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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 QA/QC AND EQ OPINIONS,  
FINDINGS AND CONCLUSIONS OF SUFFOLK COUNTY AND THE STAFF

April 25, 1983

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

VOLUME ONE OF ONE

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ATTACHMENT 1: SC USE OF FINDINGS IN OPINION

ATTACHMENT 2: INACCURATE SC FINDINGS

## PRELIMINARY STATEMENT

This volume continues the briefing of issues litigated in the Shoreham operating license proceeding. The Long Island Lighting Company has previously served:

LILCO's Proposed Opinion, Findings of Fact and Conclusions of Law in the Form of a Partial Initial Decision, Volumes One to Three (January 17, 1983),

LILCO's Reply to the Proposed Opinions, Findings and Conclusions of Suffolk County and the Staff, Volumes One and Two (February 22, 1983), and

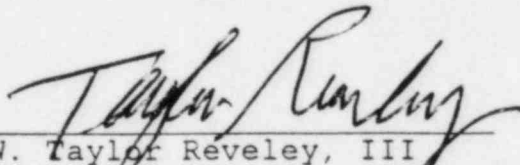
LILCO'S QA/QC and EQ Supplement to its Proposed Opinion, Findings of Fact and Conclusions of Law in the Form of a Partial Initial Decision, Volumes One and Two (March 28, 1983).

The present document is the eighth in the series just described. It responds to the QA/QC and EQ submissions of Suffolk County and the NRC Staff, filed on April 7 and 18, 1983, respectively.

LILCO agrees generally with the Staff's proposed opinion and findings. The Company believes that much of the County's submission is wrong, however. Its errors are detailed in subsequent pages.

For the reasons set out in this reply and in the Applicant's filing of March 28, 1983, the Company renews its request that the Board adopt the QA/QC and EQ partial initial decision proposed by LILCO.

Respectfully submitted,

  
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DATED: April 25, 1983

## REPLY BRIEF

### I. QUALITY ASSURANCE/QUALITY CONTROL

#### A. Overview

This portion of LILCO's reply deals with the quality assurance contentions, SC/SOC Contention 12 and SC Contentions 13-15. The reply is organized in two parts: a response to SC's proposed opinion and reply findings of fact. The reply findings include two attachments: one listing SC proposed findings that are not substantively used in the County's proposed opinion and one listing SC proposed findings that are incorrect or misleading. The Company's initial quality assurance findings of fact were designated with a "QA-," followed by a sequential number designation. These reply findings continue that basic form except an "R" is inserted prior to the "QA-" to distinguish reply findings from initial findings. Many reply findings also have a parenthesis containing a Suffolk County finding number. Where this occurs, the finding includes a direct response to the referenced County finding.

In our judgment, the County's proposed opinion on quality assurance is nothing short of a polemic, stating and restating its preconceived QA notions. While SC appears to have treated the record comprehensively by submitting over 350 pages of findings, in fact almost a third of the findings are not used in any substantive way to support the County's conclusions.<sup>1/</sup> Significantly, many of the unused findings contain facts contrary to positions taken by the County. This is but one indication of the County's unbalanced and unfair use of the record.<sup>2/</sup>

Not only does the County's proposed opinion ignore substantial parts of the record, its findings are also flawed materially. As described in section B, in too many instances the findings simply do not accurately reflect the evidence. In some cases the record cited by the County does not support or,

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<sup>1/</sup> Attachment 1 contains a listing of the County's findings that are not cited in the proposed opinion or are cited only in introductory sections that say, in effect, the following findings relate to a particular subject matter.

<sup>2/</sup> LILCO does not believe the County is under any obligation to use every finding it proposes nor is it obliged to consider every fact that might possibly be favorable to LILCO. It is obliged, however, to restate the record fairly and accurately and make whatever arguments it deems appropriate based upon those facts. The County, in many instances, has exceeded the bounds of aggressive advocacy by improperly ignoring important facts that are included in its own findings.



indeed, may say the opposite of what is claimed. Statements are taken out of context. Prefiled testimony or exhibits are paraphrased ignoring substantial amounts of discussion clarifying or explaining the point in question. And unwarranted inferences or conclusions are drawn -- in some cases without even an attempt to cite any support from the record. Consequently, to the extent the County's opinion draws on the findings, as it must, it is unreliable.

In addition to these fundamental defects, the County's opinion contains a number of themes that are without merit. First, SC dismisses favorable conclusions about the quality of Shoreham that are based on the LILCO/S&W audit program, the I&E program and the Torrey Pines Independent Verification because these programs did not employ statistical methodology. Contrary to the County's assertions, statistical methods are neither required by 10 CFR Part 50, Appendix B, nor are they necessary to draw overall conclusions about the adequacy of Shoreham. Their use would be impractical and inappropriate for the auditing of quality assurance activities at a nuclear power plant. See section C.1 below.

Second, the County claims that the QA programs applied to Shoreham are incomplete because they do not encompass non-safety related structures, systems and components. This



allegation is an obvious attempt by the County to divert attention from the principal issue in these contentions, LILCO's compliance with Appendix B. In any event, LILCO has applied appropriate quality assurance to all structures, systems and components. See section C.2 below.

Third, the County claims that all deficiencies must be assumed to be significant and that lack of safety significance is irrelevant to the Board's consideration of the quality assurance contentions. The County has lost sight of the fundamental purpose of Appendix B -- to ensure the safe operation of the plant. Thus, safety significance is an important measure of the effectiveness of the QA efforts. Indeed, if discrepancies are limited to matters that do not have an impact on safety, the program has achieved its purpose. See section C.3 below.

In addition to these general themes, the County asserts that LILCO's Quality Assurance Program has been improperly implemented. Essential to this claim is the County's view that the existence of deficiencies and the failure to eliminate them completely indicate a failure to implement a quality assurance program in compliance with Appendix B. Although lip service is paid to the notion that discrepancies are inevitable in a project such as Shoreham, SC fails to recognize that the

identification and correction of discrepancies by LILCO indicates compliance with Appendix B, not noncompliance. Moreover, despite testimony by the NRC Staff that the I&E violations found at Shoreham were not particularly significant and that they generally were of the type expected at such a project, the County persists in its conclusion that the violations per se indicate improper QA program implementation. Indicatively, although SC disclaims the usefulness of sheer numbers as a measure of the effectiveness of implementation, the County fails to analyze the alleged QA deficiencies, simply concluding that many violations exist and therefore, ipso facto, the program must be defective. See section D.1 below.

The County attempts to illustrate its theory using a number of alleged implementation problem areas: calculations, E&DCRs, control of manuals, storage and housekeeping, FSAR control, electrical separation, the Readiness Assessment Team Inspection results and welding. As explained in this reply, none of these examples supports SC's thesis. See section D.2 below.

B. The County's Findings Do Not  
Accurately Reflect the Record

The NRC's Rules of Practice require:

Proposed findings of fact shall be clearly and concisely set forth in numbered paragraphs and shall be confined to the material issues, with exact citations to the transcript of record or exhibits in support of each proposed finding.

10 CFR § 2.754(c) (emphasis added). In other words, findings of fact must be rooted in the record. The County's are not.

As in its January 31, 1983, proposed findings of fact, the County has disregarded the evidence. LILCO's initial reply findings, those on SC/SOC 7B in particular, identified the inaccurate or misleading statements in the County's submission. (See, e.g., LILCO Proposed Opinion, Findings of Fact and Conclusions of Law, Vol. 2 (January 17, 1983), at 1-2).

The County has now submitted additional findings that improperly use the record in this proceeding. Because there is inadequate time to write a comprehensive reply to each such finding, these flawed findings have been listed in Attachment 2 below.<sup>3/</sup> The attachment has three columns: (1) the number of

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<sup>3/</sup> Minor factual errors that do not affect the meaning of the finding have generally not been included in Attachment 2. Also, Attachment 2 does not address the appendices to SC's proposed findings of fact. These appendices purport to summarize the audit observations covered during cross-examination. As

(footnote cont'd)

each flawed SC finding, (2) LILCO's response, and (3) a brief explanation of the response with citation to the record. In order to develop this appendix, LILCO reviewed each proposed County finding and compared it to the record. In so doing, five categories of inaccuracies were identified and used in LILCO's response. Each is explained below.

(1) Not supported by citation: This category includes instances where the cited portion of the record either says the opposite of what is asserted in SC's finding or says something substantially different from the "fact" asserted. The latter flaw may involve a completely different subject matter, the same subject matter directed at a different point, or opinion stated as fact.

(2) Out of context: This category includes instances where only part of an answer or series of answers is relied upon, without mention of any explanation or qualification appearing in the same answer or series of answers. The category

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(footnote cont'd)

became apparent during hearings, the audit observations themselves are often incomplete and misleading without considering all the information presented by the witnesses. While the County has attempted to provide some explanatory remarks, LILCO believes its proposed findings regarding audit observations more accurately reflect the record as a whole.

also includes findings in which the County takes testimony directed to a specific point and uses it as "proof" of a far more sweeping conclusion.

(3) Refuted by Record: During the hearings on quality assurance, it became apparent that documents such as audit and I&E reports contain statements or observations which, when considered in isolation, are very misleading. This result flowed from the nature of the auditing process. An auditor or NRC inspector focuses on a particular area, noting perceived deviations from requirements. Many times, however, further review reveals that the conditions are acceptable or have been previously identified and controlled. Thus, care must be taken when using statements from quality assurance audits or inspections reports to ensure that explanations or clarifications provided by witnesses familiar with the documents are included in the finding. In many instances the County did not exercise appropriate care. This category of flawed finding includes those instances where the County used statements from audit and inspection reports that were refuted or clarified in a significant way by prefiled or cross-examination testimony. The category also includes instances where the County cites prefiled testimony, particularly its own, as if it were undisputed fact, ignoring subsequent cross-examination or other prefiled testimony that substantially rebuts it.<sup>4/</sup>

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<sup>4/</sup> In a few instances, the category also includes statements made during cross examination which are used by the County to

(footnote cont'd)

(4) Unjustified inference: A number of SC findings attempt to draw inferences or conclusions, either explicitly or implicitly, by assembling bits and pieces of testimony in a way that unfairly characterizes the record. This category also includes instances where the County cites an accurate statement but, with the addition of "however," "although" or some other qualifier, attempts to draw an unjustified inference that some impropriety existed.

(5) No citation: This category applies whenever a SC finding or portion of one lacks any citation whatsoever to the record. Conclusory findings without citation might be appropriate where they follow logically from other, factually accurate findings. In general, though, the County states conclusions in findings without laying an appropriate foundation. This category also includes findings that rely on statements made by the judges or attorneys or on material not admitted into evidence.

In developing Attachment 2, LILCO has distinguished between County findings with which LILCO disagrees because

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(footnote cont'd)

support a proposition that is clearly refuted by other testimony.

other, more persuasive evidence exists, and those SC findings that must be rejected out of hand because they improperly use the record. The former are dealt with in individual reply findings; the latter are included in the attachment. Though not every statement in the SC findings cited in Attachment 2 is incorrect or misleading, SC should bear the consequences of its misuse of the record. The unreliability of the County's findings precludes their use in resolving the issues at hand.

### C. Recurrent Themes

Three claims appear repeatedly in the County's proposed opinion: (1) that the LILCO, NRC I&E and Torrey Pines programs are inadequate because they fail to use statistical methodology, (2) that they are defective because they do not include non-safety related structures, systems and components, and (3) that the safety significance of QA findings is not relevant to determining whether a QA program is working. None of these theories has merit.

#### 1. Statistical Methodology

The County would have the Board hold that the conclusions of the LILCO audit program, the Staff I&E program and the Torrey Pines verification are invalid since statistical



methodology was not utilized (see SC Proposed Opinion at 4, 8-11, 23-25, 27, 112-13, 141-48).

a. Statistical Methodology Impractical  
and Inappropriate

The County's position on this subject ignores the large body of testimony in the record by LILCO, Staff and Torrey Pines witnesses concluding that the use of statistical methodology in these areas would be not only impractical but inappropriate (LILCO Proposed Opinion at 118-20, 139-42; LILCO Proposed Findings QA-724, -725, -849 to -852, -856, -860 to -862, -869; Reply Findings RQA-1 (SC QA:411) to -7; Attachment 2, at SC QA:405 to :421).

For instance, SC failed to engage the important distinction between the functions of a product acceptance inspection and an audit. The LILCO witnesses testified that while statistical methodology is common practice for product acceptance inspection, and is in fact often used by LILCO for this purpose, an audit is vastly different. Its purpose is to monitor a process and its various cause mechanisms rather than to accept or reject a "lot" of items based solely on a sample of the lot (or population). (LILCO Proposed Findings QA-849 to -852). The County's failure to recognize this vital difference



between the product acceptance and audit functions is obvious upon examination of its proposed finding QA:421, which confuses LILCO testimony concerning QA inspections and audits (Reply Finding RQA-4 (SC QA:421)).

Statistical methodology is merely a tool to be used, where appropriate, to achieve an objective. It is an appropriate and effective tool for product acceptance inspection but not for auditing (LILCO Proposed Finding QA-860). As LILCO's witnesses testified, the complexity and diversity of the attributes assessed by an audit program make it more effective to rely upon the specific knowledge and judgment of a qualified auditor (LILCO Proposed Findings QA-861, -863; see also QA-725, -857). The County's stated position that audits and similar activities (i.e., Staff I&E inspections<sup>5/</sup> and the Torrey Pines verification) can never be valid without use of statistical methodology evidences a talismanic advocacy of statistical methodology in complete disregard of the specific nature of the functions to be performed (LILCO Proposed Findings QA-724, -858, -859, -865 to -868; Reply Findings RQA-6, -7).<sup>6/</sup>

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<sup>5/</sup> The term "inspection(s)" as used in "NRC (I&E) inspection(s)" does not denote a product acceptance inspection, but reflects the term used by NRC as equivalent to audits (see LILCO Proposed Findings QA-460, -461).

<sup>6/</sup> The County's position that statistical methodology must be used without regard to its suitability is further evidenced by

(footnote cont'd)

The County also argues repeatedly that statistical methodology must be used in order to extrapolate from a sample to the total population. This is valid to the extent that the objective is to determine, within a specified degree of confidence, the actual percentage of defects in a "lot" (or population) based upon a sample. Audits, I&E inspections and verifications have an entirely different objective. They are designed to determine the adequacy of a program and its implementation, as well as to suggest improvements, based upon an in-depth assessment of the processes that comprise that program. (LILCO Proposed Findings QA-457, -461, -685, -694, -740, -859). The County's consistent use of "extrapolation from a sample to the total population," or closely equivalent terminology, to challenge the validity of the conclusions drawn from LILCO audits, I&E inspections and the Torrey Pines verification reflects a fundamental misunderstanding of the nature and objectives of the auditing processes. (See, e.g., Reply Finding RQA-2 (SC QA:415)).

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(footnote cont'd)

proposed SC findings QA:410, :418, :715, :722, :723, :726 to :728. These findings, based upon the testimony of the County's consultants, collectively express the view that audit and verification functions must be forced into the statistical mold despite the factors identified on the record that clearly make the use of such methodology inappropriate (LILCO Proposed Findings QA-724, -725, -861, -862, -869).

Another aspect of the "extrapolation" argument is the County's belief that the use of judgment-based sampling methodology prevents the auditor from reaching conclusions that apply beyond the sample examined. Therefore, in SC's view, the LILCO audit program did not verify all aspects of the QA program in violation of Criterion XVIII (SC Proposed Opinion at 21-24). The conclusion is wrong.

All activities were audited, and each activity was audited at least annually (see, e.g., LILCO Proposed Findings QA-143, -145, -154). For example, Stone & Webster Engineering Assurance audited each activity (such as preparation, review and control of calculations) in each discipline at each location (Boston, New York and the Site Engineering Office) on an annual basis (LILCO Proposed Finding QA-154).

Each audit included evaluation of the effectiveness of the QA program (see, e.g., LILCO Proposed Findings QA-124, -144, -150). Audit results provided feedback to management identifying where changes to the program were necessary (see, e.g., LILCO Proposed Findings QA-151, -152, -177). When an audit did reveal a need for corrective action, it was designed to correct the condition observed, not just the specific deficient items (LILCO Proposed Finding QA-174). Additionally, audit results were used in preparing plans for subsequent

audits to ensure that previously identified problems did not exist in other areas (LILCO Proposed Finding QA-126). Moreover, audits and surveillances performed by the various organizations under the LILCO audit program resulted in the overlapping audit coverage of activities (LILCO Proposed Finding QA-125). Thus, LILCO's audit process does verify all aspects of the QA program.

The appropriateness of judgment-based methodology is underscored by the testimony of Staff witnesses and Mr. Johnson of Torrey Pines that their respective organizations had unsuccessfully attempted to develop practical and meaningful statistical methodologies. They concluded that it could not be done in a way that could provide the level of confidence achieved by using informed technical judgment. (LILCO Proposed Findings QA-724, -856; see also QA-858, -859). Further, the record clearly shows that statistical methodology is not normally used in quality assurance auditing or NRC I&E inspection programs throughout the nuclear industry (LILCO Proposed Findings QA-726, -854, -856, -858).

While the County condemns the use of informed judgment as a basis for selection of items to be audited or verified (SC Proposed Findings QA:405, :408, :416, :715, :731), the statistical methodology advocated by the County's consultants would,

as these consultants conceded, require a significant amount of informed judgment both in the development of the methodology (SC Proposed Findings QA:410, :418, :727) and evaluation of the results (SC Proposed Findings QA:726, :727; SC Proposed Opinion at 26, 27, 146). These conflicting views regarding the usefulness of engineering judgment cannot be reconciled. The County's concession that informed judgment plays a significant role in the process undermines its indictment of the judgment-based approach presently in use throughout the nuclear industry. (Reply Finding RQA-5).

b. Criterion XVIII of Appendix B

The County asks the Board to conclude that Criterion XVIII of Appendix B cannot be met unless an audit program employs statistical methodology (see SC Proposed Opinion at 4, 21, 27). This conclusion is not only unsupported, but contradicted by the preponderance of testimony in the record (LILCO Proposed Opinion at 140; LILCO Proposed Findings QA-123, -193, -855; Attachment 2, at QA:417). SC's own witness testified that statistical methodology is not required by Criterion XVIII (LILCO Proposed Finding QA-853). Indeed, NRC I&E, charged with enforcement of Appendix B, does not itself use such methodology or consider its use to be appropriate for

auditing applications (LILCO Proposed Findings QA-858, -859; SC Proposed Finding QA:419; Staff Proposed Finding QA:59).

The County's proposed conclusion regarding Criterion XVIII has no basis in the record other than Mr. Hubbard's opinion that statistical methods, though not mandated, are nonetheless necessary to meet Criterion XVIII (LILCO Proposed Findings QA-853) and a similar view stated by Dr. Samaniego, whose experience with nuclear quality assurance was, to say the least, limited (LILCO Proposed Findings QA-727, -728). In view of the substantial testimony rebutting the views of the County witnesses, Criterion XVIII cannot fairly be interpreted to require the use of statistical methodology.

To summarize, the record overwhelmingly refutes the County's argument that LILCO audits, I&E inspections and verifications must utilize statistical methodology to comply with Criterion XVIII. Moreover, the County's theory, carried to its logical conclusion, would invalidate the quality assurance programs at most, if not all, nuclear power plants. Such a result cannot be justified by the testimony of the County's witnesses.

## 2. Important to Safety

The LILCO, NRC I&E and Torrey Pines programs are alleged to be inadequate because they are limited to safety



related structures, systems and components (see, e.g., SC Proposed Opinion at 18-20, 112, 123). This argument is a transparent attempt to use alleged deficiencies in non-safety related quality assurance programs to impugn the adequacy of LILCO's Appendix B Quality Assurance Program.

As noted in LILCO's proposed opinion on SC/SOC Contention 7B and elsewhere, all parties agree that 10 CFR Part 50, Appendix B must be applied only to safety related structures, systems and components (see, e.g., LILCO Proposed Finding QA-14). LILCO has a quality assurance program that meets these requirements (see, e.g., LILCO Proposed Findings QA-20 to -22). The NRC reviewed LILCO's compliance with Appendix B throughout construction (see, e.g., LILCO Proposed Finding QA-455), and Torrey Pines verified compliance near the completion of construction (see, e.g., LILCO Proposed Findings QA-684, -686, -687). Thus, the adequacy of LILCO's compliance with Appendix B is a discrete issue quite apart from whether an adequate non-safety related quality assurance program is in place. Moreover, the principal focus of the QA/QC litigation has been Appendix B.<sup>7/</sup> It follows that the County's important to safety

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<sup>7/</sup> Only SC/SOC Contention 12 mentions GDC 1, and even there it is clear that safety related quality assurance is the principal, if not only, focus (see Appendix I to SC/SOC 12).

argument, in the context of these contentions, is a diversionary tactic designed to shift attention from the real issues.

In any event, testimony has been heard in the SC/SOC 7B litigation and the QA litigation on the meaning and use of the term "important to safety" as well as on LILCO's application of quality assurance to non-safety related plant features. As explained in detail in the parties' proposed opinions on SC/SOC 7B, there is disagreement over the meaning of important to safety and, hence, disagreement over the scope of GDC 1. In LILCO's view the term "important to safety" as used in GDC 1 has been interpreted and applied in practice by the NRC and industry to be synonymous with "safety related," thus establishing the scope of items covered by GDC 1 as equivalent to that covered by Appendix B. The NRC Staff and the County disagree, claiming that important to safety means more than safety related, though how much more has never been defined.

Without regard to its interpretation of GDC 1, the Company has applied appropriate quality measures to all structures, systems and components in the plant. As explained in detail in LILCO's filings on SC/SOC 7B, Stone & Webster and General Electric apply essentially the same QA programs to all structures, systems and components, tailoring the QA to the



function of the feature in question. (LILCO Proposed Findings B-211, -214, -219, -224). LILCO also applies quality assurance measures to all structures, systems and components (LILCO Proposed Finding B-235), though not necessarily its Appendix B program. In fact, there is no programmatic guidance available for non-safety related quality assurance programs (LILCO Proposed Finding B-255; LILCO Reply Finding RB-27). Therefore, the Company applies programs which, in its judgment, ensure that structures, systems and components can meet their intended function (see, e.g., LILCO Reply Finding RB-28).

The issues of important to safety and quality assurance for non-safety related structures, systems and components are far too complex to be discussed adequately in three pages of opinion and 13 findings, as the County has tried to do in its QA submission (see SC Proposed Opinion at 18-20; SC Proposed Findings QA:562 to :574).<sup>8/</sup> These issues have been briefed in previous SC/SOC 7B filings and will be supplemented in filings now scheduled. More important, these issues are not the focus of the QA/QC contentions: that focus is LILCO's compliance with the requirements of 10 CFR Part 50, Appendix B for safety related structures, systems and components.

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<sup>8/</sup> In addition, most of these proposed findings are flawed (see Reply Findings RQA-8 (SC QA:562) to -14 (SC QA:574); Attachment 2).

### 3. Safety Significance

The County's proposed opinion rests heavily on the premise that any deviation from a quality assurance related procedure or requirement is per se significant and in derogation of Appendix B. The County's purpose in advancing this theory is two-fold: it inflates the number of so-called "Appendix B violations," and it excuses the County's complete inability to make any credible showing that quality assurance discrepancies have had an impact on Shoreham's safety.

More specifically, the County urges that all quality assurance deficiencies must be considered "significant" or "serious" (SC Proposed Opinion at 17, 33). There are several reasons why this conclusion is wrong. First, it is inconsistent with 10 CFR Part 50, Appendix B. Criterion XVI requires that the cause be identified and preventive action taken only for significant conditions adverse to quality, thereby indicating that some deficiencies, deviations, nonconformances or defects may not be significant. Second, it is inconsistent with the County's own proposed opinion, which recognizes that the determination as to whether particular deficiencies are sufficient to constitute a violation of Appendix B depends on the facts and circumstances of the specific conditions examined

(SC Proposed Opinion at 28-29). Third, the County's conclusion is inconsistent with the record. Observations resulting from audits were extensively examined in testimony. LILCO categorized and characterized observations in order to distinguish their significance and put them in perspective. The Company's witnesses indicated the relative significance of each category of observations and, where appropriate, the significance of individual observations. (See, e.g., LILCO Proposed Findings QA-199, -204, -207 to -212, -217, -222, -227, -240, -247, -251, -258, -267, -275, -279, -312 to -315). The resulting record shows that none of the conditions revealed by the observations had any impact on the integrity of the design or the safety of the plant (LILCO Proposed Findings QA-169 to -173). The County, however, would have this Board disregard this important evidence.

SC's proposed opinion states that a QA program, proper in scope and vigorously implemented, cannot eliminate all errors; that in a facility as complex as a nuclear plant, some errors are inevitable; and that the purpose of QA/QC is to impose necessary controls to reduce errors wherever possible and to detect and correct those which nevertheless may occur (SC Proposed Opinion at 17; SC Proposed Finding QA:17). LILCO agrees, but again notes that this portion of the County's

proposed opinion and findings is not consistent with the County's assertions elsewhere that any deviation from an internal procedure must be considered both significant and a violation of Appendix B. The proper standard was stated by the Indian Point Licensing Board:

[N]o quality assurance program, however thorough, can guarantee that there will be no errors in design and construction, or failures of equipment, or misoperation in a nuclear plant. It can, however, provide substantial assurance that the number of faults will be greatly reduced and that they will not be of such magnitude as to jeopardize the health and safety of the public.

Consolidated Edison Co. (Indian Point Station, Unit No. 2), LBP-73-33, 6 AEC 751, 755-56 (1973) (SC Proposed Opinion at 17). And as the Perry Licensing Board noted in determining the admissibility of a quality assurance contention:

An allegation of a deficient quality assurance program has the inherent danger that it can interfere with the efficient operation of the very program it questions, both at this plant and at others. A good, working quality assurance program identifies deficiencies for correction. If deficiencies are reported the system is working; and intervenor cannot fashion an admissible contention merely by filing deficiency reports without further explanation. Otherwise, we would create an adverse incentive for reporting deficiencies; and this incentive could seriously impact plant safety.

Cleveland Electric Illuminating Co. (Perry Nuclear Power Plant,

Units 1 & 2), LBP-81-24, 14 NRC 175, 211 (1981) (emphasis added).<sup>9/</sup>

Though the lack of safety significance is indicative of an effective program, LILCO agrees with the proposed County opinion at page 35 that it is appropriate not to wait until a safety problem actually exists or is imminent to raise questions about the adequacy of implementation. In fact, the LILCO audit program raised such questions in the form of observations and was effective in identifying problems and initiating their correction before they became significant. (E.g., LILCO Proposed Findings QA-124, -126, -127, -174 to -176, -313, -324, -340).

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<sup>9/</sup> In Perry, the Board reworded the intervenor's contention to require specifically that any QA/QC deficiency had to be linked to a construction deficiency. In the words of the Board:

[I]n rewording the contention we have introduced the requirement that any quality assurance deficiency must be linked to a construction deficiency. That is, interveners must provide us with a reason to believe that quality assurance deficiencies have led to some safety defect in Perry.

Id. at 212 (emphasis added). The County, in its proposed opinion at 34, mischaracterizes this decision, suggesting incorrectly that the Board there considered it sufficient that a deficiency might have led to a safety deficiency.

LILCO also agrees with the County that, in some circumstances, a specific condition may not have a direct impact on safety but the underlying conditions could lead to significant problems. LILCO understood and operated under this concept by identifying and correcting all conditions, including conditions that were not, but might have become, significant. (E.g., LILCO Proposed Findings QA-126, -170, -172, -174, -175, -212, -214, -313, -324). Observation EA 29 A/O 93 illustrates this aspect of LILCO's philosophy. In this instance a management-imposed additional review of flow diagrams, over and above the normal required review of drawings, was not being performed for minor changes to the flow diagrams. LILCO's concern in this case was not with the accuracy of the minor changes. The concern was that personnel were not aware that even minor changes required this additional review. The record shows that this condition was effectively corrected. (LILCO Proposed Findings QA-240 to -244).

In view of the foregoing, the Board should not accept the County's conclusion. Its acceptance would ignore the intent of 10 CFR Part 50, Appendix B, as well as the extensive evidentiary record that provides essential insights as to the relative significance of the observations addressed in the record. (E.g., LILCO Proposed Findings QA-169 to -173, -180 to



-183, -191, -193). In the QA hearings, the County failed to identify any significant conditions adverse to quality at Shoreham. Few, if any, of the conditions identified could have had adverse impact on safety. Certainly none represented programmatic breakdowns in quality assurance at Shoreham.<sup>10/</sup> Consequently, it is highly unlikely that any significant conditions adverse to safety have escaped detection at Shoreham. (E.g., LILCO Proposed Findings QA-169 to -173; NRC Proposed Findings QA:28, :50; NRC Proposed Opinion at 5).

#### D. LILCO Program Implementation

##### 1. In General

Suffolk County's proposed opinion urges the Board to find that the LILCO Quality Assurance Program has not been implemented in compliance with Appendix B (e.g., SC Proposed Opinion at 4-5). The County relies heavily on this argument and the allegations put forth to support it throughout the County's opinion (see, e.g., SC Proposed Opinion at 5, 8, 17, 28-33, 37 n.6, 38, 40, 44-45, 48, 65-66, 71, 73). These

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<sup>10/</sup> Significantly, SC has abandoned the term "breakdown" in its opinion. Moreover, the County was unable to identify any specific QA deficiencies that would contribute to safety risk (Reply Finding RQA-15).

allegations are that: (1) any deviation from LILCO's internal procedures violates Appendix B; (2) deviations from LILCO policies or procedures demonstrate failure and lack of involvement on the part of the Company's management; and (3) LILCO failed to initiate effective corrective and preventive action. Each of these claims is wrong.

a. Noncompliance with Internal Procedures  
Does Not Ipso Facto Violate Appendix B

As noted, the County insists that any noncompliance with LILCO's Quality Assurance Program represents a violation of Appendix B (SC Proposed Opinion at 5, 28 to 33). This is so because the County thinks that an Appendix B violation exists regardless of whether the pertinent QA noncompliance is detected by LILCO's internal audit program or by an NRC I&E inspection and regardless of whether corrective and preventive action is implemented (see SC Proposed Opinion at 31 & n.4).<sup>11/</sup> Adoption of the County's view would require the Board to ignore the testimony of the LILCO and Staff witnesses and would result in an unwarranted interpretation of Appendix B. The record

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<sup>11/</sup> As noted above, this County position is inconsistent with other portions of the County's opinion which recognize that some errors are inevitable and that a well planned and implemented QA program will detect and correct inevitable errors.



reflects that Appendix B anticipates the occurrence of noncompliances within an applicant's QA program and therefore includes requirements (e.g., Criteria XVI and XVIII) for the applicant to identify and correct such noncompliances (LILCO Proposed Opinion at 44-45; LILCO Proposed Findings QA-183, -487).

