UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

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

LILCO'S REPLY TO THE PROPOSED OPINIONS, FINDINGS AND CONCLUSIONS OF SUFFOLK COUNTY AND THE STAFF

February 22, 1983

May 24, 1983 (Revised)

Hunton & Williams
P. O. Box 1535
Richmond, Virginia 23212

VOLUME THREE OF THREE:
SAFETY CLASSIFICATION AND SYSTEMS INTERACTION

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IV. REPLY FINDINGS OF FACT

A. "Safety Related" and "Important to Safety"

RB-1

Many of Suffolk County's proposed findings contain a basic assumption that there exists an "important to safety but not safety related" classification category of structures, systems and components. This assumption ignores the evidence that plainly establishes that LILCO's practice of treating "important to safety" and "safety related" synonomously is consistent with past regulatory interpretation and industry practice. See LILCO Findings B-4, B-11 to -83, B-158 to -174, B-176, B-187 to -197.51/

RB-2 (SC 7B:5)

Suffolk County proposed finding 7B:5 is not, as it purports to be, an entirely accurate reflection of 10 CFR Part 50, Appendix A, GDC 1 and certain portions of the County's and LILCO's prefiled testimony. The proposed finding mistakenly asserts that GDC 1 requires that nuclear power plants be

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51/ Rather than repeat this citation to the record, LILCO proposes that reply finding RB-1 apply to each County proposed finding containing the erroneous assumption that there is an important to safety classification category. The reply finding to each County proposed finding containing this assumption should therefore be deemed as being in the alternative.

designed, fabricated, constructed, maintained and operated to high quality standards. GDC 1 refers to design, fabrication, erection and testing, but not to maintenance or operation.

RB-3 (SC 7B:6)

Suffolk County proposed finding 7B:6 inaccurately paraphrases Staff and LILCO testimony concerning the "defense in depth" concept. This proposed finding states that the defense in depth concept has been used by the NRC for licensing "in recognition of the need for high quality standards at nuclear power plants." This notion is not supported by Staff or LILCO testimony cited in the proposed finding. Both Staff and LILCO testimony make clear that the defense in depth concept is employed to assure adequate safety. See LILCO Finding B-40.

The final sentence of this proposed finding is an opinion or conclusion that all structures, systems and components that contribute in a significant way to any of the three levels of the defense in depth concept help to ensure safe operation and therefore are "important to safety." This conclusion is not supported by the record, as indicated by the absence of any citation.

RB-4 (SC 7B:8)

Suffolk County proposed finding 7B:8 is merely a restatement of an allegation from the County's prefiled testimony to the effect that structures, systems and components important to safety must be systematically identified in order to comply with applicable regulations. This proposed finding ignores the evidence establishing that there is no requirement to identify the important to safety structures, systems and components. Further, there is no guidance for defining such a category. See LILCO Findings B-173 to -176, B-200.

This proposed finding also contains the erroneous conclusion that without systematic identification of important to safety structures, systems and components it is impossible to demonstrate that appropriate quality assurance is being applied. The evidence establishes that LILCO has not compiled an important to safety list but is nevertheless applying quality standards and quality assurance to all structures, systems and components at Shoreham commensurate with their respective importance to the safe and reliable operation of the plant. See LILCO Findings B-209 to -248. Similarly, the evidence establishes that LILCO has complied with the General Design Criteria. See LILCO Finding B-259.

* RB-4A (SC 7B:11)

This proposed County finding states that Metropolitan Edison has adopted the classification terminology specified in the Denton Memorandum. The implication of this statement is that the utility has developed a classification scheme consisting of more than the two groups of safety related and non-safety related. The Staff witness stated that Metropolitan Edison was more willing to accept the Denton definition than LILCO, but there is no record that such acceptance resulted in a new classification scheme. Tr. 20,833 (Mattson).

RB-5 (SC 7B:13)

Suffolk County's proposed finding 7B:13 is not an accurate reflection of LILCO's prefiled testimony. This proposed finding states that safety related structures, systems and components are not generally required for normal operation or transient control. The referenced prefiled testimony does state that the safety related items do perform safety functions such as prevention and mitigation of accidents. Burns et al., ff. Tr. 4346, at 51. The prefiled testimony, however, does not state that the role of safety related items is limited to such functions. In fact, many safety related items are in use for normal operation and transient control, including items such as reactor coolant pressure boundary components and the reactor protection system.

RB-6 (SC 7B:15)

The last sentence of Suffolk County proposed finding 7B:15 is an inaccurate reflection of the record as a whole because it concludes that the only commitments in LILCO's licensing documents relate to safety related structures, systems and components. This is not true. The licensing documents contain many examples of discussions of non-safety related structures, systems and components and, in some instances, LILCO makes commitments with regard to these non-safety related items. See LILCO Findings B-203, B-210, B-249; Staff Proposed Finding 7B:27. This proposed finding also fails to state that there are specific quality assurance and quality control related commitments for non-safety related structures, systems and components in the FSAR. See LILCO Findings B-129, B-210, B-252, B-254; see also Tr. 6981 (Haass).

A number of structures, systems and components that do not need to be safety related, such as the standby liquid control system and RCIC, are in large part classified as safety related. See LILCO Findings B-85, B-86, B-101. This is another instance of a quality assurance commitment for structures, systems and components that are not required to be safety related but which the County would certainly call "important to safety."

RB-7 (SC 7B:18)

Suffolk County proposed finding 7B:18 is derived directly from the Staff's supplemental prefiled testimony prepared by Mr. Conran. The proposed finding is inaccurate because it ignores the extensive cross-examination record regarding the preparation of the Denton Memorandum. See LILCO Findings B-158 to -208. An example of the inaccuracy of this proposed finding is the apparent implication that the definitions in the Denton Memorandum were in agreement with "the standard definitions." The County's own proposed finding, SC 7B:23, which acknowledges there was confusion among the Staff regarding the proper use of "safety related" and "important to safety," implicitly recognizes that there were no standard definitions. See also LILCO Findings B-165, B-167 to -174.

In addition, the evidence establishes that some Staff members did not even use the term "important to safety" in their experience with I&E. Further, a number of plants with which they were familiar did not use the term. See LILCO Findings B-187, B-188. The proposed finding is also flawed in failing to acknowledge that Mr. Conran's efforts were his own and not those of NRC management, though there was NRR review. Finally, this proposed finding is mistaken in its implication that "safety classification terms are defined and safety classification concepts established" in 10 CFR Part 20. 10 CFR

Part 20 does not use any of those terms, nor is it a classification oriented regulation. See RB-272 (Staff 7B:27).

RB-8 (SC 7B:19)

Suffolk County proposed finding 7B:19 takes issue with LILCO's findings concerning Mr. Conran's discussions with industry representatives concerning the definitions contained in the Denton Memorandum. Significantly, the proposed finding relies solely on the Staff's prefiled testimony and ignores the cross-examination on this issue. Accordingly, it does not fully and accurately reflect the record.

The LILCO findings on this subject, particularly B-163, more accurately reflect the significance of Mr. Conran's discussions with industry representatives. Mr. Conran admitted he did not send the Denton Memorandum to all industry members or to any organization representing the industry. He also stated that the "several occasions" referred to on page 4 of his prefiled testimony involved specific discussions with one utility, PASNY, and an AIF subcommittee on two occasions. The Denton Memorandum was not given to the AIF subcommittee. Instead, the definitions, in final or near final form, were attached to material presented at the meeting. Mr. Conran also conceded that the discussions with AIF did not involve one-on-one discussions with any representative of industry regarding these definitions. Tr. 7741-44 (Conran).

Finally, Mr. Conran, during cross-examination, questioned the weight being given to the conclusions regarding his contact with industry and made unmistakably clear that the majority of his effort was interaction with the Staff. Tr. 7750 (Conran). In sum, Suffolk County proposed finding 7B:19 is simply not an accurate reflection of the entire record in that it ignores substantial cross-examination testimony on this subject.

RB-9 (SC 7B:22)

Suffolk County proposed finding 7B:22 asserts that Mr. Conran's TMI-1 prefiled testimony is consistent with his Shoreham testimony. This is a substantial oversimplification and ignores the absence in this record of the cross-examination testimony record in the TMI-1 restart proceeding.

In his TMI-1 testimony, Mr. Conran stated that the category "important to safety" was meant to apply generally to the structures, systems and components addressed in the General Design Criteria. In this proceeding, however, Mr. Conran has indicated that the "important to safety" category includes features in addition to those explicitly addressed in the General Design Criteria. Speis et al., ff. Tr. 6357, at 5-6; Conran, ff. Tr. 6368, at 2.

Mr. Conran's TMI-1 testimony uses the term "safety grade," but he now uses the term "safety related." Speis et al., ff. Tr. 6357, at 5-6; Conran, ff. Tr. 6368, at 2. The change from "safety grade" to "safety related" occurred after the TMI-1 proceeding because he had difficulty determining a standard definition from the regulations for "safety related" before the TMI-1 proceeding. Tr. 7744 (Conran). This was apparently true even though Mr. Conran used the 10 CFR Part 100, Appendix A definition of "safety related" for the term "safety grade." Conran, ff. Tr. 6368, Attachment R-1, at 5. Only after the TMI-1 proceeding did the "standard definitions" change in Mr. Conran's mind. Tr. 7745 (Conran).

Also significant is the fact that Mr. Conran stated that as a result of his testimony for the TMI-1 proceeding it was necessary to change words in Staff testimony on other contentions in that proceeding. Tr. 7736 (Conran). That is, the terms were being applied differently by Staff witnesses in the same proceeding.

The length of time it took to develop the Denton Memorandum, the changes in terminology that occurred during this process and the inconsistency and confusion that Mr. Conran admits existed all confirm that there has been no long-standing, consistent interpretation of "important to safety." See LILCO Findings B-172, B-173. The Board should note,

however, that Mr. Conran's discussion of the treatment of non-safety related features in his TMI-1 testimony, see Conran, ff. Tr. 6368, Attachment R-1, at 7-10, is entirely consistent with the treatment of non-safety related structures, systems and components at Shoreham. See LILCO Findings B-86 to -130, B-209 to -248.

RB-10 (SC 7B:24)

Suffolk County proposed finding 7B:24 is not an accurate reflection of the record and is internally inconsistent. The first sentence asserts that Staff practice has been consistent in differentiating between "safety related" and "important to safety." The second statement concedes, however, as the record abundantly reflects, that Staff members have used the terms inconsistently in the past. In addition, Suffolk County proposed findings 7B:23 and 7B:27 recognize inconsistent application of "important to safety" and "safety related" by the Staff and inconsistent usage in regulatory guides. The testimony substantiates this inconsistent interpretation and application of the two terms. See LILCO Findings B-162 to -191, B-195.

This proposed finding also ignores an abundance of evidence establishing that the Staff did not even use an "important to safety but not safety related" classification.

Instead, this proposed finding relies only on Mr. Conran's statement that it was Staff practice to classify structures, systems and components as "safety related" or "important to safety but not safety related." There is no evidence in the record that the Staff or I&E has ever used a category of structures, systems and components entitled "important to safety but not safety related." See LILCO Findings B-162 to -191; see also Reply Finding RB-273 (Staff 7B:35).

** RB-11 (SC 7B:26)

~~Suffolk County proposed finding 7B:26, based solely on the prefiled testimony of Mr. Conran, asserts that the differences in terminology between LILCO's classification scheme and that set forth in the Denton Memorandum cannot go unresolved. Mr. Conran also stated, however, that "[t]here appears to be close agreement between most important aspects of the respective positions and conclusions of Staff and Applicant regarding adequacy of safety classification of Shoreham plant features, particularly as to the substantive technical safety classification considerations at issue." Conran, ff. Tr. 6368, at 2. These substantive technical issues are the relative safety importance in view of the function to be performed and the perception of consequences if a component fails, and from these the selection of the appropriate quality standards and~~

quality assurance measures to be applied. See LILCO Finding B-202. In addition, the evidence establishes that a commitment by LILCO to do in the future what it has done in the past with respect to quality assurance for important to safety but not safety related items would be sufficient to satisfy the Staff's interpretation of GDC 1. See LILCO Finding B-197.

This proposed finding suggests three reasons why the differences in terminology cannot go unresolved.52/ The third reason states that LILCO's interpretation of the term "important to safety" might result in a more narrowly construed 10 CFR Part 21 reporting obligation than would be proper under the Staff's broader definition. This is plainly incorrect as 10 CFR Part 21 focuses solely on safety related components. See supra part III.A.

RB-12 (SC 7B:27)

Suffolk County proposed finding 7B:27 is an inaccurate reflection of the record. In the second sentence, this proposed finding cites Mr. Hubbard for the proposition that "certain guides appear to have equated the terms [safety

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52/ Though the three reasons are basically in block quote form and thus appear to be quotes from Mr. Conran's testimony, they are not quotes but are paraphrases. In addition, the County uses the term "Staff" in this proposed finding without clearly indicating that the three reasons listed come from Mr. Conran's prefiled testimony.

related and important to safety]." In fact, Mr. Hubbard did not testify that these guides appeared to equate the terms; he testified that they did equate the terms. Tr. 15,429-32 (Hubbard). Although Mr. Hubbard did state that he was not aware of the NRC equating "important to safety" and "safety related" in the quality assurance area, he was not knowledgeable of the review and concurrence requirements within the NRC for regulatory guides. Tr. 15,429 (Hubbard). He does not know, therefore, whether the quality assurance branch did or did not review and approve these regulatory guides.

RB-13 (SC 7B:28)

Suffolk County proposed finding 7B:28 is an inaccurate reflection of the record in one significant respect. This proposed finding cites Mr. Higgins and states that even though Region I had not applied the categorizations contained in the Denton Memorandum, this did not mean that they disagreed with the statements in the Denton Memorandum. Mr. Higgins stated, however, that not only were the categorizations or definitions not being used in Region I, they were not being used, to his knowledge, in the NRC. Tr. 17,470-71 (Higgins). See LILCO Finding B-190.

* RB-13A (SC 7B:29)

This proposed County finding attempts to use Staff testimony that Metropolitan Edison has accepted the terminology of the Staff to counter the testimony of I&E witnesses that they have never observed a plant that used the classification important to safety to apply to non-safety related features. The record states that Metropolitan Edison has accepted the Denton definition, but there is no support in the record for the implication that the utility has developed a classification scheme which embodies the term important to safety. Tr. 20,833 (Mattson).

RB-14

10 CFR Part 50 has recently been amended to include 10 CFR § 50.49, "Environmental Qualification of Electrical Equipment Important to Safety for Nuclear Power Plants." 48 Fed. Reg. 2728 (1983). The scope of this section is stated in 10 CFR § 50.49(b) which reads:

> (b) Electric equipment important to safety covered by this section is:
>
> (1) Safety related electric equipment: This equipment is that relied upon to remain functional during and following design basis events to ensure (i) the integrity of the reactor coolant pressure boundary, (ii) the capability to shut down the reactor and maintain it in a safe shutdown condition, and (iii) the capability to prevent or mitigate the

consequences of accidents that could result in potential offsite exposures comparable to the 10 CFR Part 100 guidelines. Design basis events are defined as conditions of normal operation, including anticipated operational occurrences, design basis accidents, external events, and natural phenomena for which the plant must be designed to ensure functions (i) through (iii) of this paragraph.

(2) Nonsafety-related electric equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions specified in subparagraphs (i) through (iii) of paragraph (b)(1) of this section by the safety-related equipment.

(3) Certain post-accident monitoring equipment.

48 Fed. Reg. 2733 (1983) (footnotes omitted).

RB-15

The new environmental qualification rule was discussed during cross-examination on SC Contention 8/SOC Contention 19(h). The NRC witnesses on the issue were Mr. Vincent S. Noonan, Branch Chief of the Equipment Qualification Branch and Mr. James E. Kennedy, Equipment Qualification Engineer in the Equipment Qualification Branch. Kennedy and Noonan, ff. Tr. 19,311, at Attachments 1 and 2.

In response to cross-examination on the scope of the NRC Staff's review of the Shoreham Environmental Qualification Program, Mr. Kennedy testified that the Staff's review only included safety related equipment. This review enabled the Staff to conclude that the Shoreham plant complies with the relevant parts of GDC 4. The Staff's conclusions in the SER address safety related equipment, even though the term in GDC 4 is important to safety. His conclusion that this adequately responds to GDC 4 is based upon Commission Memorandum and Order CLI-80-21, dated May 23, 1980, which, according to Mr. Kennedy, "states that NUREG-0588 forms the requirements for qualifying safety-related electrical equipment to meet the relevant parts of GDC-4." Tr. 19,387-91 (Kennedy).

RB-16

Since Mr. Noonan joined the Staff in 1974, whenever the Staff made a finding that the intent of GDC 4 was met, the Staff always referred to safety related equipment. In fact, Mr. Noonan stated that safety related "was always a definition of equipment important to safety. Other equipment, the so-called non-safety related equipment as defined in paragraph (b)(2) of the new rule, the [10 CFR] 50.49, was never really considered by the Staff." Tr. 19,391 (Noonan).

Moreover, in 1980, the Commission issued Commission Memorandum and Order CLI-80-21, which dealt strictly with safety related equipment. It was not until the NRC Staff drafted the latest version of the environmental qualification rule that the Staff "expanded upon the definition of equipment 'important to safety.'" Tr. 19,392 (Noonan).

RB-17

In addition to the NRC witnesses' statements that the NRC has never construed important to safety in GDC 4 to mean anything but safety related, there was further evidence to support those statements concerning this Staff interpretation and practice. When section 50.49 was issued, no guidance existed on how to determine what non-safety related equipment fell under GDC 4. There is still no guidance on how to prepare a list of equipment for the (b)(2) subset of equipment. Tr. 19,520 (Noonan). The Staff has no criteria by which an analysis would be performed to generate such a list. Staff witnesses also admitted that the Staff does not have a working knowledge concerning this category or type of equipment. Tr. 19,574-75 (Noonan). No formal policy has been established as to how the Staff is going to assure itself that an applicant's (b)(2) list is correct. Tr. 19,519 (Noonan). The Staff is only now developing a position on how it will handle the

situation where the applicant's list identifies no pieces of equipment in the category. Tr. 19,576 (Noonan). All of the Staff's equipment qualification reviews through January 1983 have been limited to safety related equipment. Tr. 19,392 (Noonan).

These facts strongly support the conclusion that, in actual practice, the NRC has not construed important to safety to be broader than safety related in the area of environmental qualification. Clearly, if section 50.49 does apply to non-safety related equipment, it is an expansion of previous NRC requirements.

RB-18

Although the testimony was not explicit, there is evidence that Licensing Boards have accepted the Staff's long-standing interpretation that important to safety in GDC 4 meant safety related. NRC witness Noonan stated:

> And many times we are required to testify to the fact that we met GDC 4, equipment important to safety; and I said by our definition it never really was challenged.

Tr. 19,393 (Noonan).

RB-19

LILCO stated that it believes the set of equipment under 10 CFR § 50.49(b)(2) (non-safety related equipment whose function could prevent accomplishment of safety functions by safety related equipment) is a null set based on LILCO's classification and design processes, as discussed in the SC/SOC 7B testimony. Tr. 19,529, 19,650-55 (Kascsak). NRC Witness Noonan was not ready to agree with LILCO without further review, although he believes there is little or no equipment in the category. Tr. 19,529-30 (Noonan). Staff witness Kennedy agreed that the (b)(2) set would be small or nonexistent based on discussions with the authors of the rule and other Staff systems experts. Tr. 19,511 (Kennedy).

RB-20

The reason 10 CFR § 50.49(b)(2) was included in the new environmental qualification rule was a concern among the Staff that older plants, particularly plants in the SEP program with a number of years in operation, might not have classified their electrical equipment in the same way Class IE equipment is now classified. These plants might have pieces of equipment that, in function, were safety related but not so classified. Conversely, an appropriate design philosophy for a plant could take care of the section 50.49(b)(2) equipment by classifying

it as Class IE (safety related). Tr. 19,644-45 (Noonan). In other words, the inclusion of (b)(2) was not intended to be a substantive expansion of important to safety in GDC 4. Rather, its purpose was to ensure that all equipment performing a safety related function was encompassed by the rule, no matter what the actual classification.

B. LILCO's Compliance with General Design Criteria

RB-21

Many of the Suffolk County proposed findings assume that GDC 1 requires a quality assurance program covering an important to safety but not safety related classification category of structures, systems and components. This program would be in addition to the 10 CFR Part 50, Appendix B quality assurance program for safety related structures, systems and components. The assumption that there is a regulatory requirement for a quality assurance program for anything other than safety related structures, systems and components ignores the evidence establishing that such a program is not currently required. See LILCO Findings B-4, B-5, B-11 to -83, B-158 to -174, B-176, B-187 to -197, B-205 to -208.53/

53/ Rather than repeat this citation to the record, LILCO proposes that reply finding RB-21 apply to each County proposed finding containing the erroneous assumption that GDC 1 requires a quality assurance program for something other than safety re-

(footnote cont'd)

RB-22 (SC 7B:31, 7B:32, 7B:35)

Suffolk County proposed findings 7B:31, 7B:32 and 7B:35 all state that compliance with GDC 1 and 10 CFR Part 50, Appendix B is impossible without identifying and classifying those items that are important to safety but not safety related. Even if there is a category of structures, systems and components classified as important to safety but not safety related, these proposed findings ignore the evidence establishing that there is currently no requirement to prepare a list of items in this category. See LILCO Findings B-173, B-200. Moreover, there is no guidance for defining such a category. See LILCO Findings B-173 to -176. These proposed findings also ignore the fact that the Staff has conducted a systematic review of Shoreham and determined that the plant meets the General Design Criteria with the exception of the remaining SER open items and a future commitment regarding the application of GDC 1, as interpreted by the Staff. See LILCO Findings B-197, B-198, B-205, B-259.

(footnote cont'd)

lated structures, systems and components. The reply finding to each County proposed finding containing this assumption should therefore be deemed as being in the alternative.

Specific identification of important to safety items is not needed. The evidence establishes that LILCO applies quality standards and quality assurance to all structures, systems and components at the plant commensurate with their respective importance to the safe and reliable operation of the plant. See LILCO Findings B-209 to -248.

RB-23 (SC 7B:34)

Suffolk County proposed finding 7B:34 relates to the relationship between 10 CFR Part 50, Appendix B and the quality assurance program for the non-safety related structures, systems and components. It states that while 10 CFR Part 50, Appendix B applies only to the safety related set, the criteria listed in Appendix B provide guidance for the quality assurance program for the non-safety related set. The record actually reflects that there is no requirement to apply all or any part of the Appendix B criteria to non-safety related structures, systems or components. See LILCO Findings B-180, B-182 to -185.

This proposed finding is inaccurate in stating that the Suffolk County witnesses did not argue that non-safety related items must be designed, fabricated, erected and inspected in accordance with the quality assurance requirements of Appendix B. The County's prefiled testimony states:

> The NRC in its recent Regulatory Agenda stated that it intends to issue revisions to GDC 1 to clarify, as originally intended, that the QA requirements of Appendix B to Part 50 would apply to all SS&Cs to which Appendix A applies.

Goldsmith et al., ff. Tr. 1114, at 3 n.3. In addition, during oral testimony, the County's witnesses made clear that it was their position that the regulations require at least some part of Appendix B to apply to all items in an important to safety category. Tr. 1335-36, 1772 (Hubbard).

RB-24 (SC 7B:36, 7B:37)

Suffolk County proposed findings 7B:36 and 7B:37, read together, state that while only safety related equipment is relied upon for design basis accident analyses as set forth in Chapter 15 of the FSAR, operators will actually utilize non-safety related structures, systems and components. Further, according to proposed finding 7B:37, these operators will rely, in many cases, on the non-safety related structures, systems and components prior to resorting to safety related structures, systems and components.

The subject addressed in these proposed findings is clarified somewhat by LILCO Findings B-403 through -410. The use of non-safety related structures, systems and components allows for utilization of the full capabilities of the plant and provides an additional layer of protection to the safety

related structures, systems and components. See LILCO Findings B-404, B-410. For each non-safety related structure, system or component that may be utilized, however, that structure, system or component plays no role in mitigating the event in question or, where it may play a role in mitigating the event, there is a safety related structure, system or component capable of preventing core damage in the event the non-safety related structure, system or component fails. See LILCO Finding B-413. Thus, even though the operators may use non-safety related structures, systems or components to respond to an event, they only rely on safety related structures, systems and components for the design basis accidents analyzed in Chapter 15 of the FSAR. See LILCO Finding B-48.

In addition, proposed finding 7B:37 does not accurately reflect Mr. McGuire's testimony. Mr. McGuire did not state that operators "rely" on non-safety related equipment. He stated that operators will "use" non-safety related equipment, leaving the safety related equipment as a second line of defense. Tr. 4769-70 (McGuire).

C. LILCO's Quality Assurance Program for Non-Safety Related Structures, Systems and Components

** RB-25 (SC 7B:44)

Suffolk County proposed finding 7B:44 states that for those structures, systems and components that are non-safety related, General Electric and Stone & Webster performed an evaluation based on their respective judgment and experience to determine what degree or range of "high standards commensurate with function" are needed for these items.

This proposed finding is not an accurate reflection of the record. The County has mischaracterized the testimony by relying heavily on a parenthetical expression in the question by the County's counsel. The transcript actually states:

> Q It is my understanding that both GE and Stone and Webster evaluate, at least on a judgmental basis, [systems,] structures and components which are not classified as safety-related to determine what degree or what range of high standard[s] commensurate with function needs to be applied, correct?
>
> A (WITNESS ROBARE) That is correct.
>
> . . . .
>
> A (WITNESS DAWE) That is correct for Stone and Webster, and it is at least a judgmental basis more often than not. It will be based on an evaluation of the component's function and the service conditions it is going to see.

Tr. 4441 (Robare, Dawe) (emphasis added).54/

54/ LILCO made a transcript correction in to Mr. Dawe's response in its Proposed Transcript Corrections, dated January

(footnote cont'd)

RB-26 (SC 7B:45)

Suffolk County proposed finding 7B:45 states that non-safety related structures, systems and components at Shoreham were designed for "normal service conditions" and were not designed to ensure operability in an emergency situation. Further, according to the proposed finding, abnormal service conditions were considered in the design of non-safety related structures, systems and components only to the extent necessary to ensure that they would not have an adverse interaction with safety related structures, systems and components. Further, according to the proposed finding, in some cases, non-safety related equipment was designed for a role in transient mitigation, but the majority of any additional quality assurance was to ensure plant reliability and not to ensure availability in emergency situations.

This finding is a totally inaccurate reflection of the record. Mr. Garabedian, whose testimony is relied upon as support for this proposed finding, testified that non-safety related structures, systems and components are designed with

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(footnote cont'd)

17, 1983. The correction is to change Mr. Dawe's first sentence so that it ends after the word "basis" and to make "more often than not" the first four words of the second sentence.

consideration for operation under unusual conditions. Tr. 4431 (Garabedian).

Mr. Robare, whose testimony is also relied upon as support for this proposed finding, testified that more than normal service conditions are considered in the design of structures, systems and components that are non-safety related. When these items have been demonstrated to be of some use in mitigating or preventing transients, they are looked at beyond their use under normal service conditions. General Electric considers all credible modes of operation that the equipment may see. If the non-safety related structures, systems and components perform transient mitigation, they are designed accordingly. Tr. 4435-36 (Robare).

Mr. Dawe, whose testimony is also relied upon as support for this proposed finding, testified that he included "[t]he transient operation of a nonsafety system . . . in [his] definition of its service condition." Tr. 4440 (Dawe). In other words, when Mr. Dawe explained that non-safety related structures, systems and components are designed for normal service operation, he was including within that definition the possible operation during transient conditions of those non-safety related structures, systems and components. Mr. Dawe's definition of normal service operation is supported by 10 CFR Part 50, Appendix A where "anticipated operational

occurrences" are defined as "those conditions of normal operation which are expected to occur one or more times during the life of a nuclear power unit . . . ." (Emphasis added).

This proposed finding also cites the Board on Tr. 4430 as support. The use of this cite is inappropriate given that the Board was merely paraphrasing a question. The paraphrasing of a question is not support for a proposed finding of fact.

Further, this proposed finding evidences a misconception on the part of the County that additional quality assurance will allow a piece of equipment designed to operate in a given set of service conditions to operate in some set of conditions beyond those for which it was designed. The record establishes that the design of non-safety related items, and not additional quality assurance applied to those items, allows for their operation under transient conditions. Tr. 4434 (Robare), 4440-41 (Dawe). Suggesting that additional quality assurance will ensure availability in emergency situations ignores the fact that quality assurance will not ensure operability under conditions for which the item was not designed.

RB-27 (SC 7B:47)

Suffolk County proposed finding 7B:47 states that though LILCO testified that Shoreham's construction effort

established and implemented quality programs and requirements relating to the fabrication and installation of non-safety related systems and components, the details of these programs and requirements were never documented. In addition, according to the proposed finding, though LILCO provided some examples of quality assurance activities applied to certain non-safety related structures, systems and components, the Board never received any manual, procedure or instruction purporting to describe in detail LILCO's quality assurance program for structures, systems and components important to safety but not safety related.

LILCO agrees that there is no single manual or procedure labeled as the quality assurance program for non-safety related structures, systems and components. See LILCO Finding B-206. There is no requirement to have such a manual or procedure. See LILCO Finding B-255. There is ample evidence in the record, however, documenting the quality assurance program that LILCO applies to non-safety related structures, systems and components. See LILCO Findings B-206 to -259.

That LILCO did not produce all documents related to quality assurance for non-safety related items is not surprising. This contention addressed examples chosen by the County. LILCO did provide a substantial summary of its quality assurance activities for non-safety related items as part of its testimony. See LILCO Findings B-235 to -248.

RB-28 (SC 7B:48)

Suffolk County proposed finding 7B:48 purports to contain a summary of the evidence relating to the quality assurance activities performed on non-safety related structures, systems and components. While this is a fairly accurate summarization of the examples extensively discussed in the record, the proposed finding ignores the evidence establishing that LILCO applies quality assurance and quality standards to all structures, systems and components at Shoreham commensurate with their respective importance to the safe and reliable operation of the plant. See LILCO Findings B-209 to -248. In addition, this summarization comes directly from LILCO findings B-236 to -248, which more clearly address this subject.

RB-29 (SC 7B:51)

Suffolk County proposed finding 7B:51 states that none of the General Electric witnesses on the 7B panel had been members of the General Electric quality assurance organization. This proposed finding further states that Mr. Robare's testimony relating to the General Electric quality assurance program was based on a close working relationship with General Electric's quality assurance personnel.

The evidence clearly establishes Mr. Robare's qualifications to testify regarding General Electric's quality assurance program. Mr. Robare has been employed by General Electric for over 25 years in various positions, including Applications Engineer and Design Engineer in the Control and Instrumentation Department, Program Manager in the Projects Department, Licensing Engineer and Manager. Tr. 5512-13 (Robare).

In connection with his duties and his responsibilities as an Applications Engineer and a Design Engineer, Mr. Robare was familiar with General Electric quality control and assurance standards and procedures. This was especially true in connection with Mr. Robare's duties and responsibilities as a Design Engineer where it was imperative for him to work closely with the Quality Assurance Department in order to ensure the adequacy of design work and quality assurance. As a Design Engineer, Mr. Robare made the major decisions concerning the degree of quality assurance to be applied to the design. Tr. 5513 (Robare).

As a Program Manager at General Electric, Mr. Robare was familiar with General Electric's quality assurance standards and procedures. Specifically, as Program Manager, Mr. Robare was more concerned with the contractual and code aspects of the quality assurance requirements. Tr. 5514 (Robare).

As a Licensing Engineer at General Electric, Mr. Robare was familiar with General Electric quality assurance standards and procedures. In this capacity, Mr. Robare worked closely with General Electric Quality Assurance to ensure that licensing commitments and code commitments were properly established and implemented by the General Electric Engineering Department. Tr. 5514-15 (Robare).

Though Mr. Robare was not a member of the General Electric Quality Assurance Department in his 25 years with General Electric, he has worked closely with the General Electric Quality Assurance Department and has been required to be familiar with General Electric quality assurance standards and procedures and their implementation. Tr. 5512-15 (Robare).

Mr. Robare's testimony on the General Electric program for quality assurance and quality standards applied to non-safety related and safety related structures, systems and components is consistent with and supported by the testimony of Mr. Donald Long, a member of the General Electric Quality Assurance Department, who testified in connection with the quality assurance contentions. See LILCO Findings B-211, B-212.

RB-30 (SC 7B:53)

Suffolk County proposed finding 7B:53 states that when Mr. Hubbard managed the General Electric Quality Assurance Department in 1976, General Electric did not have a systematic quality assurance program for non-safety related items, that the quality assurance manuals and programs he developed were related only to safety related structures, systems and components and that General Electric did not apply the same design control procedures for both safety and non-safety related designs.

This proposed finding is not an accurate reflection of the record. Mr. Hubbard was asked whether General Electric, in connection with the design functions they performed, had one manual or set of procedures for design control that applied to safety related and another that applied to non-safety related. Mr. Hubbard replied:

> The recollection is there was one set of engineering practices and procedures that applied to all engineering activities. However, the emphasis on those EP&Ps was for safety related activities, and it wasn't really what I would call a systematic program for things that were nonsafety related.

Tr. 15,999-16,000 (Hubbard). Though Mr. Hubbard's opinion may be that the program at General Electric in 1976 is not what he would call a systematic program for non-safety related structures, systems and components, the evidence clearly establishes

the existence of such a program at General Electric. See LILCO Findings B-211 to -218.

RB-31 (SC 7B:54)

Suffolk County proposed finding 7B:54 states that the majority of quality controls applied by General Electric to non-safety related equipment relate to ensuring reliable power generation rather than transient mitigation.

This proposed finding is not an accurate reflection of the record. Mr. Robare did not state that the majority of the quality controls that General Electric applies to non-safety related equipment relate to ensuring reliable power generation rather than transient mitigation. Mr. Robare stated that the majority of the "additional" quality assurance requirements are for purposes of plant reliability. Tr. 4458 (Robare).

The evidence is plain that General Electric has one overall quality assurance program that is applied to both safety related and non-safety related activities. See LILCO Finding B-211. The level of degree of application of the quality assurance program depends on the importance of the equipment to the safe and reliable operation of the plant, see LILCO Finding B-217, with approximately 90% of General Electric's non-safety related structures, systems and components receiving a quality assurance that is very close to full Appendix B treatment. See LILCO Finding B-214.

RB-32 (SC 7B:56)

Suffolk County proposed finding 7B:56 summarizes the testimony of the Staff's Resident Inspector for Shoreham, Mr. Higgins, to the effect that there is no well-defined quality control or quality assurance manual for non-safety related structures, systems and components that defines the quality assurance program for all non-safety related items.

This proposed finding fails to mention that there is no requirement to have a manual for non-safety related structures, systems and components that defines the quality assurance program for those items. See LILCO Finding B-255. In fact, there is no guidance for defining such a program. See LILCO Findings B-173 to -176, B-255. This proposed finding, by implication, also ignores the evidence establishing that the Staff was satisfied that LILCO was meeting the regulatory requirements with respect to the quality assurance program for non-safety related structures, systems and components. See LILCO Findings B-197, B-198, B-259.

RB-33 (SC 7B:58)

Suffolk County proposed finding 7B:58 summarizes Mr. Higgins' testimony to the effect that, except for those items in the appendix to the quality assurance manual, the quality assurance program for non-safety related structures, systems and components is not graded.

This proposed finding, summarizing Mr. Higgins' testimony, is without support in the record given Mr. Higgins' admission that:

> [W]e have never really inspected that program [quality assurance for non-safety related structures, systems and components] as a whole. So what it has and doesn't have, we don't have a real firm handle on.

Tr. 17,290-91 (Higgins). Thus, Mr. Higgins' statement regarding the lack of gradation in the quality assurance program for non-safety related structures, systems and components is without a foundation given that he stated that he really does not have a handle on that program.

RB-34 (SC 7B:59)

Suffolk County proposed finding 7B:59 states that while Mr. Hubbard agrees that LILCO applies some quality assurance to some non-safety related equipment, he was unable to identify that program from looking in the FSAR, the Quality Assurance Manual, and the Quality Assurance Procedures.

LILCO concedes that there is not a single procedure or manual labeled as the quality assurance program for the non-safety related structures, systems and components. There is no requirement to have such a procedure or manual. See LILCO Findings B-173, B-200, B-255. There is no guidance for defining the scope of such a program. See LILCO Findings B-173 to -176. Shoreham, however, does have procedures or activities similar to Appendix B for items that are non-safety related. See LILCO Finding B-206.

The fact that Mr. Hubbard was not able to identify the systematic program at Shoreham has nothing to do with whether such a program is required or, if required, that it be detailed in the documents reviewed by Mr. Hubbard. In short, whether Mr. Hubbard was able to discover the systematic program is irrelevant with respect to whether such a program exists.

RB-35 (SC 7B:60, 7B:62)

Suffolk County proposed findings 7B:60 and 7B:62 contain Mr. Hubbard's opinion that LILCO's quality assurance program for non-safety related items does not reflect any systematic application. Mr. Hubbard does not believe LILCO meets the intent of such a program as required by GDC 1.

Even if there is a requirement to have a quality assurance program for non-safety related items, these proposed

findings ignore the evidence establishing that LILCO has established such a program, applying quality standards and quality assurance commensurate with the item's respective importance to the safe and reliable operation of the plant. See LILCO Findings B-209 to -248.

These proposed findings also ignore the evidence establishing that the Staff has determined that LILCO's quality assurance activities in the past for non-safety related items satisfy GDC 1. See LILCO Findings B-197, B-198, B-259.

RB-36 (SC 7B:63)

Suffolk County proposed finding 7B:63 summarizes the testimony of LILCO witnesses to the effect that the LILCO operational quality assurance manual that is applied to safety related structures, systems and components may be applied to non-safety related structures, systems and components. The witnesses, according to the proposed finding, also stated that the manual does not have a listing of all non-safety related activities under a quality assurance program.

