites Tr. 9207-10 (Calone) to try to rebut the Licensing Board's finding that the ATWS procedure "unequivocally" requires the operator first to attempt a manual scram. But the cited testimony refers to alternate manual scram methods; Mr. Calone had previously testified that the operator first attempts at least two manual scram methods. Tr. 9195 (Calone). More important, in actual practice no ambiguity has been found to exist. Tr. 9196-97 (Calone).

Nor is there any evidence in the record to support the alleged need for a specific step in the procedure to verify SLCS flow. To the contrary, as a result of his training, the operator will verify SLCS initiation without having to be told to do it Tr. 9028-30 (Calone).

The proposal that the procedure include a step to raise water level after SLCS initiaion is also unnecessary. Both Staff and LILCO witnesses agreed that the operator will take steps to raise the water level at the appropriate time. Tr. 9100 (Hodges), 9260-61 (Carter).

And the suggestion that the procedure must be modified because it violates a "10-minute rule of thumb" is not persuasive. The "rule of thumb" is not a requirement;[97] it is an assumption used in analyzing some transients. Tr. 9239 (Eckart). Conservative assumptions that may be appropriate for design purposes are not appropriate when the issue is whether a procedure will be effective in a real accident. The record demonstrates that this procedure will be effective. See, e.g., PID at 339-41 (D-6 & -7); SC Ex. 39, ff. Tr. 9173, and following testimony. Also, if the Commission, when it recited "interim steps taken to develop procedures" in the ATWS rulemaking notice, 46 Fed. Reg. 57,521, 57,522, col. 2 (Nov. 24, 1981), had meant only procedures that need not be started for ten minutes, it would have said so.[98]

VII. CONTENTION 19(e): SEISMIC DESIGN

SC claims that Regulatory Guide 1.60 is not overconservative for any site; thus, the County says that LILCO cannot show that the Shoreham design response spectra are adequately conservative absent justification of

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[97] SC cites no regulation or regulatory guidance to support its view.

[98] Significantly, the final ATWS rule, which also eschews automatic SLCS and relies on operator action, has no requirement that a "10-minute rule of thumb" must be met.

any exceedance of the Shoreham spectra by the Regulatory Guide spectra. SC also claims the Licensing Board misstated the issue in arriving at its decision to the contrary. SC Brief at 115-16. These arguments are totally without merit.

The evidence is uncontroverted[99] that the Regulatory Guide 1.60 spectra were developed for application to many sites; accordingly, they are overly conservative for most sites. 18 NRC at 507; PID at 353 (E-19). On the basis of the evidence, the Board correctly found that the Shoreham spectra need not track the Regulatory Guide spectra at any given frequency in order to be sufficiently conservative to comply with the Commission's regulations. 18 NRC at 509.

Conservative, site-specific spectra were developed for Shoreham, prior to the issuance of Regulatory Guide 1.60, using appropriate original earthquake records and methodology. This approach is still the alternative to use of Regulatory Guide 1.60 that the Staff encourages. 18 NRC at 507, 510. The Shoreham spectra have been reviewed by the Staff and found to comply with 10 CFR Part 100, Appendix A. 18 NRC at 509.

SC's claim that the Board misstated the issue by asserting the County was trying to make Regulatory Guide 1.60 a regulatory requirement is wrong.[100] First, the Board directly ruled on the County's past and present

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[99] SC presented no testimony on this contention. 18 NRC at 504.

[100] SC also states the Board missed the point by addressing spikes that exceed the Shoreham spectra. SC Brief at 116. That the Board addressed the significance of these spikes, as it should, 18 NRC at 509-10, in no way diminishes the fact that the Board also fully addressed the issue SC now appeals.

argument, as explained above. Second, the Board merely noted, and correctly so, that to accept the County's argument would necessarily require the Board to hold that compliance with this guide is mandatory in order to comply with 10 CFR Part 100, Appendix A. 18 NRC at 509. SC again seeks to make law.

VIII. CONTENTION 21: MARK II CONTAINMENT

Though not clear, Suffolk County's complaints about Mark II appear to focus on two issues: first, the Licensing Board should have retained jurisdiction over four issues that the County alleges were "still the subject of analysis and review," SC Brief at 117; and second, the test procedures used "to demonstrate periodically an acceptable leakage rate between the drywell and the wetwell" have not been shown to be adequate, id. at 117. Both of these complaints are meritless.