NRC I&E policy reflects this reality. If the licensee identifies and corrects a problem or deficiency in the implementation of its own program that is less than a severity level II, it is not a violation of Appendix B (LILCO Proposed Finding QA-500; SC Proposed Finding QA:393). Further, the NRC views LILCO's identification of problems or deficiencies as demonstrating that its program is working (LILCO Proposed Finding QA-500).

To support its position, the County cites three examples, in all of which deficiencies were identified, not by LILCO, but by NRC I&E and consequently cited as Appendix B violations (SC Proposed Opinion at 30-31). These examples do not support the premise that noncompliance with LILCO procedures inherently violates Appendix B. Rather they show that noncompliance with LILCO procedures may violate Appendix B only when the noncompliance is not detected or corrected by LILCO's own program. (See, e.g., LILCO Proposed Findings QA-178 to -183, -191, -193).

The County cites two additional examples. They involve conditions identified by the NRC "CAT" inspection but not considered by the I&E to represent violations of Appendix B. (SC Proposed Opinion at 31-32). The first example is one identified as a "weakness," based upon the NRC's concern with the status of LILCO's program to ensure adequate electrical separation throughout the plant. This instance was not considered a violation of Appendix B by the Staff because work was still in progress and the cables in question had not yet received final inspection by the Company. (LILCO Proposed Findings QA-557, -558, -559).

The second example involved blockage of some of the drywell spray nozzles by ventilation ductwork; I&E believed this was a deviation from FSAR requirements. But this condition was not a noncompliance with LILCO design documents or procedures; it was a question of compatibility between design documents and the FSAR. (See LILCO Proposed Finding QA-548). Moreover, as LILCO explained, this blockage was within the plant's design basis analysis, and no change to the FSAR or plant hardware was required<sup>12/</sup> (see LILCO Proposed Finding

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<sup>12/</sup> While the condition noted might have quality assurance implications, the NRC witnesses did not have enough information at the time of their testimony to reach any conclusion in this regard (see Attachment 2, at QA:319).

QA-551). In light of the Staff's determination that these two instances cited by the County involved no violations of Appendix B, the Board should find that these examples do not support the County's claim (SC Proposed Opinion at 32-33) that these conditions evidence inadequate implementation by LILCO of its quality assurance program (see generally LILCO Proposed Finding QA-673).

In sum, the County's conclusion that the record evidences a pattern of LILCO failures to implement its quality assurance program depends upon SC's assumption that all noncompliances with the program identified by LILCO constitute violations of Appendix B. In view of the extensive evidentiary record invalidating this assumption, and the failure of the County to provide any substantive support for it, the assumption and the conclusion dependent on it must fail. (See, e.g., LILCO Proposed Findings QA-173, -178 to -183; Staff Proposed Findings QA:26 to :28, :49, :50).

b. Other Premises

(1) Management Involvement

The County asserts that the number of observations in LILCO audits and NRC inspections are per se proof of lack of

management involvement, awareness, attention and concern for procedural compliance and LILCO's failure to institute effective corrective and preventive action (see, e.g., SC Proposed Opinion at 17, 37 n.6, 44, 48, 53, 71).<sup>13/</sup> It is, of course, essential that a quality assurance program have the full support and attention of management in order to be effective. SC cites instances of noncompliance with a S&W procedure as evidence of lack of management attention (SC Proposed Opinion at 44). In fact, the record shows that management, even for detailed administrative requirements, fully supported all procedural requirements and their implementation.<sup>14/</sup> For example, management was involved in the modifications to training programs as necessary to achieve implementation and actually participated in the training sessions (SC Proposed Findings QA:37, :44; LILCO Proposed Findings QA-200, -201, -327 to -339). The County ignored this testimony.

The County also uses housekeeping deficiencies in an attempt to show lack of management attention (SC Proposed

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<sup>13/</sup> The only testimony cited by the County to support this allegation was derived from the SC witness, Mr. Hubbard.

<sup>14/</sup> The County conceded management involvement in at least one of its findings yet failed to acknowledge this in its opinion (see Attachment 1; SC Proposed Finding QA:125).

Opinion at 37 & n.6). The testimony of LILCO and NRC witnesses shows the contrary (LILCO Proposed Findings QA-433, -446, -447; see SC Proposed Findings QA:228, :229).

Additional evidence of management concern with and attention to implementation of Shoreham's QA Program includes:

(1) Strict enforcement by high-level management of timely corrective action through the issuance of Stop Work Orders (see LILCO Proposed Findings QA-135, -214; see also QA-80, -81).

(2) Involvement of upper-level management in resolving E&DCR problems (LILCO Proposed Findings QA-303, -336, -338).

(3) Management emphasis on quality assurance as demonstrated by LILCO's voluntary initiation of the Torrey Pines review (LILCO Proposed Findings QA-674, -675, -742).

(4) Implementation of quality assurance programs and procedures beyond those required by regulation (LILCO Proposed Findings QA-84 to -120, -200; Staff Proposed Finding QA:51; see LILCO Proposed Findings QA-788, -789).

(5) Availability of detailed quality assurance documentation allowing the LILCO witness panel to

testify at length concerning observations made up to ten years earlier and enabling independent investigations such as Torrey Pines to review the entire quality assurance process (see LILCO Proposed Finding QA-742).

The County argues in a related vein that the LILCO Quality Assurance Program set requirements which could not be satisfied and that repeated failure to achieve program goals conditioned personnel to believe that QA compliance was unimportant. No one was "conditioned" to disregard any quality assurance requirements. This is evidenced by the Company's audit program, resulting observations, and the associated corrective action requirements, as well as by NRC I&E activities. (See, e.g., LILCO Proposed Findings QA-174 to -177). LILCO could have reduced the number of observations in a particular area where implementation was difficult by deleting requirements exceeding those of Appendix B. This, for example, might have resulted in abandonment of ready traceability requirements and some of the requirements for logging, posting and filing of E&DCRs. This certainly would not have improved quality assurance at Shoreham, though it would have curbed the number of observations. LILCO chose not to delete such requirements but rather to seek persistently their implementation. (See, e.g., LILCO Proposed Finding QA-200).

(2) LILCO Corrective and Preventive Action

On pages 5, 48 and elsewhere in the its proposed opinion, the County alleges that LILCO has failed to institute adequate corrective and preventive action. To the contrary, the record shows that corrective action was taken, where appropriate, for all observations (e.g., LILCO Proposed Finding QA-174). For difficult problems and important concerns, corrective action was particularly vigorous, including close management involvement (e.g., LILCO Proposed Findings QA-211, -214, -303, -327 to -339).

Criterion XVI requires correction of all specific conditions adverse to quality. This was done in all cases (e.g., LILCO Proposed Findings QA-174, -211, -303). Criterion XVI requires action to prevent recurrence only for significant conditions adverse to quality. None of the observations cited by the County identified significant conditions adverse to quality (see, e.g., LILCO Proposed Findings QA-169, -175). Therefore, there would have been no violation of Appendix B even if preventive action had not been taken. The fact that LILCO and Stone & Webster nonetheless took preventive action is indicative of their commitment to quality. In many cases, LILCO undertook preventive action even for minor implementation



problems with detailed administrative requirements (e.g., LILCO Proposed Findings QA-175, -201; see SC Proposed Finding QA:46).

The County alleges that any repetition of a condition indicates that the preventive action was not effective. The Board must recognize, however, that any condition has the potential for recurrence. That is one of the reasons why an audit program is always needed. (Reply Findings RQA-16 to -18). Thus, the LILCO witnesses testified that, although a problem was observed in one audit and was corrected, it was not then assumed the condition would not recur (Reply Finding RQA-17). Because of the nature of specific types of problems, the possibility of some recurrence of such problems was recognized (see, e.g., LILCO Proposed Finding QA-200; Reply Findings RQA-17, -18).

The LILCO witnesses conceded that in some instances preventive action was not totally and immediately effective. However, tenacious auditing, audit follow-up and reauditing to ensure correction ultimately produced effective action (e.g., LILCO Proposed Findings QA-327 to -340). For example, training presentations were modified when initial training proved to be insufficient. (LILCO Proposed Finding QA-177, -200, -201). Observations were written against S&W engineering divisions when previously instituted preventive action by the divisions

appeared not to be immediately effective (LILCO Proposed Finding QA-234). In short, problems were not ignored. Follow-up was performed to ensure that the work was performed correctly (e.g., LILCO Proposed Finding RQA-18).

## 2. Specific Examples Used by SC

### a. Calculations

The County argues that observations concerning calculations indicate that LILCO failed to implement its QA Program properly (SC Proposed Opinion at 40-48). The record does not support this argument (see, e.g., LILCO Proposed Findings QA-195 to -234; Reply Findings RQA-19, -21). None of the conditions had any effect on the integrity or safety of the plant design (LILCO Proposed Finding QA-199), nor was there any programmatic breakdown (LILCO Proposed Finding QA-200). The audit program ensured that the conditions were corrected, that re-audits were conducted, and that preventive action was taken (LILCO Proposed Findings QA-200, -201).

The County uses ready traceability as an example of inadequate implementation. But the proposed opinion on this subject ignores substantial portions of the record -- much of which is reflected in some of the County's own proposed

findings -- by relying on the number of observations regarding ready traceability to allege a widespread, uncontrolled implementation problem. The County also claims that these observations reflect poorly on the engineering staff and management's commitment to quality. The record does not support SC's allegations. Shoreham's stringent requirements for identification of input sources, albeit difficult to meet, exceed Appendix B requirements. (LILCO Proposed Findings QA-198, -200, -201). Contrary to the County's view, the condition was controlled; corrective action was always taken and broad based preventive action had management involvement (LILCO Proposed Findings QA-174 to -177, -196 to -201). Though the observations had no safety significance (LILCO Proposed Finding QA-199), LILCO and Stone & Webster vigorously enforced QA program requirements (see LILCO Proposed Findings QA-174 to -176).

The County also alleges that a number of calculation-related observations had a potential to affect safety (SC Proposed Opinion at 46). To the contrary, only five calculation-related observations had more than an extremely remote possibility of affecting the quality of design if undetected (see, e.g., LILCO Proposed Findings QA-207, -212). Indeed, after investigation, LILCO found that there were no instances where the conditions noted would have affected the integrity or safety of

the design (LILCO Proposed Findings QA-169, -170, -212; see also Reply Findings RQA-20, -21).

The County argues that because the audit process has identified discrepancies, there is no assurance other problems do not exist (SC Proposed Opinion at 46).<sup>15/</sup> This ignores uncontroverted testimony that the extent of the conditions in all observations, important concerns in particular, was determined to ensure that similar conditions in other calculations were identified and corrected (LILCO Proposed Findings QA-174 to -176 -208 to -211, -213, -214). In this regard, the County asserts that LILCO and Stone & Webster did not ensure that the generic implications of observations were addressed (SC Proposed Opinion at 46-48). Using observation EA 34, AO 120 (involving pipe support calculations) as an example,<sup>16/</sup> SC suggests that an investigation of calculations performed by other disciplines should have been performed. This argument ignores substantial evidence demonstrating that such an investigation would be unnecessary because:

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<sup>15/</sup> But as the County itself recognizes, perfection cannot be achieved (SC Proposed Opinion at 17).

<sup>16/</sup> The County's description and characterization of this observation is not entirely accurate (see Reply Findings RQA-20 to -22).

(1) observations in one discipline are not necessarily applicable to others because conditions vary among disciplines;17/

(2) the same comprehensive and thorough audit program that identified AO 120 is applied to all disciplines but similar problems were not identified elsewhere (e.g., LILCO Proposed Findings QA-123, -126, -153, -154, -155; Reply Finding RQA-22; see also Reply Finding RQA-23);

(3) audit results are used in developing subsequent audits thereby ensuring that conditions such as AO 120 are considered in auditing other disciplines (see, e.g., LILCO Proposed Findings QA-130; Reply Finding RQA-22).

Contrary to the County's arguments, the record concerning calculations confirms the effectiveness of LILCO's QA Program.

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17/ For this same reason the audit program encompasses all disciplines and audits each one at least annually (see, e.g., LILCO Proposed Findings QA-154, -155).

b. Engineering and Design Coordination Reports

LILCO and the Staff agree that Shoreham's Quality Assurance Program adequately controlled design changes through a system of Engineering and Design Coordination Reports (see, e.g., LILCO Proposed Findings QA-295, -296, -298 to -307, -340). Suffolk County, however, would have this Board find that there has been widespread noncompliance with E&DCR control requirements, and that this noncompliance represents a QA breakdown (SC Proposed Opinion at 50). In part, Suffolk County's conclusion rests on proposed findings that distort or ignore material portions of the record. These problems are addressed in reply findings and Attachment 2 below.

More fundamentally, the County's conclusion rests on the erroneous notion that any observation relating to E&DCRs both violates Appendix B and also relates to all other findings which mention E&DCRs, thereby reflecting a continuing pattern of noncompliance. LILCO's views on why it is inappropriate to call every audit observation a violation of Appendix B are set out in section D.1.a above. Patterns of noncompliance, if any, can be found only by examining the facts and circumstances of each incident, including such things as the purpose of the E&DCR, the reason for the observation, the LILCO or Stone &

Webster response, and the impact on the implementation of the E&DCR (see LILCO Proposed Finding QA-494). Suffolk County's opinion and proposed findings ignore this guiding principle.

Suffolk County bases its opinion principally on a limited group of LILCO audits conducted during the period of 1977-79 and on a small number of I&E Reports, principally 76-06, CAT, 82-26 and RAT. The LILCO audits relied on by Suffolk County address basically the same group of administrative activities, namely, the logging, posting or filing of E&DCRs. (See SC Proposed Findings QA:94 to :95, :97 to :100, :106 to :116). These audits do not indicate, however, that these E&DCRs were totally missing or that they were being improperly implemented. In fact, the evidence at Shoreham clearly demonstrates that E&DCRs were being properly implemented (see, e.g., LILCO Proposed Findings QA-295, -296, -298 to -307, -313 to -326, -340). Moreover, the audits reveal that the logging, posting and filing concerns were primarily limited to one contractor -- Courter and Company (see, e.g., LILCO Proposed Finding QA-323; Reply Finding RQA-26 (SC QA:117, :118); Attachment 2, at QA:84). LILCO took immediate steps to remedy this concern, including meeting with the president of Courter. These steps corrected the Courter problem by early 1979. (See LILCO Proposed Findings QA-331 to -340). Subsequent audit



observations represent isolated occurrences that were quickly remedied (Reply Finding RQA-26 (SC QA:117, :118); Attachment 2, at QA:90).

Suffolk County attempts to use the above mentioned I&E Reports to support its theory that widespread E&DCR problems existed and continue unabated to the present time. SC's argument exhibits a lack of analysis and disregard for fact and, therefore, must fail. I&E Report 76-06 cited LILCO for a violation of Criterion 16 -- failure to take corrective action. The Staff closed this item in I&E Report 76-12. Despite explicit Staff testimony to the contrary, Suffolk County insists this violation is related to the E&DCR observations in LILCO audits 602, 654 and 718 and thus was prematurely closed by the Staff (Reply Finding RQA-28 (SC QA:142, :143)).

Suffolk County's attempt to link CAT, RAT and I&E Report 82-26 findings with the earlier LILCO audits are similarly without merit.<sup>18/</sup> In the CAT Report, the inspectors had only a potential concern about the potential effects of the backlog of unincorporated E&DCRs. Significantly, they observed

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<sup>18/</sup> The County also attempts to link E&DCR control to electrical separation. This is without basis; the electrical separation issue is largely technical in nature (see section D.2.f below).

that while the E&DCR system was cumbersome it nevertheless was effective in implementing E&DCRs. (Reply Findings RQA-29 (SC QA:145), -30 (SC QA:146)). I&E Report 82-26 had nothing to do with the control of E&DCRs; it involved an apparent drafting error which, coincidentally, involved an E&DCR (Reply Findings RQA-31 (SC QA:147, :148, :149, :150), -32 (SC QA:148), -33 (SC QA:149)). Likewise, the RAT Report did not identify an E&DCR control problem (Reply Finding RQA-36). Thus, the County's assertions about continuing problems are wrong.

The record demonstrates that LILCO's Quality Assurance program, with its multiple checks, ensures E&DCRs are implemented in the field. Though administrative problems were identified in 1977-79, they were aggressively pursued until eliminated. Consequently, the County's E&DCR claims are unfounded.

c. Manuals

The County's proposed opinion at 71 concludes that on numerous occasions LILCO failed to keep manuals up-to-date. In reaching this conclusion, the County has failed to acknowledge and, in some instances, has misconstrued the testimony by LILCO and Staff witnesses.

By stating "numerous occasions," the County implies a pattern of recurrent problems. To the contrary, the

observations involving manuals relate to different factual situations, different organizations and different causes (LILCO Proposed Finding QA-276). The County, however, has ignored these facts (compare SC Proposed Opinion at 71-72 with LILCO Proposed Findings QA-269 to -273).

The County's allegation that corrective action in general was not effective is also refuted by the record (LILCO Proposed Finding QA-277). The County relies upon an NRC I&E observation (I&E Report 81-13) regarding start-up manuals. It is true that the initial corrective action, although resulting in improvement, was not completely effective (LILCO Proposed Finding RQA-39). But LILCO had not ignored the situation. The Company inspected all start-up manuals on site to identify and correct all existing discrepancies. When the NRC re-inspected the area, LILCO had not yet finalized changes in distribution methods commenced as a result of the prior finding. In particular, changes in personnel contributed to the delay in resolving the issue completely. After I&E 82-08, management attention was focused on the problem, and it was effectively corrected. Importantly, NRC witness Higgins testified that the deficiencies had no adverse effects on the conduct of the start-up program. (LILCO Proposed Findings RQA-38, -39; SC Proposed Findings QA:273, :277).

In sum, the manual observations were generally minor isolated instances rather than a failure of the QA program to implement adequate controls. In the one instance where conditions did recur, the matter was pursued until corrected, with no adverse impact on the plant. Consequently, these observations do not support the County's position.

d. Storage and Housekeeping

The County, ignoring a great deal of the record establishing that LILCO's storage and housekeeping programs are adequate, argues that the LILCO audit and I&E observations in these areas establish a failure to implement pertinent programs in a "systematic manner, thereby constituting a pattern of noncompliances . . . ." (SC Proposed Opinion at 61). In addition, the County argues that these observations evidence inattention on the part of LILCO management to adequate implementation of these programs.

In emphasizing individual observations in both its proposed opinion and proposed findings, SC attempts to divert attention from the evidence, which the County dismisses, establishing the lack of safety significance of these observations (see LILCO Proposed Findings QA-371, -373, -388, -394, -399, -401, -402, -403, -413, -421, -426, -429 to -431,

-439; see generally Reply Findings RQA-42 (SC QA:178) to -66 (SC QA:249)). The County also seeks to divert attention from evidence, which SC likewise dismisses, establishing that these observations were not unexpected given the nature of storage and housekeeping difficulties, the number of years and the large number of components involved, the number of workers onsite, and the ongoing construction activity (see LILCO Proposed Findings QA-371, -372, -375, -398, -404, -417, -419, -427, -441; see generally Reply Findings RQA-44 to -67 (SC QA:260 to :266)). In short, the County fails to place storage and housekeeping issues in perspective by focusing on a relatively few deviations from the otherwise acceptable implementation of those programs.

Ongoing construction activities make it virtually impossible to avoid some deficiencies (see LILCO Proposed Findings QA-375, -417, -419, -427, -441; Reply Finding RQA-50 (SC QA:199); see also Section C.3 above). The Staff, recognizing this reality, stated that the storage observations at Shoreham were similar to what would normally be expected from audits of Appendix B storage programs (LILCO Proposed Finding QA-375). Because storage difficulties are expected to occur, the Staff noted that additional quality checks prior to and after installation of equipment are important (see LILCO Proposed Finding

QA-510). LILCO witnesses explained how additional quality checks have been applied at Shoreham (see, e.g., LILCO Proposed Finding QA-385, -388, -394, -401). LILCO, through its storage and housekeeping programs, is committed to keeping deficiencies to a minimum and detecting and correcting those that do occur (see LILCO Proposed Findings QA-369, -373). The audit program is evidence of this commitment.

The County nevertheless attempts to use these deficiencies to support a claim that there is general inattention by LILCO to full implementation of its storage and housekeeping programs. LILCO management, contrary to exhibiting inattention, has been committed to developing and implementing effective storage and housekeeping programs (Reply Finding RQA-47 (SC QA:188, :190, :192)).<sup>19/</sup> Evidence of this is found in LILCO's storage-related surveillance programs for mechanical, electrical and instrumentation equipment (LILCO Proposed Finding QA-372; SC Proposed Finding QA:259 to :260), continual efforts to maintain the cleanliness of site areas

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<sup>19/</sup> As noted in LILCO's Proposed QA/QC Opinion, the Company has had a philosophical difference with the Staff concerning the proper timing of the housekeeping effort as the plant approaches fuel load (LILCO Proposed Opinion at 58, 61). But that difference in philosophy does not reflect management inattention (LILCO Proposed Findings QA-443, -446).

consistent with the activities being performed (LILCO Proposed Finding QA-432), improvement in the implementation of these programs (LILCO Proposed Finding QA-433), the priority given to cleanliness in areas of the plant nearing completion (LILCO Proposed Finding QA-437; Reply Finding RQA-59 (SC QA:225 to :227)), and the Company's commitment to the NRC following the RAT Inspection (LILCO Proposed Finding QA-444, -445; see generally QA-446, -447).

SC's proposed opinion contains a number of references to "repeated" instances of deficiencies (at least ten separate references on eleven pages of proposed opinion), as well as "widespread" deficiencies and "recurrent" problems, in an attempt to portray Shoreham as totally lacking in its storage and housekeeping programs. Yet, as discussed above and reflected in the record, these deficiencies were not excessive in number, lacked safety significance and must be viewed in light of the surrounding circumstances (see LILCO Proposed Findings QA-371, -372, -374 to -376, -398; Reply Findings RQA-42 (SC QA:178) to -46 (SC QA:187), -49 (SC QA:197, :198) to -54 (SC QA:210)).

In addition, the County lists audit and I&E reports, covering a number of years and different areas of the plant, in an attempt to support an argument that corrective action was not effective because the same problems reappeared. The result



is misleading. For example, the County states on pages 67-68 of its proposed opinion that the corrective action implemented following I&E Report 79-16 "can only be viewed as ineffective" given that "widespread housekeeping deficiencies" were subsequently discovered during the CAT Inspection. Missing from the proposed opinion in this regard, however, is the testimony of Staff witness Higgins that the corrective action for I&E Report 79-16 would not be expected to ensure cleanliness in the areas identified during the CAT Inspection. (Reply Finding RQA-63 (SC QA:244)). As in other parts of its opinion, the County has failed to provide sound analysis to support its conclusions. Disclaimers to the contrary (see SC Proposed Opinion at 111, n.32), the County erroneously continues to rely on sheer numbers of findings to support its position (see Reply Finding RQA-67 (SC QA:260 to :266)).

In sum, the storage and housekeeping programs at Shoreham are but one layer in the overall QA effort. The County incorrectly focuses too narrowly on isolated observations, rather than on the effectiveness of the whole and on how the storage and housekeeping programs mesh with other layers of quality assurance to create a safe and reliable plant. Viewed in the proper focus, the evidence establishes that Shoreham's QA Program, including its storage and housekeeping elements, has been effectively implemented.

e. FSAR Control

The County also alleges lack of control of the Final Safety Analysis Report (SC Proposed Opinion at 39, 74).<sup>20/</sup> Contrary to the County's view, the LILCO audit and I&E inspection findings do not reveal widespread deficiencies in the accuracy of the FSAR. The LILCO/S&W audits discussed on the record contain only a small number of FSAR related observations, none of which indicated any significant problem with the accuracy of the document. (Reply Finding RQA-68 (SC QA:290 to :292)).

To the extent the County relies on NRC concerns about the accuracy of the FSAR, the County misrepresents the record. Any pertinent disagreement between LILCO and the Staff related only to the least important level of descriptive detail (see, e.g., LILCO Proposed Findings QA-548, -660, -662, -665). It is instructive to contrast the County's characterization of the record as showing widespread FSAR control failures with the NRC Resident Inspector's testimony that the minor differences found between the plant and the FSAR constitute a small percentage of

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<sup>20/</sup> By lack of control, the County apparently refers to what it believes to be an excessive number of instances where differences between the as-built plant and the FSAR have been identified.

the information in the document. He concluded that there are no major problems with the accuracy of the FSAR and that LILCO is meeting its FSAR commitments. (LILCO Proposed Finding QA-662). Thus, the County greatly overstates the magnitude and ignores the lack of significance of the relevant discrepancies found in the FSAR (see, e.g., Reply Finding RQA-69 (SC QA:298)).

The County also ignores the significant changes that have taken place in FSARs in recent years. As noted in LILCO's proposed opinion and the supporting findings, the NRC's concerns about FSAR detail and accuracy do not reflect a QA concern. Rather, it reflects a generic evolution of FSARs from summary reports of principal design features to extensive descriptive documents now maintained current throughout plant lifetime for their potential value during operation. In addition, NRR's safety review has become more detailed, requiring more information in the FSAR. (LILCO Proposed Finding QA-657; see LILCO Proposed Opinion at 102-04). Other plants, like Shoreham, have had to adjust to this situation (LILCO Proposed Findings QA-657, -658).

Further, as the County concedes, Shoreham's SPCR program is adequate to identify and correct any discrepancies that do exist in the FSAR (SC Proposed Opinion at 77). Nor is there

any need for the Board to maintain jurisdiction over the SFCR program until its completion. During the quality assurance hearings, seven SPCR reports were the subject of testimony by the LILCO witness panel. As the record reflects, the results of the program confirm that discrepancies between the as-built plant and the FSAR are of only a minor nature and have not resulted in any plant hardware changes. (LILCO Proposed Findings QA-672, -673). Thus, there is no reason to believe that the program will generate any new information of concern to the Board. Also, I&E will continue to review the results of the program until it is completed (LILCO Proposed Finding QA-673). In sum, SC's reliance on FSAR conformance to allege improper QA implementation highlights the superficial and misleading approach taken by the County in alleging QA program implementation failures.

f. Electrical Separation

Suffolk County next focuses on failures to comply with electrical separation criteria (SC Proposed Opinion at 78-81). In addition to the factual errors described in Attachment 2,21/

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21/ Part of the problem with the County's findings and opinion is that they fail to acknowledge the limitations of the NRC's witnesses on this subject. Electrical separation is a complex subject and its difficulties cannot be extrapolated to other

(footnote cont'd)

the County fails to distinguish between technical difficulties created by the complexity of the electrical separation issue and actual QA problems. The County has failed to show that the electrical separation findings are other than what is expected for such a complex undertaking.

Electrical separation questions raised by I&E at Shoreham over the years were, by and large, questions concerning technical matters, not QA/QC questions (Reply Finding RQA-73). During the construction of Shoreham, the evolving standards for electrical separation became more stringent. Regulatory Guide 1.75, one of the evolving standards, was adopted by LILCO although not required to do so. This commitment required backfitting, resulting in a number of technical difficulties. (See LILCO Proposed Finding QA-558; Reply Finding RQA-74). These technical difficulties were the sort any plant would have encountered in trying to backfit to meet Regulatory Guide 1.75 (Reply Finding RQA-74).

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(footnote cont'd)

aspects of the plant. (Reply Finding RQA-75). By the witnesses' own admission, their knowledge of the area was somewhat limited (Reply Finding RQA-72). It is telling that, given the extensive record on quality assurance, the County finds it necessary to rely on an area which the witnesses could not discuss in great detail, and which had been settled in another contention (Reply Finding RQA-77). Equally telling is the County's failure to question LILCO's witnesses on electrical separation.

It follows that the substantial discussion over the years among I&E, NRR and LILCO to resolve technical difficulties has little to do with quality assurance. This does not mean that occasional quality assurance discrepancies have not been found in the electrical separation area at Shoreham. The NRC witnesses testified, however, that QA findings were of a type and number expected at a plant such as Shoreham (Reply Finding RQA-74). Further, the record reflects that all of the NRC's quality assurance concerns have been satisfactorily resolved (Reply Finding RQA-73).

The County contends it is a significant QA deficiency that electrical separation criteria were not completely established at the time of the CAT inspection (SC Proposed Opinion at 80-81). The County ignores that the observation in the CAT Report involved separation of cables in free air, one limited aspect of electrical separation. The NRC testified that at the time of the CAT inspection, LILCO had established separation criteria for cable in free air. However, it was not clear whether separation requirements for this type of cable were even needed or what they should be. Thus, it was not inappropriate that LILCO's criteria were still evolving. (Reply Finding RQA-76; see also Attachment 2, at QA:334, :346). The nature of this observation also indicates, again, the



essentially technical rather than QA/QC nature of the electrical separation issue.