This proposed finding misconstrues the record. The witnesses did not testify that the quality assurance manual purported to include a quality assurance program for non-safety related structures, systems and components. The witnesses merely stated that what is in the quality assurance manual, and

is meant to apply to safety related structures, systems and components, may be applied to non-safety related structures, systems and components as well. This approach is in accordance with applicable regulatory requirements as there is no requirement that there be a listing of all non-safety related activities under the quality assurance program. See LILCO Findings B-173, B-200, B-255.

This proposed finding also ignores the record. The evidence establishes that quality assurance is applied to non-safety related structures, systems and components. Portions of that program are documented in the FSAR. Tr. 10,166-67, 10,175-76 (Museler).

RB-37 (SC 7B:64)

Suffolk County proposed finding 7B:64 purports to summarize Mr. Dawe's testimony to the effect that the FSAR documents broadly the kinds of analyses which were performed on non-safety related systems.

This proposed finding oversimplifies the record. Mr. Dawe did state that most of the important systems that have some relationship to the overall function of the plant are described in the FSAR. Tr. 4956 (Dawe). Further, the conclusions of the examination and evaluation of the non-safety related systems are generally stated in the FSAR. For these

systems, the FSAR contains the description of the design basis, description of the system and a description of the safety evaluation. The description of the safety evaluation may include flow diagrams, structural diagrams or sketches that explain its relationship to the plant. It also includes tables of data and information where necessary. Tr. 4956-57 (Dawe).

D. Staff Satisfaction With LILCO's Quality Assurance Program for Non-Safety Related Structures, Systems and Components

** RB-38 (SC 7B:73)

~~Suffolk County proposed finding 7B.73 states that the Staff believes that, based primarily on the written and oral LILCO testimony, LILCO has, in substance, complied with GDC 1 as it relates to a quality assurance program for non-safety related structures, systems and components. Further, the proposed finding purports to summarize Staff testimony to the effect that the Staff would be satisfied if LILCO would commit to comply with the Denton Memorandum terminology in the future.~~

~~Though the record does indicate that the Staff would be satisfied if LILCO would commit in the future to comply with the terminology contained in the Denton memorandum, the evidence is not that such a commitment on the part of LILCO is the only way to satisfy the Staff in the future with respect to GDC 1 compliance. The Staff will be satisfied if LILCO continues~~

~~to do in the future what it has done in the past with respect to its quality assurance program. See LILCO Finding B-197.~~

This County finding states that the Staff's position has changed from the Staff's prior testimony that LILCO has, in substance, adequately complied with the Staff's interpretation of GDC 1 QA requirements for non-safety related plant features. This is a serious misrepresentation of the facts. The record demonstrates that the Staff maintains its position that LILCO has complied with the substantive regulatory requirements for plant features which are important to safety, as defined by the Staff. E.g., LILCO Findings B-204, B-204A. Mr. Conran's position can not be called the Staff position. Even so, to the extent that County proposed finding 7B:73 discusses the quality assurance requirements for non-safety related features, Mr. Conran continues to state that LILCO's quality assurance for non-safety related features is a reasonably good program. Tr. 20,500, 20,769-70 (Conran).

** RB-39

Proposed finding 7B:73 summarizes the Staff testimony relating to the Staff's opinion that LILCO has adequately complied with the General Design Criteria on quality assurance requirements for non-safety related structures, systems and components. Despite the evidence summarized in this proposed

finding, and despite the record as reflected in LILCO Findings B-197, B-198, and B-249 to -259, the County concludes on page ~~44~~ 49 of its proposed opinion that the Staff testimony has no foundation. A review of the record, particularly Tr. 7711-27, as well as those portions of the record relied upon by LILCO Findings B-249 to -259, demonstrate the absurdity of the conclusion in the proposed opinion. At the very least, the proposed finding contradicts the conclusion.

E. Reply to County Supplemental Findings on Safety Classification

* RB-39A (SC S7B:5)

SC proposed finding S7B:5 incorrectly states as fact that LILCO does not recognize the applicability of NRC regulation to equipment other than safety related equipment. This is entirely based on Mr. Conran's testimony and ignores the position stated by LILCO witnesses that NRC regulations do, in a number of instances, apply to non-safety related equipment. LILCO Finding B-210A.55/ The portion of this County finding that states Mr. Conran believes there is a substantive defect in LILCO's understanding of what is required as a minimum to protect public health and safety is a correct representation of

55/ For clarity, it should be noted that the comma in line 6 of LILCO Finding B-210A should be deleted.

Mr. Conran's affidavit. Conran Affidavit, ff. Tr. 20,401, at 31. But the finding is not directly supported by the references to Mr. Conran's testimony at Tr. 20,525 and Tr. 20,722, which simply restate Mr. Conran's erroneous opinion of LILCO's interpretation of regulations. Tr. 20,525, 20,722 (Conran). The finding also fails to state that Mr. Conran's position that LILCO does not understand what is minimally required for safety is simply his understanding that LILCO does not accept his legal position that certain regulations should be construed to apply to non-safety related plant features, e.g., Tr. 20,542-44, 20,557, 20,778 (Conran). Mr. Conran has no specific knowledge to demonstrate that LILCO has failed to treat properly any structures, systems or component of Shoreham, e.g., LILCO Finding B-259BB.

* RB-39B (SC S7B:7)

SC proposed finding S7B:7 is not a fully accurate reflection of the record cited and incorrectly implies that LILCO witnesses were not forthright in their original testimony on SC/SOC 7B. There is no cited record support for the statement that LILCO made no effort to resolve the language dispute during the time frame "spring of 1982 until February 1983." In fact, Mr. Conran indicated he was aware of LILCO efforts to reach agreement with the Staff in November 1982. Tr. 20,571

(Conran). The County finding adopts Mr. Conran's characterization of the testimony of LILCO witnesses as "couching" their position, but Mr. Conran did not explain his use of the term "couched." See, Conran Affidavit, ff. Tr. 20,401, at 30; Tr. 20,456-59, 20,486-96, 20,555-56, 20,571 (Conran). The implication of the finding that LILCO was not forthright and its position is unsupported by the record. Far from true, a review of the transcript reveals that the LILCO witnesses freely admitted that non-safety related equipment does have safety significance. Contrary to Mr. Conran's suggestion that they "carefully avoided acknowledgment or recognition that such items had enough safety relevance or importance to number them among that category of things required minimally for safety by the regulations," nothing in the questions could reasonably be interpreted to call for a response on the matter. See Tr. 5,425-49 (Dawe).

* RB-39C (SC S7B:8)

This County finding misrepresents LILCO testimony concerning the extent to which NRC regulations may apply to non-safety related items. This finding correctly reflects LILCO's position that a non-safety related item which affects a safety related item, is within the scope of the regulations. But, as the finding neglects to state, LILCO witnesses also

provided other examples of non-safety related equipment within the scope of NRC regulations. LILCO Finding B-210A.

* RB-39D (SC S7B:9)

This finding is not supported by the citations given. No witness stated there could be no reasonable assurance that Shoreham can be operated without undue risk to the public health and safety absent the definitions from the Denton Memorandum. This is an inference by the County, and a vain attempt to show unanimity among Staff and County witnesses. Admittedly, Mr. Conran's affidavit does use similar words, but does not draw exactly this conclusion. Mr. Conran states that LILCO does not understand what is minimally required by the regulations to provide reasonable assurance of no undue risk to the public. This is a question of regulatory construction. It does not lead to the conclusion that LILCO does not know what is necessary to operate the plant such that there is no undue risk. Conran Affidavit, ff. Tr. 20,401 at 28; Tr. 20,555 (Conran). Dr. Mattson finds the term necessary for licensing, but his principal concerns are future reporting and inspection, Tr. 20,850-56 (Mattson), not a substantive problem with how LILCO intends to operate Shoreham. The County prefiled testimony cited simply finds fault with LILCO's recent FSAR commitment. Goldsmith et al., ff. Tr. 20,903, at 28. In fact, the

County's own consultant, Mr. Goldsmith, testified that it was not necessary to adopt the Denton definition to meet regulatory requirements. Tr. 20,965-68 (Goldsmith).

* RB-39E (SC S7B:10)

This proposed County finding correctly paraphrases Mr. Conran's testimony that safety philosophy is reflected by the manner in which a utility recognizes a minimum set of regulatory requirements for a plant. Without more explanation, however, the statement does not accurately convey Mr. Conran's position. Mr. Conran does not advocate judging safety philosophy by looking at a licensee's actually treatment of non-safety related structures, systems and components. Rather, he only considers a licensee's legal interpretation of NRC regulations. Thus, he concludes LILCO's safety philosophy is inadequate only because LILCO does not agree, as a legal matter, that certain portions of the regulations apply to non-safety related plant features. Mr. Conran's comments on safety philosophy have nothing to do with the substance of how a plant is designed, built or operated. In this regard, he was unable to provide any evidence that LILCO has treated non-safety related structures, systems and components improperly. See LILCO Findings B-259AA, B-259BB, B-259DD to -259GG; Staff Finding 7B:141R. Contrary to Mr. Conran, the Staff has concluded that there is

no evidence that LILCO's legal interpretation has had any practical adverse impact on Shoreham. Tr. 20,833 (Rossi), 20,834 (Mattson); Staff Findings 7B:131, 7B:141E, 7B:141P.

* RB-39F (SC S7B:11)

This County proposed finding is an incomplete statement of Mr. Conran's opinion about LILCO's safety philosophy. The term "safety philosophy" to Mr. Conran means nothing more than an applicant's position with respect to the scope of the term "important to safety." E.g., Tr. 20,495 (Conran). Thus, "safety significance" has nothing to do with LILCO's actual operation of the plant. This finding also relies on Mr. Conran's testimony to state that LILCO denies that non-safety related items are addressed by NRC regulations. As with other County findings on this point, it improperly ignores LILCO testimony to the contrary. LILCO Finding B-210A.

* RB-39G (SC S7B:12)

The County's proposed finding is misleading because it ignores related testimony. It states that Mr. Conran acknowledged there had been confusion about the meaning of the term "important to safety." But, it fails to acknowledge Mr. Conran's statement that, if not alert, he would still be prone to use the term non-safety related when he meant "important to safety but not safety related." Tr. 20,583 (Conran). In fact,

this occasionally happened in his oral testimony. See, e.g., Tr. 20,502 (Conran). Mr. Conran indicated in other portions of his testimony that he is aware that LILCO is not the only utility that now uses the term important to safety interchangeably with safety related, although he attempted to differentiate between "language" and "conceptual" problems. Tr. 20,592 (Conran). Mr. Conran gave no rationale to support such a differentiation. None exists. The finding also states that the Denton memorandum was drafted in order to deal with confusion about the meaning of the terms "important to safety," "safety-related" and "nonsafety related," implying that the memorandum addressed a long-known interpretation. However, the record cited by the County clearly indicates the definition in the Denton Memorandum is new. Tr. 20,835-36, 20,853 (Mattson); LILCO Findings B-162B to -162D. Moreover, Mr. Conran, at the time he drafted the Denton Memorandum, recommended additional measures to ensure there was agreement among licensees. These recommendations were not acted upon because no specific safety problems were identified. In his differing professional opinion, he restates the recommendation to review additional licensees and applicants. Tr. 20,506-08 (Conran). Despite these recommendations Mr. Conran still does not know the extent to which other utilities share LILCO's regulatory interpretation. Tr. 20,485-86 (Conran). Thus, he has absolutely no

basis for concluding that the interchangeable use of "important to safety" and "safety related" is only a "language" difference. The unequivocal testimony of witnesses familiar with industry practice is that the industry interprets the regulations as LILCO does. LILCO Findings B-159, B-160; see B-162A.

* RB-39H (SC S7B:14)

The County materially misrepresents the record in this proposed finding. It states that Mr. Conran does not know of any other applicant or licensee who interprets the term important to safety as LILCO does. But it simply fails to disclose that the record in fact shows that, of his own knowledge, Mr. Conran does not know whether such licensees exist or do not exist. Also omitted by the County is that Mr. Conran had been told by Mr. Haass of the NRC that other applicants and licensees do use the term much like LILCO does. Tr. 20,485-86 (Conran). The finding also states Mr. Conran is not aware of any utility other than LILCO which does not recognize the existence of regulations for equipment important to safety, but not safety related. Tr. 20,504-05 (Conran). Here again, the County disingenuously omits acknowledging that LILCO in fact does recognize the existence of such regulations. LILCO Finding B-210A. Moreover, the finding also conveniently ignores the fact that Mr. Conran is not a reviewer and would therefore not

be familiar with such information. LILCO Finding B-259Z. In light of Mr. Conran's testimony that other utilities use the term much like LILCO does, there is no logical basis for the implication in the County finding that LILCO is unique among utilities in its interpretation of important to safety. If a utility construes the term as LILCO does, it is illogical to assume they interpret the scope of the regulations differently. Indeed, it is logical and reasonable to imply the opposite; utilities that understand the term "important to safety" as LILCO does, construe the scope of the regulations in the same way.

* RB-39I (SC S7B:15)

This County finding accurately reflects Mr. Mattson's testimony that Metropolitan Edison has adopted the definitions in the Denton Memorandum at TMI-1. Tr. 20,833 (Mattson). The record, however, does not indicate what Metropolitan Edison has done as a result of this acceptance or whether it constitutes anything different from what LILCO already does. While Mr. Mattson did state that <u>at least one</u> licensee, Metropolitan Edison, has adopted the definition of the Denton Memorandum, Tr. 20,833 (Mattson), significantly, no other example was provided. Therefore, no inference that more such licensees exist is warranted, particularly in light of (i) the likely fact that

Metropolitan Edison only recently adopted the Denton definition because it had not used it in the past, see Tr. 20,833 (Mattson), (ii) the testimony by Mr. Mattson that the definition was "new," Tr. 20,853 (Mattson), (iii) the testimony by I&E witnesses that they did not use the term, LILCO Finding B-190, and (iv) the LILCO testimony that others in the industry interpret the term as do LILCO and its contractors (which have built other plants). LILCO Findings B-159, B-160, see B-162A.

* RB-39J (SC S7B:16)

This proposed finding is contrary to the record. It implies that Dr. Mattson said that the Staff had to start somewhere in applying the Denton memorandum "even if the clarifications contained in those definitions were assumed to be 'new'" (emphasis added). Dr. Mattson did not say "even if . . . those definitions were assumed to be new." On the contrary, he said "this is a new definition." He also stated the new definition is a clarification that would probably benefit stations other than Shoreham. By this he clearly implies that other utilities have the same interpretation as Shoreham. Tr. 20,853 (Mattson); LILCO Finding B-162B.

* RB-39K (SC S7B:17)

This proposed County finding is an incomplete and therefore misleading reflection of the record. The County

finding reflects Staff testimony that LILCO has two reasons for not accepting the Denton Memorandum -- cost and concern for unknown future additional requirements. But the County's finding fails to indicate, as the record shows, that the cost of accepting the definitions is not a major factor for Shoreham since the LILCO programs are already in place. In fact, Dr. Mattson stated cost was not a factor for Shoreham as a result of LILCO's FSAR commitment. Tr. 20,876 (Mattson). It further fails to acknowledge that LILCO's concern is valid since the Staff conceded it is not in a position to advise industry where regulation ends once the Denton definitions are adopted. LILCO Finding B-259T.

* RB-39L (SC S7B:19)

The County's proposed finding is not supported by the record cited, and flagrantly misrepresents the cited testimony of Mr. Conran. First, this finding repeats the County's misrepresentation of the record with the all-inclusive statement that LILCO regards the NRC's regulations as applying only to safety related equipment. The portions of the record cited by the County do not say this, and the testimony of LILCO witnesses clearly contradicts it. LILCO Finding B-210A. Further, Mr. Conran did not state that there is no assurance that LILCO properly applied quality standards and quality

assurance measures during the design and construction of Shoreham. Quite to the contrary, Mr. Conran stated: (1) that he could not offer an opinion on that matter because he was not an expert reviewer and could not verify that on his own, (2) the technical reviewers and other NRC witnesses on the original Staff panel for SC/SOC 7B maintain LILCO has properly applied quality standards and quality assurance measures during design and construction, and (3) the only caveat Mr. Conran would add is that if he were a reviewer, he would look again to be sure that in any area where ambiguity might exist, he was still satisfied. But even with the caveat, Mr. Conran restated there is a good deal of unchanged testimony in the record from technical reviewers that Shoreham does meet the NRC's regulations. Tr. 20,430-32 (Conran). In fact, Mr. Conran generally conceded that Shoreham was most likely designed and constructed in compliance with regulations. LILCO Finding B-259AA; Staff Findings 7B:141Q, 7B:141R; see Tr. 20,672-75 (Conran).

* RB-39M (SC S7B:20)

This proposed County finding is not accurate in presenting Mr. Conran's testimony as to what he meant by a quality standard. Mr. Conran stated his understanding by providing two examples: (1) detailed specifications of what the materials should be and (2) that the system should meet the

single failure criteria. Mr. Conran did not mention "performance levels" for the design, construction or operation as the finding erroneously indicates. Tr. 20,439-40 (Conran). Mr. Conran's testimony on what constitutes a quality standard was not, in fact, clear. He stated that in differentiating between quality standards and quality assurance, he might be having a language problem like that affecting important to safety and safety related. Tr. 20,425, 20,441-43 (Conran). Mr. Conran's apparent confusion over what constitutes a quality standard is important given that his major concern is not quality assurance for non-safety related areas, but rather is a concern about LILCO's understanding of what is minimally required for safety with regard to quality standards. Tr. 20,574-75 (Conran). Yet he has no clear understanding of what is meant by a quality standard. Further, to the extent the County finding implies that all quality standards are found in NRC's regulations and/or regulatory guidance, it is not supported by the cited portions of the record. Tr. 20,441-46, 20,502-03 (Conran).

* RB-39N (SC S7B:23)

The County's finding states that, in Mr. Conran's opinion, original Staff prefiled testimony on the adequacy of its review process does not apply to LILCO. Tr. 20,406-08

(Conran). This finding is incomplete unless considered in light of the fact that Mr. Conran, in subsequent testimony, could provide no basis for concluding any actual difference existed in the review process or its results between a utility that might use the language in the same way the Staff does, and a utility that does not. LILCO Finding B-259GG.

* RB-390 (SC S7B:24, 7B:25)

County proposed finding S7B:24 highlights the word "perhaps" in Mr. Conran's statement that, with respect to design and construction, the Standard Review Plan and Regulatory Guide information can perhaps provide a safety net or backstop to mitigate misunderstandings. The County fails to acknowledge, however, that Mr. Conran said "perhaps" because he is not an expert reviewer, lacks detailed knowledge of the review process and would be unable to verify on his own that strucures, systems and components at Shoreham had been design and installed properly. LILCO Finding B-259BB; Staff Finding 7B:141R. Rather, the County follows with S7B:25 and incorrectly implies the "perhaps" is attributable to the scope of the Staff's audit review.

* RB-39P (SC S7B:26)

The County concludes that Mr. Conran is advocating a re-review of the Shoreham application by the Staff. As the

County states in the finding, Mr. Conran was of the opinion that review of an additional sample may be necessary, and that sample would be made up of structures, systems and components not ordinarily looked at by the Staff. But Mr. Conran did not call for a full re-review of areas already reviewed by the Staff. Tr. 20,438-39, 20,449-51 (Conran); Staff Finding 7B:141C. Staff witnesses familiar with the NRC review process do not believe any additional review is needed. LILCO Finding B-259CC.

* RB-39Q (SC S7B:27)

The County has mischaracterized the testimony of Dr. Mattson by taking it out of context in an effort to support Mr. Conran's opinion that an additional review sample may be needed to demonstrate compliance with GDC 1 for construction. Dr. Mattson's testimony relied on by Suffolk County is not related to and does not support this opinion of Mr. Conran. The cited portion of Dr. Mattson's testimony, fairly read in context, referred to the future treatment that may be accorded non-safety related equipment, for example in maintenance and surveillance testing, based on a utility's philosophy of operation. He was not referring to design and construction activities. Tr. 20,836-37 (Mattson). In fact, Dr. Mattson clearly stated his opinion that additional review would not be

worth the resources it would take because the returns would be small for the effort. He does not believe additional review is necessary for the findings the Staff needs to reach to license Shoreham. Tr. 20,860-61 (Mattson).

* RB-39R (SC S7B:28)

This County proposed finding implies that even though Mr. Conran was not aware of any specific examples of items important to safety but not safety related that had been improperly treated at Shoreham, such conditions existed and can be found in the several hundred review questions submitted to LILCO by the Staff. There is no record that the review questions in the Shoreham FSAR demonstrate a philosophical difference between the Staff and LILCO. Mr. Conran said he had personally reviewed a few review questions but gave no specifics of his review such as the subjects, or classifications of items involved in the inquiries, and he gave no indication that questions of Shoreham were unique in number or content. In fact, he stated that even in reviewing such questions, he was not sure if one could attribute the substance of the question to differences in understanding between the utility and the Staff. Mr. Conran indicated that an extraordinary number of disagreements between the Staff and LILCO might indicate that a philosophical difference was involved, but he

had not even established that there was an extraordinary number of questions involved, let alone disagreements. Tr. 20,515-16, 20,526-27, 20,538-39 (Conran). To the contrary, Staff witnesses testified that LILCO's interpretation of the regulations had had no practical effect on Shoreham. Tr. 20,833 (Rossi), 20,834 (Mattson); Staff Finding 7B:131, 7B:141E. In short, there is no record basis for the implication in the SC finding that the review questions on Shoreham are indicative of any philosophical difference between LILCO and the Staff.

* RB-39S (SC S7B:29 to :34)

This series of proposed County findings repeats, several times in different ways, the theme that LILCO has not demonstrated a knowledge of what is minimally required for safety. The County finds: (i) that the Staff cannot rely on LILCO's assurances during review because LILCO does not recognize "requirements" for items important to safety but not safety related, SC Proposed Finding S7B:29, (ii) that because of this, design defects may have slipped through the Staff review, SC Proposed Finding S7B:30, (iii) that the safety significance attributed to this class of features by LILCO cannot be determined, SC Proposed Findings S7B:31, :32, :33, and (iv) that one cannot predict how LILCO will operate in the future, SC Proposed Finding S7B:33, since LILCO may have, in fact,

satisfied Staff requirements only to get a license, not because it was required by regulations or necessary for safety, SC Proposed Finding S7B:34. These findings and their logic are fatally flawed in several ways, though primarily because they are incomplete reflections of the record. The findings fail to acknowledge that Mr. Conran's statement that LILCO does not acknowledge requirements only means he believes LILCO does not agree that certain regulations apply to non-safety related items, e.g., Tr. 20,542-44 (Conran). In fact, Mr. Conran concedes that the regulations do not provide express requirements for the class he calls important to safety but not safety related, but rather he relies on Staff guidance documents for the "requirements" even though he concedes they are not regulations. Tr. 20,512, 20,542 (Conran), see, e.g., Tr. 20,489 (Conran). As to the possibility that design defects could slip through the Staff review, the County fails to indicate that expert Staff witnesses have testified they have reasonable assurance this is not the case, Tr. 20,520 (Conran), and that Mr. Conran knows of no example of Staff guidance not met by LILCO. Tr. 20,523 (Conran). This is significant as Mr. Conran stated that everything which is covered under the NRC regulations as important to safety also has been addressed in Staff guidance documents. Tr. 20,773 (Conran). The discussions of the assignment and quantification of safety significance also ignore

the facts of the record. Mr. Conran's testimony indicates that he believes LILCO has not attributed proper safety significance to non-safety related equipment only because of LILCO's interpretation of the regulations. He believes that if LILCO does not agree these features are covered by those regulations that use the term important to safety; LILCO cannot be attributing sufficient safety significance. But Mr. Conran himself provides no quantification of safety significance except to say the regulations apply, e.g., Tr. 20,465-67, 20,775 (Conran). It is in light of these opinions that Mr. Conran postulates without any basis in fact that LILCO may have met Staff requirements only to get a license, giving him concern for future operation. SC Proposed Findings S7B:33, :34. Mr. Conran fails to separate LILCO's interpretation of the regulations from its demonstrated understanding of what is required for safe construction and operation of the plant. Staff Finding 7B:141F.

* RB-39T (SC S7B:35)

This proposed County finding takes a portion of Mr. Conran's testimony out of context. In an offhanded and unexplained remark, Mr. Conran stated that he did not intend to minimize the concerns that others might have with respect to the effect of LILCO's safety classification position on quality assurance applied at Shoreham. By merely paraphrasing this

statement, the County ignores many of Mr. Conran's statements in this regard, including two in the same response the County cites. In fact, Mr. Conran stated that he does not have serious concerns about LILCO's QA program for non-safety related items. Tr. 20,770 (Conran). The Staff knows more about this subject for Shoreham than it does in the case of a good faith assurance from an applicant that it will comply with requirements. The Staff has a fairly elaborate description of LILCO's non-safety related QA program, and it appears to be a reasonably good program. Tr. 20,769 (Conran). Mr. Conran noted that the Staff had individuals qualified to make assessments about the QA program. Tr. 20,500 (Conran). Contrary to the implications of this proposed finding, Mr. Conran does not share the County's concern that the safety classification issue has implications in the quality assurance area. Tr. 20,575 (Conran). Moreover, Staff QA experts have concluded that Shoreham's QA program for non-safety related items complies with the Staff's interpretation of GDC 1. LILCO Finding B-256.

* RB-39U (SC S7B:36)

This proposed County finding incorrectly states that the County's witnesses testified that LILCO's quality assurance program for non-safety related structures, systems and components is unsatisfactory because it is not documented. Neither

cite provided contains such testimony. Tr. 21,022, 21,027 (Hubbard). LILCO witnesses testified that the LILCO programs are documented. Tr. 21,070-73 (McCaffrey, Pollock).

* RB-39V (SC S7B:37)

This County finding relies on SC prefiled testimony to state that one cannot know whether adequate quality assurance measures had been applied to non-safety related structures, systems and components because LILCO has not specifically identified the safety significance of each and because the future QA treatment would be based upon the original classification. In essence, the County claims there is no assurance that the engineering judgments applied during the design and construction of the plant were correct. This criticism ignores the weight of the SC/SOC 7B record which demonstrates that LILCO did apply adequate quality assurance measures to all structures, systems and components at Shoreham. E.g., LILCO Findings B-16, B-200, B-209, B-210; Staff Findings 7B:75, 7B:141E.

* RB-39W (SC S7B:38)

This County finding unjustifiably extends the record to suit the County's purpose. It states that any QA program has three essential elements. It then states that none of these is satisfied at Shoreham with respect to features which are important to safety but not safety related. The County's witness

stated no basis for concluding that these elements are necessary conditions. Also, in the record cited, Mr. Hubbard does not say that none of the elements is present at Shoreham. Mr. Hubbard was not even talking about the Shoreham programs in the response cited. Tr. 21,022 (Conran).

* RB-39X (SC S7B:39)

This finding attributes statements concerning Staff review practice to both Mr. Conran and the Staff. Only Mr. Conran's testimony is cited, however.

* RB-39Y (SC S7B:40)

This finding states that Mr. Conran, the Staff, and the County witnesses all agreed that the disagreement over definitions is more significant with respect to future operation than design and construction. The County cites Dr. Mattson for the Staff's support of this proposition. Dr. Mattson's testimony was clear that he saw no practical effect on LILCO's performance to the present time. In his mind, future operation is not more significant, it is the only significance. Tr. 20,833-34, 20,872-73 (Mattson).

* RB-39Z (SC S7B:42)

This finding concludes that if LILCO accepted the Denton definition, there would be no need in the future to go

through the exercise of determining whether what LILCO said they did during operations is in fact equivalent to what the Staff requires. This conclusion is not reached by Dr. Mattson in his testimony. Tr. 20,855-57, 20,872-73 (Mattson). On the contrary, Dr. Mattson conceded that even if an applicant agrees with the Denton definitions, the Staff has the same problem with respect to knowing whether or not the safety significance accorded in a licensee's judgment was correct in the Staff's view. Tr. 20,856-58 (Mattson).

* RB-39AA (SC S7B:43)

This finding is not supported by the cited record and fails to address relevant, related portions of the record. It states that all parties agree that the difference in safety classification terminology would lead to confusion between LILCO and the Staff in the future, and that all parties except LILCO believe this would impact safety. The cited portion of Mr. Conran's affidavit does not discuss potential confusion. Conran Affidavit, ff. Tr. 20,401, at 31-32. The County does not address LILCO witness Dawe's observation that use of the term important to safety, as used by the Staff, would also result in confusion without further definition. Tr. 21,127-28 (Dawe).

* RB-39BB (SC S7B:49)

This proposed County finding relies only on Mr. Conran's testimony to characterize LILCO's proposed FSAR commitments as nothing new. This is only Mr. Conran's opinion, not fact. Tr. 20,571 (Conran), LILCO Findings B-259A to -259H.

* RB-39CC (SC S7B:54)

This proposed County finding inaccurately characterizes the record. It presents a number of reasons which the County concludes would cause a plant feature to be important to safety but not safety related. Two of the reasons stated are (1) the plant feature contributes to safety by providing margin and reliability, and (2) the plant feature may be used in mitigating particular design basis accidents. The County cites the testimony of both Messrs. Conran and Minor for these reasons, implying they are in agreement. The former reason is in fact attributable only to Mr. Conran, and he did not mention reliability, while the latter reason is attributable to neither. Tr. 20,456, 20,663, 20,667 (Conran), 21,011-12 (Minor). Three additional reasons given are: (1) its relationship, including interactions, with other features; (2) whether its failure could result in exceeding Chapter 15 analysis; and (3) whether reliability contributes to safety by not initiating transients and accidents. Again, the County cites testimony of

both Messrs. Conran and Minor for all three, while the first is reflected only in Mr. Minor's testimony and the other two only in Mr. Conran's testimony. Tr. 20,479-80 (Conran), 21,011-12, 21,017 (Minor). To the extent this finding implies that these are recognized, all inclusive attributes of features important to safety but not safety related which clarify the term and allow construction of a list, the finding is not supported in the record.

* RB-39DD (SC S7B:56 and :57)

These findings express Mr. Conran's views that (1) it would not require much effort on the Staff's part to prepare a list of items important to safety because the Staff regularly deals with this information, and (2) the creation of a list would not require backfitting unless somehow somebody missed something in a licensing review. These views must be contrasted with the Staff's testimony that the Staff is not in a position to accurately estimate the impact of adopting the definitions of the Denton Memorandum. Tr. 20,871-72, 20,876 (Mattson). With respect to backfitting of already licensed plants, Mr. Conran did not address the question of the issue date of guidance documents versus the issue date of a plant's license.

* RB-39EE (SC S7B:58)

This finding states that Mr. Conran and the County testified that LILCO should be required to produce a list of items important to safety to demonstrate its understanding of the concepts that underlie the NRC regulation. The County's finding ignores the fact that County consultant Goldsmith testified that he did not know whether a list was appropriate. LILCO Finding B-173D. The Staff and LILCO witnesses agreed that a list of items important to safety was not required, Staff Findings 7B:141I, 7B:141J, and that LILCO has demonstrated an understanding of what is required for safety. LILCO Findings B-173 to -173C; Staff Finding 7B:141E, 7B:141K.

* RB-39FF (SC S7B:59)

County witness Marc Goldsmith disagreed that a Shoreham list was necessary to ensure that the safety significance and treatment of items had been considered and implemented at Shoreham. LILCO Finding B-173D.

* RB-39GG (SC S7B:60)

This proposed County finding incorrectly implies that preparation of a list of important to safety but not safety related items could alter the way LILCO treats the items on the list in the present as well as in the future. A fair reading of the record indicates that preparation of the list would not

have that effect. Mr. Conran testified that little else would have to be done to the items now considering what LILCO has testified has been done. He then stated it could possibly affect treatment in future operation based on the safety significance accorded. Tr. 20,672 (Conran). This is simply a restatement of Mr. Conran's speculation that acknowledging a different scope to certain regulations could alter performance. There is substantial evidence from the Staff and LILCO witnesses that the act of preparing a list would have no effect. LILCO Findings B-173B, B-173C, B-257, B-259C, B-259D.

* RB-39HH (SC S7B:62)

This proposed County finding is an accurate representation of the testimony of County witnesses. It also points out the potential confusion which arises from the definitions in the Denton Memorandum. The finding states, in part, "it is possible that a system classified as not important to safety may contain components that are important to safety." The witness stated "you might decide a system was not safety related but you may have components within that system which would be important to safety which may not therefore be accorded the proper safety significance if they were just thrown into the bailiwick of not safety related." Tr. 20,932-33 (Minor). The two become equivalent statements because of the overlap created

in the definitions of safety related and important to safety. The finding can be stated given the testimony, but the testimony cannot be restated just from the finding. Confusion abounds.

* RB-39II (SC S7B:63)

This proposed County finding misinterprets the testimony of NRC witness Vollmer. The finding states "Staff witness Vollmer stated that if an applicant's safety classification process had been set up with due consideration of both safety related and important to safety equipment, one could cull out of that process a list of safety related items and items which are important to safety, but not safety related." A careful reading of Mr. Vollmer's testimony in context shows that he was not referring to a "safety classification process." Rather, he was referring to a preventive and corrective maintenance program as a process which identifies the important attributes of structures, systems and components and then preserves these attributes over the life of the plant. It is the inclusive nature of these programs which Mr. Vollmer finds significant, not a list. He concludes a list could be culled from these programs, but it would not be important enough to expend the resources required. Tr. 20,840-43 (Vollmer), LILCO Finding B-259D; Staff Finding 7B:141N. By LILCO's FSAR commitment, the

non-safety related plant features addressed in the FSAR, the technical specifications and the emergency operating procedures will continue to be addressed in the Shoreham maintenance program to ensure their attributes are maintained. But the commitment is broader and involves other programs controlling activities, such as procurement and plant modification, which can affect the important attributes of plant features. LILCO Finding B-259C.

* RB-39JJ (SC S7B:64)

This County finding states that the Staff requested LILCO to comment in its FSAR that it will comply with GDC-1 during operations by accomplishing the Staff position set forth in a letter from Mr. Eisenhut to Mr. Pollock dated February 18, 1982. The finding correctly quotes the contents of the Staff's letter, but the statement that the commitment is intended to ensure compliance with GDC-1 is the County's assumption. Staff Ex. 14, ff. Tr. 20,812. The commitment is related to GDC-1, but is not necessarily related only to GDC-1.

* RB-37 (SC S7B:66)

This proposed County finding misrepresents the record. The finding states, in part, "although the Staff witnesses stated in their prefiled testimony that in their judgment LILCO's commitment to amend its FSAR would demonstrate that

LILCO understands the importance of non-safety related SS&Cs . . . it was clear from the Staff's oral testimony that that conclusion was dependent upon LILCO's acceptance of the Denton definitions." In fact, the Staff prefiled testimony did not say that committing to (the act of) amending the FSAR would demonstrate LILCO's understanding. The testimony states that the Staff has reviewed the language of LILCO's commitments and example FSAR amendments, and are satisifed that LILCO does understand the importance of non-safety related structures, systems and components. Mattson et al., ff. Tr. 20,810, at 12; Staff Finding 7B:141E. Dr. Mattson did state that the Staff believes the terms of the Denton Memorandum should be used by LILCO in the future, but he in no way modified the conclusion of the prefiled testimony. He expressed his concerns for the definitions as being related to future confusion in communication, scope of reporting requirements and inspection authority. Tr. 20,848-53 (Mattson); LILCO Finding B-259E.

* RB-39KK (SC S7B:67)

This County finding contains significant errors. It states in part that "the Staff's disagreement with the significance accorded such (non-safety related) equipment in the FSAR is precisely what gave rise to the need for the FSAR amendments in the first place." It continues "thus, in Mr. Conran's

opinion, the proposed FSAR amendments do not address at all the problem with LILCO's understanding of what is required minimally for safety." The County has not been true to the record in stating the Staff disagrees with the significance accorded non-safety related equipment in the FSAR. The Staff has stated that LILCO has treated non-safety related equipment properly, e.g., LILCO Findings B-197, B-259B, B-259C. This finding is not based on Staff testimony. It is based on Mr. Conran's personal difficulty with the ability of the FSAR commitment to resolve his concern over LILCO's understanding of what is minimally required for safety. His concern with the FSAR amendment is that it does not address the question of whether the plant features involved are within the scope of the NRC regulations. Tr. 20,617-20 (Conran). Mr. Conran was not taking issue with the content of the FSAR nor was he saying that the FSAR indicates quality levels unacceptable to the Staff. LILCO Findings B-259AA, B-259BB; Tr. 20,617-20 (Conran).

* RB-39LL (SC S7B:70)

This finding states that in order to implement LILCO's FSAR amendment, "the plant's records and procedures would have to be modified so the safety significance accorded to SS&Cs in the licensing process is identified and described in such a way that twenty years from now a maintenance person, not involved

in the licensing process, can know what to do if a problem arises." This "fact" is attributed to the testimony of Dr. Mattson. Dr. Mattson stated some effort would be required of LILCO to review and ensure the commitment is reflected in plant documents. There have to be procedures that direct people to identify requirements, and records from which the identification can be made. Dr. Mattson did not say records and procedures had to be modified. Tr. 20,872-75 (Mattson). LILCO witnesses testified that the programs are in place and documented to ensure the commitment is met. Modifications to procedures will not be a significant item. LILCO Findings B-259C, B-259G, B-259T.

* RB-39MM (SC S7B:76)

This County finding is a misleading interpretation of the record. It states that LILCO does not agree that the NRC regulations cover a class of important to safety structures, systems and components that is larger than the safety related class. LILCO witnesses testified that the terms important to safey and safety related have equivalent meaning. Therefore, regulations which use either the term important to safety or safety related have the same scope of applicability. LILCO does not say that the body of regulations as a whole is addressed only to the safety related set. Tr. 21,051 (Pollock), 21,078-79 (Dawe); LILCO Findings B-158, B-210A.