Suffolk County alleges that the Board should have retained jurisdiction over the continuing analysis and review of the so-called "Humphrey" concerns, the modifications to Shoreham's vacuum breakers, the comparison of confirmatory program amplified response spectra (ARS) with the design basis ARS, and the piping system evaluation at three locations on the containment wall, since these analyses "may reveal a safety problem resulting in the need for a modification." SC Brief at 117-18 (emphasis added). The record clearly indicates, however, that the remaining analyses were properly characterized as confirmatory in nature and that they would not lead, or be unlikely to lead, to any modifications.[101]

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[101]Suffolk County's attempt to rely on the possibility of a plant modification as the basis for arguing that the Board should have retained jurisdiction

(footnote cont'd)

First, the Board found that only one of the Humphrey concerns could possibly lead to an erosion of the safety margin that existed in the plant or to design modifications. PID at 376 (F-38). The Board justifiably concluded that the Staff's characterization of the analyses of these concerns as confirmatory was proper. 18 NRC at 517-19. The Board retained jurisdiction over the single issue that could have reasonably resulted in the need for a corrective action. See 18 NRC at 519-20; PID at 377-78 (F-39 & -40); see also Tr. 21,570 (resolution of the matter).

Second, the modification to the Shoreham vacuum breakers involved two elements: (1) the replacement of a four-bar linkage with a single-bar linkage, and (2) the strengthening of the valve disk and the addition of an internal stop to reduce loads on the rotating shaft. PID at 375 (F-34 & -35). The Board concluded that the first element, which had been reviewed and accepted by the Staff, would, by itself, remove any concerns about the integrity of the vacuum breakers. 18 NRC at 517; PID at 375 (F-34 & -36).

(footnote cont'd)

over these issues is at odds with the test previously applied by licensing boards. It has long been recognized that certain matters may be "left for the Staff to resolve following the hearings." Consolidated Edison Co. of New York (Indian Point Station, Unit No. 2), CLI-74-23, 7 AEC 947, 951-52 (1974). These matters are typically minor in nature and are such that further on-the-record procedures, like cross-examination, would not affect the making of the prerequisite findings for an operating license. See Southern California Edison Co. (San Onofre Nuclear Generating Station, Units 2 and 3), LBP-82-39, 15 NRC 1163, 1216 (1982). Even in the case where a Board resolves an issue in the applicant's favor, and leaves the Staff to perform what is believed to be a confirmatory review, the Staff has been found to have a continuing obligation to inform the Board should a corrective action become necessary. See 18 NRC at 520 n.21. Thus, SC's proposed test unduly restricts a Board's ability to refer confirmatory analyses to the NRC Staff.

Accordingly, the Board's conclusion that the Staff's analysis of the generic-evaluation of the other element of the modification was merely confirmatory, 18 NRC at 517, was proper.

Third, Suffolk County's concern about differences between the design and confirmatory ARS simply ignores the record. The Board expressly recognized that loads, and not response spectra, are the important consideration in judging the design sufficiency of the Shoreham containment. 18 NRC at 525; PID at 386 (F-65). It found that LILCO had discovered differences in design and confirmatory ARS and had undertaken a program to determine whether those differences would exceed design stress allowables. 18 NRC at 525. The Board further found that this evaluation identified no exceedances. Id. Accordingly, it correctly concluded that the remaining Staff review was merely confirmatory.

Finally, the piping analyses conducted by LILCO included 30 representative systems. 18 NRC at 526; PID at 387 (F-66). The Staff's review of these analyses revealed no stresses or support loads which exceeded or failed code allowables. 18 NRC at 526; PID at 387 (F-67). Nevertheless, the Staff requested LILCO to perform what it viewed as a confirmatory analysis of a 100 percent of all piping systems attached to three locations on the containment wall. Id. The Board's acceptance of the Staff's characterization of this request, 18 NRC at 526, has an adequate factual basis.