Moreover, even if the Board were to conclude that the QA/QC in this area has not been implemented properly, the obvious remedy would be an electrical separation inspection. Under the settlement negotiated by the parties and accepted by the Board on electrical separation, LILCO is conducting just such an inspection. (Reply Finding RQA-77). A broader remedy, such as a physical inspection of the entire plant, would not be warranted even if electrical separation QA problems were widespread. As the NRC Staff witnesses testified, electrical separation is a complex matter and one not typical of other construction activities (Reply Finding RQA-75). Thus, QA problems, if any, cannot be extrapolated to the plant as whole.

g. Readiness Assessment Team

(1) Overreliance on Final Inspection

The County goes on to claim that the RAT Inspection Report demonstrates that LILCO has placed excessive reliance on final inspections to identify construction discrepancies (SC Proposed Opinion at 83). SC also concludes that the final inspection process at Shoreham is ineffective. As a result, the



County urges the Board to order a statistically based random sampling reinspection of structures, systems and components that have been inspected and accepted by FQC to date. (SC Proposed Opinion at 90). In addition, in a number of instances, the County urges the Board to disregard testimony by LILCO or the NRC Staff that a particular condition identified by one or the other of these organizations prior to final inspections would have been caught and corrected in that final process (e.g., SC Proposed Opinion at 104, 108). These claims and conclusions are unsupported by the record.

In the RAT Report, the Staff identified a number of instances which appeared to involve final inspection discrepancies. The Staff also noted what appeared to be a high level of rejection during FQC final inspections. The Staff then expressed concern over an "apparent" overreliance on such inspections. (LILCO Proposed Finding QA-615; see also Attachment 2, at QA:429). As shown below, however, analysis of the Staff findings reveals no significant deficiencies in FQC final inspections (Reply Finding RQA-80 (SC QA:432)).

RAT Violations A and D had implications for the final inspection process. Of the conditions identified in A, several were shown not to involve inspection deficiencies. One was an alleged failure to check the hand tight condition of bolts.

LILCO's prefiled and cross-examination testimony showed that the bolts had been inspected, that there was evidence the inspector had checked the bolts as hand tight, and that investigation revealed it was likely that the tightening of the bolts had resulted from normal operating conditions. (LILCO Proposed Findings QA-575 to -578). Two other conditions that the Staff initially believed to be inadequate inspections of cable tray supports ultimately turned out to be drafting errors.<sup>22/</sup> The cable tray supports had been properly installed and inspected; in the course of developing as-built drawings, drafting errors were made. (LILCO Proposed Findings QA-585, -589).<sup>23/</sup>

Of the other inspection deficiencies noted in Violation A, none is indicative of a programmatic or widespread defect in the FQC inspection process (see LILCO Proposed Finding QA-634).

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<sup>22/</sup> The County also cites a cable tray support discrepancy that was not included as part of Violation A (SC Proposed Opinion at 85). It, too, appears not to have been an inspection error (see Reply Finding RQA-90 (QA:491)).

<sup>23/</sup> In one of these instances, the final inspection was conducted using the as-built drawing. The drafting error did not affect the inspection of the cable tray support. Under ideal circumstances, the inspector should have noted the drafting error. Since his principal focus was the installation of the cable tray support, however, the failure does not reflect adversely on the actual inspection process. (LILCO Proposed Findings QA-589, -590).

One deficiency involved welds on control rod drive pipe supports that had been constructed by Reactor Controls, Inc. (RCI). The final inspection had also been done by RCI personnel since that contractor has its own approved quality assurance program. (LILCO Proposed Finding QA-571). Therefore, this deficiency does not reflect adversely on the S&W's FQC final inspection effort. Nonetheless, the discrepancy was of concern to LILCO and steps were taken to identify its cause and confirm that it was an isolated instance. (See LILCO Proposed Findings QA-572, -573).

Violation A did identify two conditions -- one involving "full bearing" of pipe clamps and lugs and another involving the location of a cable tray brace -- that were discrepancies in the FQC inspection process (LILCO Proposed Findings QA-579, -591). But these conditions were isolated instances attributable to particular circumstances associated with the installation (see LILCO Proposed Findings QA-580 to -582, -591 to -593).

Violation D of the RAT Report also entailed potential discrepancies in the final inspection process. This violation, however, involved OQA inspection of repair/rework activity, not an FQC inspection. (Reply Finding RQA-80 (SC QA:432)). Again, as in the case of the RCI weld mentioned above, these

deficiencies, though of concern to LILCO, were not relevant to the effectiveness of the FQC inspection process. In addition, in each case LILCO identified the cause of the problem and demonstrated that the conditions were isolated (see LILCO Proposed Findings QA-607 to -609, -611 to -614). Thus, Violation D has no bearing on the effectiveness of the FQC inspection process.<sup>24/</sup>

The second reason the Staff expressed concern about an apparent overreliance on final inspection was the high rejection rate for FQC final inspections (LILCO Proposed Finding QA-615). Staff inspectors obtained from LILCO raw data concerning the percentage of rejected inspections. The Staff believed that these data indicated a large number of discrepancies in items turned over to FQC for final inspection. As the record reflects, however, the raw data, absent

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<sup>24/</sup> The County also claims that the RAT violation concerning the failure of construction to use Form 15.4 to notify FQC when performing work on previously inspected structural components reflects badly on the adequacy of the final inspection program (SC Proposed Opinion at 84). The County confuses two principles. The potential for future construction activity on completed installations without notification to QA/QC relates to the invalidation of a final inspection, not on the completeness or accuracy of the inspection at the time it is performed. With respect to the potential for improper invalidation of a final inspection, the RAT Inspection findings demonstrated no such concern (LILCO Proposed Findings QA-597, -598).

explanation or analysis, could be misleading. (Reply Finding RQA-81 (SC QA:433, :434)).

Analysis of the raw data shows that many times FQC final inspections are rejected for reasons unrelated to quality. For example, an inspection is rejected if the equipment to be inspected is temporarily inaccessible when the inspection is scheduled. (LILCO Proposed Findings QA-619). The data also cover all FQC inspections, even though some of them are considered in-process and not final (LILCO Proposed Finding QA-624). Moreover, actual rework rates following FQC final inspections have been quite reasonable (see LILCO Proposed Findings QA-618; Reply Finding RQA-87 (SC QA:443)), and the rework has generally involved only minor discrepancies (LILCO Proposed Finding QA-620). The County chose to ignore this evidence in discussing LILCO's supposed overreliance on final inspections (see Reply Findings RQA-82 (SC QA:435), -83 (SC QA:436)).

Despite the fact that analysis of the RAT results did not demonstrate any programmatic deficiencies in the FQC final inspection process, LILCO agreed to take measures to ensure that the process remained effective in the final stages of construction (LILCO Proposed Finding QA-630). Although the steps taken by LILCO are comprehensive and responsive to the Staff's concerns (LILCO Proposed Finding QA-617), the County

erroneously claims they are inadequate (SC Proposed Opinion at 86; see Reply Finding RQA-84 (SC QA:439)). First, the County criticizes the reinspection program being conducted by Field Quality Assurance because it does not use statistical methods. This criticism is without merit as discussed in section C.1 above. Second, the County believes that the three deficiencies identified by the FQA reinspection program to date reinforce SC's view that the final inspection process is ineffective (SC Proposed Opinion at 87). Both NRC Staff and LILCO witnesses testified that the discrepancies found by the FQA reinspection program were not significant and that the program results would be closely monitored by LILCO and the NRC to confirm the continued effectiveness of the final inspections (LILCO Proposed Finding QA-625; Reply Findings RQA-85 (SC QA:440), -86 (SC QA:441)). Third, the County rejects LILCO's analysis of the FQC rejection rates, claiming that not enough information is available (SC Proposed Opinion at 88). The evidence is otherwise (see LILCO Proposed Findings QA-616, -618 to -622). Finally, the County does not believe that LILCO has taken adequate steps to reduce the workload of FQC inspectors (SC Proposed Opinion at 88-89). SC's belief lacks basis in the record (see Attachment 2, at QA:447 to :449).

For these reasons, no grounds exist to grant the County's demands for either an extensive reinspection program<sup>25/</sup> (SC Proposed Opinion at 90) or for the disregard of portions of the testimony the County finds uncongenial to its position (see, e.g., SC Proposed Opinion at 104, 108; SC Proposed Findings QA:534, :546).

(2) Violations

Suffolk County wrongly concludes that the RAT Inspection confirmed that LILCO has improperly implemented its quality assurance program (see SC Proposed Opinion at 7, 82). To this end, the County simply ignores the conclusion stated by the RAT team leader and by Shoreham's Senior Resident Inspector that the RAT results confirmed the effectiveness of Shoreham's QA Program (LILCO Proposed Findings QA-632 to -634). Beyond this glaring omission, the County's RAT arguments are defective because (1) a substantial number of the SC's findings lack references to the record, are taken out of context or draw improper inferences; (2) SC's proposed opinion contains little or no

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<sup>25/</sup> Contrary to the County's view, the NRC Staff testified that it would not be appropriate to reinspect previously accepted installations unless it were first shown that the EQC inspection process had not been effective (LILCO Proposed Finding QA-626).



analysis on either the QA or safety significance of the RAT findings; (3) the County ignores testimony, including some embodied in its own findings, contrary to statements made in its opinion; and (4) the remedies urged by SC are not justified even if the "facts" were as stated by the County.

Factual errors in the County's proposed findings are listed in Attachment 2. It should be noted, however, that SC's RAT findings are particularly inaccurate (see Attachment 2, at QA.429 to :559) and therefore the opinion based upon them is particularly unpersuasive.

By and large, the County's RAT opinion is a recitation of the findings made by the Staff in the course of the inspection. SC made no meaningful effort to consider adverse testimony or to analyze the findings in light of LILCO's QA Program to demonstrate an implementation failure (as contrasted with an isolated deficiency) or to analyze the safety significance of the findings. The County's discussion of Violations C(2) and C(3) is illustrative (see SC Proposed Opinion at 109). In two paragraphs, SC describes the violations, ignoring much of the cross-examination testimony (see Reply Finding RQA-92 (SC QA:548 to :552)). In the final paragraph of its proposed opinion, the County notes, without explanation, the Staff's disagreement with LILCO's response and asks the Board to

conclude that these violations are a "concern." There is no indication of what the "concern" is, why there is a "concern," or whether the "concern" has any safety significance. In fact, the Staff "disagreement" concerned only whether additional controls should be established (see id.). The record indicates that LILCO's program was being properly implemented (see LILCO Proposed Finding QA-600 to -605).

The County's discussion of Violation A(1), CRD welds, is similarly unenlightening (SC Proposed Opinion 91-92). The violation is described and the County urges the Board to conclude that the fit-up gap requirements should have been specified. LILCO, however, had already reached that conclusion (LILCO Proposed Findings QA-572, -573). SC made no attempt to suggest why this point represents anything other than an isolated instance.

As noted already, the County's RAT opinion repeatedly ignores testimony contrary to SC's position (see, e.g., Reply Findings RQA-91 (SC QA:543), -92 (SC QA:548 to :552)). Indeed, the County ignores some of its own proposed findings. For example, in discussing Violation A(2), the County concludes that, of the two installations inspected, "both were found during the RAT inspection to have bolts installed with an indeterminate torque in excess of finger tight" (SC Proposed Opinion at 93).

But, the County fails to cite, much less explain, its own finding, QA:470, which concedes that one of the installations contained a temporary bolt because construction was still in progress. The County also ignores its QA:471, which discusses evidence that the completed installation had been inspected properly, and its QA:472, which indicates that the condition had no impact on the function of the pipe support. (See Reply Finding RQA-88 (SC QA:470 to :472); see also Reply Findings RQA-82 (SC QA:435), -83 (SC QA:436), -87 (SC QA:443)). In sum, the County is manifestly guilty of viewing the record, here and elsewhere, with a convenient myopia that is not excused by their advocates role.

Finally, the RAT remedies proposed by the County are not justified by the facts, even as they are stated by the County. For example, SC correctly acknowledges that in response to Violation B LILCO has instituted an additional program for tracking the cold setting of spring hangers. Inexplicably, however, the County urges the Board to order a review of Shoreham's procedures for the master punch list to ensure that its priorities are proper and that it includes all remaining work items, NRC open items, and other commitments and open items. (SC Proposed Opinion at 104-05). This proposed requirement bears no relationship to the violation other than that it involves the master punch list.<sup>26/</sup>

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<sup>26/</sup> If the County relies on SC Proposed Finding QA:533, cited on page 103 of the SC opinion, the reliance is improper.

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In other instances, the steps suggested by the County have already been taken by LILCO. As a result of Violation D, which noted discrepancies in OQA inspections, the County urges the Board to order LILCO to reinspect a representative sample of OQA final inspections (SC Proposed Opinion at 102). The County, however, ignores the fact that LILCO has already conducted a similar review, which found no other discrepancies (LILCO Proposed Findings QA-611 to -614).

In summary, the County's discussion of RAT is an inaccurate, biased recitation of the results of the inspection, which contains little or no analysis to support the County's conclusions. Moreover, SC studiously disregards the fact that this comprehensive inspection, conducted by a team of experienced inspectors, found only four relatively minor violations. As the Staff members involved in the inspection testified, the results did not reveal any programmatic breakdown in LILCO's QA/QC program and, indeed, reinforced Staff confidence in the effectiveness of Shoreham's Quality Assurance Program. (LILCO Proposed Findings QA-632 to -634).

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QA:533 rests on material not admitted in evidence. (See Attachment 2, at QA:553).

h. Welding

After disclaiming the usefulness of numbers in analyzing the effectiveness of quality assurance programs, the County emphasizes that 16 welding violations were found during the 10 years of Shoreham's construction. The County notes that they occurred primarily from 1977 to mid-1979. (SC Proposed Opinion at 111). The County ignores the Staff's analysis showing that the welding violations were generally unrelated and did not constitute a breakdown of quality assurance in the welding area (LILCO Proposed Findings QA-513, -514). In the one instance where repetitive violations were noted, LILCO took appropriate corrective action (LILCO Proposed Finding QA-515). With respect to the increase in welding violations in the 1977-79 time frame, the record reflects that this increase was tied to the increase in welding activity and the need to train new welders. Once the number of welders stabilized, the number of violations began to drop. (LILCO Proposed Finding QA-516; Reply Finding RQA-105 (QA:350)). The County impermissibly pretends these facts do not exist (SC Proposed Opinion at 7, 111).

Finally, SC claims that the I&E welding violations could have been potential safety concerns (SC Proposed Opinion

at 111-12). Based on a brief review of I&E Reports and LILCO's responses, the NRC witnesses identified four welding violations that might have been unacceptable welds and that might not have been detected by other LILCO programs. But this testimony was speculative in nature and, in any event, indicated that in some instances it was likely that the welds would have performed their functions. (Reply Finding RQA-106 (QA:351)).<sup>27/</sup> The County also cites welding violations found in the RAT inspection. Although welding discrepancies were identified by RAT, the welds themselves were acceptable as is -- another indication that it is improbable that unacceptable welds have escaped detection at Shoreham (Reply Finding RQA-107 (QA:352)).

#### E. The NRC I&E Program

Having found no merit in LILCO's QA efforts, the County moves on to decry the effectiveness of the NRC's I&E inspection program and to argue that little weight should be given to I&E's conclusion that LILCO has complied with Appendix B (SC Opinion at 110-117). Once again, the County rests its argument on two specious themes: lack of statistical methodology and

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<sup>27/</sup> LILCO witnesses were not cross-examined on welding violations.

failure to include structures, systems and components "important to safety" (see SC Opinion at 110, 112-13, 115). These issues are addressed in sections C.1 and C.2 of this reply.

The County also claims, without citation to the record, that the Staff's limited use of S&W and LILCO audit reports in the I&E program is a "serious deficiency" (see SC Proposed Opinion at 113). The record, fairly read, simply does not support this charge. The I&E program is an independent review designed to verify that the licensee's quality assurance program is being properly implemented (see LILCO Proposed Findings QA-455, -457). The I&E program relies on experienced, trained professionals who, in the course of their inspections and evaluations, review audit reports when appropriate (see LILCO Proposed Findings QA-461, -462, -476 to -478).

Similarly, the County implies, again without support from the record, that the lack of I&E review of LILCO quarterly reports constitutes a deficiency in the I&E inspection program (SC Opinion at 114). But as LILCO witness Gerecke testified, the information in the quarterly reports is not necessarily an indicator of significant QA problem areas. He also testified that if an audit finding was significant, Quality Assurance would not wait for the quarterly report, but would advise



management immediately. (Reply Finding RQA-103 (QA:396)).

While NRC Staff witnesses did state that the quarterly reports might conceivably be of some value (SC Proposed Finding QA-396; Reply Finding RQA-103 (QA:396); LILCO Proposed Findings QA-475, -476), Mr. Narrow indicated that, in his experience, they did not add anything to what he already knew from his other document review (LILCO Reply Finding RQA-103 (QA:396)).

The County asserts next that QA breakdowns at other plants raise questions as to the ability of I&E to make a competent judgment on the adequacy of quality assurance/quality control implementation (SC Proposed Opinion at 114). There has been no showing, however, that any deficiency at another plant exists at Shoreham (see LILCO Proposed Finding QA-456; Staff Proposed Finding QA-92). And spurred by the problems elsewhere, the Staff has taken steps to improve the effectiveness of I&E's review process (LILCO Proposed Findings QA-456, -480; Staff Proposed Finding QA-92; Reply Finding RQA-100 (SC QA:374)). These improvements were applied, in turn, to Shoreham, and the construction inspection results continued to be favorable (see LILCO Proposed Findings QA-566, -570, -631 to -634, -648).<sup>28/</sup> Though the CAT and RAT inspections and the

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<sup>28/</sup> Since the submission of LILCO's proposed opinion and findings of fact on QA/QC, the NRC Staff has issued a notice of vi-

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formal SALP process are of recent vintage, they confirm the effectiveness of LILCO's QA Program, which has been in effect since work began on Shoreham (LILCO Proposed Findings QA-9 to -13, -23 to -25, -566, -570, -632 to -634, -648; Reply Findings RQA-94 (SC QA:359) to -97 (SC QA:367), -104 (SC QA:403)).

Finally, the County contends that the Staff witnesses were not qualified to render an opinion regarding design quality assurance because Region IV personnel, not Region I, reviewed the adequacy of the GE and S&W design processes (SC Opinion at 115-16). The Staff witnesses testified that they had reviewed the design process in their work at Shoreham. Though the review was generally related to the design effort at the site (SC Proposed Finding QA-376; LILCO Proposed Findings QA-473 to -475), Stone & Webster uses the same design process for Shoreham wherever the work is done (see LILCO Proposed Finding B-220). Moreover, contrary to SC's opinion at 116, there are a number of ways Region I is informed of Region IV's

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olation concerning a previously identified discrepancy in the diesel generator testing program. The notice of violation was classified as severity level III, proposing a \$40,000 civil penalty. LILCO has not yet filed its response, which will indicate whether the Company opposes the violation, its classification and/or the proposed civil penalty.

design review activities. Periodic summary reports of Region IV's findings are reviewed by Region I management and Region IV procedures require notification of appropriate organizations, including regional offices, if significant deficiencies are found. (LILCO Proposed Findings QA-466, -468, -645, -646; Reply Finding RQA-102 (SC QA:395)). The NRC witnesses testified that to their knowledge Region IV had not found any significant deficiencies in the Shoreham design process (LILCO Proposed Findings QA-466, -645). And, of course, NRR conducts a significant review of the results of the design process -- the actual Shoreham design (LILCO Proposed Findings QA-471, -472; see Reply Findings RQA-98 (SC QA:372), -99 (SC QA:373)). Thus, the NRC does have a basis for concluding that the design process for Shoreham has been adequate.

In sum, the County presented no good reasons for finding I&E's program and judgments essentially worthless. The evidence is to the contrary.

#### F. Torrey Pines

Suffolk County would have the Board conclude that what may well be the most comprehensive independent construction and quality assurance verification ever undertaken at a nuclear power station, involving 35,000 manhours and costing nearly \$3

million, was also essentially worthless. Once more, the County seeks to make its case through a patently selective and lopsided interpretation of the record. (See LILCO Proposed Finding QA-674; Reply Finding RQA-111).

The County's proposed opinion on Torrey Pines is little more than a regurgitation, often verbatim, of its findings. The opinion thus suffers from the same problems as the findings, which with few exceptions are inaccurate or misleading (see Attachment 2).

The County urges that the Board adopt the following interpretations of the Torrey Pines record (Reply Finding RQA-112):

(1) That Torrey Pines was not adequately independent of LILCO and that the protocol governing the inspection was inappropriate (SC Proposed Opinion at 120-21);

(2) That the scope of the inspection was inadequate (id. at 122-32), and that Torrey Pines' conclusions are invalid because its sampling methodology was based upon its engineering judgment rather than statistical techniques (id. at 141-47).

(3) That Torrey Pines' Discrepancy/Finding process was deficient (id. at 132-37);

(4) That the discrepant conditions observed by Torrey Pines demonstrate that construction quality assurance for Shoreham was ineffective (id. at 137-40); and

(5) That LILCO's corrective action program was inadequate (id. at 140-41).

With respect to the inspection's independence and protocol, the record is devoid of any evidence that Torrey Pines was not, in fact, free to exercise its independent judgment in conducting the inspection and analyzing its results (see LILCO Proposed Opinion at 110-12; Reply Finding RQA-113 (SC QA:592); Attachment 2, at QA:590 to :602). The County distorts the record in its vain effort to discredit TPT's independence. For example, SC's proposed finding QA:592 represents to the Board that revenues from the inspection were so substantial that GA could not resist additional marketing contacts and implies that TPT's independence and integrity were impaired. Conveniently omitted from the County's finding or analysis are the facts that TPT revenues account for only ten percent of GA Technologies' revenues, and that the marketing contacts were completely unrelated to the inspection. (Reply Finding RQA-113 (SC QA:592)). The County was unable to reference anything but alleged "opportunities" for improper influence. The evidence is clear, however, that both LILCO and Torrey Pines were aware of the importance of maintaining independence and that the integrity of the inspection was safeguarded (see, e.g., LILCO Proposed Findings QA-729 to -734).

The record is similarly clear that the project's scope was not inadequate. The County's principal objections appear to be (1) that the effort focused on safety related structures, systems and components rather than those important to safety; (2) that when sampling was used it was based on Torrey Pines' judgment; and (3) that the various tasks into which the inspection was divided were, for various reasons, deficient (SC Proposed Opinion at 123). The issue of "important to safety" is discussed in section C.2 above (see Reply Finding RQA-114 (SC QA:652)).

The County's criticism of Torrey Pines' judgment-based sampling methodology permeates its findings. As discussed in section C.1 above, this criticism rests largely on the testimony of Dr. Samaniego. But his views on the applicability of statistical methodology to an inspection such as that performed by Torrey Pines reflect little more than academic speculation without any relevant grounding in actual experience (see LILCO Proposed Opinion at 119; LILCO Proposed Finding QA-727; see also Attachment 2, at QA:711, :715 to :732). Dr. Samaniego's inexperience in the nuclear industry stands in sharp contrast to that of Torrey Pines, Torrey Pines' Mr. Johnson, LILCO witness Burns and the NRC Staff witnesses, whose testimony establishes that judgment-based sampling is not only acceptable, but preferable in this context.<sup>29/</sup> (See, e.g.,

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<sup>29/</sup> Here, as in other instances, the County has chosen to ignore a pertinent portion of the record uncongenial to its posi-

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LILCO Proposed Opinion at 118-20, 139-42; section C.1 above).

The County's proposed opinion also criticizes the various tasks developed by Torrey Pines. None of the criticisms is valid, as illustrated by the following two examples. First, the County urges that the Board find Task C (physical inspection/walkdowns) inadequate because of its allegedly disproportionate emphasis on mechanical and piping features at the expense of electrical features (see SC Proposed Opinion at 129). While it is true that, in raw numbers, there was relatively less emphasis on electrical components, both the Torrey Pines Final Report and the testimony of Messrs. Johnson and Novarro establish that the scope of the Task C walkdowns was appropriate (see LILCO Proposed Finding QA-711; Attachment 2, at QA:628 to :630).<sup>30/</sup>

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tion. The record establishes that TPT, both on its own and at the request of LILCO, expressly considered and rejected the applicability of statistical methodology in its independent verification of Shoreham (LILCO Proposed Finding QA-724).

<sup>30/</sup> The County's complaints in this regard originate with the prefiled testimony of Mr. Hubbard. He, of course, did not conduct the walkdowns. Moreover, the omission in his prefiled testimony of any reference to Torrey Pines' explanation of the apparent imbalance, which was located in the middle of the section of the Final Report from which Mr. Hubbard quoted, illustrates the County's unwillingness to treat the record fairly. Compare LILCO Ex. 59, Vol. II, at 7-25 to -26 (includes explanation of relative percentages) with Hubbard and

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Second, the County's complaints about the scope of the inspection are also deficient because they fail to recognize the existence of subtasks D2 (testing of all but one lift of primary containment), D3 (observation of primary containment pressure test) and E2 (inspection of all completed preoperational tests) (see Reply Finding RQA-117). The County's failure to include in its rendition of the record any reference to these aspects of Torrey Pines' inspection illustrates its biased use of the extensive Torrey Pines record.

The County also incorrectly faults the Discrepancy/Finding process used by Torrey Pines. The findings relied on in this section of the County's opinion are rife with mischaracterizations of the evidence (see Attachment 2 at QA:642 to :671). In addition, the credibility of the County's description of this aspect of the Torrey Pines' methodology suffers from SC's omission of any reference to the Torrey Pines Finding Review Committee (see Reply Finding RQA-117). Given the County's oft-repeated, but never substantiated, charge that

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Samaniego, ff. Tr. 19,068, at 9-10 (quotes from Final Report but omits portion explaining different percentages) and Hubbard and Samaniego, SC Ex. 112, at 164-69 (explains omission from prefiled testimony as result of Mr. Hubbard's disagreement with omitted language).

the inspection was not independent, it is disappointing, but not surprising, that the County ignored this cornerstone of Torrey Pines' effort to ensure the integrity of its process.

The only value that the County ascribes to the Torrey Pines inspection derives from SC's view that the discrepancies it identified are additional evidence that the Shoreham quality assurance program has not been effectively implemented. The County, again, relies on counting the number of discrepancies, an approach soundly discredited in the record (see SC Proposed Opinion at 111, n.32; Reply Finding RQA-109 (SC QA:581)). Although the County failed to assess the safety significance of these discrepancies, the testimony of Messrs. Johnson and Novarro establishes that it was extremely small. Moreover, even if the County were correct that simple quantitative analysis of discrepancies is useful, Torrey Pines noted fewer than 300 discrepant conditions out of the roughly 150,000 conditions inspected -- a ratio that inspires confidence in the effectiveness of LILCO's program, especially in light of the qualitative insignificance of the discrepancies (see Reply Finding RQA-115 (SC QA:674)).

The final alleged shortcoming rests on what the County argues was an inadequate corrective action program undertaken by LILCO in response to the inspection results. SC urges not

only that the specific Corrective Action Plans (CAPs) undertaken to cure the findings were deficient, but also that LILCO should be directed to repeat its assessment of all discrepant conditions, in addition to those that became findings. (SC Proposed Opinion at 140-41). The County's arguments are founded on its findings, almost all of which are flawed in one or more respects. Further, the County has ignored evidence that LILCO and contractor personnel reviewed all PFR's and valid DR's for safety significance and the necessity for modifications. None were required. (Reply Finding RQA-116 (SC QA:710); Attachment 2, at QA:691 to :709). Fairly read, the record shows that LILCO responded appropriately to the discrepancies found by Torrey Pines. To hold otherwise simply because the CAPs did not have a separate section entitled "Root Cause" would be to ignore the abundant testimony that LILCO and Torrey Pines sufficiently engaged the quality assurance implications of the observed discrepancies.

For the foregoing reasons, as well as those set forth in LILCO's initial Proposed Opinion, the Board should find that this important independent verification affords substantial additional confidence that quality assurance at Shoreham has been effective.

G. Operational Quality  
Assurance -- Independence

SC Contention 13(a) raises the concern that LILCO's Operational Quality Assurance Section does not have sufficient organizational freedom and independence from costs and scheduling concerns and, therefore, does not satisfy Criterion I of Appendix B (SC Proposed Opinion at 148). LILCO and the Staff agree that LILCO's organizational structure complies with Criterion I (LILCO Proposed Finding QA-749; Staff Proposed Finding QA:80). Suffolk County, while having few factual disagreements with LILCO and the Staff, nevertheless concludes that it does not.

At the outset, it is important to note that the proposed findings of LILCO, the Staff and Suffolk County agree on the details of LILCO's organizational structure, including that of the Operational Quality Assurance Section (see LILCO Proposed Findings QA-744 to -748; Staff Proposed Findings QA:69 to :73; SC Proposed Findings OQA:1 to :7). In addition, all parties agree that the Staff's Standard Review Plan is an appropriate document for judging compliance of LILCO's OQA structure with the requirements of Criterion I, and that the Plan permits the organizational structure used by LILCO (LILCO Proposed Findings QA-756, -757; Staff Proposed Finding QA:79;

SC Proposed Finding OQA:15). Finally, LILCO and SC agree that the guidance offered by ANSI Standard 18.7-1976, which was adopted by Regulatory Guide 1.33, Revision 2, expressly prefers an organizational structure in which the Operating Quality Assurance Engineer reports to onsite plant management (LILCO Proposed Finding QA-758; SC Proposed Finding OQA:18). Despite these areas of agreement, Suffolk County would have this Board find that LILCO's structure does not meet Criterion I because of unsubstantiated claims that the Plant Manager will elevate cost and scheduling considerations above all others, that the Plant Manager will transmit this preference to the Operating Quality Assurance Engineer through job intimidation, and that the checks and balances in LILCO's QA structure will be ineffective in preventing this pressure.