* RB-39NN (SC S7B:78)

This County finding is misleading in that it is incomplete. It states that LILCO's objection to the vagueness of the term important to safety would not be eliminated if the class of important to safety were the same group of equipment addressed in the proposed FSAR amendment. The LILCO witnesses stated they would still object to the vagueness, but it was because of the implications of the term in regulations other than GDC 1. Tr. 21,125-27 (Pollock, Museler, Dawe). The question asked was related only to GDC 1, while the responses went beyond to address concern for other regulations. See also LILCO Findings B-259A, B-259C, B-259O, B-259P.

* RB-39OO (SC S7B:79)

This County finding is misleading. It states LILCO would reject, as vague, the definition that the class of important to safety is that equipment specifically called out in the SRP and Regulatory Guides. The finding does not make clear that the concern of the LILCO witnesses was that, if the term were interpreted as broader than safety related, the term would vary as a function of the regulation in which it appears. Tr. 21,058-65 (Dawe, Museler); e.g., LILCO Findings B-259O, B-259Q, B-259U.

* RB-39PP (SC S7B:81)

This finding states that LILCO would agree to the use of the term "safety significance" in place of the term "important to safety" in GDC 1 only if it did not signify a change to LILCO's belief that the regulation applies only to safety related equipment, and, therefore, would involve no change in what LILCO has done or plans to do. This is a misleading summation of the record. The record demonstrates that the LILCO witnesses stated that they were comfortable with the term safety significance and that LILCO's programs accord appropriate safety significance to the function of the equipment in the plant. This includes all equipment, not just safety related equipment, and all of LILCO's programs including those it committed to maintain in its FSAR amendment. The LILCO witnesses believed that if the term "safety significance" were inserted in GDC 1 in lieu of "important to safety," GDC 1 would accurately reflect LILCO's philosophy and what LILCO has done. The witnesses noted, however, that had the term "safety significance" been used throughout the General Design Criteria from the start, had been interpreted to have a certain meaning, and then had been subject to re-interpretation with a different meaning, the same problems would arise as have arisen with the term "important to safety." Tr. 21,099-102 (Pollock, Dawe).

* RB-39QQ (SC S7B:82)

This finding implies that the basis for LILCO's position that important to safety is synonomous with safety related is merely that LILCO has difficulty in defining the outer bound of the set if it is not identical to the safety related set. The portion of Mr. Pollock's testimony cited by the County states, when fairly read, that LILCO's basis is its knowledge of the longstanding, widespread usage of the terms. Tr. 21,143-44 (Pollock).

* RB-39RR (SC S7B:84)

This County finding is a misleading summation of the record. It states that "LILCO believes it would be proper for the NRC to require a utility to define a set of equipment subject to NRC requirements that would be necessary for it to maintain a safe plant." The record shows that in response to a question formulated in these terms, LILCO witness Dawe stated that the NRC could ask a utility to do that. But if the response were to be a list, one would have to know quite specifically what the NRC interpreted that set to include in terms of such things as functions, roles and interactions, before a responsive list could be provided. Moreover, witness Dawe testified that it would be unwise for the NRC to arbitrarily impose a list because it might impinge on the utility's

judgment as to the safety significance of an item. Tr. 21,133 (Dawe); Staff Finding 7B:141M.

* RB-39SS (SC S7B:86)

This proposed County finding mischaracterizes the testimony of LILCO witnesses as stating that LILCO believes that a change in equipment that did not affect safety related equipment would not involve an unreviewed safety question as defined in 10 CFR § 59.59(a)(2), and, therefore, would not require prior approval from the NRC. County finding S7B:86 indicates that § 50.59(a)(2) states, in part, that a change shall be deemed to involve an unreviewed safety question if it may increase the probability of the occurrence or the consequences of malfunction of equipment important to safety. Not indicated by the County is the fact that § 50.59(a)(2) also states that such a malfunction must have been previously evaluated in the safety analysis report. This section also states a change is deemed to involve an unreviewed safety question if it may increase the probability of occurrence or the consequence of an accident previously evaluated in the safety analysis report. This condition is unaffected by LILCO's interpretation of important to safety. An unreviewed safety question also exists under § 50.59(a)(2) if a change creates the possibility for an accident or malfunction of a different type than any evaluated

previously in the safety analysis report. 10 CFR § 50.59. Again, this condition is unaffected by LILCO's views on classification. Thus, contrary to the County's finding, LILCO does not believe that a change in equipment must affect safety related equipment to be an unreviewed safety question. The LILCO witness clearly testified that every change must be evaluated to see if an unreviewed safety question exists. LILCO does not believe that a change to a non-safety related component cannot be an unreviewed safety question. Rather, LILCO believes the change must be reviewed for consequential effects on safety related functions, previously evaluated accidents, or new accidents or malfunctions to determine if an unreviewed safety question exists. Tr. 21,136-37, 21,146-47 (Dawe); LILCO Findings B-259V, B-259W.

* RB-39TT

On page 53 of the County's proposed opinion, Suffolk County attributes to the Staff the position that "LILCO's refusal to recognize the NRC's regulatory authority constitutes sufficient reason to deny LILCO a license." This statement is an inaccurate characterization of the record. First, the record is void of any indication that LILCO has refused to recognize the NRC's regulatory authority. The difference of opinion between the Staff and LILCO concerns interpretation of

the NRC's regulations. E.g., LILCO Finding B-259M. Second, it is true that the Staff has asked the Board to impose the Denton definition on LILCO as a condition of license. LILCO Findings B-259E, B-259J. But it is not true, as the above quote implies, that the Staff believes LILCO's views on the interpretation of the NRC's regulations justify a denial of a license. The difference is significant. As the Staff testified, they have no quarrel with the design or construction of Shoreham. LILCO Finding B-257, B-259, B-259CC. In the Staff's view, LILCO does not need to make any change in the design, construction or intended operation of Shoreham. Staff Finding 7B:141E. Rather, LILCO need only adopt the Denton definition to satisfy the Staff. LILCO Findings B-259E, B-259J.

* RB-39UU

In footnote 14 on pages 55-56 of the County's proposed opinion, SC discusses LILCO's point that Mr. Conran was unable to point to any example where LILCO's interpretation of important to safety would have an impact on operations. The County claims this argument is specious because the plant has not operated yet. The County misses the point. Mr. Conran could not even conceive of any substantive way in which the actual operation of the plant would be affected. See LILCO Proposed Opinion at 70; LILCO Findings B-259GG, B-259II.

* RB-39VV

In footnote 21, on page 64 of SC's proposed opinion, the County claims that LILCO's conclusion that Mr. Conran thought a list of equipment important to safety is only marginally beneficial is disingenuous. The comment reflects the County's failure to engage the full record. Mr. Conran did state in his affidavit that a list was essential. Conran, ff. Tr. 20,401, at 32. But a fair reading of the transcript references cited in LILCO Finding B-173F and SC Finding S7B:58 supports LILCO assessment of the record. The following passage, which discusses the development of a list (cited by the County in SC Proposed Finding S7B:55), clearly indicates Mr. Conran's ambivalence about a list:

> That's not a recommendation. I thought it was a good idea for a long while. I've had -- it's not necessarily my idea. I've never thought it was really necessary to understand the concept of important to safety, but a number of persons I've talked to in the last couple of years about the problem have suggested very strongly if there were just such a list, then they wouldn't be so hesitant to use the language the way that we do.

Tr. 20,660 (Conran); see Staff Finding 7B:141J.

F. Classification Using DBAs, Regulatory Guides and Industry Standards

RB-40 (SC 7B:75)

This proposed finding, suggesting that LILCO has relied primarily upon DBA analysis, regulatory guides and industry standards for classification and has therefore developed a "sharp distinction" between safety related and non-safety related, is misleading in two respects. First, while it is true that LILCO's classification methodology has relied on the DBA analysis, regulatory guides and industry standards, this proposed finding omits the use of operating experience and the analyses in the NSOAs. See LILCO Findings B-17 to -61, B-78.

This proposed finding is also misleading in suggesting that the result of the LILCO methodology was to develop a "sharp distinction" between safety related and non-safety related structures, systems and components. The cited testimony does not use that terminology. While it is true that structures, systems or components are classified as either safety related or non-safety related, no conclusion that LILCO has developed a "sharp distinction" can be inferred without an examination or review of the design requirements and quality assurance/quality control standards for specific safety related and non-safety related structures, systems and components. The testimony reflects that in many instances the distinction may not in fact be sharp. See LILCO Findings B-214, B-219, B-224, B-235 to -248.

** RB-41 (SC 7B:77)

This proposed finding states that the Staff's review process does not require that items important to safety but not safety related (i.e., non-safety related structures, systems and components) be specifically identified in a listing or otherwise specifically addressed by the applicant. While it is true that no specific listing of non-safety related structures, systems and components is required, the cited language from the Staff's prefiled testimony contradicts the proposed finding that non-safety related structures, systems and components are not otherwise specifically required to be addressed by the applicant in the Staff's review process. On the contrary, the Staff's testimony, cited in the proposed finding, establishes the opposite. The Staff's documents, specifically the Standard Review Plan, do require the applicant to address non-safety related items. The record is replete with evidence to this effect. See, e.g., LILCO Findings B-204, B-173A to -173C, B-249 to -259.

1. Classification Methodology Prescribed by Staff's Standard Review Plan

** RB-42 (SC 7B:80)

The first two sentences of this proposed finding are an accurate reflection of Mr. Conran's initial testimony to the effect that the NRC considers classification to have been correctly demonstrated if an applicant complies with the Standard Review Plan, and, in the Staff's view, it is implicit in the criteria of the Standard Review Plan that there is an understanding of how important a system is and therefore what quality standards it must meet. The Staff continues to hold this view. Mattson, et al., ff. Tr. 20,810, at 8-10. The proposed finding is flawed in the ~~final~~ penultimate sentence, however, because it does not accurately reflect Mr. Thadani's testimony. Mr. Thadani did not state that if an applicant's submittal satisfies the Staff's "so-called deterministic requirements," the Staff considers the application to be adequate. Mr. Thadani instead stated, "[LILCO's] application satisfies, as far as I understand it, all of our so-called deterministic requirements and that was considered adequate." Tr. 6594 (Thadani). Thus, the County omits Mr. Thadani's conclusions that the LILCO application satisfied the deterministic requirements and was considered to be adequate by the NRC Staff.

** RB-43 (SC 7B:81)

Suffolk County proposed finding 7B:81 is misleading because it suggests that Mr. Conran's testimony indicated that the Staff's review was superficial and undocumented. In fact, Mr. Conran's testimony supports the contrary. The fact that a Staff reviewer examines the Standard Review Plan and, upon finding that appropriate standards and criteria have been met, uses suggested conclusions from the Standard Review Plan does not suggest that the review is superficial or that many aspects of the review are not documented in the SER. On the contrary, Mr. Conran was stating that the use of the standard conclusions did document the proper completion of the Standard Review Plan review process. Tr. 7096 (Conran). The final sentence of this finding is also misleading. The belief in the adequacy of the Staff review process is a Staff position, not just that of "certain Staff witnesses" as stated by the County. Mattson et al., ff. Tr. 20,810, at 10.

RB-44 (SC 7B:83)

Suffolk County proposed finding 7B:83 states that the Staff and County agree that the Standard Review Plan does not present a systematic methodology for classification and treatment of equipment important to safety. This proposed finding is contrary to the record. Mr. Conran stated that the

methodology of the Standard Review Plan is not explicit, but it is there. Tr. 6583-84 (Conran). Moreover, the Staff clearly testified that the methodology it uses in connection with its review pursuant to the Standard Review Plan is adequate to ensure that applicants, including LILCO, comply with the regulations. The evidence establishes that a well-developed systematic process for classification is embodied in the Regulatory Guides and Standard Review Plan. See LILCO Finding B-13.

** RB-45 (SC 7B:84)

Suffolk County proposed finding 7B:84, stating that the County identified a host of errors in Table 3.2.1-1 of the FSAR, is misleading and fails fully and accurately to reflect the record. The County did not identify errors in Table 3.2.1-1. As reflected in Attachments 2 and 3 to Suffolk County's prefiled testimony, the changes and clarifications in the table were identified by LILCO, not the County. Moreover, a review of the table in Attachment 2 indicates that many of the changes were in fact clarifications and most were clarifications unrelated to the issue of classification. During cross-examination, County witnesses were unable to demonstrate that any of these changes were errors. The County witnesses claimed they were inconsistencies resulting from their lack of understanding of the detailed functions of the items involved.

Tr. 1481-1555. LILCO's prefiled testimony further responded to these allega ons and, to the extent questioned, so did the LILCO witnesses. See LILCO Findings B-131 to -157. The restatement of this proposed finding in footnote ~~11~~ 28 on page ~~48~~ 77 of the County's proposed opinion perpetuates the inaccuracies discussed above.

2. Classification Based on DBA Analysis

a. The DBA Approach

RB-46 (SC 7B:88)

Suffolk County proposed finding 7B:88 accurately reflects the cited testimony concerning the relationship between DBA analysis and safety related items, except that it is an oversimplification on one point. Contrary to the implication in the proposed finding, there are structures, systems and components at Shoreham that are classified as "safety related" and yet are not designed to mitigate design basis accidents. Put another way, not all safety related structures, systems and components at Shoreham are so classified because they mitigate design basis accidents. See, e.g., LILCO Findings B-85 to -89, B-100 to -110.

RB-47

Suffolk County proposed finding 7B:88 is cited on pages 27 and 28 of the County's proposed opinion in support of the proposition that "safety related SS&Cs are those which are required to function in mitigation of Chapter 15 DBA events" (emphasis in original). As the record reflects, this is an inaccurate statement; there are various safety related structures, systems and components at Shoreham that are not required to mitigate design basis accidents. See Reply Finding RB-46 (SC 7B:88).

The County also cited proposed finding 7B:88 on pages 27 and 28 in support of the general proposition that operators use non-safety related systems as well as safety related systems in responding to design basis accidents. While it is true that some EOPs may call for the use of non-safety related structures, systems or components in response to design basis accidents, this is not a basis for upgrading these structures, systems and components to the safety related category. LILCO is plainly aware that these non-safety related structures, systems and components appear in its EOPs, and the record reflects a sound rationale for permitting operators to make use of reliable operating non-safety related structures, systems and components in connection with dealing with design basis accidents, in addition to using the backup safety related set. See LILCO Findings B-401 to -418.

RB-48 (SC 7B:90)

Suffolk County proposed finding 7B:90 addresses the origination of the DBA concept and states that the "DBA approach was then extended into a stylized methodology to look at specific accidents . . . ." The use of the term "stylized" by the County is potentially misleading. "Stylized" is an ambiguous term that was not defined by Mr. Goldsmith in his testimony. According to the dictionary, "stylized" means to represent or to design according to a style or stylistic pattern rather than according to nature. Webster's New Collegiate Dictionary at 1148-49 (1979). If, by using this term, the County would have the Board imply that the DBA approach is a systematic methodology, then this proposed finding accurately reflects the record. On the other hand, if the County used the term "stylized" to imply that the DBA approach is in some sense irrational, then this proposed finding is contradicted by the record.

While it is true that the DBA approach does not consider and analyze all conceivable accidents, there is abundant testimony from Staff and LILCO witnesses that the DBA approach is a bounding analysis. It considers the most likely, serious accidents and ensures that the design is capable of protecting the public health and safety as required by the regulations in the event of those accidents. See LILCO Findings

B-40 to -49. Accordingly, the record refutes any implication that the DBA approach is in any way irrational or not according to nature.

RB-49 (SC 7B:91)

Suffolk County proposed finding 7B:91 addresses the method for selecting the transients and accidents analyzed in FSAR Chapter 15. The first three sentences of this proposed finding are accurate reflections of the testimony, though the third sentence is incorrectly attributed to Mr. Garabedian, rather than to Mr. Robare. See Tr. 4939-40 (Robare). Mr. Garabedian's testimony, however, provides important context for these first three sentences. Mr. Garabedian properly pointed out that DBAs for Shoreham were determined through investigation of the spectrum of possible events. For each of the possible events an evaluation was made to establish the highly unlikely accident to be used as the design basis in order to establish engineered safety features required to maintain the consequences of the accident within the limits of 10 CFR Part 100. Tr. 4938-40 (Garabedian). See LILCO Finding B-46. In addition to indicating that essentially the same accidents were analyzed for all BWR plants, Mr. Robare also indicated that "Shoreham-unique analyses were performed during Chapter 15." Tr. 4940 (Robare).

The final three sentences of proposed finding 7B:91 are conclusions that are unsupported in the record and indeed contrary to the first sentence. There is ample evidence in the record that a systematic methodology has been used to select accidents and transients to be analyzed. See LILCO Findings B-40 to -49. These LILCO findings demonstrate that the DBAs for Shoreham were determined through investigation of the spectrum of possible events. For each case an evaluation was made to establish highly unlikely accidents to be used as the design basis in order to establish engineered safety features required to maintain the consequences of the accident within regulatory limits.

The last two sentences of proposed finding 7B:91 also fail to acknowledge that the evidence establishes that the DBA approach is a bounding analysis designed to ensure that the set of safety related structures, systems and components ultimately identified as a result of the analysis is adequate to maintain the consequences within regulatory limits. See LILCO Findings B-45, B-46. The heart of the County's contention in this proposed finding, and others, is that uncertainties in predicting potential accidents, and the impossibility of analyzing all accidents in the DBA approach, mean that equipment may be necessary to mitigate accidents beyond that equipment currently defined as safety related. This proposed conclusion fails to

take account of the substantial testimony in the record that the DBA approach is a bounding analysis which means that it is an analysis designed to ensure that whatever course an accident takes and whatever occurs with respect to the non-safety related set of structures, systems and components, the safety related set is adequate to satisfy 10 CFR Part 100, Appendix A.

** RB-50

Suffolk County proposed finding 7B:91 is cited on page ~~45~~ 74 of the proposed opinion to support a statement that the structures, systems and components not required to function to prevent and mitigate the Chapter 15 DBA events were classified as non-safety related. This statement is inaccurate and not supported by the proposed finding. The record demonstrates that some structures, systems and components used to mitigate transients (which are Chapter 15 DBA events) are not safety related, and do not have to be safety related. See LILCO Findings B-149, B-404, B-409 to -418. The evidence also establishes that there are no transients that require non-safety related equipment for mitigation to prevent unacceptable accident consequences. See LILCO Finding B-48.

RB-51 (SC 7B:92)

Suffolk County proposed finding 7B:92, which purports to rely on testimony by Mr. Robare, would have the Board find that Chapter 15 DBA analyses are "highly stylized and . . . not intended to depict the actual course which accidents and mitigation efforts might take." Mr. Robare did not make this statement. Instead, this statement appears to be the County's conclusion. It is misleading to suggest that Mr. Robare testified along these lines, particularly given the use of the argumentative term "highly stylized." See Tr. 4436 (Robare).

Proposed finding 7B:92 is also not entirely accurate in suggesting that the DBA analysis does not depict a possible, actual course which accidents and mitigation efforts might take. Chapter 15 analysis, though very conservative, is mechanistic; it does in fact simulate possible accident scenarios. It is true that the Chapter 15 DBA analysis does not model or cover all possible courses that a postulated accident might take. This analysis, however, is conservatively performed to ensure that it is bounding. See LILCO Findings B-42 to -46.

Proposed finding 7B:92 is also incomplete in failing to acknowledge that Mr. Robare's testimony at Tr. 4436 was specifically related to transient mitigation, not accident mitigation. Thus, Mr. Robare's actual testimony is as follows:

> When we performed the transient analysis, as in Chapter 15, we assume the mitigation is

> obtained by systems that would mechanistically perform that function and, from that analysis we can determine what systems and components are required and design for them accordingly . . . .
>
> . . . .
>
> They are mostly safety systems, yes, but not totally.

Tr. 4436 (Robare).

RB-52 (SC 7B:93)

Suffolk County proposed finding 7B:93 is misleading in stating that "in Chapter 15 transient and accident analyses, mostly safety-related systems are used for mitigation." This sentence mistakenly suggests that non-safety related systems are required for mitigation of accidents. Mr. Robare clearly stated the contrary on the precise page cited in support of this proposed finding:

> I want to be sure that we are differentiating between transients and accidents. The accidents utilize only safety grade equipment for mitigation. The transients generally use safety grade equipment. There are a few exceptions that are noted in our testimony, and those exceptions are the only what I would call active mitigators of those transients. In other words, those systems that are required to operate in order to turn the event around.

Tr. 4437 (Robare).

Thus, contrary to proposed finding 7B:93, accident mitigation is accomplished solely with the safety related set.

With a few exceptions, the same is true with respect to transient mitigation. With respect to the use of the non-safety related set for the mitigation of transients, the evidence establishes that there are no transients that require non-safety related equipment for mitigation to prevent unacceptable accident consequences. See LILCO Finding B-48.

The final sentence of proposed finding 7B:93 is essentially true but may be misleading to the extent that it suggests that non-safety related equipment would be relied upon or depended upon for mitigation of DBA events. It is true that non-safety related equipment may be used in accident and transient mitigation efforts, but it is important to recognize, as the record amply reflects, that such non-safety related structures, systems and components are not relied upon and need not function in order to prevent or mitigate the accident. See LILCO Finding B-413. This is confirmed by Mr. McGuire's testimony where he stated:

> If you have a non-safety related system that can perform a function, the operator should utilize it, because all that does is it improves reliability in what he has behind him.

Tr. 4769-70 (McGuire).

RB-53 (SC 7B:94)

This single sentence proposed finding is somewhat misleading because it suggests that LILCO identified and determined the classification of safety related structures, systems and components solely through DBA and transient analysis. In support of this proposed finding, the County cites page 27 of LILCO's prefiled testimony. The testimony on page 27, however, does not support the proposed finding:

> The methodology used for classification of systems, structures and components at Shoreham involved the application of regulations, regulatory guides, industry standards, design basis evaluations and design and operating experience . . . These elements were applied in the systematic, controlled design process described in Section II above.

Burns et al., ff. Tr. 4346, at 27.

RB-54

Suffolk County cites proposed finding 7B:94 on page 4 of its proposed opinion in support of the allegation that the traditional DBA approach does not address systematically "the safety functions" of all structures, systems and components "important to the safe operation of the facility." Proposed finding 7B:94, because it mischaracterizes the record, cannot be relied upon to support this allegation. The great preponderance of the testimony establishes that LILCO did analyze the safety functions, as defined in 10 CFR Part 100, Appendix A, in

classifying structures, systems and components at Shoreham. Moreover, an analysis of the safety functions is inherently a part of the DBA approach. This approach requires the identification of the structures, systems and components required to mitigate or prevent DBAs. Prevention and mitigation of DBAs are safety functions. Therefore, the DBA approach requires identification and analysis of these functions. See LILCO Findings B-4 to -78.

RB-55 (SC 7B:96)

This proposed finding is misleading in suggesting that Stone & Webster does not adequately review classification. This single sentence proposed finding fails to account for much of the testimony of Mr. Dawe, which is cited for support of this proposed finding. When asked whether Stone & Webster, with respect to its scope of supply, conducted a review of classification in 1979 or at any time after the classifications were originally determined, Mr. Dawe stated as follows:

> I think there are differences in our organization which lead to differences in the way we would do the kind of things that Mr. Ianni was referring to. Our organization is a project organization where all disciplines on the project and all individuals working directly on the production of the project are part of your project team sitting together in one area.
>
> We do that type of review on a continuous basis, in that each time a component is being specified for purchase or installation at the

> plant those determinations are made. But we are not working on a product line basis; we are working on a project basis. So I think that our organization leads to different procedural requirements.
>
> In direct response, if I have not responded, yes, we do review classifications. But I am not aware of a single late stage review of all classifications such as Mr. Ianni mentioned. But they are reviewed continuously for the purposes of the work that needs to be done.

Tr. 4623-24 (Dawe). He later added that:

> The time for review of a classification would be when, if we became aware of some new requirement, for example, against which we had to measure a particular component of the system.
>
> . . . .
>
> Review of classification would occur if there were a need to review a classification. That would occur if there were some judgment that a new requirement were being placed on a portion of a plant.
>
> . . . .
>
> I'm not aware of such a policy or program [i.e., comprehensive review of all classifications at some stage in the development of a plant], nor am I aware that such a policy or program would be needed with the design process that we use.

Tr. 4626-27 (Dawe).

As Mr. Dawe's testimony on this issue reflects, this proposed finding fails to indicate that Stone & Webster performs classification reviews on a continuing basis if there is

a judgment that a new requirement is being placed on a portion of the plant. Also, Mr. Dawe indicated that a policy or program in the nature of a comprehensive review of all classifications is not needed in light of the nature of the Stone & Webster process.

b. Chapter 15 DBA Approach

RB-56 (SC 7B:97)

Suffolk County proposed finding 7B:97 accurately paraphrases a portion of Mr. Minor's testimony, but significantly omits the very next sentence, thereby inaccurately presenting the testimony. The proposed finding states:

> The GDC and the regulations define a list of accidents that should be analyzed in Chapter 15 of the FSAR. That list is a minimum list.

In the cited testimony, however, Mr. Minor characterized the list as "an acceptable minimum." Tr. 1466 (Minor) (emphasis added).

Proposed finding 7B:97, as clarified above, states that the list of accidents in the General Design Criteria and the regulations, when analyzed in the FSAR, constitute an acceptable mode of meeting the regulations. The record confirms that LILCO utilized such a list and, in accordance with the testimony of the County's own expert, LILCO has therefore used a list

of accidents in its DBA approach in the FSAR that is acceptable under the regulations. See LILCO Findings B-40 to -46, B-62 to -71. Given this testimony by Mr. Minor, it follows that the County's dissatisfaction with the list of accidents analyzed in the FSAR is an attack on the regulations rather than an attack on LILCO's compliance with the regulations.

RB-57 (SC 7B:98)

Suffolk County proposed finding 7B:98 fails to summarize correctly the cited testimony regarding the DBA approach and supplemental techniques. The first sentence of the proposed finding states that the DBA approach "has had advantages in the past, but current supplemental techniques have shown that the DBA approach has inherent limitations and weaknesses." In fact, the County's expert, Mr. Goldsmith, said more than this. He stated:

> In my opinion, the DBA technique and the Chapter 15 identification has lots of advantages and is a good technique. It has inherent limitations. Prior to having the availability of a PRA type analysis as one example, that was probably the best one might do under those circumstances in identifying accident initiators and sequences and identifying safety related equipment. The PRA technique has been around since 1974. Supplementing the DBA, it provides the classifier with a significantly greater amount of information, and therefore would imply that the DBA has some inherent weaknesses in it.

> So that I do believe that there are some inherent weaknesses in the DBA methodology that could be substantially improved by supplementing it. I am not suggesting that it be eliminated and not used, but it should be supplemented.

Tr. 1694-95 (Goldsmith) (emphasis added).

Thus, Mr. Goldsmith recognized that the DBA approach has lots of advantages, is a good technique and should not be eliminated. Mr. Goldsmith's testimony does suggest that the DBA methodology plus a PRA would be adequate for classification. Of course, it is clear that the design for the plant must be in place in order to perform a PRA. It therefore follows that a PRA is more appropriately a device or technique for confirming classification rather than a technique to be used for initial classification.

The record discloses that LILCO has, in fact, done precisely what Mr. Goldsmith implies would be adequate for classification -- use of the DBA methodology plus a PRA. In this connection, it is important to note that LILCO's PRA for Shoreham confirms that no classification changes were required as a result of the PRA. See LILCO Findings B-394, B-396. Not only does the record disclose that no classification changes were necessary as a result of the Shoreham PRA, the record also discloses that the County failed to present any credible evidence that any structure, system or component was improperly classified. See LILCO Findings B-84 to -157.

The second sentence of proposed finding 7B:98 implies that the DBA methodology is an adequate basis for starting the analysis of safety functions of structures, systems and components, but may not be adequate for obtaining all of the conclusions needed. There is no basis for this implication given Mr. Minor's testimony that the list of accidents to be analyzed in the FSAR is an "acceptable minimum as defined by the regulations." Tr. 1466 (Minor).

RB-58 (SC 7B:99)

In this proposed finding, the County concludes that a shortcoming of the DBA approach is a failure to analyze accidents more severe than the DBAs. Again, the County ignores Mr. Minor's testimony that the list of accidents to be analyzed in the FSAR "is an acceptable minimum as defined by the regulations." Tr. 1466 (Minor). The complaint that the DBA approach has shortcomings is, therefore, an attack on the regulations.

RB-59 (SC 7B:100)

This proposed finding addresses the relationship between actual events and the assumptions in the FSAR Chapter 15 analysis. The first two sentences of this proposed finding do not faithfully and fully reflect the record. The first sentence purports to be based on page 16 of the Staff's prefiled testimony and reads as follows:

> Specific, actual events (which are not analyzed in FSAR Chapter 15) may not follow the same assumptions made in the Chapter 15 analysis of the specific set of transients and accidents.

The only portion of the cited Staff testimony related to this sentence in the proposed finding reads as follows:

> [C]onservative bounding analyses performed [in Chapter 15] are used to demonstrate that the potential consequences to the health and safety of the public are within acceptable limits for a wide range of postulated events even though specific actual events might not follow the same assumptions made in the analyses. In addition, the analyses performed are used to demonstrate that the potential consequences to the health and safety of the public are within acceptable limits . . . when only safety-related . . . equipment and systems are used to mitigate the consequences of the postulated events. Sufficient safety related . . . equipment is provided to assure that essential safety functions will be performed even with the most limiting single failure.

Speis et al., ff. Tr. 6357, at 16-17. Thus, while it is true that the Staff's testimony indicates that specific, actual events may not follow the same path or assumptions as the scenarios analyzed in Chapter 15, the implication in the proposed finding that such specific, actual events are therefore not covered by the Chapter 15 analysis is simply not supported by the record. The quoted Staff testimony confirms that those specific, actual events are included within the Chapter 15 analysis.

The second sentence of this proposed finding is equally misleading. It states that the "analysis methods" and "acceptance criteria" associated with the DBA approach are not realistic. This is undeniably true, but the proposed finding misses the point that the DBA analysis is not intended to be realistic; it is quite deliberately intended to be conservative and therefore bounding. The Staff's prefiled testimony demonstrates that the DBA approach is not flawed for failing to consider all possible accident sequences. Speis et al., ff. Tr. 6357, at 17-21.

RB-60 (SC 7B:103)

Suffolk County proposed finding 7B:103 is largely speculative and is not supported by the record as a whole. Illustrative of this is the final sentence which states:

> The introduction to 10 CFR Part 50, Appendix A, also suggests that applicants' analyses may need to go beyond the GDC in areas that are not currently completely defined to assure that they have covered all necessary considerations in evaluating the safety of the plant.

Thus, according to this proposed finding, the regulations merely "suggest" that there "may" be the need in areas "not currently completely defined" to assure that undefined "all necessary considerations" are covered. Such conclusions, without any support in the regulations and no basis in the record, do not constitute acceptable findings of fact.

RB-61

Suffolk County proposed finding 7B:103 is used only once in the County's proposed opinion, on page 4. It does not support the assertion on that page, however, that the DBA approach ignores multiple failures and adverse systems interaction. There is, in fact, ample evidence from the cross-examination of County witnesses that the DBA methodology, incorporating single failure analysis, does consider multiple dependent failure situations. Tr. 1373-74 (Goldsmith), 1383-84 (Minor), 1385 (Hubbard).

RB-62 (SC 7B:104)

Suffolk County proposed finding 7B:104, a single sentence direct quote from the County's prefiled testimony, ignores the record and merely asserts that the DBA approach fails to consider systematically the potential for adverse systems interactions. Though the proposed finding accurately quotes the prefiled testimony, Mr. Hubbard conceded during cross-examination that a number of studies conducted at Shoreham, including the Chapter 15 analysis and single failure criterion approach, constitute systems interaction analyses. See Tr. 1284 (Hubbard). This finding is also refuted by the testimony that the single failure analysis does consider multiple dependent failures. Tr. 1373-74 (Goldsmith), 1383-84 (Minor), 1385 (Hubbard).

** RB-63 (SC 7B:105)

Suffolk County proposed finding 7B:105 relies on Mr. Minor's opinion, stated in cross-examination, that the DBA approach should be supplemented with other methodologies that would result in a larger list of accidents or combination of events which may exacerbate the accidents already identified in Regulatory Guide 1.70. The conclusion that a larger list would result if the DBA approach were so supplemented is ~~sheer speculation~~ without any factual basis in the record. At most, the record supports only the conclusion that such supplementation might result in an increased list of accidents to be analyzed. More importantly, as Mr. Minor testified at Tr. 1466, the DBA approach "is an acceptable minimum as defined by the regulations."

** RB-64 (SC 7B:106)

Suffolk County proposed finding 7B:106, again addressing supplemental classification methodologies, is not an accurate representation of the record. The first sentence of the proposed finding refers to "classification of SS&Cs required under the NRC's regulations." There is no reference, however, to any regulations in support of this finding, nor do ~~those~~ any regulations appear on the cited transcript page. Without support in the record, this proposed finding is of no merit.

RB-65 (SC 7B:107)

Suffolk County proposed finding 7B:107 is similar to proposed finding 7B:98, with the same record references cited in support, but with slightly different wording. The County contends that a PRA provides a classifier with a significantly greater amount of information than is available from the DBA approach alone. A short answer to this contention is that LILCO has used the DBA approach and supplemented it with a PRA. The Shoreham PRA considered systems interactions and did not reveal any structures, systems or components that needed to be reclassified. See LILCO Findings B-333 to -398.

c. The Single Failure Criterion

RB-66 (SC 7B:110)

Suffolk County proposed finding 7B:110 states that the single failure criterion largely ignores risks resulting from multiple failure accidents. In its prefiled testimony, the County asserted the claim that single failure analysis, by definition, ignores the risks resulting from multiple failure accidents. As this proposed finding evidences, the County has retreated from this absolute position and now states that single failure analysis, by definition, "largely ignores" the risk resulting from multiple failure accidents.

The cross-examination of the County's witnesses confirms that even this retreat in the proposed finding from the County's initial testimony is insufficient for an accurate reflection of the record. Mr. Goldsmith confirmed that the LOCA analysis, including single failure analysis, is a multiple failure analysis. Tr. 1371-74 (Goldsmith). Mr. Minor testified that the single failure criterion definition he uses in fact includes failures which result from a single failure such as common mode effects. Tr. 1382-83 (Minor). The record taken as a whole discloses that the County's consultants acknowledge that single failure criterion analysis addresses multiple dependent failures. Tr. 1383-84 (Minor), 1385 (Hubbard).

Further, at one point Mr. Minor conceded that a single failure criterion analysis (as described in the County's prefiled testimony, Goldsmith et al., ff. Tr. 1114, at 7-8) addresses some multiple independent failures. Tr. 1385-86 (Minor). See also Proposed Findings SC 7B:112 to 7B:114, 7B:118. The same County witness also stated that the single failure criterion ignored multiple independent failures. Tr. 1417 (Minor). In any case, the County's witnesses stated that a single failure criterion is not adequate by itself because it will not find all of the independent multiple failures which might occur in a power plant. This so-called failure is motivation for supplementing the methodology with other

methodologies such as walkdowns, PRAs and dependency analysis. Tr. 1388 (Minor).

This position misapprehends the nature of a systems interaction study. Independent failures are not the aim of, nor are they found by, a systems interaction study. If there is an interaction, there is no independence. Conversely, if there is an interaction (a functional one), the single failure analysis, which includes functional dependent failures, will identify it. The confusion of the County's witnesses on this point is clear from the testimony. See Tr. 1390-1400 (Minor, Hubbard), 1417-21 (Minor, Hubbard).

As the record reflects, the County's witnesses have either not had experience in conducting single failure analysis or their experience has been limited with respect to the testimony they provided. Tr. 1369 (Hubbard, Minor, Goldsmith, Harwood), 1378-79 (Goldsmith). Indeed, the record also discloses that the County's prefiled testimony on the single failure analysis was derived in part from the testimony of another witness in another proceeding. Tr. 1375-77 (Hubbard).

RB-67 (SC 7B:111, 7B:115)

Suffolk County proposed findings 7B:111 and 7B:115 state, in part, that "[t]he single failure criterion does not adequately fulfill the purpose for which it is applied," 7B:111, and that there is no assurance that it will discover all safety related or important to safety equipment or identify all multiple independent failure possibilities, 7B:115. These proposed findings are manifestly inaccurate. They rely for support on Mr. Minor, whose testimony does not support the proposed findings. A review of that testimony shows Mr. Minor consistently, if not clearly, responding to three successive questions establishing his position that the single failure criterion "is not inadequate as applied today for the purpose it is applied." See Tr. 1425-26 (Minor) (emphasis added).

There is an inconsistency in the County's position. The single failure criterion is embodied in the General Design Criteria of 10 CFR Part 50, Appendix A. In the introduction to Appendix A, the single failure criterion is directly linked to structures, systems and components "important to safety" through the use of the express terms "single failure" and "redundancy." 10 CFR Part 50, Appendix A, Introduction. Single failure criterion also appears specifically in various criteria, including GDC 17 and GDC 44. Where it applies, it is plain that its intended application is to safety related

structures, systems and components. Thus, linkage in 10 CFR Part 50, Appendix A between the term "important to safety" and single failure analysis and the fact, reflected in the County's proposed findings, that single failure criterion is intended to apply only to the safety related set supports and confirms LILCO's position that the terms "important to safety" and "safety related" are intended to be, and are recognized as, equivalents.

Further, the definition of "single failure" in 10 CFR Part 50, Appendix A identifies the single failure as a loss of capability of a component to perform its "safety functions." 10 CFR 50, Appendix A, Introduction. This also supports LILCO's position that "safety functions" is properly attributable only to specific functions of safety related items.