The County's second concern about Contention 21 is nothing more than baseless speculation. Suffolk County has totally failed to explain why the testing "has not been done to any satisfactory degree." See SC Brief at 119. It has failed both in testimony and in cross-examination to indicate any

deficiencies in the testing procedures or the reported results. See 18 NRC at 522-23.

IX. CONTENTIONS SC 27/SOC 3: POST ACCIDENT MONITORING/REGULATORY GUIDE 1.97

This contention concerns LILCO's compliance with Regulatory Guide 1.97, Revision 2,[102] with respect to four of the variables listed in the guide. Significantly, the County does not challenge the substance of the Board's ruling that LILCO does have adequate instrumentation to monitor each of the variables in question. 18 NRC at 534-35.

The County complains that insufficient information exists to determine LILCO's compliance with Regulatory Guide 1.97. SC Brief at 120. As noted above, the Board did find persuasive evidence that, for the four variables in dispute, LILCO had adequate monitoring equipment installed at Shoreham to meet the intent of the guide. That the Staff did not present testimony on these individual items is of no moment since nothing suggests that LILCO's evidence was not credible and persuasive. Importantly the NRC Staff did testify that designs reviewed under the Standard Review Plan presented no undue risk to the public health and safety. PID at 424-25 (H-15). Thus, there was ample basis to conclude that this contention raised no valid safety concern.

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[102] "Instrumentation for Light-Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," Dec. 1980.

In addition, a finding of compliance with Regulatory Guide 1.97 is not necessary prior to licensing Shoreham. In SECY 82-111, the Commission approved a flexible schedule for implementing Regulatory Guide 1.97.[103] PID at 420-21 (H-8 & -9) Thus, the Commission made a decision that the implementation of Regulatory Guide 1.97 need not be tied to a specific date or event (such as licensing the plant). It follows that the Licensing Board was bound by the Commission's guidance and was not required to find that LILCO had met Regulatory Guide 1.97 prior to issuance of an operating license. Once again, Suffolk County's real complaint is with the state of existing law, and once again the County inappropriately wants this Board to make new law.

X. CONTENTIONS SC 28(a)(VI)/SOC 7A(6): SAFETY RELIEF VALVE TESTS AND CHALLENGES

The County appeals the Board's decision that LILCO has complied with NUREG-0737, Item II.K.3.16, "Reduction of Challenges and Failures of Relief Valves -- Feasibility Study and System Modifications." Although the SC Brief is confusing, it appears to focus on two related arguments: (1) LILCO has not complied with Item II.K.3.16 in that credit was taken for reduction in SRV failures as well as challenges, SC Brief at 122, and (2), even if reduction in failures can be considered, LILCO cannot take credit for the use of two-stage Target Rock valves for this purpose because the decision to use them pre-dated NUREG-0737, id. at 123. Neither claim has merit.

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[103]This flexibility was incorporated into Supplement 1 of NUREG-0737. PID at 421-22 (H-10). A schedule for Shoreham has now been submitted to the NRC by LILCO. PID at 422 (H-11).

In its first argument, SC mischaracterizes the requirements by stating:

> A key issue litigated in Contention 28 was whether LILCO's calculated order of magnitude reduction included only a reduction in SRV challenges as required by Item II.K.3.16 or if it combined a reduction in both SRV challenges and SRV failures.

SC Brief at 122 (emphasis added). For this, the County relies on a literal interpretation of a statement in Item II.K.3.16 that "challenges to the relief valve should be reduced substantially (by an order of magnitude)." Id. But the title of Item II.K.3.16 clearly refers to the reduction of failures as well as challenges, and Staff witness Hodges, who drafted this NUREG item, testified that its goal was a reduction in stuck open relief valve (SORV) events, which could be achieved by reduction of either challenges or failures.[104] PID at 408 (G-27), 409 (G-30), 410 (G-34). This was also the interpretation on which generic BWR Owners Group evaluations were based. See PID at 407 (G-25). Thus, the Licensing Board properly found that Item II.K.3.16 seeks "to reduce SRV failure," which LILCO has done. 18 NRC at 531.