Suffolk County's conclusion rests largely on its perception that the primary concern of the Plant Manager is with cost and scheduling, not safety, and that the Plant Manager transmits this preference to the OQA Engineer through his administrative control over him (see SC Proposed Opinion at 149-150). This reasoning has two flaws. First, the Plant Manager is responsible for the safe operation of Shoreham (LILCO Proposed Finding QA-747; Staff Proposed Finding QA:70). This duty necessarily implies that the Plant Manager must balance safety

consideration with cost and scheduling concerns in the operation of the plant. In fact, the Plant Manager is specifically delegated responsibility for quality assurance at the plant (id.). Staff witnesses testified that the Shoreham Plant Manager has demonstrated a strong concern for quality (Reply Finding RQA-118). Also, direct responsibility for cost and scheduling, like operational quality assurance, has been delegated to people reporting directly to the Plant Manager (Staff Proposed Finding QA:75).

Second, while the Plant Manager is authorized to review the performance of the Operating Quality Assurance Engineer, the checks and balances contained in LILCO's organizational structure help to ensure that this authority will not be abused (LILCO Proposed Finding QA-751; Staff Proposed Finding QA:76). For example, SC's concern that the OQA Engineer will be intimidated by the Plant Manager's authority to fire him is without merit. Should the Plant Manager fire the OQA Engineer for his failure to acquiesce in some quality matter, the OQAE would then have every incentive to report this to the Quality Assurance Manager and other upper level management (see id.; see also SC Proposed Finding OQA:14). Thus, the Plant Manager's power to fire the Operating Quality Assurance Engineer does not hold the intimidation value ascribed to it by the County.

Suffolk County's reliance on the earlier separation of the Quality Assurance Department from the Nuclear Projects Manager, as an indication of the inherent weakness of LILCO's operational quality assurance structure, is misplaced. It fails to consider (1) that the Plant Manager has responsibility for safety, including quality assurance, as well as cost and schedule matters, and (2) that checks and balances exist to ensure the OQAE has access to the Quality Assurance Manager who has no cost and scheduling responsibility.<sup>31/</sup> It is the effectiveness of those checks and balances that must be examined in judging the effectiveness of LILCO's current structure.

The County contends that the checks and balances are not effective (SC Proposed Opinion at 150). It argues that the Quality Assurance Manager cannot protect the OQA Engineer; that the review procedures operate only after the fact; and that the OQA Engineer's shutdown authority is without substance. These contentions are baseless. SC's contention that the Quality Assurance Manager cannot protect the OQA Engineer rests on Suffolk County's view that the Quality Assurance Manager, who

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<sup>31/</sup> In fact, the NRC changed Criterion I in 1975 to make it clear that complete separation of quality assurance functions from cost and schedule considerations was not required (LILCO Proposed Opinion at 126).



is on the same organizational level as the Plant Manager, operates as nothing more than a messenger -- merely passing along OQA concerns to higher authorities (SC Proposed Opinion at 151). Nothing in the record suggests that the Quality Assurance Manager will so abdicate his responsibilities. In fact, NRC I&E has audited LILCO and has determined that the Company's organizational structure provides sufficient independence (Reply Finding RQA-118).

Suffolk County's suggestion that review procedures will operate only after the fact ignores a primary purpose of creating review groups, namely, breeding a concern for Quality Assurance matters within LILCO's managerial structure, including the Plant Manager (see generally LILCO Proposed Finding QA-754; Staff Proposed Finding QA:78). It also ignores the on-going nature of some of the checks (see, e.g., LILCO Proposed Findings QA-801, -802). And the County's comments regarding the efficacy of the Operating Quality Assurance Engineer's shutdown authority focuses on only a small portion of his stop work authority, and in those circumstances if the equipment or activity in question is a limiting condition of operation in the Technical Specifications, the operator's license requires him to shut down the plant (LILCO Proposed Finding QA-752).

SC offers no clear alternative to LILCO's organizational structure. Instead, one can infer two potential alternatives from the County's proposed opinion: first, that the Operating Quality Assurance Engineer report functionally to the Plant Manager but that administrative authority (including performance evaluations and firing) reside in the Quality Assurance Manager; second, that the OQA Engineer be completely removed from the control of the Plant Manager and placed entirely under the control of the Quality Assurance Manager. Neither alternative is preferable to the organizational structure utilized by LILCO. (See LILCO Proposed Finding QA-758). Drawing the distinction between functional and administrative authority implicit in the first alternative makes no practical sense. The Quality Assurance Manager, who would be required to judge the performance of the OQA Engineer, would have to make his evaluation in a vacuum since the Plant Manager, rather than he, would be aware of the day-to-day performance of the OQA Engineer. Even if one accepts SC's depiction of the Plant Manager as obsessed with cost and scheduling concerns, then this organizational structure would be no more effective in ensuring independence since, in many cases, the Quality Assurance Manager would need to rely on the Plant Manager for comments concerning the OQA Engineer's performance. Thus, no additional independence would be gained.

The alternative of providing complete control over the OQA Engineer to the Quality Assurance Manager would also yield no net benefits. The advantages of the "chemistry" of being part of the plant team, which were detailed by witnesses Gilray and Muller (see LILCO Proposed Finding QA-754; Staff Proposed Finding QA:78) and which serve as the bases for ANSI Report N18.7-1976's preference for the LILCO organizational structure, would be lost.<sup>32/</sup> In its place, an attitude that quality assurance is an "outside" concern might develop. Thus, this alternative is not attractive. In sum, LILCO's current OQA organization is permissible as well as preferable.

#### H. Conclusion

In large measure, the County has simply ignored the record so as to be free to argue its QA prejudices. Even then, SC has been unable to identify any safety concern as a result of alleged defects in the implementation of Shoreham's QA Program. The County could only point to discrepancies noted in the many and varied reviews of Shoreham, arguing that they might pose safety concerns while ignoring the substantial

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<sup>32/</sup> These advantages were also recognized by the Commission in modifying its regulations to permit the type of structure used by LILCO (see LILCO Proposed Opinion at 132).

evidence that, where appropriate, extensive corrective and preventive actions have been taken to remedy the problem identified and to ensure similar problems do not exist elsewhere. And the County could only harp on the number of quality assurance findings in an effort to demonstrate QA breakdowns. But SC utterly failed to present an analysis based on a full and fair treatment of the record that suggests any programmatic or widespread deficiency in LILCO's Quality Assurance Program.

The County has attempted vigorously to discredit the LILCO QA Program, the NRC I&E effort, and the Torrey Pines Independent Verification. The fact remains that every comprehensive review of Shoreham has resulted in the same conclusions. First, each review has confirmed that discrepancies exist, as is inevitable in a project such as Shoreham (LILCO Proposed Findings QA-15, -16). But the findings, in large part, have not been significant. Second, each review has confirmed the adequacy of the quality assurance program for Shoreham. Thus, based on the very extensive audit programs of LILCO and its contractors (see LILCO Proposed Findings QA-122 to -168), the Company has concluded that Shoreham's QA has been properly implemented (see, e.g., LILCO Proposed Findings QA-169 to -172, -175, -178, -183). The NRC Staff, having reviewed the plant's construction for over ten years, has also found Shoreham's QA

to have been effectively implemented (see, e.g., LILCO Proposed Findings QA-173, -182, -305 to -307, -374 to -376, -455, -485, -513, -525; Staff Proposed Findings QA:26, :83, :97).

After a number of comprehensive team inspections, the Staff has reaffirmed its favorable conclusions about quality assurance at Shoreham. Following the Construction Assessment Team Inspection, the Staff concluded:

Management involvement in assuring quality was evidenced by explicitly stated procedures and policies, well-maintained and available records, a working corrective action system, decision-making with adequate management review and design activities well controlled and verified by QC inspection. The installed piping and wiring conformed to drawings and specifications. Documents, drawings and technical materials were readily available and carefully controlled. No inferior workmanship was observed. The NRC inspection team identified very few exceptions to this assurance of quality. Several minor discrepancies and two of the violations were corrected by the licensee prior to completion of the inspection.

(LILCO Proposed Finding QA-535). And after the Readiness Assessment Team Inspection, the team leader for the inspection and the Senior Resident Inspector voiced renewed confidence in the QA program for Shoreham (see LILCO Proposed Findings QA-632 to -634; Staff Proposed Finding QA-90). And in the most recent SALP evaluation of the plant, the NRC Staff concluded:

Overall, we find that your performance in construction preoperational activities is acceptable and directed towards safe facility completion.

(LILCO Proposed Finding QA-648).

Finally, LILCO hired Torrey Pines Technology to conduct an independent review of the adequacy of Shoreham's construction. Torrey Pines concluded:

The small number of discrepancies identified, the very small number of potential safety concerns identified, the lack of trends in the discrepancies or safety-related concerns, and the availability of QA documentation on the construction activity from the beginning of the project demonstrat[e] that the QA program has been effectively applied over the duration of the project and that the resultant safety-related plant hardware meets construction requirements of the design documents.

. . . .

Based on the data reviewed during this independent construction verification effort, the QA program for construction of safety-related equipment at the Shoreham Nuclear Power Station is judged satisfactory.

(LILCO Proposed Finding QA-738).

In each instance where Shoreham QA has been subjected to rigorous review, the conclusion has been the same -- the program passes muster. It has complied and continues to comply with 10 CFR Part 50, Appendix B, and it has been effectively implemented.

## II. ENVIRONMENTAL QUALIFICATION

LILCO concurs generally in the proposed opinion and findings of fact of the NRC Staff regarding Environmental Qualification, but disagrees in several respects with the arguments and treatment of the record contained in Suffolk County's proposed opinion and findings of fact on this subject.<sup>33/</sup>

This reply is keyed primarily to the County's proposed opinion; however, proposed findings of fact are discussed, as appropriate, according to the subject matter to which they relate. That this reply may not address any particular finding does not mean either that LILCO agrees with it or even finds no fault with it.

Suffolk County addresses four primary questions in its proposed findings and opinion: (1) whether Shoreham complies with 10 CFR § 50.49(b)(1) in its treatment of safety-related electrical equipment; (2) whether there is sufficient evidence to conclude that Shoreham will meet the requirements of 10 CFR

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<sup>33/</sup> The County's proposed opinion on SC Contention 8 is found in Vol. 1 at pages 156 to 171 of "QA/QC and EQ Supplement to Suffolk County's Proposed Opinion, Findings of Fact, and Conclusions of Law in the Form of a Partial Initial Decision." The County's proposed findings of fact are found in Vol. 2 of its submission at pages 511 to 534.



§ 50.49(b)(2), pertaining to nonsafety-related electrical equipment; (3) whether there is sufficient information to find that Shoreham complies with 10 CFR § 50.49(b)(3), relating to post-accident monitoring equipment; and (4) whether the Staff will sufficiently review both the qualification of items that were not fully qualified at the time of the audits and the Justifications for Interim Operation (JIO's) for equipment that will still not be fully qualified at the time of fuel load.

Although the County raised questions regarding qualification methodology and aging considerations in its contention and testimony, neither the County's proposed opinion or findings address these subjects, thus conceding them to LILCO and the Staff, whose treatments of them are consistent. (See LILCO Proposed Opinion at 162-63 and Proposed Findings EQ-40 to -53; Staff Proposed Opinion at 22-23 and Proposed Findings EQ:33 to :37).

#### A. Safety-Related Equipment

Under 10 CFR § 50.49(b)(1), certain safety-related electrical equipment must be included in EQ programs. Both the Staff and LILCO believe that Shoreham complies fully with this requirement. (LILCO Proposed Opinion at 156; Staff Proposed Opinion at 19-20 and Proposed Findings EQ:19 and :20). The

County urges the Board to find that not all safety-related equipment required to be included in the EQ program has been included. (SC Proposed Opinion at 160 and Proposed Finding EQ:22). The sole basis for its argument is the opinion of the County's witness, Mr. Minor, that certain portions of the Standby Liquid Control System (SLCS), not included in the EQ program, perhaps should be.

SC's argument begins with the proposition that neither an identification of specific components excluded from the Shoreham EQ program nor a basis for their exclusion is presented in the Shoreham EQSR, and, therefore, in Mr. Minor's judgment it is impossible to determine how or on what basis LILCO excluded certain safety-related equipment. (SC Proposed Finding EQ:15).

The County's argument is incorrect. As NRC witness Kennedy explained, emergency operating summaries are developed for each item of safety-related equipment even if that equipment is not included in the EQSR. These summaries contain detailed information underlying that presented in the EQSR: operability code, safety functions, operability time requirements and other information for each item. The Staff has reviewed these summaries. (Tr. 19,498-502 (Kennedy)). Only those items with an operability code of "A" or "B" were

included in the EQ program (and displayed in the EQSR) since their failure due to a harsh environment could inhibit accident mitigation. (LILCO Proposed Finding EQ-13). Still, adequate documentation exists, and has been reviewed by the Staff, to demonstrate the basis for exclusion or inclusion of equipment into the EQ program, and the County's argument in the abstract is thus incorrect.

The County attempts to illustrate its allegation of inadequate documentation with one example, the SLCS. The County asserts that certain components of that system have been excluded from the Shoreham EQ program without "satisfactory explanation." (SC Proposed Opinion at 160). In SC Proposed Findings EQ:16 to :22, the County discusses the SLCS and why it believes that the SLCS should be in Shoreham's EQ program. Specifically, SC Proposed Finding EQ:21 asserts that the SCLS squib valves as well as other parts of the SLCS necessary for the squib valves to function and the SLCS pressure indicator are within the scope of § 50.49 and should be included in the Shoreham EQ program. Mr. Minor stated that he believed these components of the SLCS should be included because if an ATWS event were allowed to proceed without mitigation beyond ten minutes there "possibly" would be a fuel failure that would raise radiation levels in the drywell to levels approaching a harsh environment. (Tr. 19,671-72 (Minor)).<sup>34/</sup>

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<sup>34/</sup> The statement in SC Proposed Finding EQ:17 that in Mr. Minor's opinion mitigation must occur "very early" in the

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The record on the ATWS contention makes clear,<sup>35/</sup> however, that there is no support for Mr. Minor's premise, namely, that an ATWS event would not be mitigated within ten minutes. During the litigation of SC Contention 16 -- ATWS, the testimony established that an ATWS is recognizable within seconds of its occurrence. (LILCO Proposed Finding E-10). LILCO witness Calone testified that standby liquid control could be injected within one minute of the start of an ATWS transient (LILCO Proposed Finding E-32); and in any event, the operator within ten minutes of the event "would very definitely" initiate the SLCS. (Tr. 9,242 (Eckert)).

Equipment need be environmentally qualified only if its purpose is to function in a harsh environment following a design basis event.<sup>36/</sup> The SLCS does not do so; it is to

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process to avoid unacceptable radiation levels must be understood, as the transcript reference in SC Proposed Finding EQ:17 makes clear, as being mitigation within ten minutes.

<sup>35/</sup> The Board specifically invited reference to the ATWS record on this point. (Tr. 19,674-75 (Brenner, J.)).

<sup>36/</sup> SC Proposed Finding SC:18 restates LILCO witness Kascsak's statement that certain portions of SLCS may be exposed to a harsh environment. However, there is a distinction between exposure to and functioning in a harsh environment; and LILCO witness Kascsak never agreed that the SLCS would have to function in a harsh environment. (See Tr. 19,646 (Kascsak)).

mitigate the consequences of an ATWS event -- an event which, even SC witness Minor agreed, does not produce a harsh environment if mitigated within ten minutes. Accordingly, the design basis of the SLCS does not require it to function in a harsh environment resulting from either a pipe break outside containment or by a loss-of-coolant accident. (Tr. 19,647 (Kennedy)). Because the SLCS as a whole does not function in a harsh environment, its components were properly excluded from the Shoreham EQ program, though LILCO's component-by-component analysis (reviewed by the Staff) led LILCO to classify at least one component into Operability Code "B." (Staff Proposed Finding EQ:21).

For the foregoing reasons, the Board should find that all components of the SLCS necessary to be environmentally qualified have been included in Shoreham's EQ program. It also should reject SC Proposed Finding EQ:22, which urges the Board to find that not all safety-related components have been included in the EQ program. Documentation exists, not only in the EQSR but in documents underlying it, to explain and substantiate the classification of systems and components for purposes of environmental qualification. Further, the only example that the County offered to substantiate its claims -- the SLCS -- fails for the reasons discussed above. Suffolk County

has failed to present a single item which under 10 CFR § 50.49(b)(1) should be but is not in the EQ program.<sup>37/</sup>

The Board should find that Shoreham complies fully with § 50.49(b)(1) in that it includes all required safety-related equipment in its EQ program.

B. Nonsafety-Related Equipment

The Final Rule on Environmental Qualification, 10 CFR § 50.49(b)(2), contains a new provision requiring that certain nonsafety-related equipment be included in EQ programs. This rule had been published in the Federal Register five days before the litigation of this issue (Board Exhibit 3, ff. Tr. 19,553), and had not yet taken effect.

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<sup>37/</sup> Indeed, Mr. Minor's actual testimony (Tr. 19,697-98) does not stand for the proposition that he believes that the SLCS, or specific components of it, ought to be considered as safety-related (i.e., potentially within § 50.49(b)(1)). Rather, after conceding that parallel paths of information on standby liquid flow exist, Mr. Minor stated (Tr. 19,698) that he was not concerned whether the SLCS equipment was classified within § 50.49(b)(1) (safety-related) or § 50.49(b)(2) (nonsafety-related); he merely thought it should be in the EQ program. Of course, this statement by Mr. Minor destroys the relevance of his SLCS testimony to support the County's assertion that not all pertinent safety-related (§ 50.49(b)(1)) equipment has been included in the EQ program, since Mr. Minor was not asserting that the SLCS was or should be classified as safety-related.

Only safety-related equipment had been required to be included in EQ programs under the Commission's previous requirements, Order CLI-80-21 and NUREG-0588, to which the Shoreham program conforms. (LILCO Proposed Findings EQ-8 and -9; Staff Proposed Finding EQ:6; SC Proposed Findings EQ:5 and :6). Consistently, prior to the issuance of the Final Rule, the Commission, to implement the relevant portions of General Design Criterion (GDC) 4 that refer to equipment "important to safety," had interpreted that phrase to mean "safety-related." Tr. 19,391 (Noonan).<sup>38/</sup>

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<sup>38/</sup> This brief history of § 50.49(b)(2) provides a critical perspective for appraising several SC proposed findings. For example, present regulatory requirements in 10 CFR § 50.49(b) (SC Proposed Finding EQ:6) or of GDC 4 (SC Proposed Finding EQ:7) must be viewed in light of the only recent emergence of the classification of "nonsafety-related but important to safety." SC's discussions of the requirement that certain nonsafety-related equipment be included in EQ programs under 10 CFR § 50.49(b)(2) (e.g., SC Proposed Findings EQ:3 and :6), its discussions of the scope of Shoreham's EQ program (e.g., SC Proposed Findings EQ:4 to :6), and its discussions of the Staff's review of the scope of Shoreham's program (e.g., SC Proposed Finding EQ:9) do not provide a historical perspective. When the Shoreham EQ program was developed and when the issues were litigated there was no requirement that nonsafety-related equipment be included in EQ programs -- it was a provision of a rule that had not yet taken effect.

Similarly, the fact that the Final Rule had been published only shortly before the hearing and was not yet in effect is important in understanding the Staff's progress in establishing guidelines for implementation of 10 CFR § 50.49(b)(2) (e.g., SC Proposed Findings EQ:36 to :45, :48).



Shoreham's EQ program has already included much, if not all, of the equipment contemplated by Paragraph (b)(2) of § 50.49, even though the program predates the requirement. (LILCO Proposed Findings EQ-26 and -27). A brief explanation of the basis for the new requirement explains why and also provides a perspective by which to judge LILCO's compliance with the requirement. The County neither provides one nor counters the explanation provided by the NRC Staff.

As NRC witness Noonan explained, Paragraph (b)(2) was added to respond to a Staff concern arising out of the fact that older plants did not classify equipment in the same manner as is done today, and therefore may not have considered the effects of nonsafety-related equipment failures upon the safety-related equipment. (LILCO Proposed Findings EQ-24 and -25; Staff Proposed Finding EQ:25). Paragraph (b)(2) requires that such consideration be given and that if such failures could preclude safety-related equipment from fulfilling its function, the nonsafety-related equipment must be included in EQ programs.

On the other hand, if during the design process nonsafety-related equipment whose failure could preclude the functioning of safety-related equipment was classified as safety-related, the Staff's concerns would be resolved. (LILCO

Proposed Finding EQ-25; Staff Proposed Finding EQ:25). In short, there would be no equipment falling within Paragraph (b)(2), because it would have been classified as safety-related.

As LILCO witness Kascsak testified, Shoreham's design philosophy for equipment of the type now included in Paragraph (b)(2) involved either classifying it as safety-related or isolating it so as to preclude its failure from having any effects on safety-related equipment. Accordingly, there would be no equipment falling within Paragraph (b)(2). (LILCO Proposed Finding EQ-26; Staff Proposed Finding EQ:24; SC Proposed Finding EQ:51). LILCO has performed various analyses in addition to the Regulatory Guide 1.75 analysis tending to demonstrate that the Shoreham design process has eliminated Paragraph (b)(2) equipment. (LILCO Proposed Finding EQ-29; see SC Proposed Finding EQ:52). LILCO believes that it has addressed every plausible type of interaction between nonsafety-related and safety-related equipment. (LILCO Proposed Finding EQ-29).

The Staff concurs that the design philosophy of many plants such as Shoreham should result in there being little if any equipment falling within Paragraph (b)(2). (Staff Proposed Finding EQ:25; Tr. 19,642-43 (Noonan)). The Staff witnesses agreed with LILCO that the class of equipment falling within

Paragraph (b)(2) at Shoreham will be very small or nonexistent. This belief was not pure judgment on the witnesses' part, but is based on discussions with the author of the Rule, other discussions with the Staff, and the Staff's review of LILCO's compliance with Regulatory Guide 1.75, "Physical Independence of Electric Systems." (Tr. 19,510-14 (Kennedy, Noonan)). Staff witness Kennedy doubted that a further review of equipment at Shoreham would produce a significantly enlarged category of equipment falling within Paragraph (b)(2). (Tr. 19,512 (Kennedy); see also LILCO Proposed Findings EQ-27 to -29; Staff Proposed Findings EQ:24 to :28).

Given this perspective, the County's statement that "[t]here was no dispute that the Shoreham EQ program does not include any nonsafety-related equipment as defined in Paragraph (b)(2) of Section 50.49" (SC Proposed Opinion at 158), is misleading. This statement implies that such equipment exists and that the parties agreed that none of it was included in Shoreham's EQ program. The evidence, discussed above, shows the contrary to be true, as both the Staff and LILCO witnesses presently believe that there is no or very little of such equipment at Shoreham. (LILCO Proposed Findings EQ-26 and -27; Staff Proposed Findings EQ:24 and :26; SC Proposed Findings EQ:45 and :50).

The County does not expressly disagree with these conclusions regarding how much Shoreham equipment falls within Paragraph (b)(2). The County's main assertion is that the parties cannot know definitely the extent to which Shoreham has equipment covered by Paragraph (b)(2). SC Proposed Findings EQ:36 to :42 purport to establish that no criteria had been developed regarding the scope and implementation of Paragraph (b)(2) and assert, on that basis, that the degree to which Shoreham is affected is unknown. The County's proposed findings do not present a fair picture.

While precise and detailed guidelines had not been developed at the time of the hearing (before the Rule had even taken effect) as to what specific equipment falls within Paragraph (b)(2), general information sufficient to make necessary judgments did and does exist. For example, the Staff witnesses testified, as discussed above, that to a large degree compliance with Regulatory Guide 1.75 would eliminate equipment otherwise falling within the scope of Paragraph (b)(2) and also that the Shoreham design philosophy had eliminated much of the contemplated equipment.<sup>39/</sup> (LILCO Proposed Findings EQ-27 and

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<sup>39/</sup> SC Proposed Finding EQ:10 is clearly erroneous when it urges the Board to find that no conclusions can be drawn from LILCO and Staff testimony on the adequacy of Shoreham's EQ program as it relates to equipment that is important to safety but

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-28; Staff Proposed Findings EQ:25 and :26; SC Proposed Finding EQ:46). This evidence is clear and undisputed by any party.

The Staff also testified that the equipment, if any, which would fall within Paragraph (b)(2) would vary significantly from plant to plant because of differing physical layouts of plants and differing design philosophies. (Tr. 19,645 (Noonan)). These facts cast substantial doubt about either the need for or value of specific criteria for implementing Paragraph (b)(2) at Shoreham, given the small (or nonexistent) number of components expected to be involved and the variations among individual plants. Nor did the Staff witnesses, despite repeated invitations to do so, venture any suggestion that they felt that a standard, or even plant-specific, list of electrical equipment important to safety, would be necessary to enable them to perform their review functions.<sup>40/</sup>

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(footnote cont'd)

nonsafety-related. There was substantial testimony at the hearings directly relevant to this issue.

<sup>40/</sup> The County attempted at length on cross-examination to induce the Staff witnesses to endorse completion and use of a list of items of electrical equipment important to safety in connection with reviews under § 50.49. The most that could be dredged from them was Mr. Noonan's statement that he would "suppose" such a list, "if reviewed and approved by the Staff," would be "helpful," and that if such a list existed, he would use it. (Tr. 19,580-84 (Noonan)). However, as he also pointed out, no such list exists. (Tr. 19,585-86 (Noonan)). Neither

(footnote cont'd)

The County could not demonstrate a single item or component that should be included in the EQ program under Paragraph (b)(2). Although Mr. Minor suggested that several systems be considered, he was unable to provide justification for including them when questioned by Judge Morris.<sup>41/</sup> (LILCO

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(footnote cont'd)

Staff witness ever stated that he thought such a list would be either necessary or desirable; and clearly the Staff does not believe that such a list is necessary since the EQ Rule does not require one and the Staff has not independently required one of LILCO. Further, as LILCO witness Kascsak pointed out without contradiction, a generic list of structures, systems and components important to safety would be prepared on a different basis than a list prepared specifically for evaluations under § 50.49, and therefore comparisons between the two lists would not be meaningful. (Tr. 19,586 (Kascsak)). As is discussed further in Part E of this Reply, the preceding material, which summarizes the record on this point, is far from sufficient to support the County's proposals (SC Proposed Finding EQ:62(a)-(d)) for preparation of various lists of equipment "important to safety," both plant-wide and oriented toward § 50.49, by either LILCO or the Staff.

<sup>41/</sup> In large part, Mr. Minor's suggestion that the nonsafety-related equipment should be included in Shoreham's EQ program was based on the premise that their failure could result in misleading information being provided to the operator. (Tr. 19,684-99 (Minor); Minor, ff. Tr. 19,665, at 3). LILCO explained that the new rule does not require the inclusion of equipment into EQ programs on the sole basis that the equipment's failures could mislead the operator. (LILCO Proposed Opinion at 159-60). The County, while disagreeing with LILCO's position, concedes that the plain language of § 50.49 supports LILCO. (SC Proposed Opinion 166-67). The County can offer no support for its own position other than Mr. Minor's unsupported assertion.

Proposed Findings EQ-30 to -36; Staff Proposed Findings EQ:30 and :31). Nor has the County supported its argument with anything other than abstract logic to establish a need for detailed criteria. Given the parties' well-founded expectations that there is no or very little equipment falling within Paragraph (b)(2), there is no need for detailed criteria to permit an adequate analysis to be made by LILCO or an adequate review to be performed by the Staff.

Finally, LILCO will submit to the Staff an evaluation showing what equipment, if any, falls within Category (b)(2). will review. Based on the list, the Staff will determine whether an audit review is necessary. Any equipment added as a result of Paragraph (b)(2) will be fully qualified in accordance with the Final Rule. The Staff's review will ensure that LILCO complies with Paragraph (b)(2). (LILCO Proposed Finding EQ-23; Staff Proposed Finding EQ:22).

#### C. Post-Accident Monitoring Equipment

Regulatory Guide 1.97, Revision 2 requires that certain post-accident monitoring equipment be installed at nuclear plants. 10 CFR § 50.49(b)(3) requires that certain of this equipment must be environmentally qualified. LILCO has stated its intent to comply with these provisions. (Kascsak, et al.,



ff. Tr. 19,305 at 7). Full compliance with Regulatory Guide 1.97, however, is not required before fuel load, and indeed, an individual schedule for each plant is to be established. (LILCO Proposed Findings I-10 to -12).

Suffolk County asserts that Shoreham's compliance with 10 CFR § 50.49(b)(3), including the justifications for interim operation, cannot be fully determined until Shoreham fully complies with Regulatory Guide 1.97, Revision 2 (SC Proposed Opinion at 167-68 and Proposed Finding EQ:58), and complains about the fact that such a determination will not be made before fuel load.

While the County's assertions may be literally accurate, they prove nothing. They ignore the simple fact that the EQ program is a reflection of the plant -- unless equipment is to be installed prior to operation, it is not included in the program prior to operation. (Tr. 19,527 (Kascsak)). Since Shoreham is not required to have all Regulatory Guide 1.97 equipment installed prior to fuel load, the mere fact that not all such equipment will have been qualified or interim-justified prior to fuel load furnishes no basis for an argument that Shoreham does not comply with § 50.49(b)(3). The Staff will review the environmental qualification of items as they are implemented in accordance with SECY-82-111. (Staff

Proposed Finding EQ:32). This course is logical and sufficient.

As to the County's assertion that LILCO must provide justifications for interim operation prior to fuel load for any Regulatory Guide 1.97 equipment not environmentally qualified by that time (SC Proposed Opinion at 167 and Proposed Finding EQ:58), NRC witness Kennedy explained that the Commission, in effect, has implicitly provided such justification by not requiring the installation of such equipment prior to fuel load. (LILCO Proposed Finding EQ-39; Staff Proposed Finding EQ:32). There is no basis for any finding other than that Shoreham will comply in a timely fashion with Regulatory Guide 1.97 and will qualify the equipment in accordance with 10 CFR § 50.49(b)(3).