In any event, a premise of proposed finding 7B:111 is that items which are not safety related, but which the County would term "important to safety," can fail in a way to preclude accomplishing the safety related functions. The County, though given the opportunity to demonstrate specific examples of this, failed to do so. On the other hand, LILCO's testimony established that the purpose of its classification methodology was to avoid such interactions. See LILCO Findings B-83, B-260. The various interaction studies performed to date at Shoreham confirm the avoidance of such interactions. See LILCO Findings B-271 to -308.

3. Regulatory Guidance for Classification

a. Regulatory Guides

RB-68 (SC 7B:120)

Suffolk County proposed finding 7B:120 states that a well-defined group of safety related items permits the Staff and LILCO to focus their attentions, and that a similar benefit would be derived by defining those items important to safety, but not safety related. The evidence, however, is clear that a list of important to safety items is not required, see LILCO Findings B-173, B-200, nor is there any guidance for defining such a list. See LILCO Findings B-173 to -176.

The proposed finding is accurate in that a well-defined group of safety related systems helps focus the applicant and Staff review, but it is not correct to infer from this that the safety related set is the sole focus of the Staff's and LILCO's attention. As the Staff testimony not included in the proposed County finding makes clear, a substantial fraction of the Staff's review effort is applied to non-safety systems. Speis et al., ff. Tr. 6357, at 7. The record discloses that the Staff's review does cover a number of non-safety related structures, systems and components, and the record abundantly reflects that LILCO also focuses substantial efforts on non-safety related structures, systems and components in a

manner consistent with the function performed by these structures, systems and components in the overall operation of the plant. See LILCO Findings B-200, B-204, B-205, B-207 to -248. Accordingly, the conclusion in proposed finding 7B:120 is not supported by the record as a whole.

RB-69 (SC 7B:121)

Suffolk County proposed finding 7B:121 cites Mr. Minor's testimony at Tr. 1425 for the proposition that FSAR Table 3.2.1-1 "defines" the classification of structures, systems and components in terms of the seismic and safety classification and associated quality assurance categorization. Table 3.2.1-1, as ample testimony reflects, does not define classification; it summarizes classification. See LILCO Findings B-150 to -157.

Moreover, the focus of Mr. Minor's testimony at Tr. 1425 was not on Table 3.2.1-1, but rather the context was whether Mr. Minor had ever reviewed any BWR Mark IIs to compare Shoreham's classification results to those. In fact, Mr. Minor testified that all he had reviewed was the General Electric standard BWR 6. Mr. Minor indicated that he was familiar with no BWR 4 Mark II classification schemes other than Shoreham's. Tr. 1423 (Minor). Finally, this proposed finding fails to reflect ample testimony that Table 3.2.1-1 also identifies

non-safety related structures, systems and components that receive quality assurance treatment different from full Appendix B treatment. Tr. 6981 (Haass).

RB-70 (SC 7B:122)

Suffolk County proposed finding 7B:122, a paraphrase of Mr. Minor's testimony at Tr. 1270-71 relating to the evolution of safety classification, omits important context. In giving the opinion paraphrased in the proposed finding, Mr. Minor admitted that he had never participated in the classification of systems for a specific nuclear power plant. He then stated that classification is an evolution at most nuclear power plants, that he did not know any one person who had done a classification for an entire nuclear power plant and that he assumed that historically there must have been someone who had started this process, but basically it had evolved from plant to plant with markups of previous classification lists and identification of Q list items. Tr.1270 (Minor).

Mr. Minor then testified that he had done work in classification with regard to systems he had designed and that he participated in NRC discussions focusing on components that he had designed and whether or not they should be classified. Significantly, when asked, Mr. Minor indicated by "classification" he meant whether the items should be safety related or non-safety

related. Tr. 1271 (Minor). Mr. Minor's experience in classification thus supports LILCO's position that the use of the term "important to safety" to define a set of structures, systems and components broader than the safety related set is a recent position of the Staff. The evolution of classification has been into two categories: safety related and non-safety related.

** RB-71 (SC 7B:123)

Suffolk County proposed finding 7B:123, supposedly based on pages 30 to 35 of LILCO's prefiled testimony, fails adequately to reflect the record as a whole. Thus, omitted from the proposed finding but contained in the cited portions of LILCO's prefiled testimony is a full description of the NSOA analyses and a statement that these analyses formed one of the bases for the ANS-22 industry guidance on classification. Also important to note is that Attachment 2 to LILCO's prefiled testimony, the historical background for ANS-22, states in part:

> The AEC was highly influential in establishing some of the basic objectives for the ANS classification system and its ultimate character.

Burns et al., ff. Tr. 4346, Attachment 2, at 1. In short, this proposed finding is too narrow. Experience, analyses and consideration of regulatory requirements also played a role in the development of ANS-22. Significantly, as noted, the NRC also played a role in the development of that standard.

This proposed finding was cited in support of a statement in footnote ~~10~~ 27 beginning on page ~~47~~ 76 of the County's proposed opinion that Regulatory Guides 1.26 and 1.29 are limited in scope and leave gaps concerning the interpretation of how a system should be classified. Proposed finding 7B:123 does not support this conclusion, because the proposed finding does not even address the scope of these regulatory guides. Moreover, the proposition advanced in the footnote, that Regulatory Guides 1.26 and 1.29 are limited, is, at least with respect to Regulatory Guide 1.29, at odds with the Denton Memorandum. The latter states:

> Regulatory Guide 1.29 provides an LWR-generic, function-oriented listing of "safety-related" structures, systems, and components needed to provide or perform required safety functions. Additional information (e.g., NSSS type, BOP design A-E, etc.) is needed to generate the complete listing of safety-related SSCs for any specific facility.

Goldsmith et al., ff. Tr. 1114, Exhibit 1 (emphasis in original). Thus, according to the Denton Memorandum, by using this regulatory guide, an applicant can identify those structures, systems and components that perform the safety functions set forth in the regulatory guide which are the same safety functions set forth in 10 CFR Part 100, Appendix A. Those structures, systems and components therefore constitute the safety related set.

RB-72 (SC 7B:124)

Suffolk County proposed finding 7B:124, addressing ANS-22 and Table 3.2.1-1, is derived from LILCO's prefiled testimony, but omits the two sentences immediately preceding the portion from which the proposed finding is derived. Those two sentences are highly pertinent and state that it "establishes a disciplined and systematic method for defining nuclear safety requirements for a BWR" and that ANS-22 "sets out functional safety requirements for design, is responsive to NRC regulatory requirements and industry technical requirements and provides a uniform basis for design safety requirements to be reflected in licensing documents." Burns et al., ff. Tr. 4346, at 30. The record supports this omitted testimony. See LILCO Findings B-50 to -56.

RB-73 (SC 7B:125)

Suffolk County proposed finding 7B:125, addressing the use at Shoreham of Regulatory Guides 1.26 and 1.29, is misleading in its failure to take account of other evidence pertinent to the points toward which this proposed finding is directed. For example, the third sentence of the proposed finding, relying on LILCO's prefiled testimony, states:

> Although the design of Shoreham had commenced before these regulatory guides were issued, efforts were made to have the Shoreham classification scheme conform to the regulatory guides.

The testimony from which this sentence was derived in fact states:

> Although the design of Shoreham had commenced before these regulatory guides were available, they reflected a consideration of the same elements that went into the classification of systems at Shoreham. Thus, in large measure, when the guides were issued, Shoreham was in compliance with them. Efforts were then made to fully conform the Shoreham classification scheme with the regulatory guides.

Burns et al., ff. Tr. 4346, at 35. Thus, the County's selective use of the testimony omits the testimony that Shoreham was, "in large measure," already in compliance with new revisions because the design of Shoreham reflected a consideration of the same elements that were involved in the regulatory guides.

This proposed finding also ignores abundant testimony that demonstrates that there are no substantial differences between Revision 1 and Revision 3 of the regulatory guides and that LILCO complied with both. Staff testimony, too, reached this same conclusion to the effect that LILCO meets Revision 3 of each guide. See LILCO Findings B-75 to -76.

RB-74 (SC 7B:126)

Suffolk County proposed finding 7B:126 paraphrases and omits significant portions of the Staff's prefiled testimony. The proposed finding states:

> The NRC Staff performed its seismic classification review of the Shoreham systems identified in Table 3.2.1-1 in accordance with the guidance set forth in Regulatory Guide 1.29, Revision 1.

In contrast, the Staff's prefiled testimony states:

> The plant features that should be designed to withstand the effects of the SSE and remain functional are identified in Regulatory Guide 1.29 as seismic Category I. To determine the extent to which the seismic Category I design classification is applied to each fluid system, Table 3.2.1-1 must be used concurrently with the appropriate Piping and Instrumentation Diagram in order to perform a satisfactory review. The NRC staff performed the seismic classification review of the Shoreham systems identified in Table 3.2.1-1 in this manner. Our review of the seismic classification . . . of the Shoreham plant indicates that these plant features are in conformance with the guidance in Regulatory Guide 1.29. The content and format of Table 3.2.1-1 for Shoreham is consistent with other licensing applications such as LaSalle and Susquehanna and, in general, is at least as detailed as that provided for currently licensed plants.

Speis et al., ff. Tr. 6357, at 11.

This proposed finding also omits the Staff's statement that while the review was performed pursuant to Revision 1 of the regulatory guide, Revision 3 is essentially the same and

the Staff therefore found Shoreham in compliance with the latest revision. See LILCO Finding B-76.

RB-75 (SC 7B:127)

Suffolk County proposed finding 7B:127 is a selected paraphrase of the Staff's prefiled testimony and omits important matters reflected in the testimony. Thus, the proposed finding states:

> The NRC Staff performed its quality group classification review of the Shoreham systems identified in Table 3.2.1-1 in accordance with the guidance set forth in Regulatory Guide 1.26, Revision 1.

In fact, the Staff's prefiled testimony said a great deal more, including that the Staff did not rely solely on Table 3.2.1-1, but also used piping and instrumentation diagrams. In addition, the Staff stated that the results indicated that the classification at Shoreham was consistent with the regulatory guide and with other currently licensed plants:

> To determine the classification boundaries of each fluid system, Table 3.2.1-1 must be used concurrently with the appropriate Piping and Instrumentation Diagram in order to perform a satisfactory review as it is the intent to only identify major components in the table. The NRC staff performed the quality group classification review of the Shoreham systems identified in Table 3.2.1-1 in this manner. Our review of the quality group classifications of the water, steam and radioactive waste containing components of the Shoreham systems indicates that these components are in conformance with the guidance in Regulatory Guide 1.26. The content and format of

> Table 3.2.1-1 for Shoreham is consistent with other licensing applications such as LaSalle and Susquehanna and is at least as detailed as that provided for currently licensed plants.

Speis et al., ff. Tr. 6357, at 13. Also omitted from this proposed finding is recognition of LILCO and Staff testimony that Revision 3 to Regulatory Guide 1.26 is not substantially different from Revision 1 of that guide, and that Shoreham meets Revision 3 of the guide. See LILCO Finding B-75.

RB-76 (SC 7B:128)

Suffolk County proposed finding 7B:128, derived virtually verbatim from the Staff's prefiled testimony at page 8, is incomplete because it fails to include the Staff's conclusion that the Shoreham Table 3.2.1-1 is consistent with other licensing applications such as LaSalle's and Susquehanna's, and is at least as detailed as that provided for currently licensed plants. Speis et al., ff. Tr. 6357, at 11, 13.

b. Adequacy of Using Regulatory Guides 1.26 and 1.29 for Safety Classification

RB-77 (SC 7B:129)

Suffolk County proposed finding 7B:129, stating that Regulatory Guide 1.29 does not address structures, systems and components important to safety, is accurate only if the term "important to safety" covers structures, systems and components broader than the safety related set. It is no accident that Regulatory Guide 1.29 provides a generic, functional listing of safety related structures, systems and components needed to perform the required safety functions. The record reflects that there is no Staff guidance relating to classifying structures, systems and components that are not safety related. See, e.g., LILCO Findings F-173 to -176. The record as a whole strongly suggests that the reason for this is that the term "important to safety" has been construed and applied by the Staff (until the Denton Memorandum and the TMI-1 testimony) as synonomous with safety related. See LILCO Findings B-162, B-167, B-169 to -172.

RB-78 (SC 7B:131)

Suffolk County proposed finding 7B:131 states that Regulatory Guide 1.26 is ambiguous because, while its language indicates that Quality Group D is a safety related quality group, LILCO and the Staff testified that Quality Group D included safety related items but did not require application of the Appendix B quality assurance program. Further, according to the proposed finding, this alleged ambiguity indicates that this regulatory guide is not a completely systematic approach even to fluid systems classification.

This proposed finding is an inaccurate reflection of the record. LILCO's witness never testified that Quality Group D included safety related items that did not require Appendix B quality assurance. LILCO's testimony was consistent in that Quality Group D is not a safety related category. Further, the proposed finding is a misinterpretation of the Staff's testimony, because if Appendix B quality assurance is not required, then the item must necessarily not be safety related. In short, both LILCO and the Staff testified that Quality Group D does not refer to safety related items. See LILCO Findings B-132 to -140.

While Regulatory Guide 1.26 does indicate that Quality Group D applies to safety related items, this guide has never been interpreted in that fashion. In fact, the Staff and the

nuclear industry have consistently interpreted this regulatory guide such that Quality Group D is not a safety related category. Thus, the consistent application and interpretation of the regulatory guide is evidence that it is in fact systematic and, in its application, unambiguous. See LILCO Findings B-132 to -140.

RB-79 (SC 7B:132)

Suffolk County proposed finding 7B:132 states that the structures, systems and components at Shoreham were classified in accordance with Regulatory Guides 1.26 and 1.29. The Staff reviewed and documented LILCO's compliance with these regulatory guides in sections 3.2.1 and 3.2.2 of the Safety Evaluation Report. The proposed finding then quotes, in part, those sections of the Safety Evaluation Report. This proposed finding demonstrates another instance where the Staff used the term "safety related" synonomously with the term "important to safety." The Staff clearly understood, and no one questioned, that Regulatory Guides 1.26 and 1.29 applied to safety related items only. The two sections of the Safety Evaluation Report quoted in this proposed finding, documenting LILCO's compliance with these regulatory guides, use the term "important to safety" in place of, but with the same meaning as, "safety related." The Staff, in examining LILCO's compliance with two regulatory

guides that plainly apply to safety related items, stated there was compliance with items important to safety. In short, the Staff used "important to safety" and "safety related" interchangeably.

** RB-80 (SC 7B:133)

Suffolk County proposed finding 7B:133 states that LILCO does not set forth a listing of structures, systems and components important to safety but not safety related. Further, according to the proposed finding, the Staff does not require such a list, but merely requires an applicant to commit to meeting GDC 1.

This proposed finding is clarified by a full statement of the Staff's position, as reflected on page 9 of their prefiled testimony:

> The staff's present review process does not require that this subset [i.e., important to safety but not safety related] be specifically identified in a listing, nor has the staff developed quality assurance requirements, analogous to Appendix B, for these items. The staff simply requires an applicant to commit to meeting the provisions of GDC 1 and has permitted applicants to determine the appropriate quality assurance requirements for these items consistent with their importance to safety. Appropriate quality assurance for some of these plant items may be no more than normal commercial practice. Nevertheless, design criteria and quality standards for all structures, systems and components important to safety are required to be addressed, some in considerably more detail than others, in a Safety Analysis Report submitted by the applicant.

The Staff's testimony at the hearing was consistent with the statements in its prefiled testimony. See LILCO Finding B-173, B-173A to -173C.

RB-81 (SC 7B:134)

This proposed finding states that Regulatory Guides 1.26 and 1.29 provide only a minimum level of classification. Further, according to the proposed finding, they are not sufficient to discover all safety related or important to safety equipment, and need to be supplemented by other techniques to ensure that all components important to safety are identified.

This proposed finding is incorrect in suggesting that Regulatory Guide 1.29 is not a complete methodology for classification. The Denton Memorandum clearly views it as a classification guide for the entire plant, including all structures, systems and components, allowing the applicant only the decision as to which items are necessary to perform the "required safety function."

This proposed finding also implies that LILCO has used Regulatory Guides 1.26 and 1.29 as a sole basis for classification. Such an implication ignores a great deal of evidence establishing the systematic classification methodology used at Shoreham. See LILCO Findings B-4 to -83. These two regulatory guides are simply two of the tools used in that classification process.

G. The Shoreham Methodology

1. Systems Interactions Examples

RB-82 (SC 7B:137)

Suffolk County proposed finding 7B:137 is taken directly from Suffolk County's prefiled testimony, without modification to reflect the cross-examination of the County witnesses. In part, the proposed finding states "[w]ater level must always be above the active fuel length to assure that there is fuel integrity and that there is no release of radiation." On cross-examination, County witness Goldsmith stated that fuel damage will not occur immediately upon core uncovery. Even in a large break loss of coolant accident, there can be from one-half minute to several minutes of core uncovery before damage occurs. Tr. 1654-56 (Goldsmith).

RB-83 (SC 7B:139)

Suffolk County proposed finding 7B:139 again uses the County's prefiled testimony without modification to reflect cross-examination. The proposed finding states:

> The first example [of unreliable water level information provided by the system designed for and installed at Shoreham] concerns a 1981 systems interaction event that occurred at the Pilgrim Nuclear Power Station ("Pilgrim"). The event had the potential to cause a loss of all water level indication. Goldsmith et al., ff. Tr. 1114, at 46 and Exhibit 5.

The so-called Pilgrim event at Shoreham would not result in a loss of indication. See LILCO Findings B-319 to -324. A Shoreham specific analysis demonstrated that a worst case scenario, a sequence more serious and more unlikely than the Pilgrim event, would cause an error in the water level indication. The error, however, was small enough that the operator would have sufficient information to take action to prevent core uncovery in a timely manner. See LILCO Finding B-320. On cross-examination, Mr. Goldsmith agreed that the water level indication did not fail but became unreliable. Tr. 1660 (Goldsmith).

RB-84 (SC 7B:141)

Suffolk County proposed finding 7B:141, taken from Suffolk County's prefiled testimony, states that: "SC witnesses testified that the types of interactions described in the examples could be better accounted for by more rigorous systems interaction studies. Goldsmith et al., ff. Tr. 1114, at 47." There was no testimony in the record concerning how the water level events described by the County would be "better accounted for" by other types of studies. In fact, the record demonstrates that the possibility of reference leg boiloff, and the potential for reference leg break, were considered in the original Shoreham design. See LILCO Findings B-322, B-331. In

both instances, LILCO demonstrated that the plant was adequately designed to accommodate these systems interaction. See LILCO Findings B-319 to -322.

a. Shoreham Water Level Measurement System

RB-85 (SC 7B:145)

Suffolk County proposed finding 7B:145, taken from Suffolk County's prefiled testimony, states:

> Since there is no separate, diverse water level indicator, operating on a different principle, that provides an indication of reactor water level, there is clearly an effect on reactor safety if water level indication fails or otherwise becomes unreliable. Goldsmith et al., ff. Tr. 1114, at 47.

This proposed finding ignores a number of significant facts from the record. LILCO witnesses described worst case scenarios for both the reference leg boiloff and reference leg break events. These scenarios included a number of conservatisms. The analysis of the reference leg boiloff problem indicated that the error in water level indication would not be large enough to result in uncovering the core. See LILCO Finding B-320. The analysis of the reference leg break event demonstrated that, in all cases, the reactor would be shut down automatically and the operators would have sufficient time to prevent core uncovery. See LILCO Finding B-327.

b. The Pilgrim Event

RB-86 (SC 7B:147, 7B:148)

Suffolk County proposed findings 7B:147 and 7B:148 conclude that a problem similar to the Pilgrim event could occur at Shoreham and need not result from an accident condition. These proposed findings are based solely on the County's prefiled testimony and neglect portions of the record concerning differences between the Shoreham and Pilgrim plants in this regard. As the LILCO witnesses testified, Shoreham has an improved design for the drywell cooling system, see LILCO Finding B-322, and has technical specifications for drywell temperature. See LILCO Finding B-323. Both of these factors reduce the likelihood of a Pilgrim-type event at Shoreham.

RB-87 (SC 7B:149)

Suffolk County proposed finding 7B:149 states, in part, that "LILCO witness Robare also agreed that the flashing and boiloff phenomenon similar to the event at Pilgrim is a potential systems interactions situation." This statement fails to reflect fully the testimony of the LILCO witness. Mr. Robare went on to say that the boiloff phenomenon is not an adverse systems interaction because it would not result in any unacceptable plant conditions. Tr. 4598 (Robare). Similarly, the Staff stated that the potential level of error that could

occur at Shoreham had no safety significance. Speis, et al., ff. Tr. 6357, at 30; Tr. 6840-42 (Hodges).

RB-88 (SC 7B:154)

Suffolk County proposed finding 7B:154 states, in part: "Prior to July 1979, GE apparently had not advised its customers of the potential for this sort of interaction which would affect the water level indicator system." There is no citation to the record to support this conclusion. LILCO findings B-322 and B-323 indicate that the Pilgrim-type interaction had been considered in the design of Shoreham.

RB-89 (SC 7B:160)

Suffolk County proposed finding 7B:160 acknowledges that LILCO witnesses testified that the Pilgrim systems interaction event was considered in the design of Shoreham. It then goes on to state:

> However, when asked subsequently whether the interaction between the drywell coolers and the water level instrumentation had been analyzed by GE, Mr. Robare did not know what the County meant by "analyzed" and stated only that GE was "aware" of the possibility of that occurring. Tr. 4832 (Robare).

The County is incorrectly suggesting by this statement that the Pilgrim-type event was not considered in the design of Shoreham.

The question to Mr. Robare did not define what was meant by the word "analyzed" and he was merely indicating that fact in his answer. On the page following the one cited by the County, Mr. Robare reiterated that General Electric was aware of the possibility of interaction between the drywell coolers and boiler level indication. More significantly, on redirect examination, Mr. Robare was asked whether General Electric was aware of the boiloff issue prior to the Pilgrim event. He stated:

> A (Witness Robare) Yes, it was, Mr. Ellis. That was part of -- that consideration was evaluated in the original design of the water level instrumentation system at GE.
>
> Q And was that also in the Shoreham design process?
>
> A (Witness Robare) Yes, it was. It was analyzed in detail on the Shoreham as part of the Shoreham process.

Tr. 5558 (Robare). Consequently, proposed finding 7B:160 ignores direct evidence in the record contrary to what is implied in the proposed finding.

** RB-90

Suffolk County proposed finding 7B:160 is used on page ~~53~~ 82 of the County's proposed opinion to support the conclusion that the design process at Shoreham had not adequately considered the possibility of the so-called Pilgrim event. The

proposed finding, as established by reply finding RB-89 (SC 7B:160), has no basis in the record. The conclusion in the proposed opinion suffers from the same fatal defect.

RB-91 (SC 7B:162)

Suffolk County proposed finding 7B:162 takes a statement by a LILCO witness out of context. The proposed finding states "it is agreed that the interaction is not a good thing (Tr. 4598 (Robare)) . . . ." What Mr. Robare said was "not a good thing, but I do feel that the design at Shoreham is perfectly adequate." Tr. 4598 (Robare). Mr. Robare's conclusions concerning the adequacy of the Shoreham design were amply supported in the record. See LILCO Findings B-319 to -324. The Staff agreed that the Pilgrim-type systems interaction did not have any safety significance for Shoreham. Speis et al., ff. Tr. 6357, at 30; Tr. 6840-42 (Hodges).

RB-92 (SC 7B:163)

Suffolk County proposed finding 7B:163 inaccurately reflects the record. The proposed finding states that "the LILCO position also seems to be that the Pilgrim-type event may exceed the design basis." The County then goes on to quote the statement made by Mr. Robare on Tr. 4841-42. The scenario described by Mr. Robare was the worst case postulated scenario involving an interaction between drywell temperature and water

level indication. It was this scenario that Mr. Robare testified was outside the design basis of the plant. The Pilgrim event was much less severe than this worst case event. Tr. 4842 (Robare).

RB-93 (SC 7B:164)

Suffolk County proposed finding 7B:164 does not accurately reflect the record. In discussing whether the flashing/boiloff effect could confuse the operator, the County concluded "the Staff witness, Mr. Hodges, agreed that the Pilgrim event could be a potential source of confusion for the operators. Tr. 6840 (Hodges)." This proposed finding fails to include testimony that clarifies Mr. Hodges' statement.

Mr. Hodges stated that "the chance is very good that he would understand what was going on and where his water level was." Tr. 6844 (Hodges). Also, although the Staff conceded the Pilgrim event could be a potential source of confusion, they also stated that there would be no safety significance since the operator would be able to keep the core adequately covered. Speis et al., ff. Tr. 6357, at 30. In addition, Staff and LILCO witnesses stated that the symptom-based EOPs at Shoreham would be capable of dealing with this condition even if there were multiple failures. Tr. 6844-52 (Hodges), 5453 (McGuire).

RB-94 (SC 7B:165)

Suffolk County proposed finding 7B:165 may be misleading in that it implies that a Technical Specification including drywell temperature as a limiting condition for operation and a Note of Caution in the EOPs regarding potential unreliability of water level instrumentation are a direct result of the settlement of SC Contention 3, Inadequate Core Cooling. Such an implication is unfounded. Those provisions were in place in advance of the settlement agreement. See, e.g., LILCO Finding B-323.

c. The Michelson Concern

RB-95 (SC 7B:167)

Suffolk County proposed finding 7B:167 discusses the Michelson Memorandum and alleges that the Staff review concluded that "although we do not consider [the event] an immediate concern we do consider that the safety concern and associated problem need to be addressed." This is a quote from the Michelson Memorandum that is an incomplete statement of the record.

In response to the Michelson Memorandum, Mr. Harold Denton, director of NRR, stated that "the unaffected protective channels are sufficient to provide all protective functions. On this basis, we determined that the concern raised in the

report does not require any immediate licensing action." LILCO Ex. 13, ff. Tr. 5496.

RB-96 (SC 7B:168)

Suffolk County proposed finding 7B:168 is an incomplete and inaccurate statement of the record. The proposed finding states:

> Staff witnesses Rossi and Hodges agreed that the Michelson Memorandum identified a safety concern regarding an interaction between plant control and protection system. Tr. 6855 (Hodges, Rossi).

The proposed finding fails to acknowledge that the Staff does not consider the Michelson concern to be significant from a safety standpoint for Shoreham. Tr. 6866 (Hodges).

RB-97 (SC 7B:169)

Suffolk County proposed finding 7B:169 does not accurately reflect the record. The proposed finding quotes a number of statements from the Michelson Memorandum and calls them "Staff findings." This is not true; no NRC Staff witness adopted these purported statements of fact from the Michelson Memorandum. In fact, a number of the statements quoted in this proposed finding were in direct conflict with or were qualified by NRC Staff witnesses. See, e.g., Tr. 6895 (Rossi), 6870-73 (Hodges).

RB-98 (SC 7B:172)

Suffolk County proposed finding 7B:172 states that "a single failure involving one of the instrument legs connected to the level measuring differential pressure cells could affect all instruments connected to either or both legs." This proposed finding is incorrect because it ignores the evidence establishing that, for Shoreham, a single failure involving one instrument leg could not affect the instruments on both legs. Tr. 5372 (Robare).

RB-99 (SC 7B:173)

Suffolk County proposed finding 7B:173 urges the Board to conclude that "the LILCO design process failed to identify and/or appropriately limit an adverse system interaction [Michelson concern]." This proposed finding contains no citation to the record and is not a fair conclusion from the previous proposed findings. Indeed, it ignores testimony in the record that demonstrates that the potential for reference leg break was considered in the Shoreham design process and that the design is adequate to deal with this unlikely event. See LILCO Findings B-327 to -332.

RB-100 (SC 7B:174)

Suffolk County proposed finding 7B:174 is an incomplete summary of the record. It states that "GE evaluated the

Michelson scenario for Shoreham subsequent to its identification by the NRC and determined in its opinion that the protective systems are designed adequately to preclude the concern from being a safety concern. Tr. 4847-48 (Robare)." The possibility of a reference leg break was considered in the original generic design process for the water level instrumentation. The design used at Shoreham was implemented based on General Electric's judgment that protection of systems functions would not be significantly impaired. See LILCO Finding B-331. Thus, the proposed finding is misleading by suggesting that no evaluation was done prior to the Michelson Memorandum.

The study performed after the issuance of the Michelson Memorandum was done on General Electric's own initiative to confirm the validity of the original design decision for the water level instrumentation. The study confirmed the adequacy of the design. See LILCO Finding B-327.

RB-101 (SC 7B:178)

Suffolk County proposed finding 7B:178 relies on statements taken from documents without accurately reflecting the total content of the document, or including relevant cross-examination. The proposed finding concludes that "[t]he Staff, however, found it to be adverse: 'We re-confirmed that

an instrument sensing line malfunction could be the initiating event for adverse control system action and simultaneously affect the limited number of protective system channels.' LILCO Ex. 13, ff. Tr. 5496, at 1." This exhibit goes on to say:

> [H]owever, the unaffected protective channels are sufficient to provide all protective functions. On this basis, we determine that the concern raised in the report does not require any immediate licensing actions.

Id. Further, on cross-examination, NRC witnesses stated that the Staff did not consider the Michelson scenario to be a significant safety concern. See LILCO Finding B-329.

The proposed finding also states that "LILCO's witnesses believed Shoreham met the requirements of GDC 24 only by virtue of the last sentence in the GDC. Tr. 6887 (Jordan)." The statement is supported by a cite to Judge Jordan and not a LILCO witness. In fact, LILCO witnesses were not on the stand when the statement was made; the statement was Judge Jordan's attempt to summarize what he believed the LILCO position to be. This portion of the proposed finding should be disregarded by the Board since it is not based upon the testimony of a witness in this proceeding.

RB-102 (SC 7B:181)

Suffolk County proposed finding 7B:181 states, in part:

> The Board stated that GDC 24 is an important criterion and, as a result, safety and control systems should be separate. Tr. 6892 (Jordan).

No NRC Staff or LILCO witness agreed with this statement. Thus, it is not part of the evidence and it is inappropriate to rely on this statement by Judge Jordan as the basis for a proposed finding of fact.

RB-103

According to LILCO's witnesses, compliance with GDC 24 is assured at Shoreham for the reference leg design because the interconnection of protection and control systems is limited. Evaluations show that safety functions are not significantly impaired by a reference leg break followed by the worst postulated single failure. Separation of control and protective functions in accordance with IEEE 279 assure that safety is not impaired. Tr. 5460 (Robare).

RB-104

Similarly, the NRC Staff believes that the Shoreham design satisfies the requirements of GDC 24 because the sensing line connection between protection and control systems does not significantly impair performance of safety functions. In the

event of a reference leg break, even with an additional single failure, the plant is automatically shut down and there is sufficient time for manual operator action. Tr. 6891, 6896 (Rossi). It has been a consistent Staff position that GDC 24 allows a failure in a sensing line to result in a system which does not have other redundancy. The reason for this position is that sensing line failures are less likely and more easily detectable than electrical failures. Tr. 6890-92 (Rossi). Moreover, it is commonly accepted that IEEE 279 does not apply to instrument line piping. Tr. 6888-89 (Rossi).

RB-105 (SC 7B:182)

Suffolk County proposed finding 7B:182 is an inaccurate reflection of the record. It states, in part:

> Mr. Rossi of the Staff agreed that redundancy was lost after a break in the sensing line as postulated in the Michelson Memorandum. Tr. 6874 (Rossi). GE does not agree, believing that "there are sufficient systems, protective systems left to satisfy the safety concern." Tr. 5377 (Robare).

This juxtaposition of comments seems to imply that there was basic disagreement between the NRC Staff and LILCO concerning compliance with GDC 24. A complete review of the transcript shows that LILCO witnesses conceded that the failure of a reference leg would not leave a fully redundant system in that there is only one remaining reference leg. Tr. 5463 (Robare).

NRC witness Rossi testified that, consistent with the LILCO position, the Shoreham design provides adequate protections to deal with reference leg breaks. See, e.g., Tr. 6891 (Rossi).

It should also be noted that there was no clear understanding of what was meant by the phrase "all reliability, redundancy, and independence requirements" contained in GDC 24. See, e.g., Tr. 6875 (Rossi). It has been the NRC's interpretation that GDC 24 does not require that fully redundant sensing lines remain after the failure of a single sensing line. Tr. 6889-90 (Rossi). LILCO witnesses testified that following a reference leg break, all reliability, redundancy and independence requirements are satisfied for the reactor protection system (scram system). Tr. 5463-64 (Robare).

RB-106 (SC 7B:187)

Suffolk County proposed finding 7B:187 urges the Board to discount LILCO witness McGuire's statement contained in Suffolk County proposed finding 7B:186 that Shoreham's EOPs would be effective in responding to events described in the Michelson Memorandum. The County argues that because Mr. McGuire was not familiar with the details of each of the events listed in the Michelson Memorandum, his conclusions lacked adequate basis. This position is without merit.

As Mr. McGuire testified, because Shoreham uses symptom-based EOPs, the specific cause of an event does not need to be identified. The operators are trained to emphasize certain priority functions. Procedures are written so that the operator does not need to identify the specific cause of the event; instead, he is trained to use whatever safety related or non-safety related equipment is available to inject water into the reactor. Tr. 5375 (McGuire). For the same reason, Mr. McGuire does not need to be familiar with the details of the water level events mentioned in the Michelson Memorandum since he knows that the operators are trained to react to the symptoms of those events.

RB-107 (SC 7B:188)

Suffolk County proposed finding 7B:188 suggests that "the Hatch event demonstrates that automatic plant responses do need to be relied upon relative to events included in the Michelson Memorandum." The proposed finding then quotes from the Michelson Memorandum, listing the sequence of events that occurred at the Hatch plant. This sequence includes both automatic actions as well as operator actions.

There is no testimony from any witness to support the conclusion stated by the County that this sequence demonstrates that automatic responses must be relied upon to deal with the

types of events listed in the Michelson Memorandum. On the contrary, the sequence indicates that operator actions were effective in terminating this particular event at the Hatch plant. See SC Ex. 1, ff. Tr. 5373, at 39.

RB-108 (SC 7B:189)

Suffolk County proposed finding 7B:189 lists five events cited in the Michelson Memorandum that allegedly "demonstrate the safety significance of these events." There is no testimony by any witness concerning the safety significance of the events summarized in proposed finding 7B:189. Since these examples were included within the Michelson Memorandum, it is fair to assume that they were taken into consideration in reaching the conclusion contained therein that: "Although we do not consider the postulated control system or protection system interaction an immediate concern, we do consider that the safety concern and associated problems need to be addressed." See SC Ex. 1, ff. Tr. 5373, at 1 (emphasis added). These examples would have also been considered in NRR's review of the Michelson Memorandum which resulted in a conclusion that "the concern raised in the report does not require any immediate licensing action." See LILCO Ex. 13, ff. Tr. 5496.

LILCO's witnesses testified that following the issuance of the Michelson Memorandum, General Electric conducted a worst

case analysis. The result of this analysis shows that in all cases automatic scram occurs and there is sufficient time for the operator to take the necessary actions to keep the core covered. See LILCO Finding B-327. Thus, the five events mentioned in Suffolk County proposed finding 7B:189 have been analyzed for Shoreham because they were bounded by the General Electric analysis. In addition, Shoreham's use of symptom-based EOPs provides further assurance that the plant can respond safely to these events. See Reply Finding RB-106 (SC 7B:187).

RB-109 (SC 7B:190)

Suffolk County proposed finding 7B:190 attempts to summarize LILCO testimony concerning the Michelson Memorandum. It does not accurately reflect the record in a number of respects. The first sentence of the proposed finding states:

> The Michelson concern relative to the reference leg break was not identified by GE as a systems interaction problem prior to the issuance of the Michelson Memorandum.

While the potential for a reference leg break was not labeled a systems interaction concern, the record clearly reflects that the possibility was considered in the original design of the water level system and that a conscious decision was made to implement the Shoreham design because the protection function would not be significantly impaired by such an event. See LILCO Finding B-331.

The second sentence of proposed finding 7B:190 states: "This type of system has been historically designed and licensed with this concern unaddressed." This sentence is incorrect for the same reason as the first sentence. While it is true that designs similar to Shoreham have been licensed, it is incorrect to say that the concern went unaddressed. It was considered in the design process.

The third sentence of the proposed finding states: "The reason this problem had not previously been found may have been because it was a passive concern and thus was never considered a significant item." Again, as noted above, it is misleading to say that the problem had not been found since the potential for reference leg break was considered in the original design. A fair reading of the transcript indicates that the potential was not considered a concern because the reference leg is a passive feature in the design and thus the failure is unlikely. See Tr. 5485, 5490-91 (Ianni).

RB-110 (SC 7B:191)

Suffolk County proposed finding 7B:191 states:

> Subsequent to identification of the Michelson concern, GE formed a task force to analyze the situation. A brief analysis was prepared. The analysis had no title and there was no single document which supported its conclusions. Tr. 5579-80 (Robare).

The proposed finding does not address the merits of the study.

The specific analysis of the Michelson concern was initiated by General Electric following issuance of the Memorandum. The NRC did not request this information for Shoreham, and thus a formal report was not issued. Tr. 5580 (Robare). It is impossible to determine why Suffolk County included the second sentence of proposed finding 7B:191. To the extent that the second sentence of this proposed finding suggests that there is some deficiency in the General Electric analysis, there is no basis in the record for that conclusion.

RB-111 (SC 7B:192)

Suffolk County proposed finding 7B:192 states that the General Electric study of the Michelson Memorandum "did not quantify the probability" of the worst case scenario. On page 66 of the proposed opinion, Suffolk County cites this finding to support the conclusion that LILCO's treatment of the Michelson concern has been inadequate. Nothing in the record, however, suggests that the General Electric analysis is deficient in any way. In fact, the results of the General Electric analysis do not depend on the probability of occurrence since that evaluation assumed that it would occur and then demonstrated that adequate protective features exist to assure a safe recovery from the event. See LILCO Finding B-327.