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[104]SC quotes out of context the Board's statement that the Commission has not formally approved this interpretation is out of context. SC Brief at 123. The Board noted this fact but concluded that testimony given on the intent of Item III.K.3.16 was still persuasive. 18 NRC at 531. Moreover, Staff witness Hodges testified that he was not aware of, and did not believe there to be any basis for, any differing opinion within the Commission or the Staff as to the intent of Item II.K.3.16 from that which he expressed. Tr. 8613-15. In this regard, the County seems to have changed its position. In its proposed opinion, SC stated in reference to LILCO's interpretation that "[t]he Board is inclined to accept this position, based upon testimony of the Staff member who drafted this requirement." SC Proposed Opinion, dated Jan. 31, 1983, at 49.

Perhaps in recognition of the weakness of its first argument, SC's second claim is that the use of two-stage Target Rock valves is not a "change" for Shoreham and thus does not comply with NUREG-0737.[105] SC Brief at 123-24. But, first, the Staff concurred with LILCO's response to Item II.K.3.16, including credit for the use of two-stage valves. PID at 408-09 (G-26 to -30). Second, Shoreham's use of two-stage valves does in effect constitute a "change" from the three-stage valve configuration that was the typical configuration in use at the time NUREG-0737 was published, and therefore was the benchmark for the BWR Owners Group Study. PID at 411 (G-36 & -38). The two-stage valve was considered a new design in NUREG-0737. Boseman et al., ff. Tr. 7959, Attachment 1, at II.K.3.16-2.

The County also implies that the performance of two-stage Target Rock valves will not lead to the order of magnitude reduction in SORV events that LILCO has calculated. SC Brief at 124 n.60. The County fails to acknowledge, however, that neither the Hatch 1 nor Browns Ferry 2 events reported in Board Notification 82-79 were related to SORV concerns. As the record shows, these events related to set point drift, a minor generic problem for all SRVs, not to Item II.K.3.16. 18 NRC at 531-32; PID at 412-13 (G-39 to -42).

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[105]Carried to its logical conclusion, this argument would hold that a plant which had achieved maximum reduction of challenges and failures prior to, and independent of, NUREG-0737 could never comply with Item II.K.3.16.

XI. LOW POWER LICENSE

A. NO SUPPLEMENTAL IMPACT STATEMENT IS REQUIRED

Suffolk County argues that the NRC must prepare a Supplemental Environmental Impact Statement (EIS) to assess the environmental costs and benefits of licensing Shoreham for low-power operation.[106] This position is unfounded.

The County alleges that low-power operation, followed by abandonment, is a "foreseeable alternative" to full-power operation for NEPA purposes. This is, of course, directly contrary to Pacific Gas and Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 and 2), ALAB-728, 17 NRC 777 (1983):

> Low power testing, unlike full power operation, is not intended to produce electrical power, and it is not an alternative to full power operation.

Id. at 794. Indeed, Diablo Canyon holds squarely that an EIS or EIA is not required for a low-power license.

What the County really means is that low-power operation followed by abandonment is a possible consequence (that is, a possible environmental impact) of a low-power license. Though correct, this observation is without

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[106]At pages 124-25 of its brief, in note 61, Suffolk County "reasserts" its objection to the Commission's construction of its regulations "to permit low power operation even in circumstances where full power operation cannot be predicted." (As Diablo Canyon suggested, these circumstances occur every time 10 CFR § 50.57(c) is used.) This "reassertion" is, of course, without force in this appeal, since the Appeal Board cannot reverse the Commission.

legal significance. All that Suffolk County is saying is that in its opinion it has a better chance of preventing Shoreham from being licensed than other intervenors have had in other NRC cases such as Diablo Canyon. Hence, according to the County, there is in this case a greater probability that the consequence of abandonment after low-power operation will occur. This in turn would alter the cost-benefit calculus.

There are three reasons why this argument is wrong. First, as a practical matter the County's argument, if successful, would call for a finding of fact as to the likelihood of success on the merits on the full-power issues in every contested proceeding for a low-power license. In this case it would require one licensing board (the board whose decision is at issue in this appeal) to estimate the likely resolution of the dozens of offsite emergency planning issues, which are being decided by a different licensing board. The NRC regulations and caselaw contemplate no such finding for low-power licenses.