#### D. Staff Review

The County questions the sufficiency of the Staff's review of items not fully qualified at the time of the audits, and of the justifications for interim operation for items that will not be qualified at fuel load. (SC Proposed Opinion at 160-63). The County's claims, if viewed in proper factual perspective, are groundless.

1. Staff Review of Items Not Fully  
Qualified at the Time of the Audits

At the time of the audits in the second quarter of 1982, LILCO identified 81 types of equipment that were not fully qualified and which needed to be either retested or replaced. (Tr. 19,476 (Kascsak)). SC Finding EQ:28 correctly states that at the time of the hearing (late January 1983), about 30% of the remaining items had been fully qualified. The finding, however, fails to mention that LILCO expects to make more rapid progress clearing the remaining items than was possible on the earlier ones because of the substantial lead time that was necessary to develop the program for all items. In fact, much of the retesting necessary to qualify the items was already underway at the time of the hearing on this issue. (Tr. 19,559 (Kascsak)). The Staff will require as a licensing condition that all equipment be fully qualified by the end of the first refueling outage, a time frame consistent with the Rule's requirement of final qualifications by November 30, 1985. 10 CFR § 50.49(i). (LILCO Proposed Finding EQ:56; Staff Proposed Finding EQ:10).

SC Proposed Finding EQ:27 is correct in noting that the Equipment Qualification Branch does not presently plan to conduct another audit to determine whether the items have been

properly qualified, but rather will rely on LILCO responses as to the resolution of the items. The County's proposed finding, however, fails to come to grips with NRC witness Noonan's testimony that although the Staff has no plans presently to do so, it will conduct a further review if any reason develops which would warrant it. (Tr. 19,472 (Noonan)). Nor does the County's proposed finding acknowledge that at a future date, the I&E branch will perform an audit to confirm proper qualification. (Staff Proposed Finding EQ:11).

The County professes concern that "a proposed SER supplement intended to close out the qualification deficiencies will not be based upon any independent Staff review or analysis." (SC Proposed Opinion at 161). It asks that the Staff be required to perform another audit or review. (SC Proposed Finding EQ:62). The County's concern is purportedly based upon the Staff's statement in the SER that the deficiencies are "cause for concern and require further case by case evaluation." (SC Proposed Finding EQ:26). This finding has not fairly portrayed the Staff's statement, which clearly says that the deficiencies do not necessarily mean that the equipment is unqualified. (Kennedy and Noonan, ff. Tr. 19,311, Attachment 3 at 1-11). In fact, the Staff found that there was no equipment at Shoreham that had to be replaced prior to startup. (Id. at 1-10).

Given the nature of equipment qualification programs, it is acceptable for the Staff to rely upon LILCO to resolve these items. In fact, the Staff's statement that the items required "further case by case evaluation," in context, contemplates LILCO's evaluation, not the NRC's. (Id. at 1-11). The County ignores the evidence as to why it is acceptable for the Staff to rely on LILCO. As noted above, it was LILCO which identified the deficiencies in the first instance and proposed the corrective methods to be used to achieve full qualification of the items. The Staff concurred with LILCO's decision. (Tr. 19,476 (Kascsak)). LILCO understands fully and exactly what is necessary to qualify the equipment. (Tr. 19,472, 19,475 (Noonan)). The EQ program is an ongoing one which will remain active for a number of years. (Tr. 19,476 (Noonan)). LILCO is required to keep all pertinent records in an auditable form and, at a future date, the Office of Inspection and Enforcement will look at equipment qualification of these items to confirm proper qualification. (Tr. 19,470-71, 19,477-78 (Noonan)). Thus, the Staff's plan for the resolution of these items is acceptable.

## 2. Justifications for Interim Operation

The County, in addition to its assertion that the Staff's review of items not yet fully qualified is unacceptable, would also have the Board conclude that "[t]he Staff's planned treatment of deficiencies identified with respect to justifications for interim operation ("JIOs"), submitted by LILCO for equipment that will not be fully qualified prior to Shoreham operation, is similarly unacceptable." (SC Proposed Opinion at 162). The County further claims that "[t]he extent of the anticipated Staff review of LILCO's proposed resolution of JIO deficiencies is not clear." (Id.).

The County offers no support either from the transcript or from its findings for these statements. Its proposed findings do not offer support, and the record shows the contrary to be true. Although the Staff identified seven outstanding items (a to g) in the SER (Kennedy and Noonan, ff. Tr. 19,311, Attachment 4 at 3-2 to 3-3), only one type of justification for interim operation is now outstanding. At the time of the hearing, items (a), (b), (c), and (d) had already been resolved between LILCO and the Staff, though not yet officially on the docket. (Tr. 19,484-89 (Kennedy)). Additionally, items (e) and (f) had been determined by LILCO to be fully qualified,

obviating the need for the justifications. (Tr. 19,490, 19,494 (Shosho)).<sup>42/</sup> Thus, the only item that was not resolved was item (g), regarding handbook temperature ratings. Staff Witness Kennedy explained that to resolve item (g) he intended to go back and review "most, if not all, justifications for interim operation that involve handbook temperature ratings." (Tr. 19492 (Kennedy)).<sup>43/</sup> Thus, the only remaining justifications for interim operation will be subject to detailed review. The Staff requires that all justifications for interim operation be officially resolved by fuel load and LILCO will comply. LILCO in SNRC-838 (February 18, 1983) has already submitted a response to each of the open items. (LILCO Proposed Findings EQ-56, -66; Staff Proposed Finding EQ:12.)

SC Proposed Finding EQ:31, as well as SC's Proposed Opinion at 162-63, discusses a particular consideration used to evaluate justifications for interim operation -- whether

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<sup>42/</sup> NRC witness Kennedy, who had not yet seen the final qualification packages, stated that he would ask further questions or review qualification packages in detail, before concurring that the items were qualified. Tr. 19,490 (Kennedy).

<sup>43/</sup> Mr. Kennedy and LILCO Witness Shosho further explained that handbook temperature ratings were extremely conservative, and that equipment might well be qualifiable for temperatures beyond those listed in a handbook. In fact, temperature ratings used in the JIO's had been confirmed by qualification tests, just completed at the time of the hearing. (Tr. 19,493-94 (Shosho, Kennedy)).



misleading information would be provided to operators if the equipment were to fail. The County in this finding suggests that the Staff review of this consideration was inappropriate because the NRC witness could not testify regarding this aspect of the Staff review. NRC witness Kennedy testified that he was not responsible for reviewing these justification but rather sent them to the appropriate personnel for review. (Tr. 19,607-09 (Kennedy)). The County provided no independent substantiation of its expressed concern on this matter, and Mr. Kennedy's testimony indicates only that other members of the Staff than he perform the review of this portion of JIO's.

Despite the County's implication, it has not substantiated any deficiency of the Staff's review or raised any meaningful questions regarding LILCO's justifications for interim operation generally, or specifically with regard to this particular consideration. This is true even though the County cross-examined Staff and LILCO witnesses regarding the justifications for interim operation. (See, e.g., Tr. 19,482-84, 19,603-11, 19,655-57, and LILCO Proposed Findings EQ-59 to -63). In particular, the County was unable to establish that any errors were made in the misleading the operator portions of two justifications for interim operation that were the subject of cross-examination. (LILCO Proposed Finding EQ-63).

Finally, the County in SC Proposed Finding EQ:62 urges the Board to keep the record open and to require further Staff submittals on the justifications for interim operation which were identified as deficient. The Board should reject this finding. There remains, by now, only one outstanding item regarding the justifications for interim operation -- handbook temperature ratings. As noted above, LILCO has submitted the required information to the Staff and NRC witness Kennedy indicated that these justifications would receive close attention. Moreover, the Staff does not view any of the deficiencies as major or unresolvable. (Staff Proposed Finding EQ:14). The County did not specify any basis on which to conclude that the justifications will not be properly resolved without future Board involvement.

E. Suffolk County Prayer for Relief

In its Proposed Opinion at 169-71 and Proposed Findings EQ:62 to :64, Suffolk County urges this Board to require the performance of a series of studies, compilations and reviews, and to retain jurisdiction over the entire EQ issue with opportunity for further litigation on it. For reasons which are set out in detail above, Suffolk County's prayer for relief should be denied. The material below addresses briefly each of the

seven items in SC Proposed Finding EQ:62 and indicates why none of the matters in this contention require the Board's continuing jurisdiction.

EQ:62a. Preparation by LILCO of a list of electrical equipment important to safety at Shoreham: This proposal is far broader than identification of electrical equipment, either safety-related or not, which would potentially be within the scope of an Environmental Qualification Program pursuant to 10 CFR § 50.49. Preparation of such a list is not necessary to determine the scope of requirements for § 50.49(b)(1), dealing with safety-related equipment, since the record shows that that category is unaffected by issuance of § 50.49 and the record supports the conclusion that LILCO's existing program includes all equipment in this category. Nor is it warranted for identifying nonsafety-related equipment (§ 50.49(b)(2)), given the facts that design philosophy and repeated analyses have demonstrated that this will be either a very narrow or a null set of equipment, and that LILCO will be submitting its evaluation to the Staff for its review in any event before fuel load. Nor is it necessary for post-accident monitoring equipment (Regulatory Guide 1.97) under § 50.49(b)(3) since that category of equipment is flexible and, in any event, does not have to be installed by fuel load. The list proposed here was not

advocated by anyone other than Mr. Minor. Further, it almost belabors the obvious in view of the record on Contention 7B to point out that such a list has never been prepared and could not be without better consensus than now exists on the meaning of the term "important to safety," and that no such list is required by § 50.49 or by any other provision of the Commission's regulations.

EQ:62b. Preparation and submission by LILCO of a list of all items covered by § 50.49: This subset of the list proposed in item (a) is not required for the same reasons as the larger list in item (a). To the extent that evaluation of potentially eligible items of equipment remains to be submitted pursuant to § 50.49(b)(2), that evaluation is already in preparation in any event.

EQ:62c. Submittal of a list of Regulatory Guide 1.97 items: To the extent that this list would require submittal of items of equipment not covered in items (a) or (b), the short answer is that compliance with Regulatory Guide 1.97 determines the scope of post-accident monitoring equipment to be installed, and hence the potential universe of items to be qualified. Since Regulatory Guide 1.97 equipment is not required to be installed by fuel load, there is no basis for requiring compilation of a list of all such equipment, and its

environmental qualification status, as a precondition to fuel load.

EQ:62d. Preparation by the Staff of a generic "BWR List of Equipment Important to Safety": (1) This massive proposal, among other things, presumes resolution of the definitional questions concerning the term "important to safety" which have recurred repeatedly in this proceeding. (2) No such list now exists. Indeed, such a list does not necessarily provide a useful basis for determination of compliance with the scope of § 50.49 since it would be prepared on different premises than § 50.49. In short, there is neither a legal requirement nor record-based need for the taxonomic adventure requested by this proposal. (3) Though the Staff witnesses said they "supposed" such a list, if properly reviewed and approved by the Staff, would be "helpful" and that if it existed they would use it, no witness other than Mr. Minor advocated its preparation.

EQ:62e. Proposal for comparison by the Staff of LILCO's "§ 50.49 list" proposed pursuant to paragraph (b) with the criteria of § 50.49: As the record indicates, there is no separate need for this exercise since there is no need for a "§ 50.49 list." See items (a) and (b) above.

EQ:62f. Proposal for Staff Review of Regulatory Guide 1.97 list proposed in (c): Since there is no need to definitively finalize Regulatory Guide 1.97 equipment prior to fuel load, there is no need for a definitive EQ review of such a list by that time and no basis for requiring one.

EQ:62g. Staff Audit of Deficiencies identified in Appendix B to the November SSER: The Environmental Qualification Branch of the Staff proposes not to conduct a further audit prior to fuel load, but to require LILCO to fully qualify this remaining equipment prior to fuel load and to monitor LILCO's compliance through the I&E Branch. The Staff's proposal is reasonable; the identified deficiencies are documentary and not necessarily substantive, LILCO will have to close the item out by fuel load, and further review by the Staff will take place if circumstances warrant it. As to justifications for interim operation (JIO's), resolution of six of the seven open items still open in December had been accomplished, formally or informally, by the time of the hearing. It is worth recalling that the Staff did not express any criticism of LILCO's Environmental Qualification program in its prefiled or live testimony, that Environmental Qualification is a continuing process, and that the Staff expressed no doubt about the likelihood of successful closure of these items before fuel

load. Nor did any of the testimony suggest that LILCO's efforts to close these items out would be inadequate or unsuccessful.

The County proposes, in Proposed Finding EQ:63, that all JIO's for Shoreham be submitted prior to fuel load. LILCO does not disagree with this proposal, as to items covered by § 50.49(b)(1) and (2) but notes that the elaborate procedures proposed in SC Proposed Finding EQ:62 are not necessary to achieve this end. LILCO does not agree that all JIO's for Regulatory Guide 1.97 equipment need to be submitted by fuel load.

The County's proposal that the Board retain jurisdiction over environmental qualification and permit further litigation of the matter (SC Proposed Finding EQ:64 and Proposed Opinion at 159-61) presumes the existence of significant outstanding issues. This is not the case. No party's testimony suggested that the closure of documentation of the remaining 81 equipment packages was other than a routine question of time or that any conceptual or other difficulties existed. The testimony showed without contradiction that the seven remaining open items involving JIO's had been substantially narrowed between the December SER supplement and the hearing in January. The uncontroverted testimony on potential Paragraph (b)(2) equipment is that it is expected to comprise a small or



nonexistent class and that LILCO will submit its study of this potential class of equipment in time for the Staff to review it prior to fuel load. The Staff anticipates reporting its routine closure of all of these items in a SER Supplement. Regulatory Guide 1.97 equipment is not required to be closed out by fuel load.

In short, these are routine matters about which the record reveals little if any real controversy. They will be closed out, except for Regulatory Guide 1.97, by fuel load. For the reasons outlined in more detail in LILCO's Proposed Opinion at 166-68 and the Staff's Proposed Opinion at 23-25, there is sufficient evidence in the record to sustain the conclusion that LILCO has satisfactorily completed its Environmental Qualification program with the exception of these discrete open items which are expected to close routinely before fuel load, and that thus there is no need for this Board to retain jurisdiction over these issues in the meantime.

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## REPLY FINDINGS OF FACT

### I. QUALITY ASSURANCE/QUALITY CONTROL

#### A. Statistical Methodology

RQA-1 (SC QA:411). This SC Proposed Finding is based solely on Mr. Hubbard's testimony and draws an unjustified inference from that testimony. The proposed finding summarizes Mr. Hubbard's vague and brief testimony on the use of statistics at Marble Hill, Diablo Canyon and Shoreham and from this concludes, unjustifiably, that "[p]roper baseline criteria have been used in certain circumstances."

First, with respect to Diablo Canyon, the proposed finding states that the "independent design review program also involved the use of statistics." In fact, Mr. Hubbard's actual testimony is far more restrictive. He testified only that in the Diablo Canyon review, the Staff felt that statistics could not be used in all cases and had some reservations about it, but asked the independent auditor to hire a statistician to make a presentation on what the information might mean statistically. Tr. 15,801 (Hubbard). Thus, contrary to the

implication in the proposed finding, Mr. Hubbard did not testify that statistical sampling methodology had been employed in the Diablo Canyon design review. From his testimony, it simply cannot be determined whether such methodology was used and whether it was successfully used. Therefore, it cannot fairly be concluded from this vague testimony that, as the proposed finding concludes, "a proper objective baseline criteri[on]" was used in this instance.

A second example cited in the proposed finding is that statistical techniques were used at Shoreham in assessing the E&DCR problem in 1976-77. This, too, is misleading. Mr. Hubbard testified that in response to an E&DCR problem in 1976, LILCO took a random sample based upon statistical bases. Tr. 15,801 (Hubbard). The proposed finding fails to acknowledge that LILCO's testimony on this point did not indicate that "statistical bases" were used but only that a random sample of 200 E&DCRs was selected to check for one attribute, proper implementation, as follow-up action on a Field Audit. There is no evidence in the record that the number in this sample had any statistical basis at all, nor is there any evidence from LILCO to indicate that the decision to select the sample randomly was based on anything other than a judgment that randomness was appropriate in this instance and not for any mathematical or statistical reason. See Tr. 11,040-42 (Kelly).

This example, therefore, does not support the conclusion proposed by the County that statistical methodologies have been successfully used in audit and inspection programs at nuclear power plants.

RQA-2 (SC QA:415). This SC Proposed Finding is incorrect in two respects. First, it states without citation to the record that under LILCO's auditing methods, "audit findings or observations are based on judgment sampling techniques." This is incorrect and the County does not and cannot cite any statement in the record to support it. Audit findings or observations are based not on "judgment sampling techniques" but on examination and evaluation of objective evidence as to whether applicable elements of the quality assurance program have been developed, documented and effectively implemented. See LILCO Proposed Finding QA-122.

Second, this proposed finding implies that LILCO makes inferences regarding the total population based solely on specific observations of a judgmental sample. This statement fails to take account of testimony that establishes that the conduct and conclusions of an audit are based not solely on the observations of the sample but also on an understanding of the process and procedures involved, discussions between the auditor and the people responsible for the work, review of

documents that contain evidence that the individuals have implemented requirements imposed on performance of the work and the auditor's experience. In essence, under the LILCO program, an auditor is more of an investigator than an inspector. See LILCO Proposed Findings QA-864 to -868.

As Mr. Eifert testified at the transcript reference cited but not acknowledged in the County's proposed finding, an auditor can make judgments concerning the remainder of the population because he understands the process and because, when he identifies any difficulty in the process, he does not stop there. Part of the auditor's task is to ask questions to obtain insights into the problem, the cause for that problem and the extent of that problem. An auditor will question people and may look at additional items during the audit to gain confidence with respect to the population. Tr. 12,443-44 (Eifert).

RQA-3 (SC QA:419). While this proposed County finding correctly reflects the Staff's testimony that statistical methodology is not required in audit and I&E inspection sample selections, the finding fails fairly to reflect the entire record because it does not acknowledge the expressed rationale underlying the Staff's testimony on this issue. Mr. Gallo, on behalf of the Staff, testified that items in an audit or

inspection are selected on the basis of informed judgment. He indicated that in Staff inspections, safety significance is taken into account in selection of items to be inspected. In addition, Mr. Gallo indicated that the informed judgment used in sample selection would take into account the difficulty or complexity of the item involved as, for example, the difficulty in completing a weld or the first time that a task is accomplished. Tr. 17,258-61 (Gallo). The proposed finding also ignores Mr. Gallo's testimony that he considered samples based on informed judgment to be "far superior than taking a list and randomly picking a percentage of them." Tr. 17,260-61 (Gallo).

RQA-4 (SC QA:421). This County proposed finding is incorrect and misleading in several respects. First, although the first sentence of the finding correctly states that LILCO and Stone & Webster used statistical techniques in the inspection process, this statement, by itself, is misleading because it does not acknowledge that the record reflects a substantial difference between the "inspection process" and the "audit process." The record amply reflects this distinction by noting that while statistical methodology is often utilized in the inspection process, it is not used in the auditing program. Statistical methodology is used in the inspection process in the

context of product acceptance. Product acceptance is not the purpose of the auditing process. Rather, auditing is a method of assuring that the process of design and construction is properly performed. See, e.g., LILCO Proposed Findings QA-849 to -852.

Second, this proposed finding incorrectly states that "However, primary reliance is placed on the judgment of the inspector." The testimony of Mr. Eifert on this subject made clear that the judgment referred to is the judgment of an auditor, not an inspector in a product acceptance inspection process. Tr. 12,436-39 (Eifert).

Finally, this proposed finding erroneously presumes that LILCO's decision not to use statistical sampling in Shoreham's audit program was not in any way attributable to the diversity of items at Shoreham. This erroneous presumption purports to be based on Mr. Burns' testimony that in theory it is possible through stratification to subdivide diverse populations to obtain relatively homogeneous subpopulations. In fact, Mr. Burns' testimony (Tr. 12,451-52) is merely a response to a general question on what is meant by stratification sampling. Mr. Burns did not testify, as this proposed finding implies, that stratification sampling would be practical or possible for audit applications at Shoreham. Thus, this conclusion is unwarranted and unsupported by Mr. Burns' testimony.



Moreover, it is contrary to other evidence to the effect that lack of homogeneity is a substantial impediment to the application of statistical methodology in sample selection for audits at Shoreham. E.g., LILCO Proposed Findings QA-861, -869.

RQA-5. County witnesses Hubbard and Samaniego testified that statistical methodologies could be developed for an inspection of nuclear power plants, but they were unable to provide any valid, specific description of the particulars of such methodology. Rather, they responded with an abstract discussion. Tr. 19,243-59 (Hubbard, Samaniego). With respect to the statistical method Mr. Hubbard proposed, he admitted that judgment would be required in assigning significance levels (i.e., demerits) and acceptance criteria and that because judgment is required in this regard, different experts could arrive at different results. Tr. 19,253-57, 19,280-81 (Hubbard); see also Tr. 15,943-44, 15,989-93 (Hubbard). Therefore, contrary to the County's assertion, a statistical methodology, given the prominent role judgment must play, does not provide more rigorous or precise results than the methodology used by the industry, the NRC and Torrey Pines.

RQA-6. Mr. Hubbard's advocacy of statistics was unrestrained by the realities of NRC practice and industry experience. Thus, he testified that in his opinion the NRC had

not adequately determined compliance with Appendix B before licensing any plants now in existence and operating because it had failed to employ statistical methodology in its inspection process. Tr. 16,028-31, 16,034-35 (Hubbard).

RQA-7. The County asserts that it was the only party that presented testimony by a qualified statistician. SC Proposed Opinion at 23 n.2. Mr. R. G. Burns, a LILCO witness on the quality assurance/quality control contentions, is a Fellow of the American Society for Quality Control (ASQC). This is a society in applied statistics and quality assurance. He is active in the Energy Division of ASQC which specifically addresses quality assurance/quality control activities associated with energy applications, including nuclear applications. He is a member of the Standards Subcommittee of that Division. He is also a member of the main nuclear committee of the American Society of Mechanical Engineers which has responsibility for the N-45 Series, NQA-1 and NQA-2 quality assurance/quality control standards. Tr. 13,792-94 (Burns). In addition, Mr. Louis Johnson of Torrey Pines Technology presented testimony on statistical methodology. Although he does not have formal training in probability theory or statistics, Johnson, LILCO Ex. 57, at 28-30, Mr. Johnson has substantial experience in the application of statistical

methods. At Aerojet General he supervised a group of engineers involved in probabilistic design analysis which involved the use of probability theory and statistical methodology. Id. at 26-31. At Torrey Pines, Mr. Johnson has been involved with General Atomic Statisticians who unsuccessfully tried to develop a statistical methodology for Torrey Pines' independent verifications. Id. at 198-99, 220-24.

B. Important to Safety

RQA-8 (SC QA:562). SC Proposed Finding QA:562 selectively repeats one statement from Mr. Hubbard's testimony to conclude that lists of both "safety related" and "important to safety" plant features should be prepared. Mr. Hubbard's testimony in context, however, was contradictory. He stated that such lists were needed when asked which structures, systems and components an applicant should identify in accordance with 10 CFR Part 50, Appendix B. When he was then asked if it was true that the only features addressed in Appendix B were the safety related set, he stated he did not know that to be true. Tr. 15,443-45 (Hubbard). Other portions of his testimony contradict this statement. Mr. Hubbard's prefiled testimony presenting the evolution of the NRC's quality assurance/quality control requirements, was in terms of 10 CFR Part 50, Appendix A, GDC-1 and "important to safety," as well as Appendix B. Mr.

Hubbard made it clear under cross-examination, however, that this portion of his prefiled testimony on evolution of requirements referred only to the safety related set. SC Ex. 89A, at 9-13; Tr. 15,437-38, 15,443 (Hubbard). Thus, he recognized the limitation on the scope of Appendix B to be the safety related set. He provided no history to support his position that the NRC's quality assurance/quality control requirements apply to plant features that are non-safety related. Notwithstanding the absence of such history, his prefiled testimony subsequently attempts to use Criterion II of Appendix B as a regulatory requirement to identify items "important to safety but not safety related," even though he acknowledges the NRC Staff does not require such a listing. SC Ex. 89A, at 72-75. He did state his own view that all 18 criteria of Appendix B apply to safety related features, and that some or all criteria, to some degree, apply to features important to safety but not safety related based on the applicant's decision. Tr. 15,439 (Hubbard). As the record reflects, this is only Mr. Hubbard's opinion. As a regulatory requirement, Appendix B applies only to safety related structures, systems and components. LILCO Proposed Finding QA-14.

RQA-9 (SC QA:563). SC Proposed Finding QA:563 does not accurately reflect Mr. Hubbard's testimony. Mr. Hubbard's

testimony was that the scope of NRR review of the quality assurance/quality control program addresses only quality assurance/quality control for safety related items. With respect to whether NRR construes Appendix B to apply only to safety related items, Mr. Hubbard was noncommittal. With respect to Mr. Hubbard's knowledge of a debate within NRR since 1975, he does not clearly identify the subject of that debate except in the context of draft quality assurance standards NRR attempted to develop for items important to safety. Tr. 15,344-48 (Hubbard).

RQA-10 (SC QA:564 to :566). SC Proposed Findings QA:564, :565 and :566 relate to Mr. Hubbard's opinion that there is no systematic program for quality assurance for items important to safety. Presumably, by "important to safety" the County proposed finding refers only to items that are not safety related, as opposed to the definition in the Denton memorandum, which would include safety related. Each of these proposed findings suggests that an absence of knowledge of a program on Mr. Hubbard's part means a program does not exist for non-safety related plant features. This inference cannot be drawn from the record cited by these findings. SC Proposed Finding QA:564 states that Mr. Hubbard looked at the quality assurance procedures and, in general, each of these applies

only to safety related structures, systems and components. In fact, Mr. Hubbard testified that he looked at some quality assurance procedures, and then only the descriptive block at the top of the procedure for applicability. Tr. 15,996-97 (Hubbard). There is no indication he reviewed procedures not specifically identified as quality assurance procedures.

SC Proposed Finding QA:565 takes issue with the General Electric Quality Assurance Program and states it was not graded in that it did not have nine increments. Mr. Hubbard initially stated he did not consider the General Electric or Stone & Webster programs because he was focusing on quality assurance as it relates to operation, although he did comment on the LILCO construction Quality Assurance Manual. Tr. 15,998 (Hubbard). With respect to the General Electric program, Mr. Hubbard testified that there was one set of procedures that applied to all engineering activities but that there were different requirements for safety related and non-safety related activities. He did not testify there were no requirements for the non-safety related items. The program was graded in the sense of two categories. Tr. 15,999-16,004 (Hubbard). Mr. Hubbard was not aware of the LILCO inspection procedures for non-safety related items as contained in the UNICO construction site inspection program, but did not feel it was important because it was not described in the LILCO Quality Assurance



Manual for the Appendix B program. Tr. 16,004-05 (Hubbard).

In each case, Mr. Hubbard's lack of knowledge does not demonstrate that a program does not exist for the non-safety related plant features.

RQA-11 (SC QA:567). SC Proposed Finding QA:567 cites Mr. Hubbard's response to a request to provide specific examples of quality assurance deficiencies which, if undetected during construction, preoperation or startup, could contribute to an increment of risk during operation. Mr. Hubbard was unable to provide a single specific example. Tr. 16,037-38 (Hubbard). Ironically, in this finding, based on Mr. Hubbard's testimony, the County implies that such quality assurance deficiencies do in fact exist.

RQA-12 (SC QA:568). SC Proposed Finding QA:568 is similar to SC Proposed Findings QA:564, :565 and :566, which state that Mr. Hubbard could identify no systematic quality assurance program for non-safety related equipment, components and structures. His testimony, as reflected in SC Proposed Finding QA:568, is slightly different in that he stated he reviewed OQA procedures, as opposed to quality assurance procedures as he had earlier stated. Tr. 15,997 (Hubbard). It is not clear which procedures or how many he actually reviewed. Mr. Hubbard testified that he limited his comments to the LILCO



quality assurance manuals because he had not looked for such a program at other nuclear plants and because Stone & Webster does identify three categories in its program. He also testified he used the term "systematic program" to differentiate it from the judgments LILCO has applied in establishing quality assurance requirements for non-safety related features. Tr. 16,080-83 (Hubbard).

RQA-13 (SC QA:569). SC Proposed Finding QA:569 states as fact that in 1976 General Electric did not have a systematic program for quality assurance on non-safety related items in the program managed by Mr. Hubbard. As the record clearly indicates, this was only Mr. Hubbard's opinion. Tr. 16,096-97 (Hubbard). Indeed, Mr. Hubbard had earlier stated that General Electric had one set of procedures covering both safety related and non-safety related items, although the requirements for each differed. Tr. 15,999-16,004 (Hubbard).

RQA-14 (SC QA:574). SC Proposed Finding QA:574 states that the control rod drive pumps and the condensate booster pumps are important to safety but not safety related. This was Mr. Higgins' opinion. In the same context for the screen wash system, Mr. Higgins offered the opinion it would not be important to safety. He clearly stated, however, there is no document that specifies what is or is not important to safety

under the definition in the Denton Memorandum. Tr. 16,957-59 (Higgins). As to the use of GDC-1, Mr. Higgins testified that GDC-1 was too general to use as a standard for inspection. It is not appropriate to cite a violation against GDC-1 as its requirements are very judgmental and policy in that area has not been set within the NRC. Tr. 16,959-61 (Higgins).

#### C. Significance

RQA-15. Mr. Hubbard testified that he had not given any thought to the safety significance of the more significant quality assurance deficiencies that he believes have existed at Shoreham. Tr. 16,036 (Hubbard).

#### D. LILCO Program Implementation

RQA-16. In regard to storage nonconformances, Mr. Narrow acknowledged that storage problems could never be completely corrected or prevented. Tr. 17,320-21 (Narrow).