RB-112 (SC 7B:193, 7B:194, 7B:195)

Suffolk County proposed findings 7B:193, 7B:194, and 7B:195 all deal with the Michelson concern and the Shoreham PRA. These proposed findings state:

> 7B:193. Witness Burns stated LILCO had done one complete analysis on a generic basis and determined the water level problem was not a significant contributor to risk. Tr. 6176 (Burns).
>
> 7B:194. In the Shoreham PRA, the interaction between the feedwater control and the safety system initiation or termination due to Level Eight trip (a problem similar to that which occurred at the Hatch facility and which is documented in Appendix A to SC Exhibit 1) was not initially considered. LILCO witness Burns agreed that that particular initiator occurs or appears to occur at a higher frequency than had previously been anticipated. Subsequent to the issuance of the Michelson report, the BWR Owners Group began investigation of that problem and has begun research to quantify the probability of the event. Tr. 6171 (Burns).
>
> 7B:195. Witness Burns agreed that the Hatch-type/Michelson-type event should have been included in the PRA because the operating experience indicates that there is a possibility of higher frequency initiation than had previously been thought. Tr. 6171 (Burns).

While these proposed findings reflect portions of the record, they leave out information that is important to the proper understanding of this issue. Mr. Burns, with respect to the water level problem, stated:

> We have in fact done one complete analysis on the generic basis, of that basis, and determined it not to be a contributor. We have also done a very preliminary and what I would term bounding analysis for Shoreham and determined that in terms of a bounding analysis it may show up in the sequences that we have labeled as contributing -- summing up to contribute to risk.

Tr. 6176 (Burns). In addition, both the Michelson Memorandum and an NRR response concluded that the interaction between the feedwater control and the safety system initiation or termination due to Level Eight trip was not an immediate concern, but it did need to be addressed. See SC Ex. 1, ff. Tr. 5373.

It should also be noted that no methodology will ever be able to identify all systems interactions. It is always possible to postulate another sequence of extremely low probability events. It is not the purpose of the PRA to identify all systems interactions. The purpose of the PRA is to provide a diverse method of assessing the plant's safety. See LILCO Findings B-394, B-395.

RB-113 (SC 7B:196)

Suffolk County proposed finding 7B:196 states, in part:

> However, Mr. Rossi agreed that the events listed in Appendix A to the Michelson Memorandum "certainly represent postulated events, that required additional consideration by the Staff." Tr. 6862 (Rossi).

This proposed finding is an incomplete statement of the record.

As noted previously, the conclusions in the Michelson Memorandum itself and NRR's response to the Memorandum both indicated that the issue did not require immediate attention. Second, the Staff has evaluated the Michelson scenario for Shoreham and has confirmed the adequacy of the design. Tr. 6866-67 (Hodges).

Suffolk County proposed finding 7B:196 is used on page 65 of the County's proposed opinion to support the conclusion that the Staff considered the Michelson Memorandum finding a safety concern. As demonstrated, the proposed finding is without a basis in the record. The same applies to the conclusion in the proposed opinion.

2. Examples of Classification Methodology

a. Turbine Bypass System

RB-114 (SC 7B:201)

Suffolk County proposed finding 7B:201 is a distortion of the record. This proposed finding states:

> LILCO has asserted that the TBS valves are subject to the QA requirements outlined in GEZ-4482A, as stated in Footnote 19 to FSAR Table 3.2.1-1. Tr. 1734 (Goldsmith). However, the TBS valves at Shoreham were reviewed by the Staff in accordance with the SRP which specifies that the valves shall be subject to quality control procedures equivalent to those defined in a GE publication identified as GEZ-4982A. Tr. 7475-77 (Kirkwood).

Without any additional testimony, the similarity in the publication numbers raises the distinct possibility of a typographical error. The County did not have to rely on this assumption since there is overwhelming evidence that LILCO did, in fact, apply the quality assurance requirements of GEZ-4982(A).

First, LILCO's prefiled testimony correctly references GEZ-4982(A). Burns et al., ff. Tr. 4346, at 148. Second, the FSAR Table cited by Suffolk County is an early revision of the FSAR that included a typographical error. The Table in effect when the Suffolk County witnesses testified on this matter was revision 26, April 1982. That version correctly listed GEZ-4982(A) as the quality assurance program applied to the turbine bypass system. Finally, the NRC witness that reviewed the Shoreham plant testified that the Shoreham turbine bypass system was reviewed to the requirements in GEZ-4982(A). Tr. 7475-77 (Kirkwood). Thus, to the extent this proposed finding attempts to suggest inefficiency in LILCO's quality assurance program for the turbine bypass system, it misrepresents the record.

** RB-115 (SC SC 7B:202)

Suffolk County proposed finding 7B:202 states:

> Piping downstream of the TBS valves is also classified as nonsafety-related but the piping is not reviewed by the Staff with

regard to QA procedures. Tr. 7478-80 (Kirkwood).

This proposed finding is cited to support a statement on page ~~51~~ 79-80 of Suffolk County's proposed opinion that there is some inconsistency in the classification of the turbine bypass system. Other than the fact that the turbine bypass system is mentioned in this proposed finding, it does not have anything to do with the conclusion stated in the proposed opinion.

RB-116 (SC 7B:203)

Suffolk County Proposed Finding 7B:203 states:

> Regulatory Guide 1.26, Revision 1 has no upgrading of the TBS valve, and Revision 1 is the guidance that was used at Shoreham. Regulatory Guide, 1.26, Revision 3 does upgrade the TBS valve to a QA level greater than nonsafety-related. So there is a difference between Regulatory Guide 1.26, Revision 1 to which Shoreham was designed or classified, and Revision 3, which has a more stringent requirement for the TBS valves. Tr. 1732-33 (Goldsmith). At Shoreham, the steam lines up to, but not including, the turbine bypass valves are Quality Group B, QA Category 1. However, the TBS valves are Quality Group D, QA Category II, and are not seismically qualified. Burns et al., ff. Tr. 4346, at 147.

This proposed finding is not an accurate reflection of the record.

The clear implication of this proposed finding is that Shoreham does not meet Regulatory Guide 1.26, Revision 3. LILCO's prefiled testimony states that the change made in

Regulatory Guide 1.26 from Revision 1 to Revision 3 in this regard was the addition of footnote 5 to Paragraph C.1.c. This footnote in the regulatory guide is met by LILCO through the application of a quality assurance program contained in GEZ-4982A. Burns et al., ff. Tr. 4346, at 36. Thus, Shoreham satisfies Regulatory Guide 1.26, Revision 3. See LILCO Finding B-75; see also LILCO Finding B-76.

Another error in this proposed finding is the statement in the second sentence that Regulatory Guide 1.26, Revision 3 upgrades the turbine bypass valve to "a QA level greater than nonsafety-related." This statement is meaningless. Revision 3 does not change the classification of the turbine bypass system. It is still classified as non-safety related Quality Group D. See Burns et al., ff. Tr. 4346, at 36. Revision 3 gives guidance as to the appropriate level of quality assurance within the non-safety related category that should be applied to the turbine bypass system. It does not, as the County suggests, change the system's classification.

RB-117 (SC 7B:206)

Suffolk County proposed finding 7B:206 is incorrect. This proposed finding, which discusses the technical specifications for the turbine bypass system, states in part:

> However, as noted at the hearing, technical specifications can vary greatly, from daily inspection to no inspection at all for

> several weeks or months at a time. No evidence was presented regarding the exact requirement for Shoreham or how it was derived. Tr. 1736 (Brenner); Tr. 1737 (Hubbard).

The technical specification surveillance requirement for the turbine bypass valve system, which was attached to LILCO's prefiled testimony, is directly contrary to this proposed finding. Burns et al., ff. Tr. 4346, Attachment 8, at 3/4 7-36. In addition, the County cites the statement made by Judge Brenner in an exchange with the Staff counsel. This is not a proper basis for a proposed finding of fact.

RB-118 (SC 7B:207)

Suffolk County proposed finding 7B:207 is without a basis in the record. The first sentence of this proposed finding states:

> The Board finds that the Staff's treatment of upgrading the surveillance requirements on the TBS via the Technical Specifications, as a means of backfitting more stringent QA commensurate with safety importance, is not consistent with treatment of other equipment relied upon for mitigation of Chapter 15 events.

There is no citation to the record to support this statement, nor is it supported by any of the proposed findings that precede it. Additionally, while there is testimony in the record regarding the quality assurance treatment of other equipment mentioned in the Chapter 15 analyses, that testimony

is generally limited to examples raised by Suffolk County in its prefiled testimony. There is no discussion in the record by any witness concerning whether the measures applied to the turbine bypass system are inconsistent with the treatment of other equipment mentioned in the Chapter 15 analysis.

The statement in this quoted sentence about "backfitting more stringent QA" is particularly impenetrable. The County does not explain what the statement means or where it appears in the record. In addition, this sentence ignores the testimony concerning the quality assurance requirements applied to the turbine bypass system. See LILCO Findings B-124, B-126.

The second sentence of this proposed finding states:

> While implementation of such technical specification requirements is appropriate from an operational safety viewpoint, the Staff's lack of analysis to determine the basis for implementation of additional surveillance requirements, including the documentation thereof, is insufficient.

This conclusion is also without citation to any portion of the record. Moreover, no portion of the record supports such a conclusion.

RB-119 (SC 7B:208)

Suffolk County proposed finding 7B:208 states:

> The TBS provides an example of where the use of a systematic methodology, such as the review of EOPs, would facilitate the appropriate classification and qualification of equipment commensurate with its safety function. Goldsmith et al., ff. Tr. 1114, at 35.

This proposed finding cites Suffolk County's prefiled testimony and ignores the substantial record developed subsequent to the submission of that testimony. There is substantial evidence in the record that demonstrates that the turbine bypass system is properly classified and has had appropriate quality assurance measures applied to it. See LILCO Findings B-119 to -130.

Moreover, this proposed finding does not provide any explanation of how the review of the EOPs would arrive at "the appropriate classification and qualification." The statement ignores the flaws in the County's EOP review that were developed on cross-examination of the County witnesses and in the direct testimony of the LILCO witnesses. See LILCO Findings B-419 to -426.

RB-120 (SC 7B:209)

Suffolk County proposed finding 7B:209 concludes that while the turbine bypass system may be used by the operators in responding to events, it is not credited with operation in the

Chapter 15 analysis of those events. This is true, demonstrating the conservatism of the Chapter 15 analysis. Many systems that could be used to mitigate an accident or transient are not relied upon in the Chapter 15 analysis. See, e.g., LILCO Finding B-413.

RB-121 (SC 7B:210)

Suffolk County proposed finding 7B:210 does not accurately reflect the record. It states, in part:

> The TBS is important in mitigating pressure transients in the primary system resulting from initiating events or transients by loss of the main turbine and/or generator. Goldsmith et al., ff. Tr. 1114, at 35-36.

This proposed finding neglects the fact that both of the transients mentioned above have been evaluated without operation of the turbine bypass system. This analysis shows acceptable results even with a failure of that system. See LILCO Finding B-119; see also LILCO Ex. 11, FSAR §§ 15A.1.1, 15A.1.2.

This proposed finding also states:

> In the Shoreham EOPs, the operators are directed to use the TBS to relieve water pressure without exercising the safety relief valve ("SRVs"), if possible, when the normal heat sink is available. Tr. 4760 (McGuire).

This statement does not accurately reflect Mr. McGuire's testimony concerning the use of the turbine bypass system to prevent the operation of the safety relief valves. In fact, Mr.

McGuire stated that the turbine bypass valves will not prevent the safety relief valves from lifting during a transient. Tr. 4757, 4774 (McGuire). The record shows that the turbine bypass system plays only a limited role in preventing challenges to the safety relief valves. See LILCO Finding B-120.

RB-122 (SC 7B:211)

Suffolk County proposed finding 7B:211 states, in part:

> If a TBS malfunctions, there are greater challenges to the SRVs and the transient becomes more severe than if the TBS had originally operated. Tr. 1645 (Goldsmith).

This is a statement by a Suffolk County witness with no experience in the operation of a nuclear power plant. See LILCO Finding B-421. Testimony by an experienced operator indicated that it is unlikely that turbine bypass valves can prevent the safety relief valves from opening during a transient event. Thus, the turbine bypass system plays a limited role in the reduction of challenges to the safety relief valves. See LILCO Finding B-120.

RB-123 (SC 7B:214)

Suffolk County proposed finding 7B:214 contains a number of statements that do not accurately reflect the record. The second sentence of the proposed finding states: "Further analysis may show that the TBS should be upgraded from

'important-to-safety' to 'safety-related.' Tr. 1812 (Goldsmith)." This statement ignores the analyses that demonstrate that the turbine bypass system need not be upgraded to safety related because its failure would not result in any significant consequences. See LILCO Finding B-119.

The third sentence of the proposed finding urges more analysis of the turbine bypass system in order to determine the appropriate classification and quality assurance to be applied to the system. This suggestion ignores the extensive testimony in the record demonstrating the consideration that has been given to the turbine bypass system. See LILCO Findings B-119 to -130.

The last three sentences of the proposed finding state:

> In this regard, the TBS does not appear to be used on a daily basis. Rather, it appears to be used during startup and in transient response. For such equipment, which does not operate constantly, testing may be needed to establish its operability. Tr. 4771-72, 4776 (McGuire).

Mr. McGuire's statement concerning testing was taken out of context. He was discussing safety related equipment that is usually kept on standby and not the turbine bypass system. Mr. McGuire went on to say that the testing program for this safety related equipment is already in place. Tr. 4771-72 (McGuire). In any event, the evidence establishes that the turbine bypass system is subject to surveillance testing governed by the

Shoreham Technical Specifications. Burns et al., ff. Tr. 4346, Attachment 8, at 3/4 7-36.

RB-124 (SC 7B:215)

Suffolk County proposed finding 7B:215 suggests that there has been inadequate analysis to establish the appropriate level of quality assurance for the turbine bypass system. There is no evidence in the record concerning any type of analysis that is available to determine the "appropriate level" of quality assurance. Rather, as the record reflects, the level of quality assurance applied to any structure, system or component is a judgment made by a design engineer and the quality assurance engineer based upon their knowledge of the function of the system. See, e.g., LILCO Findings B-222, B-223. The evidence also establishes the adequacy of the quality assurance measures applied to the turbine bypass system. See LILCO Findings B-124 to -127, B-129.

The record also reflects that analyses have been performed to demonstrate that the failure of the turbine bypass system does not result in any significant consequences. See LILCO Finding B-119. Nothing in the record suggests that the designers at Shoreham were not fully aware of the function of the turbine bypass system. There was extensive discussion in this proceeding, particularly by LILCO witness McGuire,

regarding the role of the turbine bypass system in the safe and reliable operation of the plant. See, e.g., LILCO Findings B-119 to -121, B-128.

RB-125 (SC 7B:216)

Suffolk County proposed finding 7B:216 is a conclusory finding regarding the need for additional analyses with respect to the turbine bypass system. The proposed finding does not refer to any portion of the record. Thus, there is no basis in the record for the conclusion. In addition, to the extent that the conclusions stated in this proposed finding are similar to those stated in proposed finding 7B:215, they are similarly flawed. See Reply Finding RB-124 (SC 7B:215).

b. Rod Block Monitor

RB-126 (SC 7B:217)

Suffolk County proposed finding 7B:217 is a misleading representation of the record. The proposed finding states:

> The Shoreham Rod Block Monitor ("RBM") is relied upon to mitigate events in the FSAR Chapter 15 analyses but it is not fully safety-related. Burns et al., ff. Tr. 4346, at 141-42. As such, the Board believes the RBM clearly must be considered important to safety.

This proposed finding does not clearly distinguish between DBA analysis and transient analysis. The rod block monitor is not

relied upon to mitigate any accident or to ensure that Shoreham meets the criteria of 10 CFR Part 100, Appendix A. See LILCO Finding B-90. The statement in the proposed finding that the rod block monitor must be considered important to safety is not supported by a cite to the record. No basis for this conclusion exists in the record.

RB-127 (SC 7B:221)

Suffolk County proposed finding 7B:221 does not fully reflect the record. The proposed finding states, in part:

> The control system which would carry out the blocking function is not safety-related. If the control system fails to work, the blocking function would not be performed. Tr. 4798 (Robare).

This proposed finding ignores the fact that the reactor manual control system to which the proposed finding refers is in continuous use during normal plant operation and is therefore designed to be a highly reliable system. Because of its frequent use, plant operators will be continuously aware of its operability. See LILCO Finding B-98. In addition, a complete failure of the reactor manual control system would, by itself, preclude any rod withdrawal transient. LILCO witnesses testified that a failure of the rod block function during rod withdrawal would not result in exceeding any DBA criteria. Tr. 4998 (Robare).

RB-128 (SC 7B:224)

Suffolk County proposed finding 7B:224 is misleading. The proposed finding states:

> The additional RBM surveillance requirements were imposed by the NRC based on the assumed use and safety function of the RBM in mitigating the consequences of anticipated operational occurrences, as analyzed in FSAR Chapter 15. Tr. 7482-83 (Speis).

Mr. Speis actually stated that the Staff reviews the design of the rod block monitor to ensure that certain items are upgraded since they are used to mitigate the consequences of anticipated operational occurrences. He did not, however, state that the Staff "imposed" these additional requirements nor did he state that the rod block monitor had a safety function. Tr. 7482-83 (Speis). In fact, with respect to other classification examples discussed, the NRC witnesses stated that to the extent the equipment performs a safety function, it has been classified safety related. Tr. 7485-86 (Kirkwood, Hodges).

RB-129 (SC 7B:229)

Suffolk County proposed finding 7B:229 is an incomplete summary of the record. In discussing the consequences of a rod block monitor failure, the proposed finding states: "However, Mr. Robare agreed that Part 100 was involved somewhat with the RBM. Tr. 4797 (Robare)." What Mr. Robare said was that any involvement of the rod block monitor with Part 100 was "an

extremely small percentage." Tr. 4797 (Robare). On several occasions, Mr. Robare made it clear that any consequences from a rod block monitor failure would be an insignificant part of the 10 CFR Part 100 guidelines. See, e.g., Tr. 4787-88 (Robare).

** RB-130 (SC 7B:230)

Suffolk County proposed finding 7B:230 is used on page ~~52~~ 81 of the County's proposed opinion to support the conclusion that "no specific analysis has been performed to assess the RBM function and to justify its present classification." The proposed finding does not suppport this conclusion. As quoted in the proposed finding, it was Mr. Robare's testimony that failure of the rod block monitor was bounded by the accidents included in the Chapter 15 analysis. Tr. 4802 (Robare).

RB-131 (SC 7B:232)

Suffolk County proposed finding 7B:232 is a conclusory finding that is misleading and does not have a basis in the record. The first sentence of the proposed finding improperly equates DBA analysis and transient analysis. These are two distinct types of analyses. See LILCO Findings B-42 to -49.

The second sentence of the proposed finding states:

> In addition, the Board concludes that the RBM serves as an example that LILCO's analysis methodology does not produce a consistent and reliable technique for classifying equipment relied upon for mitigation of Chapter 15 events.

There is no citation to the record to support this conclusion, nor does the conclusion follow directly from any of the previous findings. In short, it is without support.

Finally, the County claims in this proposed finding that the rod block monitor classification "reiterates the importance of using supplemental techniques for SS&C safety classification." Again, there is no citation to the record for support, nor does any support exist in the record.

** RB-132

In discussing the rod block monitor, the following statement is made on page ~~52~~ 81 of Suffolk County's proposed opinion:

> In addition, the RBM is not considered as the single failure in this transient, in contradiction to the application of the single failure criterion. (Findings 7B:221, 227-32).

A review of the cited proposed findings indicates that none of them involves a discussion of the single failure criterion or its applicability to the rod block monitor. Thus, the conclusion is without a basis in the record.

H. Supplemental Methodologies

1. Background and Need

RB-133 (SC 7B:233 to 7B:242)

Suffolk County proposed finding 7B:233 is a quote from the County's prefiled testimony. In essence, it states that there are several authoritative groups that agree that traditional classification is inadequate because it does not account for equipment that is between safety related and non-safety related, because certain non-safety related equipment may be necessary to mitigate or prevent accidents, and because certain non-safety related equipment could adversely affect safety systems. This proposed finding supports LILCO's position that established practice is to use a safety related/non-safety related scheme of classification. Otherwise, there would be no need to attack this "traditional classification." Proposed findings 7B:234 through 7B:242, containing statements from the "authoritative groups" regarding "traditional classification," also support this conclusion as they also discuss changing the existing classification scheme.

Proposed finding 7B:233 is incorrect for Shoreham in that it suggests that non-safety related equipment may be necessary to prevent or mitigate accidents. The evidence establishes that no non-safety related equipment is needed for

accident mitigation or prevention. See LILCO Findings B-7, B-8, B-12, B-48.

These proposed findings are of little weight given that the statements contained therein were made without the benefit of an understanding of Shoreham's classification scheme, its methodology, and its rationale. Witnesses who did have this benefit, including NRC Staff witnesses, concluded that Shoreham's methodology was adequate.

Many of these proposed findings contain quotes without giving the context in which those quotes were made. In fact, several of the proposed findings purport to represent ACRS positions on classification methodology, yet the ACRS reviewed the Shoreham application and did not find LILCO's classification scheme deficient. Staff Ex. 2C (SER, Supp. No. 2), at 18-2 to -4. Consequently, the proposed findings are merely a restatement of the County's prefiled testimony containing statements by third parties or groups that were not witnesses in this proceeding. These proposed findings are, therefore, entitled to little weight.

RB-134 (SC 7B:243)

Suffolk County proposed finding 7B:243 states that there are methods, in addition to the traditional DBA analysis and the classification scheme outlined by Regulatory Guides

1.26 and 1.29, that are available for use to check the adequacy of systems classification.

While the proposed finding is correct in that additional classification methods exist, it should be noted that there are no regulatory requirements mandating the use of these other techniques. In addition, the availability of other techniques certainly does not mean that the DBA approach and the classification scheme outlined by Regulatory Guides 1.26 and 1.29 are deficient. The evidence clearly establishes the adequacy of the classification process at Shoreham. See LILCO Findings B-4 to -83. The evidence further demonstrates that the County did not identify any improperly classified equipment. See LILCO Findings B-84 to -149.

RB-135 (SC 7B:244)

Suffolk County proposed finding 7B:244 states that GDC 1 requires codes and standards, when used, to be evaluated to determine their applicability, adequacy and sufficiency. The proposed finding then merely restates Suffolk County's assertions from its prefiled testimony regarding the absence of this evaluation at Shoreham.

This proposed finding is not a finding of fact, but merely a restatement of the County's position as set forth in its prefiled testimony. The record does not substantiate this

position. Quite the contrary, the record establishes the adequacy of the classification process at Shoreham. See LILCO Findings B-4 to -83. The record also establishes the Staff's determination that LILCO has complied with the General Design Criteria. See LILCO Finding B-259.

RB-136 (SC 7B:245 to 7B:249)

These proposed findings are general in nature, describing methodologies available for analyzing systems classification and systems interaction. While these methodologies are available, their existence, in and of itself, does not discredit the methodologies that were used at Shoreham. As the evidence establishes, the methodologies used at Shoreham are sufficient for analyzing systems classification and systems interactions. See LILCO Findings B-4 to -83, B-260 to -398. These proposed findings are also subject to the specific replies that follow.

RB-137 (SC 7B:245)

Suffolk County proposed finding 7B:245 states the County's view of an appropriate systems interaction methodology. In fact, a PRA which includes the elements described, as well as elements of other techniques, is beneficial and has been applied at Shoreham. See LILCO Finding B-347. To the extent the County suggests more could be done, the record reflects that

new methodologies for systems interactions analysis are still under development. See LILCO Findings B-372 to -374. Moreover, LILCO's witnesses testified that the PRA technique is the best available methodology. See LILCO Findings B-395, B-396.

RB-138 (SC 7B:246)

Suffolk County proposed finding 7B:246 takes testimony out of context. The proposed finding states, as a general proposition, that the purpose of a walkdown program is to identify structures, systems and components which could adversely affect other systems during operation. That purpose was stated in the testimony, however, as the specific purpose of the Diablo Canyon program, which is limited to the effects of seismic events. Goldsmith et al., ff. Tr. 1114, at 67. A walkdown may be beneficial when conducted for the purpose of examining spatial considerations involved in a seismic event. For more abstract interactions, however, the usefulness of walkdowns is questionable. The LILCO witnesses testified that walkdowns for spatial considerations were utilized in the Shoreham PRA effort. See LILCO Finding B-361. The witnesses also testified on the use of walkdowns in the deterministic studies done for Shoreham. See, e.g., LILCO Finding B-273.

RB-139 (SC 7B:247, 7B:248)

Suffolk County proposed findings 7B:247 and 7B:248 state that (a) one should evaluate the use of plant equipment to mitigate or prevent transients or accidents when classifying plant features, and (b) with adequate knowledge, determine the requirements (qualification, upgraded quality assurance, etc.) applied to equipment. The evidence demonstrates that evaluations of function were performed for all plant features, see, e.g., LILCO Findings B-17, B-48, and that appropriate requirements were applied to equipment for each example discussed in detail. See LILCO Findings B-87, B-94, B-98, B-99, B-101, B-113, B-124, B-125.

2. EOP Review Methodology

a. Use of Non-Safety Related Equipment in Shoreham EOPs to Respond to Transients and Accidents

RB-140 (SC 7B:251)

Suffolk County proposed finding 7B:251 states that the NRC "relies upon" the EOPs to protect against multiple failure events. Therefore, according to the proposed finding, various event sequences that could occur but fall outside of the design envelope have been utilized.

This proposed finding is an inaccurate reflection of the record. Mr. Speis, the witness cited to support the proposed finding, never stated that the NRC "relies upon the EOPs to protect against multiple failure events." He did state that "[a]nother level of protection is provided by the trained operator and the emergency operating procedures." Speis et al., ff. Tr. 6357, at 20. The Staff's position with respect to multiple failure events and the EOPs is further clarified by the following testimony:

> In summary, the analysis in Chapter 15 of the FSAR combined with the 'defense in depth' approach, which has been extended to include multiple failures outside of the required design basis in the emergency operating procedures, and compliance with approved regulatory guidance, constitute the methodology used to insure that nuclear power plant operation will not result in undue risk to the health and safety of the public. It was never intended nor is it necessary to analyze all possible accident sequences to assure an adequate level of safety.

Speis et al., ff. Tr. 6357, at 21. Thus, the record establishes that the statement in the proposed finding that the "NRC relies upon the EOPs to protect against multiple failure events" is such an oversimplification as to be inaccurate.

RB-141 (SC 7B:252)

The substance of this proposed finding is that the operator, in performing safety functions, will use all equipment

or systems available, including non-safety related equipment that may be identified in an EOP. The proposed finding concludes with the statement that "non-safety-related equipment will be identified and called upon by the operator following an EOP."

Though accurate, the statements in the proposed finding are clarified by the following sentence from the Staff's prefiled testimony:

> However, the regulations and staff require that safety related (or safety-grade) equipment meeting stringent design criteria and quality assurance requirements be provided to mitigate the consequences of accidents which could result in potential offsite exposures comparable to the guideline exposures of 10 CFR Part 100.

Speis et al., ff. Tr. 6357, at 22. LILCO's witnesses testified that although non-safety related equipment will be called upon by an operator using an EOP, the operation of that equipment is not required. See LILCO Findings B-413, B-414.

RB-142 (SC 7B:253, 7B:257, 7B:259, 7B:260)

These proposed findings all are to the effect that if equipment is called for in the EOPs, it is therefore "relied upon" to prevent or mitigate design basis events and thus falls into the category of important to safety. Even if there is an important to safety classification category, all parties agree there is no guidance for defining such a category. See LILCO Findings B-173 to -176.

These proposed findings also evidence a total disregard for the evidence establishing the rationale for including equipment other than safety related equipment in the EOPs. See LILCO Findings B-401 to -418. Further, these proposed findings, particularly 7B:260, ignore the evidence establishing that where the operator uses non-safety related equipment, either it plays no role in mitigating the event in question, or where it could play such a role, there is a safety related system capable of preventing core damage in the event the non-safety related equipment fails. See LILCO Finding B-413.

Proposed finding 7B:259 brushes off items that are not classified as safety related as being unclassified and not subject to 10 CFR Part 50, Appendix B. This ignores a substantial portion of the record establishing that non-safety related items do receive quality standards and quality assurance commensurate with their functions. See LILCO Findings B-209 to -248.

RB-143 (SC 7B:255)

Suffolk County proposed finding 7B:255 states that there are non-safety related systems and components that face significant demands for availability, control and operability during analyzed accidents. Therefore, according to the proposed finding, the use of such equipment in EOPs to prevent or

mitigate transients and accidents and the impact of such equipment on causing or exacerbating a transient or accident due to malfunction must be considered. Further, according to the proposed finding, it is necessary to ensure that these structures, systems and components are designed and fabricated to quality standards which ensure that their function will be satisfactorily performed.

While it is an accurate summary of the County's prefiled testimony, this proposed finding is clarified by the evidence that establishes that the use of non-safety related structures, systems and components in the EOPs provides an additional layer of protection, but does not replace or endanger the safety related structures, systems and components. See LILCO Findings B-404 to -413. Hence, there is no danger of a non-safety system or component causing or exacerbating a transient or accident due to malfunction. Further, the evidence clearly establishes that for every non-safety related component or system that may play a role in mitigating an event, there is a safety related component or system capable of preventing core damage in the event the non-safety related equipment fails. See LILCO Finding B-413.

RB-144 (SC 7B:256)

Suffolk County proposed finding 7B:256 states that the impact of challenges to safety systems could be assessed through a thorough review and analysis of non-safety related equipment and its function with regard to reducing challenges to the safety systems, or initiating transients which could cause problems. While it is true that the impact of challenges to safety systems could be assessed through a thorough review and analysis, this proposed finding implicitly ignores the evidence establishing that a thorough review and analysis has already been performed at Shoreham as part of the entire classification process, see LILCO Findings B-4 to -83, interaction studies, see LILCO Findings B-260 to -313, and the PRA. See LILCO Findings B-333 to -398. As a result, all structures, systems and components necessary to ensure the integrity of the reactor coolant pressure boundary and cold shutdown under any design basis event, and to prevent offsite consequences comparable to the guideline exposures of 10 CFR Part 100, are classified as safety related. See LILCO Findings B-7, B-8. Thus, the concerns expressed in this proposed finding are unfounded.

RB-145 (SC 7B:258)

Suffolk County proposed finding 7B:258 states that challenges to the safety equipment "frequently" come from

failures in the non-safety related equipment. This proposed finding is an inaccurate reflection of the record. While Mr. Robare did state that it was possible that challenges to safety equipment come from non-safety equipment, he did not state that they may come "frequently." Tr. 4438-39 (Robare).

This proposed finding also ignores the evidence establishing that the design of Shoreham is such that failures in non-safety related equipment will not lead to unacceptable accident consequences because the safety related structures, systems and components will mitigate or prevent the accident. That is, the challenges to which this proposed finding refers have been considered in the entire classification process. The use of non-safety related equipment merely provides an additional layer of protection. See LILCO Findings B-4 to -83, B-404, B-409, B-410, B-413.

RB-146 (SC 7B:261)

Suffolk County proposed finding 7B:261 states that in the feedwater controller failure transient, non-safety related equipment is used for transient mitigation. It has been judged, according to the proposed finding, that if these items or equipment fail the resulting consequences to the public would not be too severe.

The evidence upon which the proposed finding is based is more accurately reflected in LILCO finding B-49. In its testimony, the Staff was specific as to its basis for judging that the resulting consequences "would not be too severe." The demonstration of the "alleged" high reliability of the level 8 trip and the turbine bypass system is presented in LILCO findings B-111 to -130. Further, the evidence establishes that there are no transients that require non-safety related equipment for mitigation to prevent "unacceptable accident consequences." See LILCO Finding B-48.

b. Suffolk County's Review of Shoreham EOPs

RB-147 (SC 7B:262)

Suffolk County proposed finding 7B:262 states that Suffolk County reviewed several FSAR Chapter 15 design basis accident analyses and the corresponding Shoreham EOPs to determine if LILCO had used a systematic methodology for classification of safety related structures, systems and components. Further, according to the proposed finding, this review also involved the correlation of those systems and components identified in Chapter 15 and the corresponding EOPs with their respective quality assurance classification as stated in FSAR Table 3.2.1-1.

This proposed finding reflects Suffolk County's original misunderstanding, as reflected in its prefiled testimony, regarding DBAs and transients. This proposed finding ignores the fact that of six events reviewed, only one, the loss of coolant accident, was a DBA. Four of the others reviewed were transients, and the last was an anticipated transient without scram, which is also not a DBA. Tr. 1556-64 (Harwood).

Further, it is misleading to imply in this proposed finding that the County's review of the EOPs could accomplish its stated purposes. Merely reviewing several FSAR Chapter 15 analyses and the corresponding EOPs does little to shed light on the systematic classification methodology used at Shoreham. The record is replete with evidence of this classification methodology and the fact that it includes more than the Chapter 15 analyses. See LILCO Findings B-4 to -83.

The Suffolk County review is also flawed because of a misunderstanding of the function of Table 3.2.1-1. This table does not list each component that is safety related. It is intended merely to provide a summary of the classification of Shoreham's structures, systems and components. See LILCO Findings B-150 to -152. Suffolk County's witnesses failed to understand the purpose of this table. See LILCO Findings B-156, B-157.

The Suffolk County review is also flawed in that no attempt was made to analyze the function of each piece of equipment cited in the Chapter 15 analysis and the corresponding EOP. The review is merely a tabulation of all systems mentioned. See LILCO Findings B-422 to -424. Attempting to make a meaningful analysis of a classification methodology without examining the function of the equipment is futile. Suffolk County's review is also flawed in that those conducting the review were not qualified to perform the analysis they purported to make. See LILCO Findings B-420 to -422, B-425.

RB-148 (SC 7B:263)

Suffolk County proposed finding 7B:263, in an attempt to bolster the qualifications of Mr. Goldsmith, states that a nuclear engineer with knowledge of how the systems operate, how they have been designed, and how they have been constructed could perform the review which Suffolk County attempted to perform. This proposed finding has no support in the evidence because the support for the proposed finding is Mr. Goldsmith's attempt to qualify himself. No one would expect Mr. Goldsmith to state that he was not qualified to do what he purported to do. As the Board stated at Tr. 1766:

> It is not going to do the witnesses or Suffolk County's case any good to say that we should find them qualified because they say they are qualified . . . .

RB-149 (SC 7B:264)

Suffolk County proposed finding 7B:264 states that Ms. Harwood has participated in the "analysis of plant safety and safety classification for a commercial BWR." Further, the proposed finding states that Mr. Goldsmith "has performed Chapter 15 DBA-type analyses for BWRs and PWRs."

This proposed finding is an inaccurate reflection of the record. Ms. Harwood's activities at a commercial BWR were a far cry from being an "analysis of plant safety and safety classification." Her participation was limited to writing a procedure for directing personnel on how to go about updating Table 3.2.1-1 and to writing a procedure on evaluating conditions and activities against 10 CFR Part 21 requirements. Tr. 1750-51 (Harwood).

The attempt to use the record to bolster the qualifications of Ms. Harwood to perform a review and analysis of Shoreham's EOPs must be weighed against the evidence establishing that she was not familiar with the differences between accidents and transients for a BWR, Tr.1556-64 (Harwood), has never participated in or developed EOPs for a nuclear power plant and has never been involved in an analysis and critique of EOPs for a specific nuclear power plant. Tr. 1271-75 (Harwood).

With respect to Mr. Goldsmith, he did not state he had performed "Chapter 15 DBA-type analyses" for BWRs and PWRs. He stated he had performed "different sections of Chapter 15 analyses on several different plants." He also stated he had "reviewed" the Chapter 15 analyses for several other plants. Tr. 1768 (Goldsmith).

RB-150 (SC 7B:265)

Suffolk County proposed finding 7B:265 states that the Suffolk County review revealed that differences in methodologies between the EOPs and Chapter 15 of the FSAR were used to derive the listing of classifications of structures, systems and components found in Table 3.2.1-1. This is a confusing statement in that it proposes that "differences" were used to derive the table. Further, according to the proposed finding, the fact that Chapter 15 does not identify clearly what pieces of equipment "should actually be used in the EOPs" has implications for how equipment is classified.

This proposed finding is an inaccurate reflection of the cited record, which is itself somewhat confusing. Mr. Goldsmith did not state that Chapter 15 does not identify clearly what pieces of equipment "should" actually be used in the EOPs. Rather, Mr. Goldsmith stated that Chapter 15 "clearly doesn't identify pieces of equipment used in the EOPs." Tr.

1767 (Goldsmith). There is no indication that Chapter 15 should identify every piece of equipment used in the EOPs. The EOPs, as the evidence establishes, are designed to take advantage of the full capabilities of the plant, whether safety related or non-safety related. See LILCO Findings B-409, B-410.

This proposed finding is also an inaccurate reflection of the record in that it implies that differences in methodologies between the EOPs and Chapter 15 were used to derive the listing and classification of structures, systems and components found in FSAR Table 3.2.1-1. The classification methodology is fully described in the record. See LILCO Findings B-4 to -83. Suffolk County's witnesses failed to understand the purpose of the EOPs, as evidenced by their proposed findings, see, e.g., Reply Finding RB-141 (SC 7B:252), or the purpose of Table 3.2.1-1. See LILCO Findings B-150 to -152, B-156, B-157.

RB-151 (SC 7B:266)

Suffolk County proposed finding 7B:266 states:

> Specific items of equipment were used in EOPs but were not classified in Table 3.2.1-1, or were classified as nonsafety-related within the classification scheme. Tr. 1641 (Goldsmith).