Second, even if such a finding were called for, neither a licensing board nor the Appeal Board could make the finding the County wants in this case in light of the guidance that the full Commission has provided. Suffolk County has argued many times that an operating license must be denied because the County (and now the State) are not participating in emergency planning, requiring the applicant to implement a "utility plan" instead. The Commission has refused to rule that an acceptable utility plan is an impossibility, Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), CLI-83-13, 17 NRC 741, 743 (1983), and has said that the difficult emergency planning issues in this case do not appear to be categorically unresolvable.

Suffolk County's argument, if accepted, would lead to endless reassessments of a project, whenever the cost projections changed, under the guise of amending an existing EIS. It is not difficult to imagine a host of changing factors, including plant costs, need for power, and so forth, that could be trooped out to show that the benefit side of an EIS analysis was overstated.[109] This expansion of a judicially created cost-benefit requirement[110] was never contemplated by Congress when it enacted NEPA and should not be engrafted onto the Act now.[111]

Suffolk County's reliance on Essex County Preservation Ass'n v. Campbell, 536 F.2d 956 (1st Cir. 1976), and Warm Springs Dam Task Force v.

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[109]Suffolk County claims (at page 130 of its brief) that "no reasonable argument [on the facts] can support operation at low power prior to a final full power decision." This is nonsense. If no low-power license is issued but full power is ultimately approved, what has been lost is the time that could have been devoted to low-power testing while full-power issues were litigated. This type of delay costs the utility and the public some $40 to $50 million a month.

[110]See Calvert Cliffs' Coordinating Committee v. AEC, 449 F.2d 1109 (1971).

[111]In addition, the County's suggested cost-benefit analysis is more complex than the County recognizes. First, the County suggests that a decision declining to grant a low-power license is without cost, even if full-power operation is eventually achieved. That suggestion is wrong. Deferral of fuel load and testing until the grant of a full-power license would result in substantial costs associated with the delay in the commencement of commercial operation. See note 109 above.

Second, the County asserts that, if the plant is abandoned after low-power operation, loss of the benefit derived from power generation heavily tips the balance of the cost-benefit scales. The County fails to recognize that the environmental costs on the other side of the balance -- the costs of decommissioning and disposing of irradiated fuel -- are also substantially less with low-power testing. The balance of the benefit of low-power testing, even without eventual power generation, and the environmental costs of low-power operation is more equally weighted than the County suggests.

Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), CLI-83-17, 17 NRC 1032, 1034 (1983).

Third, the consequence that the County foresees (abandonment) is an economic, not an environmental, impact.[107] Suffolk County does not dispute that the environmental consequences of low-power operation have been considered. (They are enveloped by the environmental consequences of full-power operation). Rather, Suffolk County argues that the economic benefits of the Shoreham plant may be eliminated, since the possibility exists that a full-power operating license will not be issued.[108] As is discussed above, the County has alleged no changes in environmental conditions. Thus, Suffolk County has attempted to convert the National Environmental Policy Act into a National Economic Policy Act.

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[107]As the Supreme Court noted in its decision in Baltimore Gas & Electric Co. v. NRDC, ___ U.S. ___, 51 U.S.L.W. 4678 (June 6, 1983), NEPA has two purposes. First, it obliges an agency to consider the significant environmental impacts of its proposed action. Second, it ensures "that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process." 51 U.S.L.W. at 4680 (emphasis added).

In another decision, the Court elaborated on the considerations NEPA requires. In Metropolitan Edison Co. v. People Against Nuclear Energy, ___ U.S. ___, 51 U.S.L.W. 4371 (April 19, 1983), the Court stated:

> The theme of § 102 [of NEPA] is sounded by the adjective "environmental": NEPA does not require the agency to assess every impact or effect of its proposed action, but only the impact or effect on the environment.

51 U.S.L.W. at 4373 (emphasis in original). Thus, the Court has made clear that it is the environmental consequences of an action that are of concern under NEPA.

[108]Suffolk County's reliance on 40 CFR § 1502.9(c)(1)(ii) of the CEQ guidelines is without merit, since that subsection specifically refers to new circumstances or information relevant to "environmental" concerns.