RQA-17. A LILCO witness testified that it was not assumed that because a condition was found in one audit and corrected, that the condition would not recur. For that reason, auditors continue to audit thoroughly to assure that problems are detected. Tr. 10,593-94 (Eifert).

RQA-18. A LILCO witness testified that strict requirements could result in recurring nonconformances. Therefore, follow-up to ensure the work was done correctly and identification of new ways to take preventive action was continual. Tr. 10,534 (Eifert).

#### E. Specific Examples

##### 1. Calculations

RQA-19 (SC QA:64, :65, :66). SC Proposed Findings QA:64, :65 and :66 quote from specific early pilot audits (EA 0, EA 00 and EA 1) and include very little of the testimony covering these audits. The proposed findings do not reflect, for example, that for these early pilot audits:

(1) Calculations in many cases were not always complete but were in process. See, e.g., Tr. 10,349, 13,321 (Eifert);

(2) Reporting and evaluation techniques (e.g., numerical expression of results) used in these audits were later abandoned since they did not provide meaningful methods for evaluating performance. Tr. 10,351-52 (Eifert, Burns);

(3) Correlation of the results of these audits with later audits was not possible. Tr. 13,322 (Eifert); see also LILCO Proposed Finding QA-239.

RQA-20. In discussing observation EA 34, AO 120, a LILCO witness testified that, of the 1800 calculations that

were redone, only one percent used any part of the design margin. Of that one percent, none totally used the design margin. This indicates that the engineering judgments made were, by and large, accurate and conservative. Tr. 10,776-80 (Museler).

RQA-21. The County's proposed opinion at pages 46-47 is slightly inaccurate in its depiction of observation EA 34, AO 120. The observation describes differences between the configuration (dimensions) of a support as analyzed and the issued support drawing, not differences between the support location as analyzed and the actual support location. One of the factors contributing to the condition was the large number of support relocations occurring during that time period. LILCO Proposed Finding QA-211; SC Proposed Finding QA:56. The County also indicates that "in some instances, design margins were entirely eliminated." This is wrong. Some design margins were affected but not "entirely eliminated." There were no instances where margins were reduced sufficiently so as to cause failure. The County's proposed opinion also implies that the 1800 calculations were reworked due to reduction of design margins. Only one percent of the 1800 supports had reduced design margins. All of the remaining supports were found to still have the total engineering design margin after

calculations were redone, without any need for rework of the supports. LILCO Proposed Finding QA-211; Reply Finding RQA-20.

RQA-22. A LILCO witness testified that the design consistency concern identified in observation EA 34, AO 120 was limited to one discipline; the concern was not identified in other audits and the complexities of the work were unique. Tr. 10,686-91 (Eifert).

RQA-23. The audit program normally included verification that calculations audited were consistent with the design. This was a long-standing audit attribute check. Tr. 10,690-91 (Eifert).

## 2. Engineering and Design Coordination Reports

RQA-24. (SC QA:88). This County finding is a summary of a significant portion of the testimony of LILCO witnesses concerning LILCO and SWEC audit observations related to E&DCRs. As a summary, it is not incorrect. It does, however, fail to detail the bases for the conclusions of the witnesses stated in the proposed finding. For example, the proposed finding correctly states the witness' belief that there was only a remote chance that an E&DCR would not have been received by the proper people; therefore, the audit items would not have affected the design or safety of the plant. The witnesses

provided detailed reasons for this conclusion. E&DCRs were distributed to numerous organizations and individuals, including the initiator of the E&DCR, the contractor area supervisors the UNICO construction management area supervisors and field quality control. All of these people would have had to fail to receive an E&DCR for it not to have been implemented in the plant. Tr. 13,555-58 (Museler). The County uses this proposed finding in its proposed opinion to suggest that LILCO is not deeply concerned about the potential safety impacts of E&DCR control problems because of subsequent inspections. SC Proposed Opinion at 56-57. As is shown by this example, LILCO's belief is based on far more than inspections.

RQA-25 (SC QA:91, :92). The County states that Mr. Arrington believed the overall E&DCR process was acceptable and that he disagreed with the conclusion of ¶ 3.1 of FA 602. By placing this proposed finding directly after one concerning witnesses Kelly's and Gerecke's views on this paragraph, Suffolk County attempts to cast doubt on witness Arrington's testimony. The County further attempts to impugn Mr. Arrington's testimony by suggesting that he had no basis for this conclusion. When Mr. Arrington's comments are placed in context, it becomes clear that Mr. Arrington's conclusion has a sound basis, and is not contrary to statements by witnesses

Kelly and Gerecke. Mr. Arrington stated that the problems cited in FA 602 were isolated to one or two contractors, that the problems were not associated with the entire E&DCR program for the site and that E&DCRs were properly implemented in the field. He specifically based his conclusion on firsthand knowledge and experience with the inspection process. Tr. 10,941-47 (Arrington); see LILCO Proposed Findings QA-322 to -326.

RQA-26 (SC QA:117, :118). The County implies that Mr. Kelly disagrees with Mr. Museler on whether or not Courter had E&DCR-related problems between November 1977 and June 1981. There are several problems with the County's findings. The first question asked of Mr. Kelly concerned the period of time from November 1977 to June 1981. Mr. Kelly replied that he would not agree that there was an E&DCR problem during this time period. In fact, the Courter problems occurred in 1977 and 1978 with only isolated occurrences in 1980 and 1981. In response to a second question directed to the November 1977 time period, Mr. Kelly stated that while there was a problem with some Courter documents, he did not feel these problems amounted to an "E&DCR problem." The problems experienced by Courter were mainly related to logging and posting of E&DCRs, not to all requirements of the E&DCR control process. Viewed



in the proper context, this discussion shows that there was no disagreement between Mr. Kelly and Mr. Museler. In fact, the LILCO witnesses stated, in the context of logging and posting, that Courter had difficulties in the 1977-78 time frame. Tr. 11,366-74 (Kelly, Museler); see LILCO Proposed Findings QA-322 to -326. While SC Proposed Finding QA:118 correctly states that an E&DCR audit observation related to Courter in 1981 gave some cause for concern, the finding fails to state that this was an isolated instance and that subsequent audits in 1981 and 1982 showed satisfactory performance. Tr. 11,374 (Museler).

RQA-27 (SC QA:135). This SC Proposed Finding does not accurately characterize the situation reported in FQC 33, Observations B.3 and F.1. Contrary to the County's finding, incorrect incorporation of the E&DCR into the revised drawing did not result in the weld differing from the requirements of the E&DCR. Tr. 11,173-74 (Museler). Further, the proposed finding improperly implies that the actual as-welded condition was correct only due to the fact that the E&DCR had an error. As described by the LILCO witnesses, there was an ambiguity between two sheets of the E&DCR that had been issued in response to a construction supervisor's request for welding detail. One sheet correctly showed a weld symbol calling for a weld on one side of a member. This was what the engineer

intended, it was the only possible way to weld the configuration, it complied with the detail shown on the revised drawing and with the installation accepted by the QC inspector. The other sheet of the E&DCR contained a weld symbol calling for weld on both sides of the member. This was an error in the E&DCR that was first identified by the auditor in FQC 33. As a result, the E&DCR was revised, correcting the improper weld symbol and thus resolving the discrepancy between the two sheets of the E&DCR. The weld and the drawing had always been correct, that is, as originally intended by engineering. It is true that the drawing would also have been in error if the E&DCR had been incorporated in the drawing as shown on the incorrect sheet as opposed to the correct sheet. The inspector who accepted the weld did not identify the difference between the two sheets of the E&DCR since it was impossible to weld both sides of the configuration involved. Tr. 11,171-76 (Arrington, Museler).

RQA-28 (SC QA:142, :143). In SC Proposed Finding QA:142, the County implies that I&E was never aware of the E&DCR observations identified in Field Audits 602, 654 and 708. In SC Proposed Finding QA:143, the County cites Mr. Hubbard's conclusion that having identified a problem in I&E Report 76-06, the Staff prematurely closed the issue in I&E Report

76-12. In reciting Mr. Hubbard's conclusion, the County has identified a specific time frame, 1977-79, and has characterized Mr. Hubbard's observations as large E&DCR problems. Neither of these items is reflected in Mr. Hubbard's testimony. See Tr. 16,143-44 (Hubbard). By juxtaposing these findings Suffolk County creates an unsupported inference that I&E would have agreed with Mr. Hubbard's conclusion had they reviewed Field Audits 602, 654 and 708. The County then relies on these proposed findings as a basis for its opinion that there were repeated E&DCR problems during the 1977-79 time frame and that proper corrective action was not taken after I&E Report 76-06. SC Proposed Opinion at 50, 53. The County reaches this conclusion despite acknowledging in its proposed findings that the I&E Staff believed that LILCO's program was addressing the issue and that the I&E witnesses did not feel that knowledge of Field Audits 602 and 654 would have affected the closure of I&E Report 76-06 with respect to E&DCRs. SC Proposed Findings QA:151, :153; see LILCO Proposed Finding QA-556. These proposed findings were not referenced in the County's proposed opinion. See Attachment 1.

RQA-29 (SC QA:145). In this proposed finding, the County cites the CAT Inspection Report as support for the allegation that there were large numbers of E&DCRs and that

"[c]lear, concise and timely dissemination of technical and design information is essential for effective and error-free execution of engineered construction." Based on these citations, the County concludes that "the E&DCR system as implemented at Shoreham, lacked timely drawing revision and thus did not provide for such clear, concise and timely dissemination." This implies that E&DCRs were not effectively executed in construction. The record indicates an opposite conclusion. The CAT inspectors concluded that hardware was installed in compliance with the appropriate E&DCRs, that the control of E&DCRs was as required and that the system, though cumbersome, was working. The inspectors' main concern was limited to the final effort to incorporate a large number of E&DCRs into the parent drawings in a timely fashion. Tr. 16,764-65 (Higgins); see LILCO Proposed Findings QA-307, -554, -555.

This proposed finding also cites the CAT Inspection Report for the statement that the E&DCR system had become cumbersome since its scope had been expanded beyond a change control system. The County does not cite Mr. Eifert's testimony that Stone & Webster had chosen to have one system that performs multiple functions over the use of different systems for different activities. Stone & Webster believes the advantages of a single system outweigh the disadvantages; therefore, the system receives the management attention necessary to ensure it works. Tr. 13,564-65 (Eifert).

RQA-30 (SC QA:146). In this proposed finding, the County states the Staff witnesses agree that the E&DCR weakness described in the CAT Inspection Report is an area that quality assurance/quality control should consider. This statement is not incorrect but as used in this proposed finding gives the incorrect impression that quality assurance/quality control has not considered the efficacy of the E&DCR process. In fact, NRC witness Higgins stated "[i]t is an area that quality assurance/quality control should look at, and from our experience . . . it was an area that quality assurance/quality control did look at." He also stated he had knowledge that quality assurance/quality control and engineering did discuss the E&DCR program. Quality assurance/quality control was sensitive to potential problems and looked carefully to ensure that things were adequately handled. Quality assurance/quality control did not have any basis to call for a change to the E&DCR system because problems such as lost E&DCRs or failures to implement E&DCRs did not exist. Tr. 16,376 (Higgins).

RQA-31 (SC QA:147, :148, :149, :150). In these four proposed findings, the County has taken one occurrence cited in I&E Report 82-26 and expanded that observation to make it appear to be more than one problem. Due to an oversight or error, a drawing was revised and administratively indicated

incorporation of an E&DCR which had not, in fact, been incorporated. Tr. 16,378, 16,380 (Higgins). The master log also had been updated and indicated that the E&DCR had been incorporated. This change to the master log was not an independent error because the log is updated from the drawing, which indicated the E&DCR was incorporated. Tr. 16,390-91 (Higgins).

RQA-32 (SC QA:148). In this proposed finding, the County attempts to imply that the violation in I&E Report 82-26 and the E&DCR weakness noted in the CAT Inspection Report are related. This is a misrepresentation of Mr. Higgins' testimony that he did not believe the observations were similar, but that he did not believe he could say they were totally unrelated since they had the common linkage of being related to E&DCRs. SC Proposed Finding QA:148 also neglects to state that, with respect to the CAT concern, I&E has not found the types of errors (i.e., inaccurate incorporation of E&DCRs into the drawings and improper implementation in the field) it was concerned potentially might occur. Tr. 16,379, 16,381 (Higgins). With respect to the error cited in I&E Report 82-26, the design change had been properly installed in the plant. Tr. 16,384 (Higgins).

RQA-33 (SC QA:149). This SC Proposed Finding implies the violation cited in I&E Report 82-26 was closely related to

a design control problem. The County cites Mr. Higgins' testimony that design control problems are associated with hardware. Mr. Higgins also stated that design control problems are problems associated programmatically with the design process and not with specific design documents. Tr. 16,384-85 (Higgins). Mr. Higgins did not agree that the deficiency in I&E Report 82-26 constituted a design control problem. While he stated the document control system should ensure accurate incorporation of design changes into documents, Mr. Higgins made clear that the design change had been properly implemented in the plant. Tr. 16,381-84 (Higgins).

RQA-34 (SC QA:154). This SC Proposed Finding relies on I&E Report 76-06 to state that four E&DCRs had not received quality assurance review as required by LILCO procedure. This quality assurance review is by the LILCO Quality Assurance organization as governed by a LILCO procedure. The Stone & Webster review was controlled by the engineering assurance procedure. I&E cited only the LILCO procedure. SC Ex. 106, at 10. At the time of the inspection, the LILCO procedure was under revision to require quality assurance review of safety related E&DCRs designated by the project engineer. LILCO's response to the May 1976 inspection, showing full compliance had been achieved, was submitted in July 1976. Alexander et al., LILCO Ex. 21, Attachment 10, SNRC-118 at 1, 3.



RQA-35. The County, in footnote 14 of its proposed opinion, at 54, states that Stone & Webster auditors had identified a failure to effect timely E&DCR incorporation in EA Audit 23. (The County cited its Proposed Finding QA:128, but it appears to have intended to cite QA:129.) This was not a situation involving incorporation of an E&DCR. Rather, it was a logging concern dealing with the change record. See SC Proposed Finding QA:129. In the same footnote, the County states that the Staff had identified E&DCR control weaknesses, before the CAT Inspection, in I&E Report 81-22. NRC witness Higgins acknowledged that LILCO disagreed with the I&E opinion expressed in 81-22. LILCO had controls and distribution of E&DCRs to the startup test engineers, but Mr. Higgins felt the recipients should document receipt and action. LILCO believed the situation was controlled but agreed that the results were unsatisfactory. Mr. Higgins did not classify this as a weakness, although he felt improvements were needed. Tr. 16,977-79 (Higgins).

RQA-36. The County, citing four instances, states the RAT Inspection was an additional documentation of deficiencies in LILCO E&DCR control. SC Proposed Opinion at 55. With respect to the first example, the County states there was misuse of E&DCRs that specified different requirements for

bearing between pipe clamps and lugs. The County cites its proposed finding QA:485 but fails to cite QA:486 and :487. LILCO disagreed with the Staff that the E&DCRs had been misused, and presented testimony that they were being used correctly. The Staff had not yet reviewed LILCO's response. SC Proposed Findings QA:486, :487; LILCO Proposed Finding QA-583. The second example was errors in orientation of reference points for a cable tray support, for which the County cites its finding QA:501. This was not an E&DCR control problem; it was a drafting error that did not affect the installation. LILCO Proposed Finding QA-589. The third example purportedly involved failure by FQC to request engineering approval and an E&DCR for hardware relocation. The County cited proposed finding QA:506. This County finding is factually flawed. See Attachment 2. The error was made by the installer, not FQC, and did not involve E&DCR control. LILCO Proposed Findings QA-591 to -593. The last example, citing SC Proposed Finding QA:548, involved the failure to incorporate E&DCRs into a design drawing. This situation did not involve E&DCR incorporation, and thus the finding is flawed. See Attachment 2. In fact, it was a question of posting, but it is not clear the E&DCRs were not posted correctly on the related drawings. LILCO Proposed Findings QA-600 to -603. Thus, the County is incorrect in stating the RAT Inspection demonstrated E&DCR control deficiencies.

RQA-37. The County states in its proposed opinion that "as demonstrated by the Torrey Pines inspection, there have been repeated instances where inspections or 'gates' in the LILCO process have failed to identify QA/QC deficiencies." SC Proposed Opinion at 57. The County then attempts to use this statement as support for its conclusion that reliance on a final inspection program will not provide sufficient assurance to overcome the concerns raised by the E&DCR problems experienced at Shoreham. Id. Suffolk County's proposed findings do not support this chain of logic. The discrepant conditions discussed in SC Proposed Findings QA:675 to :684 did not result from E&DCR problems and are hence inapplicable. SC Proposed Finding QA:674, which alleges a general defect in LILCO's inspection process, finds no support in the record. See Reply Finding RQA-115 (SC QA:674).

### 3. Manuals

RQA-38. I&E Inspection 81-13 identified an instance where a startup manual was not up-to-date. LILCO, as a result of I&E Report 81-13, performed a follow-up audit of all startup manuals on site and determined that 42 of the 59 startup manuals were not up-to-date. Tr. 16,507-08 (Higgins).

RQA-39. The action taken by LILCO to maintain startup manuals up-to-date caused improvement but was not initially totally effective due to surrounding circumstances. Tr. 16,510-11 (Higgins).

RQA-40. The County uses SC Proposed Findings QA:270 to :272, SC Proposed Opinion at 30, 72 n.22, to support its premise that noncompliance with an internal procedure implementing the LILCO Appendix B program constitutes a violation of 10 CFR Part 50, Appendix B regardless of whether such a noncompliance is found by LILCO or by the NRC. SC Proposed Opinion at 30-31. SC Proposed Findings QA:270 to :272 rely upon portions of Staff testimony, clearly related to I&E observations, not LILCO audits, to infer that conditions identified in LILCO audits would be violations of Appendix B. The SC proposed findings ignore Staff testimony that rejects such a conclusion. See, e.g., LILCO Proposed Findings QA-180 to -182. The SC proposed findings do not support the County's premise.

#### 4. Storage and Housekeeping

RQA-41 (SC QA:163). The Staff stated in I&E Report 79-16, Gallo et al., Staff Ex. 8 at Attachment 2.a.:

As of October 31, 1979 periodic inspections by personnel qualified in accordance with ANSI N45.2.6 were not performed to ensure the control of items in storage as required by ANSI N45.2.2.

LILCO responded with the explanation that Field Quality Control Procedure 17.1 and Project Procedure 10 assign responsibility for implementation of program requirements for storage inspections to Field Quality Control and require Field Quality Control inspection personnel to be qualified in accordance with ANSI N45.2.6. The inspections performed under Construction Site Instruction 4.6 were additional inspections performed by Construction personnel. LILCO Ex. 21, Attachment 10 at SNRC-464.

In I&E Report 79-16, the Staff also stated:

No mechanism exists to update the Equipment Storage History Cards at the time when equipment changes location either in the warehouse or from the warehouse to a permanent inplant location.

LILCO responded with the explanation that a Component Stores Requisition (CSR) is required prior to any of the equipment being relocated from the warehouse to an inplant location. The Chief Mechanical Supervisor is required to sign the CSR before the equipment is moved and he then directs the modification of the storage history card. Therefore, the CSR constitutes a record of the relocation until the storage history card is updated. Records of relocation of material within the warehouse

are maintained primarily for the use of warehouse personnel, and are not considered to be an ANSI standard requirement. LILCO Ex. 21, Attachment 10 at SNRC-464.

RQA-42 (SC QA:178). This SC Proposed Finding is used on page 61 of the SC Proposed Opinion to support the assertion that there were "repeated instances where the storage history cards specified some requirement, such as an inspection or a maintenance activity to be performed, but the storage history card requirements had not been carried out at all or in a timely manner when the auditor made his findings." All eight audit findings referred to were not the same. Three related to inspection not timely performed, three related to meggering of electric motors not performed on required schedule, one related to an inspection performed on time but not witnessed by the FQC inspector. LILCO Proposed Findings QA-379 to -381, -387, -388; Tr. 11,542 (Museler). The proposed opinion ignores the statement contained in the proposed finding that reflects evidence that, when the inspections were performed after the audits, the equipment was found to be satisfactory in each case.

RQA-43 (SC QA:179). On page 62 of the SC Proposed Opinion, this proposed finding is used to support the assertion that there were "repeated instances" of storage problems related to a lack of proper drainage. In fact, only five such

observations, occurring in different years, are identified. See LILCO Ex. 31, ff. Tr. 13,734; LILCO Proposed Findings QA-391 to -392.

RQA-44. There were no patterns of missing endcaps at the Shoreham site. Of the total population of approximately 50,000 end caps, Mr. Arrington stated that he did not consider 15 or 20 different audit findings indicating end caps were missing as constituting a pattern. Tr. 11,770-772 (Arrington).

RQA-45 (SC QA:184). This SC Proposed Finding is used on page 66 of the County's proposed opinion to support the statement that "in the area of storage, it is impossible to be sure that damage did not in fact occur, particularly premature aging, since testing will not always identify the damage." On the contrary, the proposed finding, which is an accurate reflection of the record, indicates that while damage may not always be visually detectable, it will be detected when the equipment receives testing during the construction and operational phases. See LILCO Proposed Findings QA-399, -406.

RQA-46 (SC QA:187). This SC Proposed Finding purports to list audit findings relating "in one degree or another" to actual damage being observed. In fact, three of the listed observations do not involve actual damage to equipment. See



Tr. 11,819-20, 11,823 (Kelly, Museler). Therefore, the use of this proposed finding on page 63 of the proposed opinion to support the assertion that there were nine instances where actual damage was reported is inappropriate.

RQA-47 (SC QA:188, :190, :192). While it is true that each quarterly quality assurance report for May 1980 through December 1981 advised management of problems related to environmental protection for installed or stored equipment, witness Gerecke indicated that the problems were expected. In fact, he stated that these problems would be expected to occur "almost audit after audit." Tr. 11,877-78 (Gerecke).

Mr. Gerecke stated that he would frequently get calls from management, or written questions from management, in response to these quarterly reports. He could not say whether he had received a question from management on the six quarterly reports listed in County proposed finding QA:188. Tr. 13,829-30 (Gerecke).

This proposed finding is used on page 63 of the proposed opinion to support the statement that "it was reported that adequate environmental protection for installed equipment had not been provided." The implication in the opinion is that no adequate environmental protection was being provided for installed equipment. In fact, as the quarterly reports

indicated, there were specific instances of inadequate environmental protection being identified and corrected, but not a general finding that no adequate environmental protection was being provided for installed equipment. Tr. 11,876 (Gerecke).

RQA-48 (SC QA:189). On page 63 of the SC Proposed Opinion, this finding is used to support a statement that "it was reported that adequate environmental protection for installed equipment had not been provided" in each quarterly report from May 1980 to December 1981. Yet, the opinion does not reflect the substance of this proposed finding, which accurately reflects the record, that the reports after the May 1980 report were primarily to update management on the status of the earlier findings and the significance or lack of significance of those findings. In addition, a purpose of the quarterly reports was to notify management that corrective action had been taken. The specific field audit reports referenced in those quarterly reports all contain an overall conclusion that the storage and maintenance of stored inplace equipment was found to be generally satisfactory. Tr. 11,872-73 (Gerecke).

RQA-49 (SC QA:197, :198). Both of these SC Proposed Findings are accurate reflections of the record, but the proposed opinion ignores the substance of these findings. The

findings reflect evidence establishing that the absence of an end cap, by itself, has no significance and causes no additional work and that, with respect to the environmental protection findings, corrective action was taken in each case.

RQA-50 (SC QA:199). This SC Proposed Finding does not accurately reflect the record. Mr. Higgins, in addition to making the statements contained in the proposed finding, also stated that he did not expect to find zero discrepancies in the caps or covers area. According to Mr. Higgins, storage is an area where problems are expected to arise and the construction maintenance program and the quality control surveillance inspections and audits are doing their job when they detect and correct these problems. That function was being performed. Tr. 16,537-38 (Higgins). The proposed finding, as well as the County's proposed opinion on pages 64 and 111, do not reflect the record in this regard. See also LILCO Proposed Finding QA-546.

RQA-51 (SC QA:202). This SC Proposed Finding, which is an accurate reflection of the record, is used on page 111 of the proposed opinion to support the statement that "there have been a large number of storage-related violations identified by the staff." I&E Report 79-16, discussed in the proposed finding, states, "The inspector noted that the Licensee appeared to

have a very effective program for maintaining temporary heat on electric motors and generators, which included daily surveillance checks of each component." See LILCO Proposed Finding QA-414. Thus, the I&E Report cited in the proposed finding found an adequate and effective program for maintaining temporary heat, but the County's proposed opinion ignores the substance of this finding.

RQA-52 (SC QA:205). Though LILCO had a recurrent problem with electrical jumpers being removed from the terminal block and not being tagged, the Staff witness stated that LILCO turned the situation around and that he had not found any evidence of the problem in the several months immediately preceding his testifying. Tr. 16,551 (Higgins).

RQA-53 (SC QA:208). This SC Proposed Finding is used on page 111 of the County's proposed opinion to support a statement that the Staff had identified a large number of storage-related violations. Contrary to this statement, and contrary to the inference in the proposed finding, the record plainly states that the corrosion identified in the suppression pool may have been perfectly acceptable. See Tr. 16,613-19 (Higgins).

RQA-54 (SC QA:210). The County uses this proposed finding on page 62 of its proposed opinion to support the statement that there were "repeated instances where adequate environmental protection . . . was not provided." As the record plainly states, but this proposed finding and the statement in the proposed opinion ignores, the Staff witness indicated that he did not consider the environmental protection observation to reflect a failure to maintain proper environmental conditions. I&E Report 75-05, referenced in the proposed finding, related to recordkeeping, not environmental protection. Tr. 16,781-85 (Narrow, Higgins).

RQA-55 (SC QA:212). This SC Proposed Finding is used on page 111 of the SC Proposed Opinion to support a statement that there had been a "large number of storage-related violations identified by the staff." This statement, as well as the proposed finding on which it relies, fails to reflect the testimony of Staff witness Narrow who stated that, as a matter of judgment, the Staff did not consider the observation reflected in this proposed finding to be a storage-related violation. Tr. 16,789, 16,793 (Narrow).

RQA-56 (SC QA:213). In response to I&E Report 76-01, LILCO cleaned and recoated with preservative all safety related pipe hangers in outdoor storage showing evidence of corrosion. LILCO Ex. 21, Attach. 10.

RQA-57 (SC QA:218). Notwithstanding the deficiencies noted in the quarterly reports from May 1980 through December 1981, Staff Witness Higgins believed that the corrective action instituted after I&E Report 79-16 was effective. The basis for this belief was that before the I&E report, the problems were considered programmatic in nature. Mr. Higgins indicated that the storage problems were occurring and were not getting corrected on any reasonable basis. These programmatic problems were corrected subsequent to I&E Report 79-16; therefore, Mr. Higgins considered the corrective action to be effective. The individual deficiencies highlighted in the quarterly reports were not evidence of an ineffective program. Tr. 16,846-47 (Higgins).

RQA-58 (SC QA:224). This finding, which is an accurate reflection of the record, is not used by the County in its proposed opinion except in one block citation to the entire section of storage and housekeeping proposed findings. On pages 66 through 71 of the proposed opinion, the County highlights alleged and perceived deficiencies in the housekeeping program. Yet, the County ignores this proposed finding that evidences the large number of housekeeping audits with relatively few instances of deviations.

RQA-59 (SC QA:225 to :227). These SC Proposed Findings relate to the housekeeping violation cited in the CAT Inspection Report. The County uses these proposed findings on pages 68 and 69 of its proposed opinion to emphasize this perceived housekeeping problem. The County fails to mention in its proposed opinion, however, that the housekeeping conditions at Shoreham were not significantly worse than the Staff would have expected given the ongoing construction and the number of workers involved, see LILCO Proposed Finding QA-427; that the Staff noted that the checks and balances that exist at Shoreham with respect to housekeeping are adequate and probably would be adequate even for conditions worse than those found at Shoreham, see LILCO Proposed Finding QA-429; that the Staff witnesses testified unsatisfactory housekeeping conditions did not affect the operability of plant equipment, see LILCO Proposed Finding QA-430; and that no housekeeping problems have been identified by I&E inspectors in plant areas that have received final cleanup in preparation for operation, see LILCO Proposed Finding QA-437.

RQA-60 (SC QA:231, :232). Both of these SC Proposed Findings relate to housekeeping deficiencies. Yet, the County uses these findings on page 111 of its proposed opinion to support a statement relating to a "large number of storage-related violations."



RQA-61 (QA:238). This SC Proposed Finding is an accurate reflection of the record to the effect that the Staff believes that subsequent checks on equipment are adequate to cover "any deficiencies" that might have resulted from storage deficiencies identified during the hearing. The County's proposed opinion, however, does not reflect this proposed finding nor the record on which it is based. In fact, the proposed opinion reflects the opposite. See Suffolk County Proposed Opinion at 66.

RQA-62 (SC QA:240). The County uses this proposed finding, which is not an accurate reflection of the record, on page 70 of the proposed opinion to support a statement that the Staff is concerned that if LILCO permits housekeeping deficiencies, safe startup and operation of the plant could be affected. The proposed finding does not support the statement in the proposed opinion because the finding does not concern safe startup and operation of the plant. Nor is the proposed finding itself an accurate reflection of the record. Staff witness Higgins stated that the Staff feels that "the checks and balances that exist are adequate and probably would be adequate even for a dirtier plant than [Shoreham]." Tr. 16,474 (Higgins).

RQA-63 (SC QA:244). This SC Proposed Finding is used in the proposed opinion to support assertions regarding the alleged "housekeeping deficiencies" identified in I&E Report 79-16. In fact, that I&E Report identified storage and maintenance deficiencies, not housekeeping deficiencies. Thus, the County's attempt to use I&E Report 79-16 as one in a series of I&E reports identifying housekeeping deficiencies is disingenuous given the fact that it related to storage deficiencies. Tr. 16,495-96 (Higgins).