This proposed finding is not supported by the cited testimony. There is no reference to Table 3.2.1-1 in Mr. Goldsmith's testimony at Tr. 1641.

RB-152 (SC 7B:267)

Suffolk County proposed finding 7B:267 is an excerpt from the County's prefiled testimony and contains the County's conclusions regarding their review of the EOPs. The conclusions that Suffolk County reaches are without merit, however, because of the flaws and misconceptions in their review. See Reply Finding RB-147 (SC 7B:262); LILCO Findings B-419 to -426.

RB-153 (SC 7B:268)

Suffolk County proposed finding 7B:268 states that a systematic review of the EOPs is likely to produce a more comprehensive listing of equipment for further safety classification than that produced by a review of the FSAR Chapter 15 accident analysis. Further, according to the proposed finding, this systematic review would identify equipment actually used by the operators to mitigate or prevent accidents and assure that the equipment has appropriate classification and application of necessary quality assurance controls. Further, according to the proposed finding, this review would also consider the operators' knowledge of what action(s) to take if equipment fails.

LILCO does not disagree that the review of the EOPs may produce a listing of equipment greater in length than a review of Chapter 15 of the FSAR would produce. The reason for this

is clear from the record. Chapter 15 of the FSAR is a description of the results of analyses of design basis events. Chapter 15 of the FSAR is not a procedure for coping with those design basis events. The EOPs are procedures, listing both safety related and non-safety related systems and components used by the operator. As indicated in the record, this approach enables the operators to take advantage of the full capabilities of the plant and provide another layer of protection, in addition to that afforded by the safety related set. See LILCO Findings B-404, B-409, B-410.

This proposed finding also ignores the evidence establishing that there has been a systematic methodology used at Shoreham to classify structures, systems and components. See LILCO Findings B-4 to -83. In addition, a review of the EOPs demonstrates that the classifications contained therein are proper. See LILCO Findings B-402, B-413, B-415. Finally, this proposed finding, to the extent it addresses operators' knowledge of what actions to take if equipment fails, ignores the evidence establishing that the emergency procedure guidelines anticipate that if non-safety related features are unable to control the conditions, the automatic safety related plant systems will operate. See LILCO Finding B-406.

RB-154 (SC 7B:269, 7B:270)

Suffolk County proposed findings 7B:269 and 7B:270 state that it is important to consider, as part of the overall classification process, the frequency with which the equipment must perform and the consequences of a failure, particularly if it may delay use of a more reliable piece of equipment. The evidence establishes that LILCO, in its classification methodology, has considered the service conditions under which equipment may be used and the effect of a failure of that piece of equipment. Tr. 4431, 4440 (Dawe), 4434-35 (Robare).

To the extent this proposed finding implies that use of a non-safety related structure, system or component may delay use of a more reliable piece of equipment, the proposed finding ignores the evidence establishing that while the EOPs may allow the use of non-safety related structures, systems and components, the EOPs anticipate that the automatic safety related plant systems will operate when needed. There will be no delay in operation of these latter systems. See LILCO Finding B-406. Automatic operation initiates on predetermined parameter setpoints. Any "delay" in operation because these setpoints have not been reached is desirable in that it indicates that conditions are not such that the safety related plant systems are required.

RB-155 (SC 7B:271)

Suffolk County proposed finding 7B:271 states that the review of the EOPs may reveal several key systems or components repeatedly called upon to assist in the mitigation of accidents, although such equipment has not been required to meet the safety related quality standards or some other standards consistent with the function to be performed. A review of the EOPs may identify several systems or components repeatedly called upon to assist in accident mitigation but not classified as safety related. Frequency of use in an EOP, however, is not a criterion for classifying structures, systems or components. The systematic classification methodology utilized at Shoreham is amply described in the record. See LILCO Findings B-4 to -83. If a non-safety related component or system is identified in an EOP, either the component or system plays no role in mitigating the event in question or, where it may play a role, there is a safety related system capable of preventing core damage in the event the non-safety related equipment fails. See LILCO Finding B-413.

RB-156 (SC 7B:272)

Suffolk County proposed finding 7B:272 states that the Suffolk County witnesses agreed that the EOP review is one means of improved assurance that systems are classified

correctly. Further, according to the proposed finding, when equipment is identified in this review, a further review is necessary to ensure proper classification and quality control given that equipment's function within the procedure.

This proposed finding ignores the evidence establishing that the EOPs have already been reviewed to determine that structures, systems and components are properly classified. See LILCO Findings B-402, B-415. Moreover, the proposed finding attributes to Mr. Minor's testimony on Tr. 1650 the statement that a further review would be conducted to ensure proper quality control is applied. Mr. Minor was not discussing quality control, he was discussing qualification in the context of NUREG-0588 (Environmental Qualification). Tr. 1650 (Minor).

RB-157 (SC 7B:273)

Suffolk County proposed finding 7B:273 states that a systematic method for identifying equipment used in accident mitigation, such as the EOP review, provides insight into the appropriate safety and quality assurance criteria for specific components. Further, according to the proposed finding, this review should be augmented by other methodologies in which the relative importance of equipment and safety functions in a specific accident sequence is assessed. These efforts, according to the proposed finding, will provide greater

assurance that equipment relied upon for mitigation of accidents will be identified and will meet quality levels commensurate with their function.

A review of the cited testimony indicates that this proposed finding mischaracterizes the testimony. The witnesses were not stating that an EOP review augmented by PRA techniques was the systematic method being offered. Rather, they had used the EOP review to raise the question. The PRA was the offered solution. Goldsmith et al., ff. Tr. 1114, at 37-38. The County's EOP review, however, was significantly flawed, see Reply Finding RB-147 (SC 7B:262); LILCO Findings B-419 to -426, and does not demonstrate improper classification.

RB-158 (SC 7B:274)

Suffolk County proposed finding 7B:274 states that there are examples of non-safety related equipment used in mitigating accidents for which backup safety related equipment may exist, although such safety related components are not the primary pieces of equipment upon which reliance would be placed for mitigation. The testimony of Mr. Goldsmith that is relied upon for this finding has been taken out of context. He was responding to a Board question as to why he had stated in testimony that the review of FSAR Chapter 15 and the EOPs "seems" to indicate that the operators need to rely on non-safety

related equipment to recover from DBAs. Mr. Goldsmith stated that the word "seems" was used because the analysis done by the County was done very quickly. Tr. 1644 (Goldsmith). He did recognize that the procedures reviewed always "moved" towards safety related equipment, and "have gotten you to safety-related equipment which got you to a final condition which one would consider a safe shutdown position." Tr. 1647-48 (Goldsmith). Thus, the implication in the proposed finding is without support in the record. No non-safety related equipment is "needed" to prevent core damage. See LILCO Finding B-413.

I. Systems Interactions Methodologies

RB-159

Section IX.B of the County's proposed findings, (Systems Interactions Methodologies), which is in four subsections, substantially misconstrues the extensive record on this important issue. In the final analysis, the County would have the Board simply disbelieve the abundant testimony of LILCO's witnesses regarding the ample consideration of systems interactions concerns in the design and construction of Shoreham. As the following discussion demonstrates, the County's proposed findings distort the record regarding: (1) the appropriate level of consideration of systems interactions, (2)

the specific systems interactions studies that are applicable to Shoreham, (3) the Shoreham PRA and (4) unresolved safety issue A-47.

1. Description of Systems Interactions Issues

RB-160 (SC 7B:276)

Suffolk County proposed finding 7B:276 merely paraphrases Contention 7B and is not properly a "finding," particularly with respect to its unsupported assumption that there are "deficiencies in the traditional DBA approach." The record, especially as highlighted throughout these reply findings, clearly establishes that these asserted deficiencies do not in fact exist.

RB-161 (SC 7B:283 to 7B:286)

Although these proposed findings fairly restate the various definitions of adverse systems interactions, the County apparently would have the Board adopt, without explanation, only the Staff's proposed definition. Given that there is neither a regulatory definition nor one generally accepted throughout the industry, at a minimum the Board should acknowledge the absence of a standard definition.

RB-162 (SC 7B:287, 7B:288)

These proposed findings selectively restate and, in the process, distort the Staff's unrebutted prefiled testimony. See Speis et al., ff. Tr. 6357, at 35-36. The County would have the Board ignore significant language from this portion of the Staff's testimony. The following sentence must be added to proposed finding 7B:287 in order to reflect accurately the entire paragraph cited:

> Also, the Quality Assurance Program that is applied during the design, construction, and operational phases for each plant provides additional assurance in this regard by helping to prevent inadvertent introduction of adverse systems interactions contrary to approved design.

Speis et al., ff. Tr. 6357, at 35.

Similarly, in proposed finding 7B:288, which states that "[t]he Staff concluded that the existing regulatory framework provides reasonable assurance against many, but not all, types of potential systems interactions," the County not only omits the introductory language from the prefiled testimony, it also adds the clause "but not all." The Staff's prefiled testimony actually states:

> Thus, although there is no explicit requirement for a dedicated, comprehensive systems interactions analysis of plant designs, and although there currently exists no well-defined, documented methodology for systematic analysis of plant designs for systems interactions, the existing regulatory framework provides reasonable assurance against many types of potential systems interactions.

Id. at 35-36. See also LILCO Finding B-317. The inaccurate reflection of the record is especially unjustified in light of Mr. Goldsmith's admission that the regulations do not require the types of systems interactions analyses advocated by the County. See Tr. 1477-79 (Goldsmith).

Finally, the current position of the Staff regarding systems interactions analyses cannot fairly be stated without reference to the February 12, 1982, letter from William T. Dircks, the Executive Director for Operations, to Paul Shewmon, chairman of the ACRS, expressing "confidence that current regulatory requirements and procedures provide an adequate degree of public health and safety." See Speis et al., ff. Tr. 6357, at 36; LILCO Finding B-318.

** RB-163 (SC 7B:289)

This proposed finding's reference to events at other plants does little to inform this record. Not only was there minimal attention to these events in the Shoreham record (except perhaps regarding the partial failure to scram at Browns Ferry), but this proposed finding also fails to observe that the consequences of these events did not even approach Part 100 limits. In any event, absent a detailed comparison of the factual consideration of systems interactions at these other plants with that at Shoreham, the occurence of such

events elsewhere has little probative impact upon the adequacy of the systems interactions assessment for Shoreham. It bears noting that the Staff's confidence in the traditional approach, see Reply Finding RB-162 (7B:287, 7B:288), was expressed with full awareness of the events at other plants. See Speis et al., ff. Tr. 6357, at 35-37.

RB-164 (SC 7B:290)

This proposed finding, addressing the impetus for Unresolved Safety Issue A-17, distorts the record. Although this proposed finding correctly observes that the Staff has undertaken a program to assess more fully the question of systems interactions, the County omitted the following critical portion:

> However, the NRC staff has affirmed repeatedly on numerous occasions (such as the one noted above)[i.e., the Dircks letter] its view that, until the generic program is completed and provides the basis for making an orderly decision regarding the possible need for additional systems interaction requirements, reasonable assurance of public health and safety is provided by compliance with current requirements and procedures.

Speis et al., ff. Tr. 6357, at 36-37; LILCO Finding B-318.

RB-165 (SC 7B:291)

County proposed finding 7B:291 accurately reflects the record, with one significant exception. The final sentence is

clearly an unsupported conclusion. The witnesses did not agree in the cited references that the various systems interactions techniques listed in the proposed finding provide a means of identifying dependencies between and among structures, systems and components. What LILCO witnesses did say was that the techniques cited by the County can be and were part of the systems interactions analysis in the PRA. Burns et al., ff. Tr. 4346, at 113; Tr. 5650-53 (Burns, Joksimovich); LILCO Findings B-335, B-348.

RB-166 (SC 7B:293)

This proposed finding omits three crucial portions of Mr. Conran's testimony, and thereby distorts what he said. While he did indicate that the purpose of the contemplated approach to systems interactions analysis would be to replace the "piecemeal basis" now approved by the regulations, he went on to confirm that the current approach is considered "adequate, certainly, for licensing plants." Tr. 7141 (Conran). Indeed, he then noted that the studies of whether to broaden the existing requirements might show such expansion not to be "cost-beneficial." Id. 7141-42. Finally, in explaining the rationale behind the Dircks letter, Mr. Conran testified that it was based on the judgment that "we already had . . . a perfectly adequate regulatory basis" for systems interaction consideration. Id. 7143.

RB-167 (SC 7B:294)

Although Mr. Speis did speculate that it was "possible," not "very possible" as the County erroneously suggests, that the Staff's review of systems interactions methodologies "will identify systems, structures or components that would need to be reclassified at that time," the County failed to include the very next sentence of his testimony:

> But based upon the work that so far the staff has done, we haven't identified anything that has to be reclassified as a result of systems interaction work or effects.

Tr. 6519 (Speis).

RB-168 (SC 7B:296)

This proposed finding would have the Board find that systems interactions studies "should be designed to identify previously unrecognized or unsuspected interactions." The cited testimony of Mr. Conran, however, indicates that this is in fact what such studies do. Thus, the implication in the first sentence of this proposed finding -- that existing practice is deficient -- is unfounded. See Tr. 7549 (Conran).

Moreover, the second sentence, which would have the Board summarily indict the DBA/regulatory guidance approach, is not only unsupported by any citation to the record, it is contradicted by testimony from the County's own witnesses. Mr. Goldsmith stated that he was aware that the Staff's

Standard Review Plan and Safety Evaluation Report accept, for accident analysis purposes, the list of accidents in Regulatory Guide 1.70 as a technical basis for licensing. Tr. 1460 (Goldsmith). In addition, Mr. Goldsmith conceded that the regulations do not explicitly require systems interactions analyses of the type advocated by the County. Tr. 1479 (Goldsmith).

RB-169 (SC 7B:297)

This proposed finding does no more than parrot language from the County's prefiled testimony. A review of the particular language cited shows it to be devoid of analysis or foundation. Although this prefiled testimony does reference a deposition of LILCO witnesses, the proposed finding would have the Board ignore the substantial and detailed prefiled and cross-examination testimony of LILCO witnesses regarding systems interactions and its comprehensive treatment at Shoreham. For example, Mr. Robare stated:

> I would like to state that the systems interaction-related studies in our testimony are a sampling of major studies that were formally published as part of the design process. We have definitely done a lot more than that . . . .

Tr. 5243 (Robare).

2. Consideration of Systems Interactions at Shoreham

RB-170

A failure mode and effects analysis, done on a large enough level in terms of systems or subsystems, is a systems interactions analysis. Tr. 1268-69 (Minor).

RB-171

A Suffolk County witness stated that Shoreham has performed a number of systems interactions analyses, although he considered them nonsystematic. These included turbine missile studies, fire analysis, failure mode and effects analysis, pipe break, loss of electrical buses, control system failures, handling of heavy loads, cable separation analysis, and single failure analysis. Tr. 1283-85 (Hubbard).

a. Pipe Failure and Internal Flooding

RB-172 (SC 7B:301)

This proposed finding clearly mischaracterizes the record. The proposed finding states that Stone & Webster conducted the pipe failure studies in the early 1970s. The record clearly shows that this statement referred to pipe failure inside containment studies. Tr. 5040 (Dawe). There were in fact a number of pipe failure studies. These studies

included pipe failure outside containment, which includes pipe failure in all areas of the plant. Tr. 5040, 5042 (Dawe). The County also neglected to note that these studies have been reviewed and redone as necessary to account for plant design changes and as built correctness. Such work has continued to the present. Tr. 5041, 5047-48, 5051 (Dawe). Thus, the pipe failure studies were far more extensive than recognized by the County in this proposed finding.

Further, the County attributes to Mr. Robare testimony to the effect that General Electric, although responsible for the main steam and recirculation portions of that piping, did not participate in these particular studies (i.e., the early 1970 studies of pipe failure inside containment). In fact, in response to questions from the County's counsel, Mr. Robare testified that General Electric participated in pipe failure studies to the extent it had design responsibility for the main steam and recirculation piping. Tr. 5056 (Robare). Specifically, Mr. Robare stated:

> Since we have design responsibility for those portions, we did the full evaluations and provided the information that is in the FSAR for our scope of supply.

Tr. 5057 (Robare). Mr. Robare further stated that General Electric conducted walkdowns of the plant in doing those evaluations. Tr. 5057 (Robare).

The selected cite by the County to Mr. Robare's comment on Tr. 5057, that General Electric did not participate in these particular studies (a response he quickly clarified) is misleading. The question to which he was responding asked about all the pipe break studies discussed. It is clear from the record, however, that he was differentiating between studies inside containment (the scope of General Electric's supply for main steam and recirculation piping) and studies outside containment (beyond General Electric's scope of supply).

RB-173 (SC 7B:302)

Proposed finding 7B:302 mischaracterizes Mr. Dawe's testimony regarding the extent to which regulatory guidance documents defined the scope of the pipe failure and internal flooding studies. The County, in this proposed finding, interprets the record to say that "regulatory guidance documents defined the scope of the studies by specifying which lines had to be considered." Mr. Dawe testified, however, that "some aspects of the studies are done to our good engineering judgment as opposed to a specific definition of a study that may have been proposed in a regulatory guidance document." Tr. 5041 (Dawe). The guidance documents do define certain categories of lines for consideration, but not the scope beyond that type of definition. They do not specify, for example, the

areas of the plant to be studied. Tr. 5042 (Dawe). Mr. Dawe was not aware of any regulatory guidance documents that detailed the scope or methodologies for flooding studies. Tr. 5058-59 (Dawe).

RB-174 (SC 7B:303)

This proposed finding erroneously presents LILCO testimony with respect to walkdowns conducted as part of the pipe failure studies. The County's proposed finding states unequivocally that the "conclusions of the pipe failure studies were based on drawings, rather than on the walkdowns of instrument lines." In response to a question from the Board as to whether conclusions were based on walkdowns or drawings not verified by walkdowns, Mr. Dawe stated "it could go either way." He then explained that the analysis is done in large part from available drawings, but that any doubt as to the validity of the analysis is resolved by post-analysis walkdown or pre-analysis walkdown. Tr. 5046 (Dawe). Further, the instrument line walkdowns were not the only walkdowns referred to by LILCO witnesses in the context of pipe failure analyses. Several other examples were provided. Tr. 5049 (Kascsak), 5054 (Dawe), 5057 (Robare).

RB-175 (SC 7B:304)

This proposed finding, implying that the enhancements in the plant resulting from the pipe failure studies were all related to one of the pipe breaks analyzed, also misinterprets the record. It is clear from Mr. Dawe's testimony that the changes he discussed were not all related to only "one of the pipe breaks analyzed in the studies." See Tr. 5059-61, 5065 (Dawe).

RB-176 (SC 7B:305)

This proposed summary finding not only fails to cite the record, it is contrary to the record. It states that the analysis "was not comprehensive," and yet Mr. Dawe testified that "we have considered all areas of the plan[t] in these studies." Tr. 5042 (Dawe). These plant studies simply were not "limited" in the fashion the County argues. Instead, both LILCO's prefiled testimony and the cross-examination testimony indicate overwhelmingly that these analyses were comprehensive systems interactions studies. Tr. 5042-44, 5052-53, 5059-60, 5064-67 (Dawe).

Moreover, in proposing, without citation to the record, that the Board conclude that these studies did not "make use of systems interactions techniques," the County ignores Mr. Dawe's clear testimony to the contrary. Tr. 5069, 5071-73 (Dawe). Indeed, after Mr. Dawe discussed the various techniques used,

he responded in the affirmative to the following question from the County's counsel:

> So you actually used a combination of these different techniques in doing your pipe break study? Is that correct?

Id. 5073.

b. Missiles

RB-177 (SC 7B:307)

Proposed finding 7B:307 misrepresents the testimony of LILCO witness Kascsak. The proposed finding indicates unequivocally that Mr. Kascsak testified that the missiles studies "did not involve the use of systems interaction techniques." The transcript page cited, however, confirms the opposite. Indeed, Mr. Kascsak specifically identified systems interactions techniques used in these studies. Tr. 5082 (Kascsak).

In addition, this proposed finding mischaracterizes Mr. Dawe's testimony. Although he used the word "confirmatory" in his explanation that no changes resulted from these studies, he clearly indicated that this was because the design considered and protected against this hazard. Tr. 5077-78 (Dawe).

RB-178 (SC 7B:308)

This proposed summary finding is without support in the record. Moreover, the County would have the Board believe that

these studies were in some fashion inadequate or inappropriate because they did not discover any "hidden systems interactions." To the contrary, the record clearly supports the conclusion that the studies were comprehensive in nature. Thus, that no such "hidden systems interactions" were identified merely confirms the adequacy of the design. Tr. 5077-78 (Dawe).

c. Fire Hazard Analysis

RB-179 (SC 7B:310)

This proposed finding does not accurately reflect the record. The proposed finding states that the fire hazard analysis study was done in response to an NRC Staff request and that the Staff defined both its format and content. Although Mr. Dawe testified that the specific packaging and submittal of a fire hazard analysis study was done in response to an NRC request for such a document, his testimony clearly shows that this study only documented the adequacy of the protection against fire, which had previously been established and studied in the design process. Tr. 5087 (Dawe).

RB-180 (SC 7B:311)

Proposed finding 7B:311 is wrong in stating that the fire hazard analysis study did not analyze failures. Mr.

Dawe's testimony was that he was not sure if the study was a study of failures as the County's counsel characterized it. Tr. 5093-94 (Dawe). That the study did consider loss of capabilities due to fire is uncontroverted. Mr. Dawe stated that the study considered an area, what can be lost due to fire with and without suppression system operation, and what the impact of this would be on the plant and its safe shutdown capabilities. Tr. 5095 (Dawe).

RB-181 (SC 7B:312)

This proposed finding is an inaccurate reflection of the record. There is no discussion of walkdowns at Tr. 5027 as cited by the County. In fact, although Mr. Dawe was not specifically aware of walkdowns from personal knowledge, he was confident that the personnel who performed the study had performed in-plant verification of the physical installation against the fire hazard analysis. Tr. 5103 (Dawe).

RB-182 (SC 7B:313)

This proposed finding misinterprets the record, suggesting that changes which resulted from the fire hazard analysis relate to fire suppression capability. A number of the changes involved such things as curbing to contain combustibles, barriers between components, and fire walls. Tr. 5100-02 (Dawe). These deal with separation of components and hazards, not fire suppression capability.

RB-183 (SC 7B:314)

The record does not support the County's proposed finding that this analysis "was not part of a systematic analysis of systems interactions." Not only does the County fail to cite testimony in support of proposed finding 7B:314, the prefiled and cross-examination testimony of the LILCO witnesses directly contradicts the suggestion that the fire hazards analysis was not a systems interactions study. See, e.g., Burns et al., ff. Tr. 4346, at 57; Tr. 5095-97 (Dawe).

d. Cable Separation

RB-184 (SC 7B:318)

This proposed finding infers from Mr. Dawe's testimony that the cable separation analysis was limited to a proposed predetermined hazard upon which the analysis was premised. Although the report was used for licensing purposes primarily in response to fire protection questions, Tr. 5105 (Dawe), the total concept of spatial hazards was the primary motivation for the study. Thus, the study demonstrates capabilities for spatial hazards other than fire. Tr. 5108 (Dawe). It will not, by itself, answer all regulatory questions related to all hazards, as different conservative assumptions must be considered for different types of hazards. Combined with other studies that are done, however, it adds to overall confidence. Tr. 5571-74 (Dawe).

RB-185 (SC 7B:319)

Proposed finding 7B:319 is neither supported by the proposed findings that precede it nor by the record. The naked assertion that the cable separation study "was limited in scope" and "was not part of a comprehensive systems interaction anal: is" is flatly contradicted by the record, especially Mr. Dawe's testimony asserting that the analysis was in fact comprehensive and explaining in some detail what it considered. See, e.g., Tr. 5105, 5106-09, 5567-69 (Dawe); LILCO Findings B-281 to -284.

e. Failure Mode and Effects Analyses (FMEAs)

RB-186 (SC 7B:320)

Proposed finding 7B:320 does not provide the complete record in several respects. Although the FMEAs were performed between 1974 and 1976, the County neglected to note that they were maintained, updated and redone to meet the latest issue of the drawings. Tr. 5113 (Dawe). Moreover, although the County states the FMEAs were limited to safety related control circuits in the balance of plant, they in fact were done for all safety related systems shown on Stone & Webster elementary diagrams, which include some of the General Electric NSSS systems. Tr. 5113 (Dawe).

RB-187 (SC 7B:321)

While this proposed finding correctly notes that the FMEAs did not assess interactions between safety related and non-safety related components, the County failed to include Mr. Dawe's testimony that the FMEAs did address the interfaces between safety related and non-safety related portions of systems. Tr. 5114 (Dawe). This proposed finding also failed to mention, as Mr. Dawe testified, that the next three studies identified in LILCO's prefiled testimony did assess interactions between safety related and non-safety related components. See Tr. 5120 (Dawe).

RB-188 (SC 7B:322)

The County's assertion in this proposed finding that these studies were of "limited scope" and were performed for a "limited purpose" is an unfair characterization of the testimony. See Burns et al., ff. Tr. 4346, at 58; Tr. 5117-18 (Kascsak). Moreover, the County ignores the testimony of its own witness, Mr. Hubbard, that single failure analysis is a systems interactions analysis. Tr. 1284 (Hubbard).

f. Electrical Bus Failures

RB-189 (SC 7B:323, 7B:325)

These proposed findings suffer from two deficiencies. First, both suggest that the electrical bus failures analysis was nothing more than a reformulation of existing design data. This characterization of the record is directly contrary to Mr. Dawe's testimony. Tr. 5122 (Dawe). Second, the conclusion in proposed finding 7B:325 that this analysis has "limited" value is neither supported by a citation nor any testimony in the record and should therefore be disregarded.

g. Control System Failures

RB-190 (SC 7B:326)

This proposed finding is incorrect in stating that the Control System Failures study is limited to an evaluation of the possible interaction between power sources and components supplied by such sources. The study also looks at the interaction of the supplied components to the state of the plant. Tr. 5129 (Dawe). Thus, it looks at failure states (as is, open, closed) and assesses resultant plant states. Tr. 5131 (Dawe).

The proposed finding also states that the study looks only at non-safety related conponents which offset significant reactor parameters. In fact, control systems not included in

the study are examined to confirm that they cannot have an effect on principal reactor parameters. Tr. 5130 (Dawe). The study focuses on principal reactor parameters because its purpose is to show that control system failures will not result in plant states that exceed the events analyzed in Chapter 15 of the FSAR. Tr. 5129-31 (Dawe).

RB-191 (SC 7B:327)

This proposed finding distorts the record. First, it indicates that FMEAs are not being used in connection with the studies. In the cited testimony, however, Mr. Dawe's response that "FMEAs per se are not being conducted for this analysis" was in response to a question inquiring whether Stone & Webster had conducted FMEAs in this regard. Tr. 5143 (Dawe). As noted in LILCO findings B-290, B-291, and B-292, General Electric has conducted a control system FMEA. This proposed finding is similarly misleading in its characterization of Mr. Dawe's testimony that the analysis "considers only single failures." A fair reading of Mr. Dawe's entire answer to the question whether this was a "single failure" analysis indicates that multiple failures occurring from a single failure were also considered. Tr. 5139-40 (Dawe).

RB-192 (SC 7B:328)

This proposed summary finding lacks any citation to the record and states inferences and conclusions inconsistent with the full record. For instance, the County would have the Board hold that the Control System Failure study "is not designed to identify hidden systems interactions." The proposed finding, however, contains neither citation to the record nor any analysis rebutting LILCO's testimony that this is a systems interactions analysis. In addition, the County again ignores Mr. Hubbard's testimony that a single failure analysis is a systems interactions analysis. Tr. 1284 (Hubbard).

h. High Energy Line Breaks

RB-193 (SC 7B:330)

This proposed finding, which refers to the High Energy Line Break study as well as the three preceding studies (FMEAs, Electrical Bus Failures, and Control System Failures), incompletely, and thus inaccurately, reflects the record with respect to the similarity between these studies. First, the FMEAs were explicitly distinguished from the other three studies because the FMEAs did not consider interactions between non-safety related and safety related components except at the interfaces. See Tr. 5114, 5120, 5128 (Dawe). Second, because this proposed finding does not take into account even the preceding proposed findings that are descriptive of the three

similar studies, it fails to acknowledge that the studies are complementary to the extent that they analyze similar components from a variety of perspectives and are based upon a wide variety of changing assumptions with respect to failures. Finally, the County does not cite any portion of the record that supports the inference in this proposed finding that these studies are somehow not both individually and collectively valuable simply because they were each "undertaken separately, at different times, [and] in response to discrete NRC requirements."

i. Probabilistic Risk Assessment

RB-194 (SC 7B:333)

The County suggests that the Board reject the assertions of the LILCO witnesses regarding the applicability of the Limerick and GESSAR PRAs to Shoreham. For support, the County erroneously states that the LILCO witnesses "had not reviewed the Limerick PRA or the GESSAR PRA in any detail." This assertion simply cannot be reconciled with the referenced transcript pages. For example, though Mr. Robare acknowledged that he had not formally reviewed the Limerick PRA, he testified that he had reviewed its methodology, Tr. 5149 (Robare), and that his review "included a reading of the report and discussions with the people who prepared the report and did the actual report,

including the probabilities and the data base." Tr. 5151 (Robare). Similarly, Mr. Kascsak testified that he had "reviewed [the Limerick PRA], not in great detail but in some detail," and that he was familiar with its data bases. Tr. 5155 (Kascsak); see also LILCO Finding B-296.

RB-195 (SC 7B:334)

The County's reliance in this proposed finding upon Mr. Dawe's statement that he had no "firsthand knowledge" of the Limerick or GESSAR PRA, Tr. 5161 (Dawe), is indicative of the County's misinterpretation of the clearly stated context in which LILCO relied upon these generic PRAs. Indeed, a complete reading of Mr. Dawe's response regarding his knowledge of these PRAs demonstrates the appropriateness of LILCO's looking to the Limerick and GESSAR PRAs for additional confirmation of the soundness of the Shoreham design and the extent to which the design adequately considered systems interactions. As Mr. Dawe noted: "[T]here are great similarities between these plants, particularly in the NSSS area, although they have different AEs and have slightly different balance of plant designs." Tr. 5161 (Dawe). Moreover, as noted in LILCO finding B-297, other LILCO personnel reviewed the Limerick PRA and met with personnel from Philadelphia Electric to discuss the results.

j. Heavy Loads

RB-196 (SC 7B:337)

This proposed finding suggests that the Board assign "no weight" to Stone & Webster's heavy loads analysis as a systems interactions study, yet neither of the County's proposed findings in this regard cites any evidence in the record that would support such a conclusion. Indeed, the record is unequivocally clear that this was a study of specific spatial interactions that assessed the impact on safety related equipment if a heavy load is dropped. See LILCO Finding B-298.

k. Analysis of Industry Experience

RB-197 (SC 7B:339)

The County's proposed findings regarding LILCO's Independent Safety Engineering Group (ISEG) both ignore and distort pertinent parts of the record. The heart of the County's argument in this regard is that the ISEG program cannot be credited for having the identification of systems interactions as part of its function because of several erroneous inferences that the County attempts to draw from the testimony. The County apparently would have the Board simply disbelieve the various unrebutted assertions by LILCO's witnesses that one of the functions of ISEG is to consider systems interactions. See LILCO Findings B-314 to -316.

RB-198 (SC 7B:340)

This proposed finding distorts the record in asserting that there is "no basis to conclude" that ISEG will identify systems interactions because of the various duties assigned to ISEG and its members. The referenced transcript pages, however, clearly indicate that both the charter of ISEG and the assignment of no other responsibilities to its group leader (a certified reactor operator) and his three staff members will promote effective operation of ISEG, including its efforts at identifying systems interactions. See Tr. 5173, 5194-99 (Kascsak).

RB-199 (SC 7B:341)

Proposed finding 7B:341 similarly misconstrues the record with respect to the training of ISEG members and the process by which it will identify systems interactions. Although Mr. Kascsak acknowledged that ISEG members have not received formal training at any of the indicated national laboratories, these individuals are experienced engineers with comprehensive knowledge of the plant and the ISEG program. Tr. 5178, 5179-81 (Kascsak). The proposed finding also ignores the training provided by Dr. Joksimovich for the ISEG Group Leader. LILCO Finding B-316. Moreover, as Mr. Dawe indicated, because "the lab work that is being done is developmental work . . .

geared towards new techniques for predictive studies," it is not applicable to evaluating the capabilities of the ISEG personnel. Tr. 5181 (Dawe). The last sentence of this proposed finding cites only one page of Mr. Kascsak's testimony regarding the process by which ISEG will detect systems interactions. A fair reading of Tr. 5183-85 cannot be reconciled with the County's representation of Mr. Kascsak's testimony on this point.

RB-200 (SC 7B:342)

The conclusion suggested in this proposed finding simply does not follow from the testimony cited. See Tr. 5185. The proposed finding states: "There was no evidence presented concerning the criteria to be used by ISEG members in performing their reviews." Both LILCO's prefiled testimony and the cross-examination testimony of its witnesses, however, fully describe the operation of the ISEG program. That the County's counsel did not ask a specific question soliciting a list of the particular criteria to be applied by ISEG cannot conceal the value of this program that the record otherwise demonstrates. See, e.g., LILCO Findings B-314 to -316.

RB-201 (SC 7B:344)

The last proposed finding in this regard incorrectly suggests that LILCO's testimony implied that the "primary goal"

of ISEG is to identify systems interactions. To the contrary, the record reflects nothing more than that among the many valuable features of ISEG is its capacity for and intention to identify systems interactions. See LILCO Findings B-314 to -316.

1. Preoperational and Startup Testing

RB-202 (SC 7B:346)

In this proposed finding, the County suggests that "no basis" can be found in the record for Mr. Kascsak's assertion that these tests will discover unacceptable interactions. In addition to Mr. Kascsak's unrebutted testimony in this regard, Tr. 5209, the entire description of the testing program in LILCO's prefiled and cross-examination testimony confirms that the preoperational and startup testing programs do consider systems interactions -- spatial, functional, and human. See LILCO Findings B-309 to -313.

RB-203 (SC 7B:348)

Suffolk County proposed finding 7B:348 states that "there was no evidence that the personnel expected to conduct the startup and preoperational tests will receive any training or instruction related to the identification of systems interactions or the interpretation of test results with such a goal

in mind." It is unimportant that the personnel who will conduct the preoperational and startup tests may not have had what the County describes in this proposed finding as specific "training or instruction related to the identification of systems interactions or the interpretation of test results with such a goal in mind." Nowhere in the record did the County establish what such training might be, whether such training is arguably required or whether such training would even be worthwhile, especially for personnel with substantial engineering experience. Moreover, this proposed finding ignores Mr. Kascsak's unrebutted testimony that the personnel involved are "highly experienced . . ., have been through other startups before . . ., and have trained in engineering and operational disciplines. They understand the plant. They understand how systems should operate and how they shouldn't operate. And they certainly understand the concept of systems interaction." Tr. 5214 (Kascsak).

m. Protection Systems

RB-204 (SC 7B:350)

This proposed finding states that "[s]elected FMEAs, limited to single failures, were performed as part of this study." This assertion is misleading because it does not account for all of Mr. Robare's testimony on this point. In

response to a specific question by Judge Morris regarding the meaning of the word "selected," Mr. Robare acknowledged that it was "perhaps a poor choice of words." More importantly, he went on to explain that:

> We really looked at all of the failure modes that could affect the operation of all of the protection systems. "Selected" did not mean to imply we only looked at certain ones. That is documented in the report.

Tr. 5241 (Robare).

The suggestion in this proposed finding that the FMEAs used in this study were "limited to single failures" is equally misleading. First, the proposed finding fails to include Mr. Robare's explanation that this "is generally the FMEA technique." Tr. 5230. Second, the proposed finding omits any reference to Mr. Robare's broad description of the study, in which he noted that:

> [The study] utilized FMEA's to show compliance with the standard [i.e., IEEE-279], and included in the standards requirement are single failure demonstration, general integrity, general independence, control and protection system independence, channel bypass and removal from operation, and numerous other design requirements.
>
> The study included the reactor protection system, the emergency core cooling systems, and the reactor isolation systems -- essentially, all of the major safety systems in the nuclear steam supply.

Tr. 5228 (Robare).

RB-205 (SC 7B:352)

This proposed finding, although correct in noting that the study has not been updated since 1970, is misleading to the extent that it suggests that, as a result, one cannot know whether the design changes since 1970 are in compliance with IEEE-279. To the contrary, as Mr. Robare explained, because this standard is a major design requirement, design changes since 1970 were made with full awareness of and in compliance with the standard. Moreover, the FSAR demonstrates that the design has been "continually in full compliance" with this important IEEE standard. Tr. 5231-32 (Robare).

RB-206 (SC 7B:353).

This proposed finding similarly distorts the record. The County would have the Board find that this study "provides no basis for confidence that the Shoreham as-built plant complies with IEEE-279." Given that the study was completed in 1970 before the design process was complete, such a finding might be appropriate; provided, however, it included an explanation of the function of the 1970 study as well as the process by which the completion of the design during plant construction affords continued confidence that the conclusions drawn in 1970 continue to be justified.

In this context, this proposed finding similarly distorts Mr. Kascsak's testimony, which was incorrectly attributed to Mr. Robare, regarding whether a specific investigation had been undertaken to determine whether the as-built plant complies with the IEEE standard. Judge Jordan asked Mr. Kascsak whether the as-built plant met the requirements and, if so, how Mr. Kascsak knew that. Although Mr. Kascsak acknowledged that he did not believe an "explicit investigation" had been undertaken in this regard, the following portion of the transcript clarifies his answer as presented in the proposed finding:

> [C]ompliance with 279 . . . is a requirement that is inherent in the design process in the sense that the designers who prepare the Shoreham-specific drawings ensure that the drawings reflect that compliance and that our program would assure that the as-built plant reflects the design requirements in those documents.
>
> I don't believe there has been an explicit investigation into whether we have complied with 279.
>
> JUDGE JORDAN: Are you only saying, therefore, that the design complied with 279, and that you have other ways of making sure that the as-built plant meets the design?
>
> WITNESS KASCSAK: Yes.
>
> JUDGE JORDAN: All right. I think that clears up my particular semantic problem that I had.