Gribble, 621 F.2d 1017 (9th Cir. 1980), is misplaced. Both cases involved potential changes in environmental effects. In Essex County the moratorium on the expansion of I-95 south of Route 128 could have affected the alternative to expanding the highway segment in question, perhaps requiring a smaller expansion with corresponding lower environmental effects. In Warm Springs, the changed circumstances involved discovery of a potentially more severe fault line near a dam. After reviewing the facts, the court concluded that a supplemental EIS was not required.

B. A LOW POWER LICENSE SHOULD ISSUE ONCE THE DIESELS ARE APPROVED

On pages 130-31 of its brief, Suffolk County argues that the Board has discretion to stay consideration of LILCO's application for a low-power license, given the "special" facts of this case. The County says that it agrees with the conclusions in the State of New York's brief and that the Licensing Board "failed to consider many other factors." SC Brief at 131. Again the County's position is unfounded.

First the "special facts" that exist are the same ones that were before the full Commission when it issued CLI-83-17, in which it decided that "the present uncertainty about whether the agency's offsite emergency preparedness requirements can be made for full-power operation would not, in and of itself, bar the grant of a license for low-power operation under 10 CFR §50.57(c)". Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), CLI-83-17, 17 NRC 1032, 1033 (1983). Second, Suffolk County offers no legal argument to support its view, apparently choosing to rely instead on New York's brief, which we will address below.

Third, Suffolk County's claim that the power from Shoreham will not be needed for at least 10, and perhaps 15 more years, is improper. SC cites nothing in this record to support its claim. Suffice it to say that, if the nature and immediacy of the need for Shoreham were to be determined on the basis of competent testimony, sworn and cross-examined, this County allegation could not withstand scrutiny. Shoreham is needed now.

C. THE GOVERNOR'S BRIEF

The Governor of New York filed a brief in this appeal limited to arguing that, notwithstanding the Commission's regulations 10 CFR § 50.47(d) and § 50.57(c), a low-power license should not be issued until the offsite emergency planning issues have been fully resolved.

The flaw in the Governor's argument is that it is a challenge to the regulation, 10 CFR § 50.47(d), and to the Commission decision cited above, CLI-83-17, 17 NRC 1032 (1983). Indeed, the second sentence of the Governor's brief recognizes this:

> In a June 30, 1983 decision, the Nuclear Regulatory Commission explicitly recognized that the low power license for the Shoreham plant could be issued despite the "difficult" emergency planning issues which this case presents and "the existing uncertainties about off-site emergency planning." Long Island Lighting Company (Shoreham, Unit 1), CLI-83-17, 17 NRC ___ (June 30, 1983).

Governor's Brief at 1-2. The rest of the Governor's brief, however, is simply an argument that this Board should not follow the Commission decision. But an Appeal Board cannot depart from the Commission's guidance.

The Governor gives three reasons why a low-power license should not be issued. The first is that a low-power license is being "explicitly sought in the context of a full power hearing at which many full power issues have been heard and decided." Id. at 3. The Governor's argument is that since LILCO proceeded under 10 CFR § 50.57(c), the traditional way of applying for a low-power license, instead of under the new statute 42 U.S.C. § 2242, deciding the low power issue separately is somehow inappropriate and § 50.47(d) does not really apply. There is, of course, nothing whatsoever to support this notion.[112] There has never been any doubt that the term "operating license authorizing only fuel loading and/or low power operations" in § 50.47(d) refers to low-power licenses issued under § 50.57(c).

The second reason the Governor gives is that, even if § 50.47(d) is followed, it requires the resolution of certain offsite issues before the low-power license can be granted. These are issues involving certain "offsite elements" of the utility's onsite emergency plan. See 47 Fed. Reg. 30,232, 30,234 (1982). What the Governor overlooks is that an opportunity to litigate those offsite issues was provided. The Governor concludes otherwise, but only because of a serious misunderstanding of what has occurred in this proceeding.

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[112]Moreover, the Governor's argument is inconsistent. On the one hand he argues that LILCO should have proceeded under 42 U.S.C. § 2242 if it wanted a low-power license prior to resolution of offsite emergency preparedness issues. On the other hand he argues that, under § 2242, Congress "makes no distinction between off-site and on-site emergency preparedness in the context of low power operating licenses," Governor's Brief at 4, and that on that ground too the approval of a low-power license despite the pendancy of difficult off-site emergency preparedness issues flies in the face of express legislative intent, id. at 4-5.