In addition, the County states on pages 67 and 68 of its proposed opinion that the corrective action taken in response to I&E Report 79-16 "can only be viewed as ineffective," partially because of the occurrences cited in the CAT Inspection. Yet, on page 68 of the proposed opinion where the County discusses those occurrences cited in the CAT Inspection, the County does not cite proposed finding QA:244, which reflects that Mr. Higgins stated that he would not expect the corrective action for I&E Report 79-16 to prevent the occurrences cited in the CAT Inspection.

RQA-64 (SC QA:245). This SC Proposed Finding, which is an accurate reflection of the record, is used on page 37 of the SC Proposed Opinion to support a statement referring to the County's quality assurance witness and potential damage to

components resulting from excessive dirt. This proposed finding, however, is based on testimony of a LILCO witness and has nothing to do with excessive dirt. In short, the proposed finding is on an entirely different subject than the statement in the proposed opinion which it purports to support.

RQA-65 (SC QA:245, :246). These SC Proposed Findings are used on page 89 of the SC Proposed Opinion in footnote 27 to support a statement that the observed condition "affected or could have affected the QC-inspected items." In fact, with respect to the condition referenced in the proposed findings, Mr. Museler, in response to a question by Judge Morris regarding whether that violation would have affected the ability of the pipe support to perform its function, responded, "Certainly not, Sir." Tr. 13,811 (Museler).

RQA-66 (SC QA:249). This SC Proposed Finding is used on page 66 of the SC Proposed Opinion to support an assertion that it is "impossible" to be sure that damage did not occur from a storage or housekeeping violation. In addition, the County states on page 66 of its proposed opinion that such impossibility is true particularly with respect to premature aging since testing will not always identify the damage. County proposed finding QA:249 provides little support for this statement as it is Mr. Hubbard's opinion only, taken directly

from his prefiled supplemental testimony, and contains no basis in the record for concluding that Mr. Hubbard is qualified to offer an opinion regarding premature aging. In addition, proposed QA:184, also used as support for this statement, refutes Mr. Hubbard's statement as QA:184 reflects the evidence establishing that testing will discover any potential damage resulting from storage or housekeeping deficiencies.

RQA-67 (SC QA:260 to :266). These SC Proposed Findings contain various percentages of unsatisfactory observations identified during LILCO's storage-related surveillance programs for mechanical, electrical and instrumentation equipment. While the figures themselves are accurate, they do not adequately reflect the record establishing that the significance of the unsatisfactory observations must be considered. These surveillances covered a large period of time and a great many pieces of equipment. The observed conditions did not result in any damage to the equipment. Moreover, the observed conditions were expected because the surveillances were occurring in areas of ongoing construction. Therefore, a naked examination of the numbers is meaningless. The significance of the unsatisfactory observations must be examined, and in the opinion of the LILCO witness, they were not significant. Tr. 12,463-67 (Kelly).

## 5. FSAR Control

RQA-68 (SC QA:290 to :292). The number of LILCO/Stone & Webster audit observations concerning the accuracy of the FSAR is not large, and the observations were not significant. Only four were identified during cross-examination. One instance (EA Audit 21 AO-008, item 2) raised a question of Stone & Webster control mechanisms to relate E&DCRs to FSAR changes. Stone & Webster concluded no procedural changes were needed. A second instance (EA Audit 33, AO-114) identified a specific type of FSAR change being tracked with a method not fully in compliance with approved procedures. Although the changes were being tracked, steps were taken to ensure strict conformance with approved procedure. In two other instances (EA Audit 27, AO-072 and EA Audit 40, AO-154), the correctness of the FSAR was questioned. In one, the FSAR was correct, and in the second, the FSAR had not yet been updated but the information had been correctly presented to the NRC in the Design Assessment Report concerning Mark II Containment loads. LILCO Proposed Findings QA-215 to -219, -668. Thus, in only one instance was the FSAR incorrect, and in that case, the correct information had been given to the NRC in another document.

RQA-69 (SC QA:298). This finding correctly notes that in the course of Mr. Higgins' walkdowns, he only discovered a

small number of minor differences between the FSAR and the as-built plant. The County's opinion, however, fails to mention these facts. Rather, the County cites the finding to support the proposition that there have been widespread deficiencies in the control of the FSAR. See SC Proposed Opinion at 74.

RQA-70 (SC QA:310 to :312). These SC Proposed Findings note that the SPCR reports listed a number of findings and then state that conformance between the as-built plant and the FSAR "does not exist until engineering resolution is provided." This statement is taken out of context. As the witness explained, this simply means that the overall review of a particular system is not considered to be complete until all observations are disposed of by the engineering organization. In fact, Mr. Museler testified that many of the findings are not proper observations. Tr. 12,375-76 (Museler).

RQA-71 (SC QA:328). This finding correctly notes that one of the deviations noted in the CAT report only involved a semantic difference and a typographical error. This information, which places the deviation in perspective, is not reflected in the County's proposed opinion. See SC Proposed Opinion at 76.

## 6. Electrical Separation

RQA-72. The NRC witnesses were not totally familiar with the overall area of electrical separation at Shoreham. They had been involved with the subject peripherally in terms of inspection findings, and were aware of discussions and correspondence that took place in the past. They did not have detailed knowledge of these matters. Similarly, they knew that various technical and quality assurance/quality control requirements were in place at any point in time, but they were not familiar with the detailed evolution of the requirements involved. Mr. Higgins attempted to be careful not to go beyond his personal knowledge. He was concerned that wrong impressions would be given as it is difficult to understand the situation without understanding the details. Tr. 16,583, 16,585, 16,589-91, 16,598, 16,600-02, 16,714-16, 17,160, 17,337-39 (Higgins). See Tr. 16,580 (Narrow), 16,597-98 (Gallo).

RQA-73. The NRC witnesses considered electrical separation to be a separate problem area, but not necessarily a quality assurance/quality control problem. It involved some engineering difficulties, some difficulties in terms of what the actual criteria should be, and some quality assurance/quality control problems. Tr. 16,936 (Higgins). The



matter has been the subject of engineering analysis by LILCO, which was submitted to the Staff, as well as continuing correspondence and several meetings between LILCO and the Staff. Staff Ex. 8, at 25. See also Tr. 16,579, 16,587, 16,599, 16,601, 16,607, 16,714-15, 17,338-39 (Higgins), 16,592-93 (Gallo). While not familiar with the timing of LILCO commitments to various standards and criteria, Mr. Higgins agreed that the technical issue of treatment of electrical separation has been the primary focus of I&E at Shoreham. There were also a few quality assurance/quality control problems in the treatment of electrical separation. The problem has been more in the technical area than in the quality assurance/quality control area (including, in the engineering sense, timely control of the design). Tr. 17,160-62 (Higgins). On the basis of I&E inspection 82-24, the NRC witnesses did not believe there were any remaining quality assurance/quality control problems still associated with electrical separation. Tr. 16,936-37 (Higgins).

RQA-74. In attempting to compare the situation with respect to electrical separation at Shoreham with that at other plants, Mr. Gallo was hampered by unfamiliarity with any other plant in the particular situation. However, he expected that another plant attempting to backfit requirements of Regulatory

Guide 1.75 after the start of construction would have the same problems, particularly with hardware, although they might be approached differently. These problems would include late resolution of final criteria. Tr. 16,582, 16,592-93 (Gallo); see also Tr. 17,162 (Higgins). Electrical cable separation is a problem I&E finds at essentially every construction site, although it appeared to the I&E witnesses that Shoreham had a little bit higher level than average. Tr. 16,969-70 (Gallo). The quality assurance/quality control problems relating to electrical separation cited by I&E at Shoreham are the type, and probably the number, expected to be found in plants like Shoreham considering the amount of cable and raceway installed. Tr. 17,161 (Narrow).

RQA-75. Installations involving electrical separation are not typical of any other installation at Shoreham. Electrical separation is very involved, and has been subject to technical problems and complications over the years. Tr. 16,585 (Higgins).

RQA-76. The electrical separation observation in the CAT inspection is an example of the complexity and technical nature of the electrical separation issue. The observation involved the separation of cable in free air space, in transit between raceways. The same separation criterion had been

established by LILCO for cable in free air as for cable in raceway (tray or conduit). This criterion was established by an E&DCR after installation of a majority of cables. During the inspection, four groupings of cable were noted where the specified separation was not maintained. SC Ex. 89B, at 4-21, 4-22. I&E did not consider this a violation for a number of reasons. See, e.g., Tr. 16,573-74, 17,338-39 (Higgins). In fact, from a technical standpoint, it was not clear at that time whether or not cable in free air even had to be separated. Tr. 16,601 (Higgins). Subsequent to the CAT inspection, in inspection 82-24, another instance of improper separation in free air was noted as an unresolved item. This involved cable which had been wrapped and met the separation requirement (1 inch) but subsequent to final inspection was disturbed and became nonconforming. Cable in free air has flexibility which makes it difficult to maintain separation with such small distances involved. However, the technically acceptable separation criteria may be modified again, to eliminate a distance requirement, on the basis of demonstrated capability of cable wrap material as a barrier. SC Ex. 109, at 4-5; Tr. 16,966-69 (Higgins).

RQA-77. Electrical separation was the subject of SC Contention 31/SOC Contention 19(g). These substantially

identical contentions alleged that (1) LILCO's design criteria for electrical separation of cables fail to comply with General Design Criteria 3, 17 and 21, and (2) LILCO's implementation of its stated separation criteria was inadequate. The parties agreed to resolution. SC and SOC agreed to withdraw SC Contention 31/SOC Contention 19(g), while LILCO agreed to specific separation criteria and to perform inspection of 20% of Class IE cable and raceway installation and 20% of non-Class IE cable and raceways in the vicinity of Class IE cable and raceways, as set forth in the Agreement. Resolution of SC Contention 31/SOC Contention 19(g) - Electrical Separation, ff. Tr. 18,596; Amendment to "Resolution of SC Contention 31/SOC Contention 19(g) - Electrical Separation," ff. Tr. 17,818.

7. Readiness Assessment Team (RAT)

RQA-78 (SC QA:424). Although NRC witness Greenman did make the statements cited in this proposed finding, the County improperly cites a portion of the RAT Inspection Report which was not admitted into evidence. See Tr. 20,283 (Judge Brenner).

RQA-79 (SC QA:430). This SC Proposed Finding concludes that Mr. Greenman had not reviewed LILCO's response to the RAT Inspection Report, SNRC-843, dated February 19, 1983, and that

Mr. Higgins had not completed his review of this response. As a result, the County concludes that "no evidence" was presented by the Staff regarding its review of LILCO's response. This proposed finding is incorrect because the Staff had reviewed LILCO's supplemental testimony on the RAT inspection. Tr. 19,761 (Greenman). The information provided in LILCO's supplemental testimony is essentially the same as the information included in SNRC-843. Compare Museler et al., ff. Tr. 19,757 with SNRC-843, dated February 19, 1983.<sup>1/</sup> In fact, throughout the cross-examination the Staff witnesses presented their views based on the information presented in the LILCO testimony. See, e.g., Tr. 19,976 (Higgins), 19,873 (Greenman).

RQA-80 (SC QA:432). This SC Proposed Finding states that the Staff's concerns regarding FQC final inspections stem from two sources. First, the Staff indicated that discrepancies were identified in items that had been inspected and accepted by FQC. Second, the Staff was concerned with the rejection rate identified in FQC inspections. With respect to the latter, the testimony indicated that the Staff's concerns were not well-founded because the raw rejection rate data initially given to the Staff did not reflect the fact that a

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<sup>1/</sup> SNRC-843 is not admitted into evidence in this proceeding but has been served upon the parties. LILCO does not reference this letter for the truth of the matters asserted therein.

substantial number of rejections were attributable to factors other than quality. See Tr. 20,094 (Higgins); LILCO Proposed Findings QA-616, -618 to -622. With respect to the former, a number of those items that appeared to be inspection discrepancies did not, upon review, have significant implications for the FQC inspection process. For example, violation A(2) cited LILCO for excess torque on high strength bolts that had been inspected and accepted by FQC. After a review of this finding, however, LILCO presented un rebutted evidence that indicated that final inspection had been properly conducted. LILCO Proposed Finding QA-576. Violation A(3) of the Report noted discrepancies in three cable tray supports that had been inspected and accepted by FQC. Investigation of these findings revealed that at least two represented drafting errors and not failures in the FQC inspection process. See LILCO Proposed Findings QA-585 to -589. In addition to the findings noted above, several of the other inspection discrepancies appear to be isolated instances in which the inspector, though incorrect, had some basis for accepting the as-built condition. See LILCO Proposed Findings QA-580, -591. Finally, Violation D involved discrepancies that had been inspected and accepted by OQA, not FQC. Staff Ex. 13, Appendix A at 2-3. LILCO presented evidence indicating that the OQA/Startup organizations were adequately accomplishing their tasks. LILCO Proposed Findings

QA-612 to -614. Violation A(1) also did not involve FQC. The weld was inspected and accepted by Reactor Controls, Inc. Tr. 19,805-06 (Higgins). Reactor Controls has its own quality assurance program. Tr. 17,930 (Novarro). LILCO has taken steps to ensure that this violation was an isolated instance. LILCO Proposed Findings QA-572, -573. Thus, a substantial part of the basis for the NRC's concerns about the adequacy of the final inspection process did not, in fact, reflect any significant problems with the FQC program.

RQA-81 (SC QA:433, :434). SC Proposed Finding QA:433 quotes the final inspection reject rates from the RAT Inspection Report. This information was raw data provided by LILCO. Tr. 19,799-800 (Arrington). As the record amply reflects, these raw data are not reliable indicators of the quality of structures, systems and components being turned over to FQC for final inspection. See LILCO Proposed Findings QA-616, -618 to -622. Nonetheless, the County relies on these raw data in Proposed Finding QA:434 to conclude, "[T]hese high rejection rates demonstrate that construction items are not receiving proper attention . . . ," citing, in misleading fashion, NRC witness Greenman. In fact, Mr. Greenman did not conclude that the rejection rates cited in the Inspection Report demonstrated that construction items were not receiving proper attention; rather,



he testified that they gave rise to a concern that prompted an inquiry for more information. Tr. 19,784 (Greenman). After a review of LILCO's initial data, NRC witness Higgins concluded that the rework level is much lower than indicated by the raw data. Tr. 20,094 (Higgins).

RQA-82 (SC QA:435). SC Proposed Finding QA:435 briefly summarizes LILCO's testimony demonstrating that the FQC rejection rates did not represent a significant condition. This proposed finding, however, is not cited in the County's proposed opinion. At page 84 of its proposed opinion, the County notes that the Staff raised a concern about the final inspection program at Shoreham. The County's opinion then states:

Unfortunately, LILCO's formal response had not been filed by the time of hearing. In fact, its preliminary response had not been fully reviewed by the Staff. As a result, no evidence regarding the Staff's review of LILCO's response was presented.

These statements incorrectly imply there is little or no additional information regarding LILCO's response to the Staff's concerns about the final inspection program. This is contrary to the record and ignores the County's own Proposed Finding QA:435. Moreover, the statement is misleading because the Staff presented evidence regarding its review of LILCO's prefiled testimony concerning the RAT Inspection Report. See RQA-2 (SC QA:430).

In addition, this proposed finding attempts to draw improper inferences by transposing portions of the record. The County states: "Mr. Museler testified that typical examples of the type of item rejected by FQC were Shoreham's cable tray cover holddowns." The County quotes NRC witness Higgins, who testified that this was not a typical example of an item rejected by FQC. In fact, the County has improperly reversed the sequence of testimony to accomplish the County's purposes. Following a discussion of the minor deficiencies in the cover holddowns, Tr. 19,789-90 (Museler), Mr. Higgins was asked whether this was a typical example of a rejected item. Mr. Higgins testified that it was "probably not a typical example, but it is one example of a type of thing which is a rejected item and is not reworked." Tr. 20,095 (Higgins) (emphasis added). Mr. Museler immediately clarified the record, testifying that cable holddowns with these minor deficiencies were in fact reworked in the field. Id. Additionally, during redirect examination, Mr. Museler confirmed that the type of deficiency found in the cover holddowns was typical of deficiencies requiring rework. Tr. 20,098-99 (Museler).

RQA-83 (SC QA:436). SC Proposed Finding QA:436 correctly notes that LILCO witnesses testified that many of the rejections by FQC have no bearing on the quality of the item

turned over to FQC for inspection. Significantly, this portion of the proposed finding is not cited or considered within the County's proposed opinion where the significance of the RAT Inspection Report is discussed. See SC Proposed Opinion at 83-90. Moreover, the finding provides an example of an instance where (a) the cited transcript does not say what the County claims it says and (b) the County has made findings that are out of context because important information was omitted. The County claims Mr. Museler was "unable to provide evidence regarding the percentage of items rejected" because of inaccessibility, citing two transcript references. The first involves a general discussion by Mr. Museler of the FQC rejection rates and contains no indication of whether or not he could provide percentages for the various types of rejections. See Tr. 19,787 (Museler). At the second transcript reference, in response to a question concerning the percentage of items rejected because of access, Mr. Museler provided a concrete example: "[F]or the period beginning in November through late January, there were 202 findings that applied to cable tray [supports]. Of those findings, 43 were of the nature I described where access could not be gained to the particular piece of equipment." Tr. 19,792 (Museler). Thus, although the witness did not provide an overall percentage of items rejected because of access, he did provide a specific example of

numerical data available to support his position that a significant portion of the findings had nothing to do with the quality of the items or equipment being inspected. Consequently, the proposed finding takes information out of context.

RQA-84 (SC QA:439). The County's proposed finding recites a number of alleged facts concerning LILCO's reinspection program to verify the adequacy of FQC inspections. This proposed finding is used in the County's proposed opinion in support of a conclusion that the steps taken by LILCO to address the Staff's concerns regarding the final inspection program are inadequate. See SC Proposed Opinion at 86-87. The County's conclusion is not supported by the record.

First, the County notes that the reinspection program is limited to a review of a five percent sample of FQC accepted components. There is no evidence in the record to support a conclusion that this sample size is inadequate. To the contrary, NRC witnesses testified that the steps taken by LILCO are adequate. See LILCO Proposed Finding QA-617.

Second, the County concludes that the reinspection will not include items that had been inspected and accepted by FQC prior to the RAT inspection. While this is literally true, the County neglected to mention that Mr. Museler made it clear that if the results of the reinspection program raised any concerns

about the adequacy of the final inspection process, LILCO would reinspect previously accepted items. In fact, Mr. Museler testified that such reinspections are done in the LILCO Quality Assurance Program as a matter of course where dictated by circumstances. Tr. 19,781-82 (Museler). Moreover, NRC witness Greenman testified that it would not be appropriate to require reinspection of previously accepted items until the results of the reinspection program have been reviewed. Tr. 19,780 (Greenman).

Third, the County states that the reinspection program will not be performed on a "statistically valid random sampling basis," citing NRC witness Higgins. There is no evidence in the record concerning whether the reinspection program is or is not a statistically valid random sampling program. In the portion of the transcript cited by the County, Mr. Higgins explains that the reinspection program does include random sampling within various categories of items turned over for inspection. Tr. 19,775 (Higgins).

Finally, the County in this proposed finding criticizes the LILCO reinspection program because judgment will be used to determine whether the results warrant further reinspection. This criticism is without foundation. Even the County's consultant conceded that judgment was required in the evaluation of audit results and in setting acceptance criteria. E.g., Tr.

15,988-93 (Hubbard); Reply Finding RQA-5. Moreover, LILCO's use of judgment in this context is consistent with the LILCO and NRC Staff practice and with the LILCO and NRC Staff view that statistically based sample schemes are not required and may be inappropriate for application in the auditing process for nuclear power plants. See, e.g., LILCO Proposed Findings QA-853 to -858; Reply Findings RQA -3, -4.

RQA-85 (SC QA:440). This SC Proposed Finding discusses the FQA reinspection program instituted by LILCO. It contains a number of errors and misleading statements. The County claims that the program will only be conducted for two months. This statement, however, does not accurately reflect the record. The LILCO prefiled testimony stated the program would last at least two months but would be extended if the results of the program warranted further review. Museler et al., ff. Tr. 19,757, at 28. The County also notes that, at the time of the testimony, the LILCO reinspection program had found three discrepancies, see id. at 27-28, and that the Staff did not agree with LILCO's conclusion that the results confirmed the adequacy of the FQC program. The County has mischaracterized the record, drawing improper inferences from testimony taken out of context. Although the Staff witnesses were not pleased to see discrepancies, Mr. Higgins testified that they were not

particularly significant. Tr. 19,779 (Higgins). Staff witnesses testified that they had only been able to review the first week of FQA reinspection results and that based on that limited review they could not draw any conclusions. Id. In other words, the Staff witnesses did not draw any conclusions about the overall results and, indeed, agreed with LILCO that the discrepancies identified were not particularly significant. In fact, in assessing the overall results of the RAT inspection, the Staff witnesses concluded that the results did not reveal any programmatic quality assurance deficiencies. LILCO Proposed Finding QA-634. Next, the County tries to give the impression that the Staff review of the reinspection program was prompted by the discrepancies discussed in the FQA reinspection program. See SC Proposed Opinion at 87. That conclusion is unsupported by the record. While the NRC will conduct additional review of the discrepancies, it appears that it was always the NRC's intent to review the results of the FQA reinspection program. See Tr. 19,778-79 (Higgins, Greenman).

RQA-86 (SC QA:441). SC Proposed Finding QA:441 contains contradictory statements. First, contrary to some of its previous findings, the County concludes that an evaluation of the FQC inspection program "can be adequately performed through the FQC reinspection program described by the LILCO



witnesses." Significantly, this portion of the proposed finding is not mentioned in the County's proposed opinion. Second, the County states that "the Staff must be actively involved in the evaluation of the reinspection results." As the record reflects, the NRC intends to look at the results of the FQC reinspection program including a review of each discrepancy identified. See, e.g., Tr. 19,778 (Higgins).

RQA-87 (SC QA: 443). This finding accurately reflects the low percentage of rework that has resulted from the FQC inspection program. The County, however, does not cite or discuss this proposed finding in its proposed opinion section concerning LILCO's final inspection program. See SC Proposed Opinion at 86-87.

RQA-88 (SC QA:470 to :472). The SC Proposed Opinion at 93 notes that two installations were found not to have finger tight bolts as specified. The County, however, fails to cite its own proposed finding, QA:470, which indicates that one of the installations contained a temporary bolt because construction was still in progress. In addition, the County fails to mention its own proposed finding that indicates that the LILCO witnesses disagree that the completed installation had been improperly installed and that the Staff believed LILCO's explanation was plausible. SC Proposed Finding QA:471. Nor did the

County reference in its opinion its own proposed finding that noted that the condition discovered by the I&E inspectors had no impact on the pipe support in question. SC Proposed Finding QA:472.

RQA-89 (SC QA:478, :479). The juxtaposition of SC Proposed Findings QA:478 and QA:479 is misleading. As noted in QA:479, Staff witness Greenman did believe that the violation was justified, a conclusion with which LILCO does not disagree. See LILCO Proposed Finding QA-580. Mr. Greenman, however, did not disagree with the LILCO testimony cited in QA:478. In fact, as noted by the County, he had not yet reviewed that aspect of LILCO's response. Tr. 19,831-32 (Greenman).

RQA-90 (SC QA:491). This SC Proposed Finding, though correct, is incomplete. It fails to note that the cable tray support discrepancy in question was not included as part of violation A because the inspector believed it was not a hardware deficiency. It appeared to him that some clarification of the drawings was all that was needed to correct the discrepancy. Tr. 19,871-72 (Higgins).

RQA-91 (SC QA:543). This SC Proposed Finding, though correct, fails to note the reasons why construction had not been notified by FQC that an inspection had been performed in

the structural steel area. As the record shows, such notification was not required, given the ongoing nature of the activities conducted and the difficulty of giving unique identification to structural steel components. See LILCO Proposed Finding QA-598; Tr. 19,963 (Arrington).

RQA-92 (SC QA:548 to :552). These SC Proposed Findings address violations C(2) and C(3) of the RAT Inspection Report, essentially summarizing the findings in the Report. The proposed findings make no attempt to address testimony presented by LILCO witnesses on these findings. Without anything more than citing the Staff's preliminary view that it disagreed with LILCO's response, the County asks the Board to find that it "is unable to find that the discrepancies identified by the Staff are not of concern." See Proposed Finding QA:552. There is no foundation for the conclusion set out in the County's proposed findings and, in fact, there is no explanation of what concern the County has in mind. LILCO's proposed findings on these observations more accurately reflect the record. See LILCO Proposed Findings QA-600 to -605. In addition, the Staff's reservations do not relate to program implementation. Instead, the Staff is considering whether the LILCO program needs to be changed to list E&DCRs on each sheet of a multi-sheet drawing. Tr. 19,986 (Higgins).

RQA-93 (SC QA:561). The County's proposed finding notes that the Staff issued a confirmatory action letter to obtain prompt and effective corrective action for housekeeping deficiencies at Shoreham. The proposed finding does not mention that the corrective action measures appear to be effective and that LILCO has committed to take whatever steps are necessary to satisfy the NRC Staff in this regard. See LILCO Proposed Findings QA-445, -447.

F. NRC Review and I&E Program

RQA-94 (SC QA:359). The SC Proposed Finding incorrectly implies that the record, other than Mr. Hubbard's testimony, reflects that the I&E program does not provide a basis to conclude that the quality assurance program has been effectively implemented. To the contrary, the testimony of both the Staff and LILCO witnesses and the SALP Report confirm that the focus of the I&E inspection program is a systematic evaluation of the licensee's performance. The SALP Program, for example, annually reviews and evaluates the licensee's performance with an emphasis on reviewing the implementation of the quality assurance program. The SALP Program considers I&E inspection reports for the previous year as well as Region IV input on the quality assurance programs of the architect, engineer and other vendors supplying equipment and services. The 1982 SALP Report

concluded that LILCO's performance during the previous year was acceptable and directed toward safe completion of the facility. See LILCO Proposed Findings QA-448, -450, -455, -635, -636, -638, -644 to -646, -648.

RQA-95 (SC QA:360). In its proposed opinion, Suffolk County questions the ability of I&E to judge the adequacy of quality assurance/quality control implementation based on I&E's examination of a sampling of systems, structures and components at Shoreham. SC Proposed Opinion at 110, 112, 113, 115. The County ignores its own proposed finding (SC QA:360) and other evidence in the record indictating that based upon the entire I&E effort, including the SALP Report and the input of NRR, the Staff can justifiably conclude that there was no pattern of quality assurance/quality control breakdowns. See also LILCO Proposed Findings QA-455, -524, -566.

RQA-96 (SC QA:365). The County's assertion that the CAT Inspection identified a "large" number of items is contradicted by the raw numbers of the CAT Inspection (4 violations of Appendix B, 8 deviations from FSAR commitments, 4 observations regarding weaknesses, and 6 unresolved items) and by the Staff's conclusions in the SALP Report. The SALP Board, which included the Resident Inspector who participated in the CAT Inspection, summarized the findings of the CAT Inspection

in the SALP Report stating: "The NRC inspection team identified very few exceptions to this assurance of quality." SC Ex. 92, Enclosure 1, at 17; LILCO Proposed Findings QA-529, -534, -535, -641.

Mr. Hubbard's definition of the term "breakdown" is contrary to the definition used by the NRC Staff. LILCO Proposed Finding QA-566. Mr. Hubbard was unable to cite to any definition published by the NRC for the term "breakdown." LILCO Proposed Finding QA-565.

RQA-97 (SC QA:367). Mr. Hubbard's assertion that "many items" were identified in the CAT Inspection that had slipped through the normal quality assurance process is refuted by the Staff's conclusion in the SALP Report that there were few problems noted in the CAT Report. Reply Finding RQA-96 (SC QA:365); LILCO Proposed Findings QA-534, -535. Equally unfounded is Mr. Hubbard's statement that the deficiencies noted in the CAT Inspection are "significant because they went undetected by LILCO and the NRC Staff" and his conclusion that if a proper quality assurance/quality control program had been established, the deficiencies would have been detected earlier. Mr. Hubbard's statement ignores his own testimony, as well as the testimony of other witnesses, that an effective quality assurance program is not expected to ensure perfection. LILCO

Proposed Findings QA-15, -16, Staff Proposed Findings QA:15, :16. In addition, the County's proposed finding ignores testimony by Staff witnesses expressly disagreeing with Mr. Hubbard's assertion that the quality assurance/quality control "breakdowns" listed in Mr. Hubbard's testimony "clearly document" Mr. Hubbard's assertion that "LILCO and its major subcontractors did not develop and implement a QA/QC program in compliance with Part 50 Appendix B in a timely manner." E.g., LILCO Proposed Finding QA-566.

RQA-98 (SC QA:372). Contrary to this SC Proposed Finding, NRR, through its review of the FSAR, the design information provided in the FSAR and additional information requested to support review of the FSAR, does review the criteria used to develop the design. LILCO Proposed Findings QA-471, -472, -656, -657; see Tr. 15,837-38 (Hubbard).

RQA-99 (SC QA:373). Contrary to Mr. Hubbard's opinion that there is insufficient emphasis in the I&E program on the implementation of the design process, Staff I&E witness Mr. Gallo testified that the gap referred to by Messrs. Denton, Vollmer and DeYoung had been closed. NRR now conducts in-depth review of particular codes and standards and design detail. Gallo testified that Region IV takes a concentrated look at implementation and engineering results. See SC Proposed Finding QA:384; LILCO Proposed Findings QA-483, -484.