Tr. 5235-36.

RB-207 (SC 7B:354)

The County's proposed summary finding in this regard is without foundation in the record. Although none of the County's proposed findings on this study points to evidence in the record contradicting LILCO's unqualified testimony that this study considered systems interactions, see LILCO Finding B-299, this proposed finding would have the Board conclude that this study was not a systems interac'ions analysis.

Additionally, the County distorts the response of Mr. Robare to a question from Judge Jordan about the extent to which compliance with IEEE-279 "guarantees that there will not be system interactions, that there will not be any possible common mode failures." Tr. 5242. In response, Mr. Robare quite reasonably stated that he did not think one could go "that far" in drawing confidence from compliance with the standard. He went on to note, however, that "IEEE 279 is certainly a very thorough industry standard that assures to a very reasonable degree the separation and independen[ce] of safety systems within their own divisions and separation from the control systems." Tr. 5242 (Robare). The County's proposal that the Board give this study "no weight" thus totally lacks support in the record.

n. Scram Reliability

RB-208 (SC 7B:355)

This proposed finding is correct that the General Electric study in this regard was not Shoreham-specific. Significantly, however, the County failed to include Mr. Robare's testimony in the same answer that the study "included or bounded the Shoreham plant design and product line. In other words, the reference plant that was used bounded the Shoreham ATWS situation." Tr. 5248 (Robare).

RB-209 (SC 7B:356, 7B:359)

Proposed finding 7B:356 states that the Scram Reliability Study failed to identify the events leading to the partial failure to scram incident at the Browns Ferry plant. This is not a true reflection of the entire record. In fact, given time to review more fully the material in question, Mr. Robare testified that the study did consider the Browns Ferry type event and paths to the event. See LILCO Finding B-304.

RB-210 (SC 7B:360)

In this proposed finding, the County would have the Board disagree with Mr. Robare's testimony that the General Electric methodology was adequate and accurate and that the Browns Ferry event was not a systems interaction. The County

is unable, however, to cite any portion of the record contradicting Mr. Robare's testimony.

RB-211 (SC 7B:362)

The County's proposed summary finding with respect to the scram reliability study lacks citation to the record. Short of arbitrarily disregarding all of the LILCO witnesses' prefiled and cross-examination testimony in this regard, there is no foundation for the County's conclusion that the General Electric study of scram reliability "provides no assurance that systems interactions have been precluded from occurring at Shoreham." The only apparent reason for the County's suggestions in this regard relate to the partial failure to scram incident at Browns Ferry. See Proposed Finding SC 7B:356. As indicated in the LILCO findings, however, what happened at Browns Ferry does not detract from the validity of the General Electric study. See LILCO Findings B-304, B-305.

o. Common Mode Failures in Protection and Control Instrumentation

RB-212 (SC 7B:367)

This proposed summary finding is contradicted not only by the record but also by the proposed findings that precede it. In addition, the characterization in this proposed finding that this was a "generic study" fails to account for Mr.

Robare's explanation that the study is directly applicable to Shoreham because it evaluated a typical, worst case plant, thus bounding the consequences for the Shoreham-type design. See Tr. 5321 (Robare). The record as cited in LILCO finding B-306, as well as that cited in the County's proposed findings 7B:363 to 7B:366, is uncontroverted in its support of the conclusion that this study was a systems interaction study that is applicable to Shoreham.

p. Water Level Instrumentation

RB-213 (SC 7B:368)

This proposed finding correctly notes that the water level instrumentation study did not assess the reference leg break problem identified in the Michelson Memorandum. Significantly, however, the County fails to note Mr. Robare's explanation, within the answer cited by this proposed finding, that this phenomenon was assessed in a separate General Electric study. Tr. 5330 (Robare). As noted in the LILCO findings in this regard, B-325 to -332, the problem of a cold reference leg break not only has been adequately considered but is not a safety concern for any BWR. LILCO did not advance the 1981 study as anything more than a study of heatup effects on water level sensing lines. See LILCO Finding B-307.

q. TMI-2 Implications

RB-214 (SC 7B:373)

This proposed finding is an inaccurate reflection of the record to the extent it suggests in its concluding sentence that this General Electric study only analyzed "general categories of LOCAs and failures identified by the NRC Staff." To the contrary, both Messrs. Robare and McGuire indicated that General Electric and the BWR Owners Group went well beyond what the Staff requested. Tr. 5396 (Robare), 5398-99 (McGuire).

RB-215 (SC 7B:374)

In this proposed finding, the County correctly observes that Mr. Robare testified that neither fault trees nor event trees were utilized in connection with this study. Significantly, however, the County fails to include any reference to that portion of Mr. Robare's testimony, which is included in his specific answers about fault trees and event trees, in which he explains why these would have been inappropriate methodologies. Fault trees were not used because General Electric "assumed failures of systems regardless of the probability of that occurrence, and analyzed the effect on the reactor." Tr. 5395 (Robare). The use of event trees would have been inappropriate because the study was in response to specific concerns generated by the TMI accident. Id.

RB-216 (SC 7B:375)

This proposed finding refers to that section of the record in which it was acknowledged that some overlap existed between this particular study and the Electrical Bus Failures and Control System Failures studies previously discussed. The last sentence of this proposed finding, however, not only misinterprets Mr. Kascsak's testimony with respect to any comparative review of the studies, it also ignores what Mr. Dawe said in this regard. While there was no formal comparative review, which may account for the use by the County of the overtaxed modifier "systematically," both Messrs. Dawe and Kascsak testified that they believed that both the individuals undertaking these studies as well as those people familiar with them, would, as a matter of good engineering practice, take into consideration the overlap among the studies. See Tr. 5390-95 (Dawe, Kascsak).

RB-217 (SC 7B:376)

This proposed finding not only fails to cite the record, it also misinterprets the record. Though the County would have the Board find that the TMI study "was not performed for the purpose of identifying potential adverse systems interactions," the record is abundantly clear that this study in fact included numerous specific systems interactions analyses. See LILCO Finding B-308.

Similarly, the County mischaracterizes this study as "having been limited to consideration of predetermined postulated events," which suggests that the study was in some way incomplete. This characterization is directly refuted by Mr. Ianni's testimony that the study considered the "entire spectrum of permutations and combinations" involving failures of all the systems included in the analysis. See Tr. 5397-400 (Ianni). As Mr. Ianni noted when asked how he knew the "entire spectrum was covered," you "cannot wipe out more than all the systems." Tr. 5399.

RB-218 (SC 7B:377)

This proposed finding apparently relates broadly to a number of the systems interaction studies and not merely the TMI analysis. Although the County would have the Board find that LILCO has not considered the applicability to Shoreham of the various generic studies referenced above, the testimony to which the County directs the Board's attention clearly indicates the opposite. Moreover, the record as a whole establishes that, while an explicit study in this regard was neither required nor performed, Tr. 5407 (Kascsak), the design process itself has been structured so as to assure that the necessary consideration has been given to these studies. See Tr. 5402-12 (Kascsak, Robare).

3. The Shoreham PRA and Systems Interactions

a. Background

RB-219

It is readily apparent both from the County's proposed findings regarding the Shoreham PRA as well as from the County's proposed opinion on this issue that the County would have the Board decline to accord significant weight to the Shoreham PRA as a systems interaction analysis. The County's position is rebutted not only by the record as reflected in LILCO's findings and the reply findings below, but also by the testimony of the County's own witness. Although he indicated that he had not thoroughly reviewed the Shoreham PRA, Mr. Hubbard stated that:

> I think I could say that it is the type of document and uses a type of methodology that we thought was appropriate for a system interaction analysis.

Tr. 1303-04 (Hubbard).

RB-220 (SC 7B:378)

Suffolk County proposed finding 7B:378 does not accurately reflect the record. It states, in part:

> As noted above, the witnesses agreed that PRA is one of several techniques that can be applied to identify and assess systems interactions in nuclear power plants.

There are no cites to the record to support this sentence. In fact, the statement does not reflect the record since LILCO witnesses further testified that other methodologies had not been sufficiently developed or had significant weaknesses. See LILCO Findings B-348, B-349 and B-372.

RB-221 (SC 7B:379)

Suffolk County proposed finding 7B:379 suggests that LILCO witness Joksimovich did not rule out the use of methodologies other than fault tree/event tree analysis as alternative systems interaction analyses. Dr. Joksimovich said there are selected methods which can be used within the PRA, but did not say these methodologies could be used in lieu of a PRA. LILCO Findings B-396, B-397.

RB-222 (SC 7B:384)

In Suffolk County proposed finding 7B:384, the County summarizes LILCO's purposes for undertaking the Shoreham PRA. One of those purposes was a risk assessment for Shoreham. Although generally correct, the County did not acknowledge that risk assessment involves identification and assessment of systems interaction. See LILCO Findings B-333, B-348, B-354 to -359.

RB-223 (SC 7B:388)

Suffolk County proposed finding 7B:388 states:

> LILCO's witnesses testified that the PRA did not identify any risk outliers due to hidden systems interactions. Tr. 5807, 5822, 5928-29 (Joksimovich). Although it may be true that the Shoreham PRA did not identify any risk outliers, for the reasons set forth below, the Board is unable to conclude that the PRA provides assurance that there are no hidden potential adverse interactions at Shoreham.

The last sentence of this finding states a conclusion not supported by the record. In fact, there is substantial uncontroverted evidence in the record that the Shoreham PRA was a systematic type of systems interaction study. See, e.g., LILCO Finding B-395. The Shoreham PRA has not identified any unacceptable systems interactions that might affect system classification. Tr. 5940 (Burns, Joksimovich); LILCO Findings B-394, B-396. Moreover, the Shoreham PRA is an ongoing evaluation which will continue to search for systems interaction. LILCO Finding B-370.

b. Scope of the Shoreham PRA

RB-224 (SC 7B:389)

Suffolk County proposed finding 7B:389 correctly notes that fires, floods and earthquakes were not considered among the external accident initiating events. The finding is

incomplete, however, because it fails to mention that inclusion of these events had been considered by SAI. A judgment was made based on a number of factors that it was appropriate to exclude some external initiators. Tr. 5653-54 (Burns); Burns et al., ff. Tr. 4346, at 92. It should also be noted that internal flooding was considered in the PRA. See LILCO Finding B-358.

RB-225 (SC 7B:390)

This proposed finding notes correctly that LILCO witness Burns testified that at least two PRAs for other plants completed after the start of the Shoreham PRA identified external initiators as potential contributors to risk. The finding does not completely reflect the record since Dr. Burns also indicated that the conclusions in these PRAs may not be relevant to Shoreham. Tr. 5655 (Burns).

RB-226 (SC 7B:391)

Suffolk County proposed finding 7B:391 states in part that:

> LILCO's witnesses testified that the probabilistic analysis of fires, floods, and earthquakes as initiating events is within the current state-of-the-art. Tr. 5657-58 (Joksimovich, Burns).

This is not an accurate summary of the record. LILCO witness Burns did not state any conclusions with respect to the state

of the art. He acknowledges that some PRAs had included these initiators but that the evaluation of these sequences involves very large uncertainties and therefore any conclusions would need to be "tempered with that large uncertainty." Tr. 5658 (Burns); see also LILCO Finding B-387.

RB-227 (SC 7B:392)

This proposed finding states:

> Staff witness Thadani testified that exclusion of external events as accident initiators severely limits the usefulness of a PRA. Tr. 6622 (Thadani). This is the case because external events must be considered in constructing fault trees, and in identifying the spatial interactions that may result from external accident initiators such as seismic events. Tr. 6623-24 (Thadani).

While Mr. Thadani made these statements, they are taken out of context. A close reading of the pages surrounding these statements indicates that the discussion focused on the use of PRAs for classification. Mr. Thadani stated that exclusion of external events would seem to severely limit the "process of classification through probabilistic risk assessment." Tr. 6622 (Thadani) (emphasis added). Thus, the County's use of the statement in a context broader than that reflected in the testimony is inappropriate.

RB-228 (SC 7B:394)

Suffolk County proposed finding 7B:394 urges the Board to conclude that, despite large uncertainties associated with an assessment of accident sequences initiated by external events such as fires, floods and earthquakes, the exclusion of these events reduces the value of the Shoreham PRA in identifying potential adverse systems interactions. Whether the Shoreham PRA could be improved to be even more comprehensive is immaterial. The issue is whether the PRA gives adequate assurance that systems interactions do not present an undue risk to the health and safety of the public. As stated by Dr. Burns, the greatest potential for risk reduction was judged to be in the area of internal initiators similar to the WASH-1400 and the NRC IREP studies. Tr. 5654 (Burns); see also Reply Finding RB-224 (SC 7B:389). Thus, while inclusion of fires, floods and earthquakes could provide additional information, LILCO's experts testified that the scope of the Shoreham PRA was appropriate for ensuring that systems interactions had been adequately taken into account. See, e.g., LILCO Finding B-396.

c. Shoreham PRA Methodology

RB-229 (SC 7B:396, 7B:397)

These proposed findings criticize LILCO's analysts for assuming that the Shoreham plant complied with applicable NRC regulations. The County urges the Board to find that these assumptions limit the ability of the PRA to identify previously unknown potential interactions and that it limits the value of the PRA as a design verification tool. This criticism is unfounded. The Shoreham PRA began with the premise that the engineering drawings, design information and required environmental qualification were actually implemented at Shoreham. This is the same assumption that would be used in any systems interaction methodology. Beginning with this set of initial conditions, the PRA extended the traditional design basis analysis to include multiple failures within the constraints of observed failure rates, failure modes, and the identified plant design. This approach is a useful extension of the DBA approach. It assures that there is not an abrupt loss of plant integrity when multiple failures are postulated and severely degraded plant conditions exist. See, e.g., LILCO Findings B-368, B-396.

RB-230 (SC 7B:398, 7B:399)

These proposed findings deal with the use of walkdowns in the Shoreham PRA. The findings fail to mention that in addition to the two formalized walkdowns, there were also three or four plant familiarization tours. These familiarization visits are of the type recommended in the PRA Procedures Guide. Tr. 5663 (Burns).

RB-231 (SC 7B:402)

Suffolk County proposed finding 7B:402 allegedly discusses the Staff's view on walkdowns:

> The Staff considers the adequacy of the walkdowns performed to be an important consideration in reviewing a PRA. Tr. 6656-57 (Thadani). The Board agrees with the Staff witness that the key to a successful PRA is to learn how the plant is built and how it is going to operate. Familiarization with the plant is critical because the process of searching for dependencies depends heavily on knowledge of the plant. Tr. 6462 (Thadani). Mr. Thadani testified that it is not always possible to draw the conclusion that spatial interactions were identified in a PRA merely because a walkdown was performed. Tr. 6629 (Thadani). The Board agrees.

This proposed finding is misleading and incomplete. For example, at Tr. 6656-57, Mr. Thadani said that a staff review of the PRA would focus on the walkdowns, not that it was an important consideration or that it was the key to a successful PRA. The third sentence, by its juxtaposition to the first, leads

one to believe that witness Thadani was addressing plant walkdowns. He was not. A review of the record clearly shows that he was discussing generally the types of knowledge that are required to perform a PRA. In fact, the knowledge being discussed by witness Thadani cannot be obtained only by a plant walkdown. It requires a detailed engineering investigation into operating procedures, maintenance procedures, design drawings and thermal hydraulic analysis, which are then put together in a logical framework. See, e.g., Burns et al., ff. Tr. 4346, at 90-91, 101.

Besides being misleading, this proposed finding has little probative value because Mr. Thadani testified that he did not review the Shoreham PRA and is not familiar with its details. Tr. 6476-77 (Thadani). In fact, Mr. Thadani said he could not make a judgment about the adequacy of the walkdowns in the Shoreham PRA. See Proposed Finding SC 7B:404. In contrast, Dr. Burns, a highly experienced PRA expert with full knowledge of the details of the PRA, testified that the walkdowns performed at Shoreham were adequate and appropriate for use in a PRA. Burns et al., ff. Tr. 4346, at 103.

RB-232 (SC 7B:403)

Suffolk County proposed finding 7B:403 restates Mr. Thadani's views regarding what should be reviewed before a

walkdown, as well as his belief that it is important to conduct a walkdown accompanied by highly experienced technical personnel. The proposed finding is incomplete in that it does not note that each of the Shoreham PRA walkdowns generally followed the approach recommended by Mr. Thadani. Burns et al., ff. Tr. 4346, at 102.

RB-233 (SC 7B:404)

In this proposed finding the County suggests that, based on a comparison with the Indian Point walkdowns, the Shoreham walkdowns "raised a question in [Mr. Thadani's] mind as to their adequacy." This characterization of Mr. Thadani's testimony is misleading because it ignores his acknowledgement on the preceding page of the record that he had "never gone through it" himself and could not judge whether 65 man days was adequate. Tr. 6655 (Thadani).

RB-234 (SC 7B:407)

Suffolk County proposed finding 7B:407 states:

> LILCO witness Burns testified that the type of extensive walkdown advocated by the Staff, such as those performed at the Diablo Canyon and Indian Point plants, was not performed in connection with the Shoreham PRA. Tr. 6150 (Burns).

Again, the wording of this proposed finding is misleading. Dr. Burns did note that "the Staff has focused on extensive

walkdowns," but he went on to say that he did not think the Staff said extensive walkdowns were necessary. See LILCO Finding 6150 (Burns). In their testimony, neither LILCO nor the Staff indicated that extensive walkdowns were advocated. On the contrary, Dr. Burns, Tr. 6150, and NRC witnesses Conran and Thadani, see LILCO Finding B-381, testified that the advisability of extensive walkdowns was still in question.

RB-235

LILCO witness Joksimovich described the extensive walkdown programs as enhanced quality assurance. In other words, it is the type of design and construction verification being done at Shoreham by Torrey Pines Technology and Teledyne. In Dr. Joksimovich's view, very extensive walkdowns were of limited benefit in identifying systems interactions. Tr. 6117-18 (Joksimovich).

RB-236 (SC 7B:408)

Suffolk County proposed finding 7B:408 reaches a number of conclusions that have no basis in the record. It states:

> The Board finds that the walkdowns performed in connection with the Shoreham PRA, while valuable for purposes of familiarizing the analysts with the plant, were not designed to identify systematically and comprehensively all potential spatial interactions. The Board finds further that although the extent of the walkdowns may have been appropriate in the context of a PRA viewed as a risk assessment tool (See Burns

> et al., ff. Tr. 4346, at 103), both the scope and the time spent in preparing for and conducting the walkdowns were too limited for them to constitute an adequate tool for identification of potential systems interactions.

First, to the extent it is based on some of the preceding findings, it shares their flaws. See Reply Findings RB-230 (SC 7B:398, 7B:399) to RB-234 (SC 7B:407). Second, to the extent that it relies on the walkdowns at Indian Point or Diablo Canyon as a model, it is flawed since they "were not designed to identify systematically and comprehensively all potential spatial interactions." The Diablo Canyon walkdown focused only on seismic related issues, Tr. 7143-44 (Conran), 7514 (Thadani), and the Indian Point walkdown specifically excluded safety system to safety system interactions and sequence dependent functional interactions, see LILCO Finding B-381. Finally, the LILCO panel testified that the Shoreham walkdowns were an adequate tool for the PRA to consider effectively systems interactions. Burns et al., ff. Tr. 4346, at 95, 103; see also LILCO Finding B-361. Since neither the County nor the NRC Staff witnesses have reviewed the Shoreham PRA, there is no support in the record for the conclusion proposed in this finding.

RB-237 (SC 7B:409)

Suffolk County proposed finding 7B:409 argues that the PRA did not consider all spatial interactions. Without basis in the record it would have the Board find that "there are several locations that need to be evaluated to determine if the systems and instrumentation will operate correctly." No witness made that claim and it is contrary to the testimony of LILCO's witnesses. Dr. Burns testified that the important areas of the plant in which control and instrumentation systems could be adversely affected by the environment during an accident were considered in the PRA. Tr. 5719-20 (Burns). Also, he stated that the spatial interactions specifically excluded (pipe whip and fires) were specifically covered in deterministic systems interactions studies. Id.; see also LILCO Findings B-272 to -275, B-277 to -279. Thus, contrary to the County's proposed finding, an evaluation of the need to include certain spatial interactions for control and instrumentation systems in the PRA has been done.

RB-238 (SC 7B:411)

Suffolk County proposed finding 7B:411 criticizes the review of other studies mentioned in Suffolk County proposed finding 7B:410 because, for example, "the Shoreham PRA did not include the Michelson water level scenario as an accident

initiator." This finding misreads the record. The review of other studies was performed as an informational input aid to identify possible system interactions at Shoreham which would need to be accurately modeled in detail. The record does not indicate or imply that all possible systems interactions would be or could be incorporated. Burns et al., ff. Tr. 4346, at 101, 103-04. Also, the absence of the Michelson water level scenario from the draft Shoreham PRA was not a failure of the PRA methodology. It had only recently been identified as an area for further investigation, it is a low frequency event and its contribution to plant risk is small as confirmed in the generic BWR evaluation and the preliminary bounding calculations for Shoreham. Tr. 6176 (Burns); see LILCO Findings B-327, B-332.

RB-239 (SC 7B:414)

Suffolk County proposed Finding 7B:414 is misleading. It states:

> The Board finds that the comparison referenced by the LILCO witnesses of the Shoreham PRA results with the results of other PRAs and similar studies may be valid in terms of overall risk assessment. Such a comparison, however, provides no support for LILCO's assertion that the Shoreham PRA identified all potentially significant adverse systems interactions.

It is not surprising that the proposed finding does not indicate where in the record LILCO asserted that the Shoreham PRA identified all potentially significant adverse systems interactions. LILCO witnesses never made that claim. Rather, LILCO concludes the PRA was a state of the art effort that gave substantial assurance that there are no systems interactions that would cause events that are risk outliers. See LILCO Findings B-394 to -396. In other words, it does provide assurance that there is no undue risk to the public health and safety due to systems interactions.

RB-240 (SC 7B:415)

Suffolk County finding 7B:415 has several significant errors. In its second sentence, the testimony of witness Joksimovich was paraphrased to omit a very important portion of his response explaining why he personally took comfort from the Limerick PRA. Dr. Joksimovich said the study is also being scrutinized by two national laboratories working under NRC direction and this provided "comfort" to him. Tr. 5807 (Joksimovich). In the third sentence, the County does not fully state the testimony of the LILCO witnesses. The witnesses stressed the importance of the similarities in the design process that produced Limerick and Shoreham; both are General Electric BWRs. They also relied on the similarities in

the PRA methodology applied. Tr. 5811 (Kascsak), 5821-24 (Joksimovich). Also, the witnesses, while noting that the Shoreham and Limerick designs are similar, recognized there are differences as well. But the witnesses testified that an intimate knowledge of those design differences was not necessary to draw general conclusions about the Shoreham design and design process from the Limerick PRA. Tr. 5806 (Kascsak).

RB-241 (SC 7B:416)

Suffolk County proposed finding 7B:416 urges the Board to conclude that there was no basis for "LILCO's conclusion that the Shoreham design is adequate based on the results of the Shoreham [sic] PRA."56/ The County overstates LILCO's conclusion. The LILCO witnesses testified that the results of the Limerick PRA indicate that the General Electric design process was effective in preventing systems interactions. Thus, since the design process was the same and the designs generally similar, the fact that the Limerick PRA did not show any significant adverse systems interactions is some evidence that a similar conclusion can be drawn for the Shoreham design. See, e.g., Tr. 5798-800, 6004-05 (Kascsak), 5821-25, 6002-04 (Joksimovich). In addition, the proposed finding does not

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56/ This reply finding assumes the County meant the Limerick PRA.

accurately reflect the LILCO witnesses' familiarity with the Limerick PRA. See LILCO Finding B-297. It should also be noted that the Shoreham PRA results are independent of the Limerick PRA. Tr. 5813 (Burns).

RB-242 (SC 7B:417)

In this proposed finding, Suffolk County suggests that Dr. Burns "disagreed with the statements of Dr. Joksimovich and Mr. Kascsak, and testified that he did not 'take any comfort from' the results of the Limerick PRA." This finding misconstrues the record and cites incorrect transcript references. Dr. Burns was asked if he took comfort from the comparison of the Limerick and Shoreham PRAs. He did not state that he disagreed with witnesses Kascsak or Joksimovich, and he did not say that he did not "take any comfort from" the results of the PRA. Instead, he stated that "I would rather not have you say I took comfort from." Tr. 5813 (Burns). He then proceeded to give an extensive explanation of why he would choose not to use the specific word "comfort." Tr. 5813-17 (Burns). A fair summary of Dr. Burns' position on this matter is that he believed the Limerick PRA provided additional input to the Shoreham PRA. Beyond that, he indicated it was unnecessary to draw conclusions about systems interactions at Shoreham from the Limerick PRA since the Shoreham PRA adequately dealt with systems

interactions on its own. Tr. 5813-19 (Burns); Burns et al., ff. Tr. 4346, at 98-109.

RB-243 (SC 7B:418)

This proposed finding incorrectly states that SAI has not performed a review of the cut-sets produced in the Limerick PRA versus the Shoreham PRA. What Dr. Burns said was: "There has been no formal review. I am personally aware of all of the systems interactions that were identified at Limerick . . . ." Tr. 5878 (Burns).

RB-244 (SC 7B:419)

Suffolk County proposed finding 7B:419 has no citations to the record; presumably it is a conclusion based on the proposed findings that precede it. As already noted, however, a number of those findings are seriously flawed. In addition, the prior proposed findings do not support the conclusions stated. First, LILCO did not conclude that the dominant contributors to risk identified in the Limerick and Shoreham PRAs were similar. In fact, the record reflects that they are different. Tr. 5798, 5879, 6283 (Burns). Second, a comparison with the Limerick PRA results provides information about the Shoreham results but was not the sole basis for LILCO's conclusions about the adequacy of the PRA's treatment of systems interactions. In fact, the conclusions of the LILCO witnesses

with respect to the consideration of systems interactions in the Shoreham PRA did not depend on a comparison to other PRAs. See, e.g., LILCO Findings B-396, B-397.

d. LILCO's Use of PRA Results Concerning Systems Interactions

RB-245 (SC 7B:422)

Suffolk County proposed finding 7B:422 is as follows:

> LILCO's review of the PRA fault trees and event trees is limited to those that produce accident sequences having the highest contribution to public risk -- that is, those that lead to core vulnerability. Tr. 5844 (Kascsak). Thus, Mr. Kascsak testified that the LILCO reviewers examine interactions that produce "unacceptable" results, concentrating on those that have a dominant effect on system reliability or situations that lead to core vulnerability. Tr. 5847 (Kascsak). The sequences that lead to events that produce core vulnerable situations are reviewed and evaluated to determine if the interactions identified in those sequences are representative of what LILCO would expect. Tr. 5844-45 (Kascsak).

This proposed finding incorrectly summarizes the testimony of LILCO witnesses. Witness Kascsak explained the LILCO review at great length. He testified that LILCO personnel evaluated all of the following systems interactions sequences: (a) sequences which contribute most to public risk; (b) sequences which produce the largest contribution to system unreliability; (c) sequences which lead to potential core vulnerable situations

and (d) sequences which are unique. Tr. 5845, 5847, 5869, 5870 (Kascsak). In fact, Mr. Kascsak stated: "It isn't only necessarily dominant sequences we look at. We look at all of them." Tr. 5847 (Kascsak).

RB-246 (SC 7B:423)

Proposed finding 7B:423 concludes, without basis in the record, that LILCO's "limited review of fault trees and event trees severely limits the benefit" gained from the PRA. This finding ignores substantial evidence concerning LILCO's review process. A general description of the review, from both a management and technical standpoint, is described in LILCO's prefiled testimony. Burns et al., ff. Tr. 4346, at 122-24. In addition, there was substantial cross-examination concerning the LILCO review. Although it was still in progress, LILCO had already reviewed many systems interactions. Tr. 5854 (Kascsak). The LILCO reviews are performed by engineers who are familiar with Shoreham's design and design process. Id. Some documentation of the review process was completed at the time of the hearings, and LILCO plans to document the entire process. Tr. 5867 (Kascsak). Two design changes and two additional studies have resulted from the LILCO review process. Tr. 5849-52 (Kascsak); LILCO Finding B-369.

RB-247 (SC 7B:424, 7B:425)

Suffolk County proposed findings 7B:424 and 7B:425 criticize the LILCO review because there were no criteria to guide the reviewers. The proposed findings omit pertinent parts of the record. The review of cut-sets for systems interactions is conducted by SAI, LILCO and the peer reviewers. All three levels of review must concur that there are no unacceptable systems interactions. Tr. 5872 (Kascsak). The decision is based upon a number of factors, including: knowledge of the Shoreham plant and other plants, Shoreham's design basis, the function of a particular system within the plant, the Chapter 15 accident analysis and the uniqueness of the interaction. Tr. 5872-75 (Kascsak). All of the elements go into judging the acceptability of interactions. The formal review process is supervised by LILCO's Nuclear Engineering Department. Tr. 5875 (Kascsak). Thus, there is substantial evidence to show that systems interactions have been carefully considered in the LILCO review process. Moreover, there is no evidence in the record that suggests the LILCO process is deficient.

RB-248 (SC 7B:426)

This proposed finding claims the LILCO review was not formalized or retrievable, relying on a statement by Mr. Kascsak. The County omitted significant information in its paraphrasing of his testimony. He stated:

> Although that is the [review] process that is performed, it is not performed in a manner that is retrievable to the extent of documenting each individual sequence that is looked at.

Tr. 5859 (Kascsak). Mr. Kascsak explained that there was documentation that the review occurred, though it did not record the thought process that went into the review. Tr. 5859-60 (Kascsak). This proposed finding also claims that LILCO had no documentation of its system interactions review. The County again has misread the record. Mr. Kascsak testified that:

> [W]hat I was saying was that <u>that review is documented</u>. Now if you are asking me is there something that says this is a systems interaction review, . . . there is no such documentation.

Tr. 6091 (Kascsak) (emphasis added).

RB-249 (SC 7B:422 to 7B:427)

Suffolk County proposed findings 7B:422 through 7B:427 criticize LILCO's review of the Shoreham PRA for systems interactions. These findings are based solely on the testimony of LILCO witness Kascsak. They do not reflect that the LILCO review of the PRA for systems interactions is in addition to reviews by SAI, see, e.g., Burns et al., ff. Tr. 4346, at 105-06, Attachment 6, and the Peer Review Group, see, e.g., id. at 79; LILCO Finding B-341. The SAI and peer review will result in a summary of systems interactions in the final PRA. Tr. 5867 (Kascsak). Thus, even if all of these proposed findings were true, the ultimate conclusion that the Shoreham PRA has not been reviewed for systems interactions is unsupported.

e. LILCO's Use of PRA Results to Verify or Modify Classification

RB-250 (SC 7B:428)

Suffolk County proposed finding 7B:428 concludes that the Staff believes a PRA could be useful in identifying equipment which is important to safety. This proposed finding is based upon a discussion by Staff witness Thadani and does not reflect the hypothetical nature of the comments. See Tr. 6696-700 (Thadani). For example, where Mr. Thadani concludes that a PRA could be used to identify equipment important to

safety, he states that he would make an "arbitrary" selection of the top 10 sequences. The proposed finding also ignores the exchange immediately following the referenced transcript section in which NRC witness Rossi expresses doubts about the use of a PRA for identifying an "important to safety" set. See Tr. 6700-02 (Rossi). Dr. Rossi said: "I don't even think there is a set methodology that everyone is agreed upon for dividing the 'important to safety' from the not important to safety because I don't think we discussed PRA use from that standpoint." Tr. 6702 (Rossi). Mr. Thadani agreed with the statement. Id. See also LILCO Findings B-79 and B-83.

RB-251 (SC 7B:429)

In proposed finding 7B:429, the County would have the Board find:

> The [LILCO PRA] reviewers are not instructed to compare the results of the PRA with the safety classification of SS&Cs set forth in FSAR Table 3.2.1-1. Tr. 5898-99 (Kascsak).

This sentence is the exact opposite of what the witness said. The actual exchange follows:

> Q [MS. LETSCHE] Are they told to review those results against the classifications set out in Table 3.2.1-1?
>
> A [WITNESS KASCSAK] Yes, in the sense that we are particularly concerned about system and non-safety system interactions, and if we discover a situation where a non-safety system interacted in a way to degrade

a safety system we would be particularly concerned about that. And that is in fact one of the more important things the LILCO reviewers look for, for both the review of the PRA results and the review of design documents that are produced by our architect-engineer and the NSSS vendor.

Q Is there any explicit documented instruction to those PRA reviewers to look at the PRA results and compare those results to the classification set out in Table 3.2.1-1?

A [WITNESS KASCSAK] There is no explicit procedure. It is part of what they are told to do as part of the review process, but it is not documented.

Tr. 5898-99 (emphasis added).

RB-252 (SC 7B:430)

This proposed finding is incorrect. For the reasons set forth in the preceding reply finding, the first sentence of this proposed finding is wrong. See Reply Finding RB-251 (SC 7B:429). The statements made in the second sentence are based on previous proposed findings concerning the LILCO review. As noted above, these proposed findings are inaccurate. See Reply Findings RB-245 (SC 7B:422) to RB-251 (SC 7B:249). Consequently, there is no basis for proposed finding 7B:430.

RB-253 (SC 7B:431)

Suffolk County proposed finding 7B:431 urges the Board to find that there is "no evidence in this record from which it can conclude that the results of the Shoreham PRA were used by LILCO to verify or to modify its classification of SS&Cs." This proposed finding is directly contrary to the record. See LILCO Finding B-396; LILCO Reply Finding RB-251 (SC 7B:429).

Moreover, Witness Kascsak identified four specific items that are currently being changed or which are being considered for change based upon the PRA review. These are not strictly changes in classification but are modifications to the Shoreham plant. LILCO Finding B-369; Reply Finding RB-246 (SC 7B:423). These examples show that systems interactions are investigated in the LILCO review process and that positive actions do result from this review. The absence of any classification change is not surprising since there would have to have been a serious design error to cause a misclassification.

** RB-254

On page ~~72~~ 101 of the County's proposed opinion, the County urges the Board to conclude:

> Nonetheless, as we discuss below, [the Shoreham PRA's] value as an overall assessment of risk does not guarantee its value as an analysis of systems interaction.

This conclusion is not supported by any proposed finding and is

not supported by the analysis that follows in the proposed opinion. To the contrary, a PRA, in order to perform its role as a risk assessment vehicle, must accurately assess the quantitative contribution of systems interaction to risk, both in terms of probability and consequence. See LILCO Finding B-335. Therefore, the identification of systems interactions and risk assessment are intimately tied together in a PRA. See, e.g., Burns et al., ff. Tr. 4346, at 67-69, 90-91.

** RB-255

Also on page ~~72~~ 102 of the County's proposed opinion, the County concludes:

> Although the Shoreham PRA used fault tree/event tree analysis which is a systems interaction technique, the PRA was not undertaken for the purpose of identifying potential adverse systems interactions. (Findings 7B:384, 395).

In addition to the errors noted by LILCO in the cited proposed findings, see, e.g., Reply Finding RB-222 (SC 7B:384), other considerations make this conclusion unwarranted. As noted in the preceding reply finding, a PRA must accurately evaluate the quantitative contribution of systems interactions to risk in order to perform its function as a risk assessment tool. See Reply Finding RB-254. In addition, even if the PRA were not originally undertaken for the purpose of identifying systems interactions, LILCO is committed to use the PRA as a feedback

tool to the design process and will use the PRA in the future search for systems interactions. See LILCO Finding B-370.

** RB-256

On pages ~~72-73~~ 101-02 of its proposed opinion, Suffolk County urges the Board to reject LILCO's conclusions that the Shoreham PRA adequately considered systems interactions. Such a holding would not only be without basis in the record, it would be directly contrary to the extensive record that supports LILCO's conclusions. See, e.g., LILCO Findings B-395, B-396, B-397.

Moreover, without any citation, the County erroneously claims that LILCO asserted that the results of the PRA provide assurance that "all" adverse interactions at Shoreham have been identified and adequately addressed. Since there are an infinite number of potentially adverse systems interactions, no methodology could identify all or even most of the adverse systems interactions. The purpose of a methodology must be to identify those adverse systems interactions which are unacceptable. LILCO provided extensive testimony that the PRA is a state of the art effort which addresses systems interactions using the best available methodology. No unacceptable systems interactions had been found. See LILCO Finding B-394 to -398.

** RB-257

Suffolk County, on pages ~~73~~ 102-03 of its proposed opinion, asserts:

> Systematic and comprehensive plant walkdowns have been identified as an important means of identifying potential systems interactions, particularly those resulting from shared space or shared environments. (Finding 7B:398).

This conclusion is not supported by the proposed finding on which it is purportedly based. It is similar to proposed finding 7B:398 except that the County has added the modifiers "systematic and comprehensive" and changed the word "useful" to "important." See RB-230 (SC 7B:398, 7B:399). These changes significantly alter the meaning of the finding but have no basis in the record. The language in the proposed opinion thus lacks evidentiary support.

** RB-258

On page ~~74~~ 104 of the County's proposed opinion, the County argues:

> More importantly, however, no evidence was presented from which this Board can conclude that there is reasonable assurance that potential adverse systems interactions that may have been identified by the PRA analysts have been or will be actually addressed in any systematic way by LILCO.

This statement totally disregards the record. As noted above, Mr. Kascsak testified extensively on the method used to review

the PRA within LILCO. See RB-245 (SC 7B:422). Not only has there been extensive review of the PRA by SAI, the Peer Review Group and LILCO, LILCO plans to use the PRA as a risk management tool in the future. This will include a continuing review for systems interactions. See LILCO Finding B-370.