In the first place, the offsite elements that are ripe for decision at the low-power stage are only the offsite elements of the applicant's emergency plan-- the applicant's onsite plan. 47 Fed. Reg. 30,234 (July 13, 1982). And, if one thing is clear about what was put into issue in "Phase I" of this proceeding, it is that the applicant's plan was. Also subject to adjudication in Phase I were all offsite planning issues that could be resolved without the County's offsite plan being completed, (e.g., issues about the siren system, which was already installed.) As discussed in prior pages, it was the Board's contemplation that the issues to be resolved early were those that might have to be decided in order to rule on an application for a low-power license. When the Board made this clear, the State, a party to the proceeding, was silent. The intervenors submitted numerous contentions on the applicant's plan, including contentions about such things as communications to offsite agencies, traffic congestion impeding offsite agencies from getting to the site, and the warning sirens. The State raised no contentions and expressed no concerns.

The County defaulted on all its Phase I contentions. When the Board found it in default, the State remained silent. Then, when LILCO filed an application for a low-power license, the County attempted to raise new contentions, claiming them to be about "offsite elements" of the applicant's plan. These proposed contentions were denied in the Board's Memorandum and Order Denying Suffolk County Motion for Leave to File Contentions Regarding Onsite Emergency Planning, Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), slip op. (Aug. 5, 1983). Again, the State remained silent.

Thus, when the Governor's brief says, at page 6, that "all off-site emergency planning issues have been deferred" to Phase II, it is simply wrong. See also Governor's Brief at 8. There was ample opportunity to litigate the "offsite elements" of the applicant's onsite plan. The State passed the opportunity by, and the intervenors gave it up by default.[113]

The third reason that the Governor gives is that the proceeding has become entangled in "unnecessary procedural complexities." Governor's Brief at 8. Here the Governor quarrels with the Licensing Board's decision to hold the intervenors in default for defying the Board order to proceed to litigation by the initial use of evidentiary depositions. The Governor's argument is misguided for a number of reasons.

First, the State of New York, while a full party to the proceeding, said nothing about the Board's decision at the time, nor for many months thereafter. It is too late for the Governor to come now to this Appeal Board and complain of an error that it failed to say anything about at the time.

Second, the Governor misunderstands the role of the Licensing Board in NRC proceedings. He implies that the result of the intervenor's default was to leave important emergency planning issues unreviewed. In fact,

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[113]The Governor also makes a number of observations about the NRC emergency planning regulations that are for the most part inaccurate. For example, he says that offsite emergency preparedness issues are more important than other issues (because they are the "last resort" by which the public is protected), that offsite planning should be more intensely scrutinized than other safety issues, and that offsite emergency planning is the only safety system that protects the public and not the nuclear plant. Governor's Brief at 6-7. In fact, the primary means of ensuring safety is to build a safe plant; emergency planning is an additional layer of protection, an extra measure of "defense in depth," added to help effect dose savings in the extremely unlikely event that all of the other safeguards fail.

all that the default did was to relegate the Phase I issues to the NRC Staff for resolution. In fact, the Staff has continued to deal with the emergency planning issues under the applicant's onsite plan, and LILCO in December successfully completed an NRC inspection on the onsite plan. The Governor fails to grasp that a licensing board at the operating license stage, by and large, proceeds on the basis of issues raised by the parties. If no party raises an issue, or the parties decide not to pursue their issues as the intervenors did in this case, then the Licensing Board's role is, generally speaking, at an end.

Moreover, the implication in the Governor's brief that dismissal of the intervenors from Phase I was too harsh and not in the public interest ignores the reason for imposing the sanction. The fact of the matter is that the intervenors were in open defiance of a Licensing Board order and refused to give any legal basis for their defiance, simply calling the Board's action "unlawful" without any supporting analysis and declining to accept the Board's offer to facilitate interlocutory review of that allegedly unlawful action. As the Board rightly observed, it would have been irresponsible for it to have allowed such behavior, for that would have encouraged such behavior in the future.

CONCLUSION

For the reasons set out above, the County's and Governor Cuomo's exceptions lack merit. As to them, the Partial Initial Decision should be affirmed.

Respectfully submitted,

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