** RB-259

On page ~~74-75~~ 104 of the County's proposed opinion, the Board is invited to conclude:

> The LILCO PRA review process appears to focus almost exclusively on whether there were any unusual risk outliers, accident sequences, or probabilities identified at Shoreham that were not common to other similar plants. (Findings 7B:422-23, 413-19). We find that while such a review is certainly appropriate for some purposes, it cannot provide assurance that potential adverse systems interactions at Shoreham have been considered or addressed.

Such a conclusion would ignore the record. Extensive testimony was presented to indicate that the Shoreham PRA was reviewed on its own merits and that other studies were used only as benchmarks. See LILCO Findings B-394, B-395, B-396; Reply Finding RB-245 (7B:422).

RB-260

In LILCO's view, the design basis and the deterministic studies that have been done for Shoreham are the primary means for detecting systems interactions. The PRA is a method used to confirm the adequacy of the design process. Tr. 6159 (Kascsak).

RB-261

Dr. Burns provided additional detail on the review process describing the types of interactions which would be presented to LILCO and the criteria used. This testimony supports the conclusion that the Shoreham PRA considers systems interactions. See Tr. 5913-17.

* 4. Unresolved Safety Issue -- Task A-17

* RB-261A (SC S7B:87)

Mr. Conran was the principal author of the Staff's original written testimony on systems interactions and USI A-17. Speis et al., ff. Tr. 6357, at 31-42. This testimony continues to represent the opinion of the Staff. Staff Finding 7B:191K; Mattson et al., ff. Tr. 20,810, at 3-8; Tr. 20,816 (Thadani). Mr. Conran later adopted an opinion on systems interactions and USI A-17 which differs from the opinion of the NRC Staff; therefore, contrary to the County's statement, Mr.

Conran was not a witness, much less the principal witness, presenting oral testimony on the Staff's position during the reopened proceedings. Conran, ff. Tr. 20,401, at 1-27. During oral testimony before the Board the Staff's opinion on systems interactions and USI A-17 was presented primarily by Ashok C. Thadani, Branch Chief of the Reliability and Risk Assessment Branch, Office of Nuclear Reactor Regulation. Mattson et al., ff. Tr. 20,810, at 3; see, e.g., Tr. 20,813-17, 20,828-31, 20,877-80 (Thadani).

* RB-261B (SC S7B:92)

The County correctly quotes that portion of its own prefiled testimony which defines an unresolved safety issue. However, the County neglects those portions of its prefiled testimony that specifically explain that USI A-17 is a confirmatory study "to confirm the adequacy of current Staff safety requirements." Goldsmith et al., ff. Tr. 20,903, at 7; Tr. 20,934-35 (Goldsmith), 20,946-50 (Goldsmith, Minor); LILCO Findings B-318A, B-318D, B-318F. Moreover, NUREG-0510, selectively cited by the County as the basis for County Proposed Finding S7B:92, also states that the NRC Staff believes that its review procedures and acceptance criteria currently provide reasonable assurance that an acceptable leval of system redundancy is provided in plant designs and that the resolution of

USI A-17 is expected to confirm this belief. LILCO Ex. 71, ff. Tr. 20,953, NUREG-0510, at A-12, A-13.

* RB-261C (SC S7B:93)

The conclusion drawn by the County and erroneously attributed to the Staff that "A-17's designation as a USI, therefore, reflects the Staff's further judgment that it is a necessary and important program" implies that A-17 represents a significant public safety problem requiring positive action for resolution. The conclusion cited in the County's proposed finding was never stated as the Staff's position on the record. In fact, the record clearly demonstrates that resolution of USI A-17 is a purely confirmatory program to see whether undetected problems exist under the present regulatory framework. Goldsmith et al., ff. Tr. 20,903, at 7; see also Tr. 20,972-73 (Goldsmith); Staff Findings 7B:176, 7B:188 to :191.

* RB-261D (SC S7B:107)

The County's proposed finding misrepresents the Staff's testimony on USI A-17. Contrary to the suggestion in the finding, the Staff does not believe that resolution of USI A-17 will be a condition for new licensing requirements. In fact, in its written testimony the Staff states:

> The Staff's program on Unresolved Safety Issue A-17 was initiated to confirm that present review procedures and safety criteria provide an acceptable level of

> independence for systems required for safety by evaluating the potential for the more important undesirable interactions between and among systems. Progress in this program to date has provided no indication that present review procedures and criteria do not provide reasonable assurance that the effects of potential systems interactions on plant safety will be within the effects on plant safety previously evaluated (i.e., within the design-basis envelop[e]).
>
> On this basis it is concluded that additional plant-specific systems interactions are not necessary to provide reasonable assurance of public health and safety as a predicate to licensing Shoreham.

Mattson et al., ff. Tr. 20,810, at 5-6 (emphasis in original).

* RB-261E (SC S7B:111)

The County's proposed finding selectively ignores testimony in which County witnesses conceded that the three methods being studied at Indian Point may be applicable to BWR studies. Goldsmith et al., ff. Tr. 20,903, at 15. County witnesses also conceded that the Indian Point study would provide comparative data for the evaluation of the relative value of the methodologies. Tr. 21,015-16 (Minor); see Staff Finding 7B:183, at n.14.

* RB-261F (SC S7B:112)

This proposed County finding reflects only Mr. Conran's opinion as to the requirements for making the North Anna

finding which holds that, despite the pendency of an unresolved safety issue, Shoreham could be operated without undue risk to the public. Mr. Conran's opinion is not shared by Staff or LILCO witnesses and his assessment of the basis for a North Anna finding does not accurately reflect the requirements of the North Anna case. Staff witnesses testified that adequate, reasonable assurance of public health and safety is provided by Shoreham's documented compliance with the current requirements and procedures. Staff Findings 7B:188 to :190; see also 7B:191S; LILCO Findings B-318D, B-318E. The Staff and LILCO witnesses testified that USI A-17 was confirmatory in nature and refuted Mr. Conran's opinion that progress toward resolution of USI A-17 is necessary for a North Anna finding. LILCO Findings B-318D, B-318F, B-318J; Staff Findings 7B:191K to :191M.

* RB-261G (SC S7B:114)

The Staff witnesses testified, as the County concedes, that it is possible to make a finding of reasonable assurance of no undue risk to the public despite the unresolved status of USI A-17. Contrary to the implication raised by the County's finding, however, the fact that USI A-17 is confirmatory in nature is merely one of a number of factors--and not the only one--which make it possible for the Staff to make a finding

that there is a reasonable assurance that there is no undue risk to the public. Other factors relied on by the Staff to conclude that it is possible to make the North Anna finding are: that the Staff's current licensing requirements provide adequate assurance of no undue risk to the public health and safety from adverse systems interactions, that no plant-specific systems interaction analyses (other than those currently required) are or should be required prior to the completion of the Staff's program, and that the Staff's A-17 program is progressing toward resolution. Mattson et al., ff. Tr. 20,810, at 3-4. See also LILCO Finding B-318J. In addition, the County's finding takes Mr. Thadani's testimony misleadingly out of context: while Mr. Thadani did testify that there were many interactions in a plant, he further testified that the current NRC criteria would identify most if not all of the significant systems interactions. Tr. 20,862 (Thadani).

* RB-261H (SC S7B:117, :118, :120, :121)

Through these findings the County attempts to challenge the adequacy of the existing systems interaction review process by stating that past events at operating plants indicate deficiencies in the process. The County's claim is not supported by the record. For example, the Watts Bar (Sandia) Study cited in S7B:117, rather than reaching the conclusion

that present review procedures were inadequate, concluded that the plant was adequately protected against systems interactions. LILCO Finding B-318M, Staff Findings 7B:177, 7B:178. County Finding S7B:121 represents an opinion of Suffolk County and its witnesses that is contradicted by the opinions of NRC staff witnesses, who are uniformly of the opinion that the current review process is adequate and that A-17 is confirmatory. See LILCO Findings B-318D, B-318E, B-318K, B-318M; Staff Finding 7B:176.

* RB-261I (SC S7B:125)

In their testimony the County's witnesses stated their opinion that the draft "Initial Guidance for Performance Systems Interaction Analyses at Selected LWRs (Guidance for Interim Use and Comment)" should be considered in preparation of a program for Shoreham systems interaction analyses. They did not testify that the identified methodologies had been sufficiently tested to be required at Shoreham or generally. In fact, as the NRC Staff and LILCO witnesses testified, the methodology for comprehensive systems interactions analyses was still under development. LILCO Findings B-371, B-372, B-374. LILCO witnesses further testified that in the performance of the Shoreham PRA, the methods and techniques used were similar to those recommended for systems interaction analysis by

several national laboratories. LILCO Finding B-397. The Shoreham PRA and other systems interaction studies performed at Shoreham are beyond what is required by the NRC for systems interaction studies. LILCO Findings B-338, B-371, B-377, B-378, see also LILCO Findings B-271 to -316.

* RB-261J (SC S7B:127)

Contrary to the implication of the finding, neither Mr. Goldsmith nor Mr. Minor testified that LILCO had not incorporated systems interaction studies performed at Shoreham into the Shoreham PRA, nor that such studies would not be incorporated in the future. Both County witnesses testified that they were without knowledge as to whether systems interaction studies had been integrated in the Shoreham PRA. Tr. 20,976-77 (Goldsmith), 20,977-78 (Minor). In fact, systems interactions have been taken into account in the Shoreham PRA. LILCO Findings B-354, B-360, B-363, B-370, B-383.

* RB-261K (SC S7B:128, :129)

The County's proposed findings imply that absent resolution of USI A-17 and the safety classification issue, LILCO will not have adequately evaluated systems interactions at Shoreham. That opinion belongs to Mr. Conran alone. Even Mr. Conran recognized that a PRA and systems interaction studies had been conducted on numerous safety related systems at

Shoreham. Mr. Conran indicated that, except for a "possible synergistic-type consideration," he would not have reservations about issuance of an operating license to Shoreham in the face of unresolved safety issue USA A-17. LILCO Finding B-318C. Mr. Conran's assessment that systems interactions studies at Shoreham may be problematic because of a difference in terminology was not agreed with by the NRC Staff. The Staff stated that it did not share Mr. Conran's concern because systems interactions studies are done independent of the classification of structures, systems and components. LILCO Findings B-318E, B-318H; Staff Finding 7B:191U. Tr. 20,828-29 (Thadani). Therefore, Mr. Conran's concern about potential "synergy" between the systems classification issue and the systems interaction issue is without basis at Shoreham. LILCO Finding B-318H.

* RB-261L (SC S7B:130)

The County's proposed finding is not supported by the record. The County witnesses were not in agreement that LILCO's systems classification method could affect the acceptability of its systems interactions studies. Only Mr. Minor testified that the Denton definition could affect systems interaction studies at Shoreham. Suffolk County witness Goldsmith testified that valid systems interaction studies could be

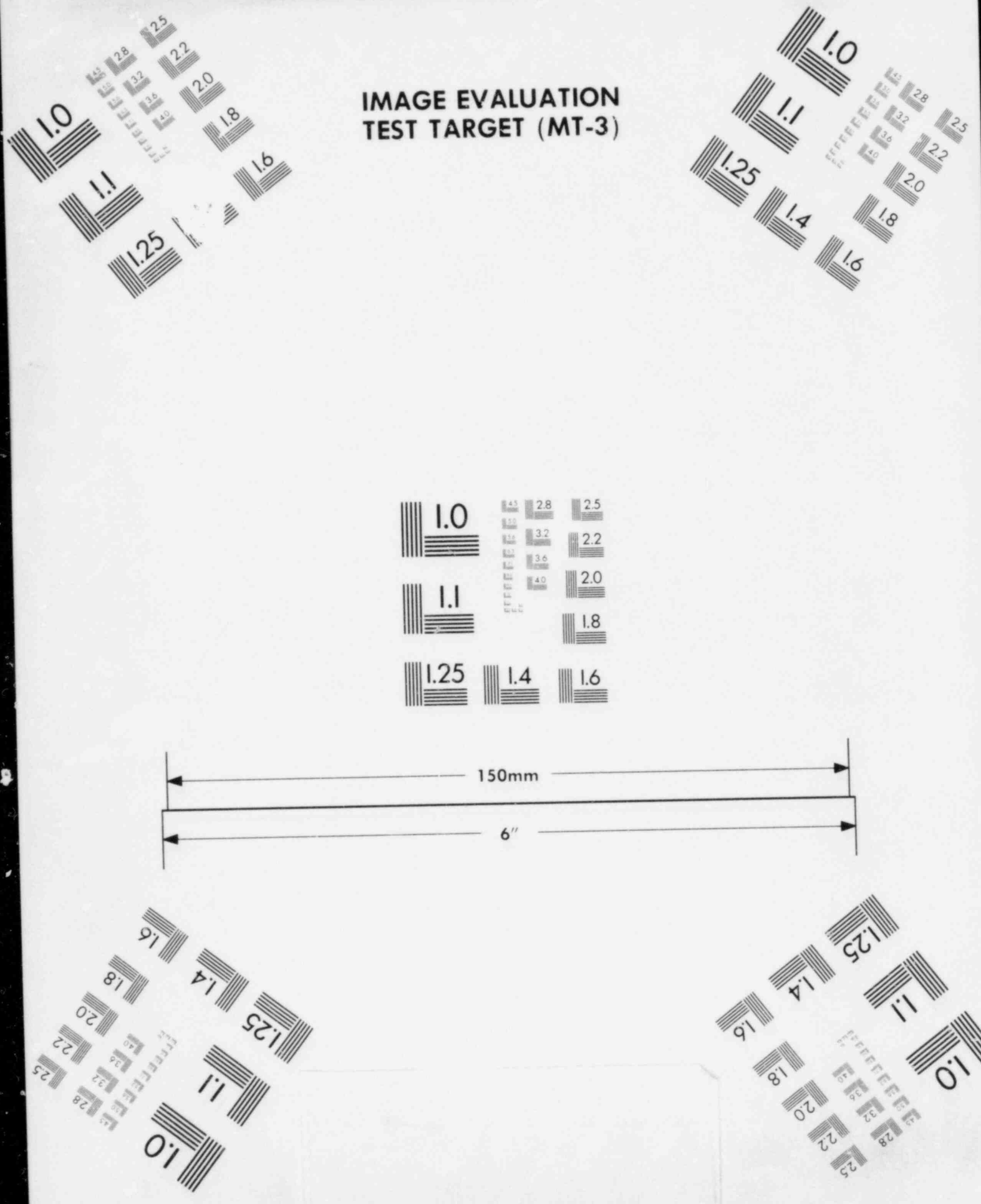
IMAGE EVALUATION
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performed without reference to systems classification taxonomy, and that adoption of the "Denton definition" was not necessary to effective systems interactions studies. LILCO Finding B-318H.

5. Unresolved Safety Issue--Task A-47

** RB-262 (SC 7B:444)

Suffolk County proposed finding 7B:444 states:

> Part of the purpose of USI A-47 is to develop criteria for plant-specific reviews of the safety system/control system interaction matter. Another part of the Task will likely be to review the criteria that have been used in the past on control systems. Tr. 7436 (Rossi).

This proposed finding does not adequately reflect the testimony of Dr. Rossi. When asked if the purpose of Task A-47 is to develop the criteria for plant-specific reviews, he stated:

> I would characterize the purpose a little bit differently than that. That is certainly a part of the purpose of this unresolved safety issue. However, . . . one of the key issues is to review the criteria and review philosophy that [have] been used in the past on control systems and, . . . determine if those are sufficient and to determine to what extent new criteria are appropriate.
>
> So I think a part of it is not just [to] define new criteria but, before we do that, to do a thorough systematic effort to determine if new criteria are required or whether, in fact, criteria that [have] been used up till now, if applied on operating plants and all other plants would be sufficient.

Tr. 7436-37 (Rossi). Thus, although Dr. Rossi agreed that development of criteria for plant-specific reviews was part of the purpose of the unresolved safety issue, he placed strong emphasis on the effort to review existing criteria to determine their adequacy. In other words, development of new criteria would only be required if the initial effort determined that existing criteria were inadequate.

This proposed finding is used on page ~~81~~ 121 of the proposed opinion to support the statement that "[t]he purpose of the Staff's A-47 efforts is to 'define generic criteria that will be used for plant-specific reviews.'" This conclusion further distorts Dr. Rossi's actual testimony. Tr. 7436-37. In addition, the use of quotation marks in the proposed opinion implies that the statement is taken directly from the Staff's testimony. This purported quote is not found in either the proposed finding or in the record cited as support for the proposed finding.

RB-263 (SC 7B:447)

Suffolk County proposed finding 7B:447 is not a complete summary of the relevant portions of the record. The proposed finding concludes that it is not possible to develop generic answers for Unresolved Safety Issue A-47 and that plant-specific reviews will be necessary. To support this conclusion the County references the Safety Evaluation Report.

On cross-examination, Dr. Rossi presented a more up-to-date version of the status of A-47. Dr. Rossi was fully aware of the Safety Evaluation Report statement relied on by the County. In fact, counsel for the County cross-examined Dr. Rossi on the statement in the Safety Evaluation Report. Dr. Rossi indicated that the current Staff position on A-47 does not include a review of every plant. Specific plants will be used as examples to verify the acceptability of systems interaction criteria. Tr. 7438-39 (Rossi). This testimony clearly indicates that representative plants can give a good indication of the validity of existing requirements.

Moreover, Dr. Rossi indicated that it was not yet clear whether plant-specific applications would be required even if new criteria were developed. While he indicated that application of any new criteria might depend on plant specific layouts, his testimony indicated that no determinations about the extent to which plant-specific applications would be required had been made. Tr. 7438, 7449 (Rossi).

RB-264 (SC 7B:448)

Suffolk County proposed finding 7B:448 ignores the prefiled and cross-examination testimony of NRC witness Rossi. The proposed finding concludes that a systematic evaluation of control systems design such as contemplated by A-47 has not

been performed for Shoreham. In its prefiled testimony, the Staff indicated that "until approximately one year ago systematic evaluation of control system designs had not been performed . . . ." Speis, et al., ff. Tr. 6357, at 43. On cross-examination, Dr. Rossi explained that the systematic evaluations to which the testimony referred were the control systems failure study and the effect of high energy line break on control systems study that were being undertaken by LILCO. Tr. 7454 (Rossi). Thus, although the systematic evaluations anticipated by the Staff had not been completed at the time of this testimony, those studies were in progress for Shoreham. See LILCO Findings B-289 to -295.

RB-265 (SC 7B:450)

Suffolk County proposed finding 7B:450 states:

> Mr. Rossi testified that he believes that serious consequences beyond those that have already been analyzed in DBA analyses are unlikely. Speis et al., ff. Tr. 6256, at 44. This conclusion is based on engineering judgment. Tr. 7456 (Rossi).

This proposed finding fails to indicate that the engineering judgment was based on Dr. Rossi's knowledge of operating experience. He stated that he knew of no situation where the limits for anticipated operational occurrence have been exceeded because of a control system failure. Tr. 7456 (Rossi).

RB-266 (SC 7B:451)

Suffolk County proposed finding 7B:451 acknowledges that Dr. Rossi testified that, in his opinion, the Michelson concern was not part of the scope of A-47. Without any basis, the proposed finding urges the Board to reject Dr. Rossi's conclusion and find that A-47 does encompass the types of events identified in the Michelson Memorandum. There is no testimony from any witness to suggest that this is an appropriate interpretation of A-47. In fact, Dr. Rossi explained that events such as those included in the Michelson Memorandum, and other general concerns about control system failures feeding back into the protection system and defeating protection functions, are adequately covered by the requirements of IEEE-279 and other criteria. Therefore, these types of events are not considered to be within A-47. A-47 "is directed at trying to better define other types of control system problems . . . and not just to rework things that we feel we pretty thoroughly understand." Tr. 7457-58 (Rossi).

RB-267 (SC 7B:454)

Suffolk County proposed finding 7B:454 summarizes statements made in the County's prefiled testimony without taking into account subsequent testimony of LILCO and Staff witnesses. First, the County claims that neither LILCO nor the

Staff has performed systematic analyses of the Shoreham control system. As noted, such systematic evaluations are being conducted by Shoreham. See Reply Finding RB-264 (SC 7B:448). For the same reason, the County's comment that there is no plan or schedule for comprehensive Shoreham analyses is incorrect.

Second, the County claims that no measures have been taken to compensate for the lack of resolution of A-47. Staff witnesses testified that the existing requirements for control systems, coupled with the two control systems studies being conducted by LILCO, would give adequate assurance that control system failures would not pose an undue risk to the public health and safety. See Reply Findings RB-269 to -271.

Finally, there is no testimony in the record that supports the County's prefiled testimony that the analyses requested by the Staff were "piecemeal and insufficient to resolve USI A-47 for Shoreham." To the contrary, Staff witnesses testified that those analyses would be sufficient to resolve A-47 for Shoreham, and the LILCO witnesses testified that, taking into account all the studies conducted for Shoreham, the plant was adequately protected from all types of systems interactions. See Staff Proposed Finding 7B:201; Reply Findings RB-269 to -271; LILCO Findings B-260, B-271, B-394 to -398.

** RB-268 (SC 7B:455)

Suffolk County proposed finding 7B:455 addresses the reasons cited by LILCO to support its conclusion that SER Open Item 47 need not be closed prior to fuel load. See LILCO Opinion at ~~76-77~~. 107-08. Subpart a of this proposed finding merely reiterates the County's position that the DBA/SRP approach to systems interaction is inadequate. The evidence establishes that such an approach is adequate. See LILCO Findings B-260 to -313.

Subpart b of this proposed finding concludes that the control systems failure study and the Staff response to the study are not evidence; therefore, the Board may not rely on this study. Contrary to this statement, there is substantial evidence in the record concerning the control system failure study. See LILCO Findings B-289 to -293. This evidence is sufficient for the Board to find that the effort to confirm the adequacy of existing design requirements is being handled appropriately by the NRC Staff.

Subpart c of the proposed finding rejects LILCO's statement that the PRA gave extensive consideration to systems interaction and that preliminary results from the PRA do not indicate that a failure of non-safety related control systems is a dominant contributor to risk. As noted in LILCO's Reply to Suffolk County, the reasons supporting this rejection are not valid. See LILCO's Reply to Suffolk County, at Part D.3.b.

Subpart d of the proposed finding rejects the General Electric analyses of control systems failure that demonstrated that control systems interactions had been adequately considered in the BWR design. The basis of this rejection, according to the County, is that generic studies are not sufficient under A-47. As noted above in response to the County's proposed finding 7B:447, this conclusion is not supported by the record. See Reply Finding RB-263 (SC 7B:447).

Subpart e of the proposed finding challenges LILCO's reliance on the fact that no specific control systems failures at Shoreham or any other plant that would lead to undue risk to the health and safety of the public have been identified. The County points to the Michelson concern as a reason to disregard this evidence. First, as the record reflects, the Michelson concern had been identified in the Shoreham design process. See LILCO Finding B-331. Second, analyses have demonstrated that the Shoreham design is adequate to handle even a worst case Michelson scenario. See, e.g., LILCO Finding B-327. Finally, as explained by NRC witness Rossi, the Michelson concern is not relevant to A-47. See RB-266 (SC 7B:451).

Subpart f of the proposed finding rejects the significant fact that control systems analysis has been conducted for another BWR with the result that no changes to the plant design were needed. The County's sole basis for this rejection is

that the study must be plant-specific. As noted above, the NRC believes it is appropriate to rely on representative plants to make a determination as to the adequacy of existing systems interaction requirements. See Reply Finding RB-263 (SC 7B:447).

RB-269

The NRC Staff review of control systems is conducted in accordance with Standard Review Plan Chapter 7. This review ensures that control systems failures will not prevent automatic or manual initiation and operation of safety related equipment needed to shut down the plant and maintain it in a safe condition following an accident or transient. In order to accomplish this goal, the review focuses on (a) the independence of safety related and non-safety related systems and (b) the existence of isolation devices to prevent failures in non-safety related systems from propagating to safety related systems. In addition, conservative analyses of transients and accident events involving non-safety related failures are conducted to verify that consequences for these bounding events are within acceptable limits. Speis, et al., ff. Tr. 6357, at 43; Tr. 7450-51 (Rossi).

RB-270

Upon successful completion of LILCO's control systems failure study and study of the effects of high energy line

breaks on control systems study, the NRC Staff will be able to conclude that control systems failures do not represent undue risk to the health and safety of the public. Speis, et al., ff. Tr. 6357, at 45; Tr. 7444 (Rossi).

RB-271

The NRC has asked other plants to conduct control systems failure studies and high energy line break studies similar to those requested for Shoreham. The NRC has allowed plants that were conducting these studies up to the first refueling to complete a portion of that work. Tr. 7442 (Rossi).

J. Reply Findings to the Staff's Proposed Findings of Fact and Proposed Opinion

1. Important to Safety

** RB-272 (Staff 7B:27)

NRC Staff proposed finding 7B:27 states that the Shoreham FSAR describes a number of structures, systems and components that are important to safety, including radioactive waste management systems that are needed to comply with the requirements of 10 CFR Part 20. This proposed finding incorrectly implies that equipment used to meet the Part 20 requirements must be important to safety. Part 20 does not use the

term "important to safety" nor does it specify any system classification requirements. Rather, Part 20 is a regulation that limits the radioactive consequences of certain activities. Thus, the plant as a whole must be designed to meet the Part 20 requirements by imposing the necessary design criteria to both safety related and non-safety related equipment. See LILCO Finding B-210A.

** RB-273 (Staff 7B:35)

This proposed finding states that "approximately 25% of the Staff's review effort is directed to the important to safety but not safety-related class of structures, systems and components." It should be noted that the Staff witness did not use the term "important to safety but not safety-related" but rather used the term "non-safety related." Tr. 7808 (Speis). This is an indication that the Staff does not routinely use the term "important to safety but not safety-related." This term appears throughout the Staff's opinion and findings as well as Mr. Conran's supplemental testimony. See LILCO Finding B-162. This term does not appear in any regulation, nor did it appear in official NRC documents introduced in the Shoreham proceeding. See LILCO Finding B-162A.

RB-274 (Staff 7B:45)

This proposed finding discusses Mr. Conran's work in preparation of the Denton Memorandum. Part of this work allegedly involved an "extensive review of those portions of the regulations in which safety classification terms are defined and safety classification concepts established (i.e., 10 CFR Parts 20, 50 and 100)." Contrary to Mr. Conran's testimony, 10 CFR Part 20 does not define or discuss any safety classification terms or concepts. Reply Finding RB-272 (Staff 7B:27). Moreover, although Mr. Conran claimed that he conducted an extensive review of the regulations, the results of that review were not presented in testimony or summarized in the NRC Staff's proposed opinion.

RB-275 (Staff 7B:46)

This proposed finding discusses Mr. Conran's efforts to develop the definition used in the Denton Memorandum. It correctly indicates that the bulk of the effort was Mr. Conran's work within NRR. It does not, however, indicate that the reason the process took so long was that there was a great deal of inconsistency on the usage of important to safety, that the task did not receive high priority, and that it was a complicated task that included a presentation to the ACRS. See LILCO Finding B-172.

RB-276 (Staff 7B:80)

Staff proposed finding 7B:80 discusses Stone & Webster's quality assurance for non-safety related structures, systems and components. A more accurate summary of the Stone & Webster program is contained in LILCO Findings B-219 to -234.

** RB-277

Page ~~22~~ 36 of the Staff's proposed opinion states, in part:

> Mr. Conran emphasized that, as the Denton memorandum itself states, the Denton memorandum was not intended to impose new technical requirements on any licensee or applicant. Nor was it intended to clarify what any regulatory requirements are.57/

Staff Proposed Opinion at ~~22.~~ 36. The first sentence is not consistent with testimony given by Staff witness Rossi, who stated that some Staff members believe the Denton Memorandum does impose new requirements. See LILCO Finding B-195. It is also inconsistent with the findings of the Kemeny Commission QA task force. See LILCO Finding B-196. The second sentence is contrary to the evidence that there was substantial debate, even within the NRC Staff, concerning the meaning of the regulations. See, e.g., LILCO Findings B-172, B-195.

57/ The second sentence of this quotation was omitted from the Staff's May 16, 1983 Revised Proposed Opinion without indicating any deletion. We assume this omission is an oversight on the part of the Staff.

* RB-277A (Staff 7B:43)

Staff proposed finding 7B:43 sets forth definitions for important to safety and safety related from NRC regulations. The Staff has, without additional citation to the record, impermissibly modified its finding to state that these definitions "were repeated in" the Denton Memorandum. The finding originally stated that these definitions "are set out" in the Denton Memorandum. To the extent the change implies long-standing acceptance of the content of the Denton Memorandum, the implication is not supported by the record. See, e.g., LILCO Finding B-166. To the extent the Denton Memorandum contains definitions that are quoted from regulations, the definitions were in that sense only repeated in the Memorandum. The Memorandum also contains a second, or explanatory, definition of important to safety and a statement that safety related is a subset of important to safety. Minor et al., ff. Tr. 1114, Attachment 1. This is not "repeated" from the regulations.

* RB-277B (Staff 7B:44)

This finding mischaracterizes the LILCO testimony. It states that LILCO believes that the terms important to safety and safety related both refer to the narrower set of plant items necessary to perform the accident prevention and

mitigation functions cited in 10 CFR 100 Appendix A, rather than the set of items that provides reasonable assurance of undue risk to public health and safety described in 10 CFR 50 Appendix A. LILCO believes the terms are intended to be synonymous in the regulations. LILCO Finding B-158. Therefore, it is not a "rather than" situation. The set defined in Part 100 Appendix A is the set which provides reasonable assurance of no undue risk to public health and safety.

* RB-277C (Staff 7B:48D)

This Staff finding notes that LILCO's interpretation of important to safety would "exclude some normal reactor controls." LILCO witness Dawe qualified his testimony, stating that the extent of the exclusion depended on the definition of "normal reactor controls." Tr. 21,164 (Dawe). The finding properly reaches no conclusion concerning the significance of this fact since there is no discussion of significance in the record.

* RB-277D (Staff 7B:50A)

This finding concludes, without basis in the record, that the existence of performance standards in the regulations demonstrates the need to impose GDC 1 on non-safety related equipment as a <u>regulatory requirement</u>. Quite the contrary is true. Performance standards purposely give greater flexibility

to the utilities in deciding how to meet regulations. Thus, absent specific imposition of specific regulatory intent, it would defeat the purpose of performance standards to assume that specific regulatory requirements also are applicable. LILCO has demonstrated such an assumption is unnecessary since it has applied quality standards and quality assurance commensurate with the importance of all structures, systems and components even though LILCO believes there is no specific regulatory requirement mandating such treatment. Staff Finding 7B:50A; LILCO Finding B-235.

* RB-277E (Staff 7B:50B)

In this finding, the Staff has misinterpreted LILCO's views on the application of 10 CFR § 50.59. In particular, the Staff incorrectly concludes that LILCO believes that a modification involving non-safety related equipment which increases the probability of occurrence or consequences of an accident is not an unreviewed safety question. Reply Finding RB-39SS (SC S7B:86).

* RB-277F (Staff 7B:50C)

This finding incorrectly suggests that LILCO complies with the Part 21 reporting requirements as a voluntary matter, not because LILCO believes it must do so. LILCO witness Museler testified that if the conditions in Part 21 are met,

LILCO will make the necessary reports regardless of whether safety related or non-safety related equipment is involved. LILCO Finding B-259U.

* RB-277G (Staff 7B:136A)

Footnote 9 of this finding takes one statement by a LILCO witness out of context to conclude that LILCO believes that areas other than safety related are not specifically covered by the regulations. This statement does not accurately reflect the Company's view that certain portions of the NRC's regulations extend beyond the safety related set. LILCO Finding B-210A.

* RB-277H (Staff 7B:136I, 7B:136J)

These findings, citing Dr. Mattson, note that LILCO's commitment ensures that plant items are "flagged" to aid future maintenance activities. These findings may be misleading without further explanation. By "flagging" particular items, the witness meant that procedures would be in place to ensure that the appropriate documents would be reviewed prior to maintenance activities to ensure the proper safety significance is accorded the equipment. Tr. 20,874-75 (Mattson); LILCO Finding B-259C.

* RB-277I (Staff 7B:138A)

The last sentence of this finding concludes, without citation, that it is "no more difficult to work with and audit against the concept of 'important to safety' than against 'safety significance.'" This does not accurately reflect the record. One of LILCO's problems with understanding important to safety is that the Staff now seeks to change the definition of a previously well understood regulatory term. See Tr. 21,102-03 (Dawe, Pollock). Moreover, important to safety and safety significance are different types of terms. The regulations use the term important to safety to designate a specific set of structures, systems and components. Safety significance means the results of a subjective engineering evaluation of a particular piece of equipment taking into account its use in the plant to determine the appropriate design, construction and operational attributes to be applied. See Tr. 21,125-26 (Museler). It is not intended to define a specific set of structures, systems and components.

* RB-277J (Staff 7B:138C)

This finding suggests that LILCO's objection to the Denton Memorandum definition of important to safety on the ground of vagueness is undercut because LILCO witnesses refused to accept some of the limited definitions offered by Staff

counsel on cross-examination. The finding makes little sense. The witnesses did not testify that an appropriate definition could not be developed. In fact, one of the definitions proposed by Staff counsel was acceptable to LILCO for GDC 1 purposes. Tr. 21,126-27 (Dawe). LILCO witnesses emphasized the need for rulemaking to develop an appropriate definition for all of the uses of important to safety if that term is to be construed more broadly than safety related. See Tr. 21,161-62 (Dawe, Museler).

* RB-277K (Staff 7B:139)

This finding proposes a license condition that did not appear in any prefiled testimony nor was it discussed by any witness on cross-examination. The proposed licensing condition includes a number of logical inconsistencies which would cause confusion if imposed on LILCO. See LILCO Reply at ____.

* RB-277L (Staff 7B:141L)

In concluding that LILCO has a list of equipment important to safety, this finding takes Mr. Pollock's testimony out of context with misleading and unintended results. Read as a whole, Mr. Pollock testified that he had the equivalent of a list in Shoreham's preventive maintenance program which extended beyond equipment with safety significance. Tr. 21,134-35 (Pollock). But LILCO does not use a separate classification

category of important to safety, LILCO Findings B-158 to -160; consequently, it does not have a list of important to safety. The scope of the preventive maintenance program makes clear it is not a list of important to safety equipment; rather it is a program for plant equipment whether or not such equipment has safety significance or simply reliability significance. Tr. 21,134-35 (Pollock). Mr. Pollock also testified that a list of certain non-safety related equipment would not be appropriate. LILCO Finding B-173E.

* RB-277M

On page 37, footnote 13, of its Revised Proposed Opinion, the Staff claims LILCO has no basis for concluding that the Denton Memorandum was a response to TMI 2. But LILCO believes that its conclusion is a fair reading of all of the original SC/SOC 7B testimony. Moreover, Staff witness Mattson confirmed that the Denton Memorandum was, in large measure, a response to TMI 2. LILCO Finding B-259I; Staff Finding 7B:48B.

2. The Shoreham PRA

RB-278 (Staff 7B:218)

Staff proposed finding 7B:218 notes that the NRC has no specific criteria for evaluating PRAs and that a benchmark is needed in order to determine the acceptability of numerical

risk results. Although no single benchmark is available, there are a number of indices available against which a PRA can be compared. LILCO witness Joksimovich testified that PRA experts generally use WASH-1400 as one benchmark against which PRAs may be compared. Tr. 5822-23 (Joksimovich). LILCO witness Burns agreed that WASH-1400 is a benchmark that can be used to assess PRA results. See Tr. 5763-65 (Burns). Thus, there does exist some basis for judging the acceptability of the results of a PRA.

RB-279 (Staff 7B:221)

Staff proposed finding 7B:221 discusses the reasons why the Staff decided not to review the draft Shoreham PRA. The finding states, in part:

> The Staff cannot afford to expend its limited resources on the review of draft PRA's because they generally change "radically" as time goes on and it is expected that the Shoreham PRA [will] undergo substantial changes as a result of mistakes, omissions or new understandings before it becomes final. Tr. 6457, 6774 (Thadani).

Mr. Thadani, however, based his statement on general knowledge because he has not conducted a review of the Shoreham PRA. See LILCO Finding B-382. Contrary to Mr. Thadani's views, LILCO's witnesses who were intimately familiar with the details of the PRA and its state of development testified that they did not anticipate any substantial changes between the draft and final versions of the PRA. See LILCO Finding B-394.

RB-280 (Staff 7B:230 and 7B:231)

Staff proposed finding 7B:231 reaches conclusions about the Staff's proposed finding 7B:230. In that finding, Staff witness Thadani is cited regarding an "ideal approach" for the use of PRA in systems interaction analysis. Many of the techniques, if not all, listed by Mr. Thadani in the testimony cited in Staff 7B:230 were used in the Shoreham PRA. See LILCO Findings B-354, B-356, B-357, B-361, B-367.

In Staff proposed finding 7B:231, the Staff notes that Mr. Thadani stated that no single PRA to date had used all the approaches that he recommended for an ideal PRA. Mr. Thadani, however, has not reviewed the LILCO PRA in light of his suggested approaches. See LILCO Finding B-382. The Shoreham PRA appears to have many of the elements of Mr. Thadani's ideal PRA. In fact, Drs. Burns and Joksimovich testified that the Shoreham PRA was a state of the art effort that incorporated appropriate systems interactions techniques. They concluded it was an effective method for identifying and assessing the potential for systems interactions at the Shoreham plant. See, e.g., LILCO Findings B-396, B-397.

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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 to the Proposed Opinions, Findings and Conclusions of Suffolk County and the Staff, Volumes Two and Three (May 24, 1983 (Revised)), were served this date upon the following by hand, as indicated by two asterisks, by Federal Express as indicated by one asterisk, and otherwise by first-class mail, postage prepaid.

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