RQA-100 (SC QA:374). Mr. Hubbard's opinion that the quality problems at other plants call into question the NRC's conclusion that the Shoreham quality assurance/quality control program is effective is refuted by substantial evidence of commitment to quality both by LILCO and the NRC. Shoreham has been inspected under the tougher I&E enforcement policy outlined in Mr. Dircks' statement before the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs. In addition, during their inspection of Shoreham, NRC inspectors have been mindful of the problems which have occurred at other plants and have inspected for those problems. No similar inadequacies or deficiencies have been found to exist at Shoreham. LILCO Proposed Findings QA-456, -480, -566, -570, -631 to -634, -648.

RQA-101 (SC QA:384). In its proposed opinion, the County limits its focus to Region I's limited design review activities and to Mr. Hubbard's opinion, and urges the Board to characterize design control as one area of great concern. SC Proposed Opinion at 115-116. In doing so, the County has ignored its own proposed finding, QA:384, which demonstrates that, in addition to Region I's onsite review, Region IV had engaged in detailed design review and engineering review with respect to Shoreham.

RQA-102 (SC QA:395). The County correctly states that Region IV was not involved in the 1982 SALP inspection of Shoreham. This is neither unusual nor cause for concern. Generally, Region IV is involved in the SALP process only when Region I finds a significant problem outside its area of expertise and requests that Region IV conduct an investigation. See SC Proposed Finding QA:380; LILCO Proposed Finding QA-644. Moreover, Region I has a number of ways to receive input from Region IV, including review of Region IV periodic summary reports by Region I management and Region IV procedures that require notification of significant findings to appropriate organizations, including the responsible regional offices. Mr. Gallo stated that he periodically had reviewed Region IV's summary reports and that, had there been any problems, he would have referred to them in the Staff's prefiled testimony. Staff witness Higgins concurred with Mr. Gallo that there were no significant Region IV items of which Region I was not aware. LILCO Proposed Findings QA-644 to -646; SC Proposed Finding QA:378.

RQA-103 (SC QA:396). This SC Proposed Finding correctly reflects the testimony of Messrs. Gallo and Narrow that it might be worthwhile for I&E to review LILCO's quarterly reports to management. The County implies that I&E should have

reviewed LILCO's quarterly reports to management. The County's proposed finding fails to reflect the Staff's testimony that the inspection program examines various audits conducted by LILCO that are summarized in the quarterly reports. The proposed finding also fails to reflect LILCO witness Gerecke's testimony that the information in the quarterly reports is not necessarily an indicator of significant QA problem areas, Tr. 13,862 (Gerecke), and that if an audit finding was significant, Quality Assurance would not wait for the quarterly report, but would advise management immediately, Tr. 13,830 (Gerecke). In addition, the County ignores Mr. Narrow's statement that he examined LILCO's quarterly reports to management at one time but found that the information contained in the quarterly reports did not add anything to what he clearly knew from his other document review. The County also ignores Mr. Gallo's statement that, in his opinion, a review of LILCO quarterly reports was not required in order to draw conclusions as to the adequacy of the LILCO quality assurance program. See Tr. 16,326-27, 16,354-55 (Gallo); see also LILCO Proposed Findings QA-475, -476.

RQA-104 (SC QA:403). This SC Proposed Finding implies that the SALP Report and a Category 3 rating in the SALP Report indicate that LILCO's quality assurance programs were

inadequate. That implication is soundly rebutted by the record. The SALP report itself and the Staff testimony clearly state that LILCO's performance in construction and preoperational activities is acceptable and directed towards safe facility completion. The Category 3 finding in the area of engineering and design indicates that improvement should be made, but does not indicate that licensee performance was unacceptable. See LILCO Proposed Findings QA-647, -648.

#### 1. Welding

RQA-105 (SC QA:350). This SC Proposed Finding is only a partial and therefore misleading reflection of the record. It correctly notes that due to an increase in welding violations in 1978-79, I&E asked LILCO to review welding activities. NRC witness Narrow testified, however, that the increase in the number of violations was not significant enough to warrant a management meeting. Tr. 16,872 (Narrow). He also testified that the increase was not unusual given the increased welding activity and the need to train new welders. Tr. 16,880-83 (Narrow). Once the number of welders stabilized, the number of violations began to drop. Gallo et al., Staff Ex. 8, at 23.

RQA-106 (SC QA:351). This SC Proposed Finding discusses four of the welding violations cited by the NRC

during the construction of Shoreham. Though generally accurate, it omits information pertinent to a full understanding of the testimony. As indicated in the finding, the NRC witness did not know whether the condition noted in I&E Report 76-11 would have been acceptable. Mr. Gallo did state, however, that in the NRC's experience, structural steel welds, such as the one in question, are generally far oversized for the anticipated load. Tr. 16,942 (Gallo). Thus, it is possible that the weld was acceptable. With respect to I&E Report 78-15, LILCO had indicated an intention to qualify the weld procedure so the cited welds could be accepted as is. Alexander et al., LILCO Ex. 21, Attachment 10 (SNRC-340, dated November 24, 1978). Although this implies that LILCO thought the welds were acceptable, Mr. Gallo did not know whether the procedure was subsequently qualified. Tr. 16,944-45 (Gallo). Finally, the weld involved in Inspection Report 78-16 was a structural weld. As noted above, this type of weld is usually significantly overdesigned, Tr. 16,947 (Gallo), and therefore may have been acceptable. In summary, although the NRC expressed concerns about whether these four welds were, in fact, acceptable, they may have still been able to perform their intended function.

RQA-107 (SC QA:352). As reflected in this finding, the Staff witnesses testified that it is improbable that an

unacceptable weld will escape detection at Shoreham. Nonetheless, the County urges the Board to find otherwise, relying on weld deficiencies which were noted in the RAT Inspection Report. This is an insufficient basis for disregarding the Staff's conclusions which were based on significant information of welding activities at Shoreham. See LILCO Proposed Finding QA-511; see also Tr. 17,331-32 (Higgins) (NDE van capabilities). First, although weld discrepancies were identified in the RAT Inspection, the welds in question were still adequate to perform their function. LILCO Proposed Findings QA-573, -609. Second, the welding findings identified in the RAT Inspection appeared to be isolated instances (in one case investigation was still underway to confirm this). See LILCO Proposed Findings QA-572, -609, -612. Finally, the Staff witness testified that the RAT Inspection did not reveal any programmatic quality assurance breakdowns. LILCO Proposed Findings QA-634. In addition, Torrey Pines performed non-destructive testing on 75 welds and found no discrepancies. LILCO Proposed Findings QA-713, -716. Consequently, there is ample support in the record for the Staff's conclusion.

This proposed finding is also misleading in implying that the RAT Inspection was somehow unduly restricted by the Staff's "limited resources." This is not true. The RAT Inspection was a week-long, in-depth inspection conducted by a

team of experienced inspectors. See LILCO Proposed Findings QA-568, -569, -631, -633.

## 2. Number of I&E Violations

RQA-108 (SC QA:579, :580). These SC Proposed Findings do not completely reflect the record concerning the increase in the number of violations noted during early 1982. While the Staff did express concern and did meet with LILCO management in August 1982, the County failed to mention that following the management meeting the number of violations decreased. Gallo et al., ff. Tr. 16,411-A, at 3; Tr. 16,672 (Higgins). Moreover, while it is true that the Staff witness did not identify a specific cause for the increase in violations at Shoreham in 1982, the testimony makes it clear that Shoreham is not unique in this regard. Mr. Gallo stated that, in general, the number of violations during the last year of construction increases "fairly substantially." Tr. 16,671 (Gallo).

RQA-109 (SC QA:581). This finding recites the number of I&E violations found at Shoreham over the years. The NRC Staff does not believe that the number of violations is a meaningful indicator of licensee performance. Rather, it is more important to consider the type of violations, their severity and the particular circumstances involved. Tr. 16,669 (Higgins).



RQA-110. The County takes contradictory positions concerning the importance of the number of I&E violations at Shoreham. In its proposed opinion, the County concludes that the number of violations at Shoreham does not constitute a meaningful measure of quality assurance/quality control compliance. SC Proposed Opinion at 111 n.32. Yet on the same page, the County points to "a large number of storage-related violations." Id. at 111. Although the County draws no explicit conclusion, the implication is that the LILCO program was deficient because of the number of findings. As explained by Mr. Higgins, the number of findings, by itself, is not a useful measure in assessing quality assurance. Tr. 16,669 (Higgins).

#### G. Torrey Pines

RQA-111. The Torrey Pines inspection of Shoreham was subjected to extensive examination. The record consists of four days of depositions (approximately 650 transcript pages) and ten days of hearings (approximately 1700 transcript pages). The massive Torrey Pines Final Report is in evidence. LILCO Ex. 59. The County's proposed findings, however, would have the Board ignore substantial parts of this extensive record, as explained more fully below.

RQA-112. The County's proposed findings criticize the following aspects of the Torrey Pines endeavor: (1) its independence and the inspection's protocol, (2) the scope of the review, (3) Torrey Pines' Discrepancy/Finding process, (4) Torrey Pines' assessment of construction quality assurance at Shoreham, (5) LILCO's response to the discrepancies found by Torrey Pines, and (6) Torrey Pines' use of a judgment-based sampling methodology. Most of the County's proposed findings, to which LILCO has responded in Attachment 2, fail to reflect accurately the record. Set out below are several of the more egregious examples.

RQA-113 (SC QA:592). The thrust of SC Proposed Finding QA:592 is that Torrey Pines' inspection of Shoreham was so remunerative for Torrey Pines and its parent company, GA Technologies, that marketing contacts were made by Torrey Pines with LILCO during the inspection. The thinly-veiled inference is that Torrey Pines did not exercise its independent engineering judgment. The pivotal phrase in the proposed finding is the language "as a result," which prefaces the final sentence.

This proposed finding contorts the record beyond recognition. The County did not include the key fact that Torrey Pines' annual revenues account for only ten percent of GA Technologies' revenues. Johnson, LILCO Ex. 57, at 127.

Because this testimony appears on the very page cited by the County, the omission can hardly have been inadvertent. Similarly, with respect to the two marketing contacts, the County has ignored clear and un rebutted testimony in the record explaining the nature of these contacts and establishing that they were completely unrelated to the inspection. See LILCO Proposed Finding QA-734.

RQA-114 (SC QA:652). The County in this proposed finding claims TPT inconsistently handled valid DRs because those involving non-safety related components were not made PFRs. This contention ignores the evidence that such DRs were not within the scope of the Torrey Pines verification; hence, they could not have been inconsistently handled. See 17,696-702 (Johnson). Torrey Pines handled consistently those DRs within the scope of their verification. In addition, the cited County prefiled testimony is speculative regarding whether there were, in fact, any DRs for items important to safety but not safety related; the term "important to safety" was not used by Mr. Johnson at the cited pages.

RQA-115 (SC QA:674). In its proposed finding the County would have the Board find that the Torrey Pines review "revealed that LILCO's [quality assurance] inspection process fails to ensure the detection of deficient materials,

components or equipment." The County's advocacy of this sweeping holding completely disregards two fundamental and un rebutted conclusions that the record supports.

First, simple arithmetic illustrates that the Torrey Pines inspectors looked at an extensive variety of structures, systems and components and yet found very little that had slipped undetected through LILCO's quality assurance program. Of the approximately 150,000 particulars inspected, any one of which could have generated a DR, fewer than 300 discrepant conditions were observed, of which a mere 19 became Findings. Of these 19, only six necessitated modifications to the as-built hardware. LILCO Proposed Findings QA-716 to -719, -735; see also Tr. 18,904 (Johnson).

Second, the County would have the Board indict LILCO's quality assurance implementation without regard to the significance of the discrepancies noted by Torrey Pines. The record, however, clearly establishes that quality assurance effectiveness cannot be assessed without analyzing the significance of those discrepant conditions that sift through the process. Moreover, the un rebutted evidence establishes that what Torrey Pines found was of minimal safety significance. LILCO Proposed Findings QA-735, -740, -742; see also Tr. 18,989-91 (Johnson) (function of a quality assurance program "not to produce zero defects;" not surprising that people make mistakes;

significance of mistakes is key); Hubbard and Samaniego, SC Ex. 112, at 197-98 (County's consultant did not "in a formal sense" assess the safety significance of valid DRs); see generally Tr. 16,036 (Hubbard) (Mr. Hubbard did not assess safety significance of LILCO audit findings).

RQA-116 (SC QA:710). In its proposed finding the County would have the Board (1) express "concern" about LILCO's corrective action programs, (2) "retain jurisdiction of this matter" and (3) require LILCO "to prepare and submit for Staff review corrective action measures for the Observations and DRs that were not made Findings by Torrey Pines." Such a finding cannot be justified in light of the record. As noted in Attachment 2 infra, almost all of the proposed findings that precede SC QA:710 and upon which it presumably rests are flawed in one or more respects. In addition, the County has ignored the testimony underlying LILCO Proposed Finding QA-736 to the effect that LILCO and contractor personnel reviewed all PFRs and valid DRs, which by definition included those that became Observations. It was concluded that none involved discrepancies of substantial safety significance and that it would not be necessary to implement any hardware modifications. See also Tr. 18,787, 18,932 (Novarro).

RQA-117. The County's proposed findings fail even to acknowledge the existence of significant aspects of the scope and methodology of the Torrey Pines inspection. For example, except in a general introductory proposed finding, SC QA:586, nowhere does the County describe or afford Torrey Pines credit for subtasks D2 (test of 35 of 36 primary containment lifts), D3 (observation of primary containment structural acceptance test) or E2 (inspection of all completed preoperational test packages). Moreover, in its assault on the Discrepancy/Finding process, the County neglected to include any reference to the existence, composition, or important role of the Torrey Pines Findings Review Committee. See LILCO Proposed Finding QA-721.

#### H. Operating Quality Assurance

RQA-118. The NRC I&E has audited LILCO and confirmed that LILCO's organizational structure gives the OQA Engineer sufficient independence to perform his duties. Tr. 20,217 (Caphton). In addition, Staff witness Caphton testified that the Shoreham Plant Manager evidenced a strong concern for quality. Mr. Caphton based his opinion on personal discussions with the Plant Manager. Mr. Caphton also testified that his discussions with other NRC inspectors indicated that these inspectors also considered that the Plant Manager was definitely concerned with quality. Tr. 20,225 (Caphton).

## ATTACHMENT 1

### SC USE OF FINDINGS IN OPINION

As highlighted by this Attachment, the County's proposed opinion on quality assurance matters bears little resemblance to the record in this proceeding. This Attachment shows that approximately 30% of the County's own findings have not been used substantively in its proposed opinion. While each proposed finding need not be referenced in a proposed opinion, the large percentage that have not been used reflects the County's disregard for the record.

The chart set out below lists each County finding with the pages in the proposed opinion where it is used as part of the County's analysis. In order to reflect accurately the substantive use of findings in the opinion, the chart does not include summary references.<sup>1/</sup> For example, on pages 2-11 of the proposed opinion the County summarizes its arguments, listing a block of findings that relate to each argument. This is no more than an index which does not constitute a substantive analysis of the record. Similarly, in the body of the County's opinion, references to a large block of findings generally related to a

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<sup>1/</sup> An exception to this practice is the use of the County's findings 1-7 which discuss the background of the Quality Assurance proceedings.



particular subject have not been noted. Thus, the following references have been omitted: SC Proposed Opinion at 41 (reference to 29 findings relating to calculations); 50 (reference to 38 findings relating to E&DCRs); 57 (reference to 52 findings relating to E&DCRs); 111 (reference to 32 findings relating to storage).

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<sup>2</sup>/ The citation to QA:584 on page 95 seems to be incorrect; it appears that the correct reference should be to QA:486.

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3/ See note 2.

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ATTACHMENT 2

INACCURATE SC FINDINGS

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:31	Refuted by the record; unjustified inference	See LILCO Proposed Findings QA-126, -150, -152, -153 (adding "(Eifert)" to proposed finding incorrectly implies Mr. Eifert agreed that audits did not evaluate design; EA audits did evaluate the design).
QA:33	No citation; unjustified inference; out of context	Tr. 10,503-04, 10,538 (cites to remarks made by Judge, not by a witness); Tr. 10,541 (Eifert) (Judge Carpenter did not say "there is going to be a real problem"; Judge Carpenter was trying to distinguish between ready traceability and lack of traceability); Tr. 10,504 (Museler) (contrary to suggestion that Mr. Museler believed lack of positive traceability was a "real problem," Mr. Museler testified even without positive traceability calculations were traceable).
QA:39	Unjustified inference; out of context; refuted by record	See LILCO Proposed Findings QA-130, -152; Tr. 10,690 (Eifert) (implication of lack of audit depth refuted by testimony); Tr. 10,364-66 (Eifert, Burns) (last sentence of proposed finding refers only to early pilot audits and the statement was made by Mr. Burns, not Mr. Eifert).

SC Proposed  
Finding

LILCO Response

Explanation

QA:42

Refuted by the  
record; out of  
context

Tr. 13,348-49 (Eifert)  
(contrary to implication  
that incorrect data used,  
at time calculation was  
prepared proper input  
data had been used; sub-  
sequent revision of motor  
and load list created ap-  
parent inconsistency).

QA:48

Out of context;  
unjustified infer-  
ence

Tr. 10,500-02 (Eifert)  
(contrary to inference in  
proposed finding, Eifert  
did not imply that ready  
traceability is essential  
for quality of design and  
construction).

QA:50

Not supported by  
citation; un-  
justified infer-  
ence; out of  
context

Tr. 13,389 (Eifert); see  
LILCO Proposed Findings  
QA-207, -208, -212 to  
-214 (auditors did not  
determine existence of  
four additional calcula-  
tions as stated; this was  
determined by project  
people in determination  
of extent of condition  
for the observation cited  
as required by audit pro-  
gram).

QA:57

Unjustified infer-  
ence; refuted by  
record

Tr. 10,757-60 (Eifert)  
(contrary to incorrect  
implication that design  
changes can be freely  
made based solely on  
judgment; testimony indi-  
cates that engineering  
judgment used to deter-  
mine if a design change  
within bounds of original  
analysis; not judgment  
changes made to  
analysis).

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Finding

LILCO Response

Explanation

QA:60

Unjustified inference; refuted by record

Tr. 10,773-80 (Museler) (1800 was the number of calculations redone, not the number reviewed; incorrect inference is that several thousand calculations exist that were not reviewed for the condition).

QA:71

Out of context

Tr. 13,899-902 (Eifert) (Mr. Eifert's statement that no single violation of EAP 6.3 could constitute a violation of Appendix B is supported by the existence of Criterion XVI that recognizes there will be isolated failures to be corrected); see LILCO Proposed Finding QA-315 (Staff agrees that deviations discovered and corrected by LILCO program do not violate Appendix B).

QA:74

Out of context; unjustified inference

Contrary to inference of finding, witnesses were never asked if filing, logging and indexing were administrative aspects of Stone & Webster's Appendix B commitment.

QA:75

Unjustified inference

Tr. 10,850-51 (Eifert) (construction can proceed before finalization of an E&DCR only if the project engineer has all of the details of the E&DCR; he has evaluated those details; and the E&DCR finalization and

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
		distribution process has begun).
QA:78	Out of context; unjustified inference	See LILCO Proposed Finding QA-296 (Suffolk County implies that problem with the master log will result in implementation problems; in fact, at least one other means of assuring proper implementation exists).
QA:83	Not supported by citation; unjustified inference	Tr. 11,034 (Museler) (LILCO had trouble getting people to understand that <u>all</u> procedural requirements had to be adhered to, for all documents, not just those used for construction).
QA:84	Not supported by citation; out of context	Tr. 10,859-63 (Museler); (only Courter); <u>see</u> LILCO Proposed Finding QA-322, -323 (contrary to the County's characterization, the problems with distribution and proper posting identified in 1977-78 applied to only a limited number of disciplines and areas, primarily Courter and Company; Distribution was a timing problem related to when E&DCRs are posted versus when they are transmitted).
QA:85	Not supported by citation	Tr. 10,865 (Museler); <u>see</u> LILCO Proposed Findings QA-322, -323 (only "certain" E&DCR logs and specific areas were



<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
		unsatisfactory, not entire site).
QA:86	Out of context; unjustified inference	Tr. 10,918-21 (Museler, Gerecke) (record shows that extensive rework was not required, and that rework had no safety significance).
QA:88	Not supported by citation; out of context	See Reply Finding RQA-24 (SC QA:88).
QA:89	Unjustified inference	Tr. 11,112 (Kelly); see LILCO Proposed Findings QA-334, -337 (witness testified that 5% or less is acceptable given other means of assuring implementation of E&DCRs).
QA:90	Out of context	Tr. 11,114-15 (Museler) (County has not demonstrated that the nature and extent of the observations in 1980 and 1981 were the same as those in FA 602; the observations in 1980 and 1981 involved only one audit in each period, followed by rapid improvement).
QA:91	Unjustified inference	Cited material does not support Suffolk County's inference that LILCO had failed to address observations prior to Field Audit 602.

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:92	Out of context; not supported by citation	See Reply Finding RQA-25 (SC QA:91, :92).
QA:93	Out of context; unjustified inference; not supported by citation	Tr. 10,947-51 (Museler, Kelly); see LILCO Proposed Finding QA-324 (contrary to Suffolk County's implication, the audit report did not say safety was impaired; therefore, the conclusion that Museler and Kelly disagreed with paragraph 3.1 is without basis).
QA:94	Not supported by citation; out of context; unjustified inference	Tr. 10,912-13 (Kelly), 10,926-27 (Museler); see LILCO Proposed Findings QA-316 to -321 (Kelly explained that at a <u>minimum</u> three organizations would need to miss an E&DCR; Museler testified that tracking of E&DCRs would not affect total design, but may affect specific components).
QA:95	Unjustified inference	Tr. 10,951-52 (Museler) (Suffolk County improperly implies that the entire E&DCR program was not meeting procedural requirements; Mr. Museler's comments addressed only the observations in FA 602).
QA:96	Out of context	Tr. 10,953-54 (Museler) (transcript indicates that Mr. Museler based his belief on the second sentence of Criterion VI,

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
		which Suffolk County has omitted from its quotation).
QA:97	Unjustified inference	Tr. 10,955 (Museler), 11,056 (Kelly); <u>see</u> LILCO Proposed Findings QA-311 to -316 (Suffolk County implies that a large group of specifications were checked; in fact, only five specifications were examined, SC Ex. 55; Mr. Kelly did not state that E&DCRs were missing from specification files; instead, he stated that holders had not met all requirements).
QA:98	No citation	SC Ex. 55, at 2, ¶ 4.3 was not admitted into evidence.
QA:99	Out of context; not supported by citation	Tr. 11,056 (Kelly) (Kelly states that <u>some</u> E&DCRs were not prefaced to <u>some</u> procedures, not that "in most cases the procedures were not prefaced" as the County states; SC Ex. 55, at 2, ¶ 4.4 was not admitted into evidence).
QA:100	No citation	SC Ex. 55, at 2, ¶ 4.5 was not admitted into evidence; Tr. 10,960-62 (Museler) (Museler only discussed item (a) with Judge Morris).
QA:102	Out of context	Tr. 10,973-77 (Museler); <u>see</u> LILCO Proposed Findings QA-331 to -337 (transcript reveals that

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		there were additional corrective actions beyond those listed by Suffolk County; Museler explained that these concerns were not the type that could be immediately remedied, but that LILCO provided continuous attention to the matter to ensure its resolution).
QA:103	Not supported by citation; out of context	Tr. 11,041-42 (Kelly), 11,251-57 (Kelly, Museler); <u>see</u> LILCO Proposed Finding QA-325 (Kelly's and Museler's testimony was not inconsistent; Kelly stated that none of the 200 E&DCRs reviewed had an adverse effect on permanent plant installation; he did not state that all 200 had been installed).
QA:104	Out of context	Tr. 11,396-97 (Museler); <u>see</u> LILCO Proposed Findings QA-316 to -321 (Museler stated he relied on all the inspection and other groups as well as extensive distribution of E&DCRs and other checks).
QA:106	Out of context; no citation	Tr. 11,057-60 (Kelly, Museler); <u>see</u> LILCO Proposed Findings QA-316, -334 (SC Ex. 57, at 2, ¶ 4.2 was not admitted as evidence; weekly summaries are designed to provide an update of E&DCRs issued that week;

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		thus, the implication created by the finding that weekly summaries are "needed" for construction is incorrect since the E&DCR itself goes to person performing the work).
QA:107	Out of context	Tr. 11,064 (Kelly) (Suffolk County's characterization of the weekly summary as incomplete is inaccurate; the summary reflected that E&DCRs had not been incorporated in drawings while, in fact, they had been, thus the user had duplicative information).
QA:109	Unjustified inference	Tr. 11,074-75 (Museler) (Suffolk County suggests that the audit finding is site-wide while, in fact, it relates to Courter and Company).
QA:111	Out of context; not supported by citation; unjustified inference	Tr. 11,097-100, 11,369 (Museler) (Courter and Company was posting E&DCRs needed for construction, it was not posting E&DCRs presenting information only; Suffolk County characterizes drawings as "incorrect," even if they had only posting problems).
QA:112	Out of context; unjustified inference	Tr. 11,295-98 (Museler); see LILCO Proposed Finding QA-334 (Stone & Webster engineering maintained a manual log

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		and updated it with E&DCRs sent on weekly basis; the engineers in Boston are same engineers who approve the E&DCRs and drawings).
QA:115	Not supported by citation; out of context; no citation	Tr. 11,130 (Museler) (entire audit report was not admitted into evidence, only ¶ 4.1 dealing with Courter and Company was admitted; Suffolk County understates LILCO's actions to correct the problem which included training, auditing and continuous management attention).
QA:116	No citation	Only ¶ 4.1 of SC Ex. 59 was admitted into evidence.
QA:117	Not supported by citation; out of context; unjustified inference	See Reply Finding RQA-26 (SC QA:117, :118).
QA:118	Out of context	See Reply Finding RQA-26 (SC QA:117, :118).
QA:119	Unjustified inference	Tr. 11,377-78 (Kelly) (Suffolk County implies from Kelly's testimony that Courter's performance may not have been 91% effective; Kelly suggests that Courter's performance may have been even better).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:120	Out of context	Tr. 11,379-80 (Museler) (Museler stated that the QA Department wanted upper management to know that "substantial progress" was being made, not just that the matter was "under control").
QA:124	Not supported by citation; out of context	Tr. 11,430-34 (Museler) (Museler stated that many considerations went into decision to select Courter; in addition, ASME and ANI approved the Courter ASME III program).
QA:125	Out of context	See LILCO Proposed Findings QA-327 to -328, -333 to -337 (overall corrective action was extensive including additional corrective action as a result of subsequent audits).
QA:126	Not supported by citation; out of context	Tr. 10,999-11,001 (Eifert) (finding was against only one specification; requirement for engineers to maintain a file for E&DCRs was later deleted since it came to be viewed as an unimportant control practice).
QA:127	Out of context; unjustified inference	Tr. 11,004-06 (Eifert) (there was no procedural violation involved in this audit finding; the auditor identified a new situation which demonstrated that additional



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		administrative control was necessary).
QA:128 QA:129	Out of context	Tr. 11,009 (Eifert), 11,014-15 (Museler) (these findings, and the transfer of administrative control to the site, resulted from the increasing volume of E&DCRs generated at the site and the increasing involvement of the site engineering office).
QA:131	Unjustified inferences; not supported by citation	Tr. 11,051 (Baldwin) (the "inaccuracy" and the "not up to date" findings are not separate problems).
QA:132	Out of context	Tr. 11,140-43 (Eifert) (the preparation and approval of a specification amendment is time consuming; the E&DCRs not incorporated were issued during this time interval).
QA:133	Out of context; unjustified inference	Tr. 11,143-45 (Eifert, Museler), 11,147-48 (Museler); <u>see</u> LILCO Proposed Finding QA-90 (the new guideline is the fuel load update program, not a replacement for the master log; more frequent updates were impractical, but the base document with applicable E&DCRs always defined design requirements).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:135	Out of context; unjustified inference	See Reply Finding RQA-27 (SC QA:135).
QA:136	Out of context	Tr. 11,272-76 (Baldwin) (audit findings reflect many of the same observations reported in the roughly concurrent Field Audits 602 and 654).
QA:138	Out of context; unjustified inference	Tr. 11,282-85 (Baldwin, Arrington) (observations were limited to drawings in EQC office area that were not being used for inspections at that time).
QA:139	Refuted by record; unjustified inference	Tr. 11,286-87 (Museler, Baldwin); see LILCO Proposed Findings QA-356 to -361 (timeliness of distribution is not the only criterion for judging the document control process; as witness Museler noted, the primary quality consideration is that the document gets to the right person and that the plant is built in accordance with the document).
QA:140	Out of context	Tr. 11,289-90 (Eifert); see LILCO Proposed Findings QA-360 to -361 (Suffolk County improperly confuses "documents" with the "change record").

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:142	Unjustified inference	See Reply Finding RQA-28 (SC QA:142, :143).
QA:144	Out of context	Tr. 16,310-11 (Narrow) (Mr. Narrow stated that he would discuss the engineering calculations and inputs with the S&W engineers).
QA:145	Out of context; unjustified inference; refuted by record	See Reply Finding RQA-29 (SC QA:145).
QA:146	Unjustified inference; refuted by the record	Tr. 16,374-76 (Higgins) (Suffolk County's attempt to imply that LILCO and S&W QA/QC did not consider control of the large numbers of E&DCRs is refuted by the record); see Reply Finding RQA-30 (SC QA:146).
QA:147 QA:148	Out of context; unjustified inference	See Reply Findings RQA-31, -32 (SC QA:147, :148, :149, :150).
QA:149	Out of context	See Reply Finding RQA-33 (SC QA:149).
QA:150	Out of context	See Reply Finding RQA-31 (SC QA:147, :148, :149, :150)(master log properly tracked the indication on the drawing as procedures required).
QA:151	Out of context	Tr. 16,763 (Narrow) (Narrow continues by stating that the Staff did not find problems, regardless of the promptness of the corrective actions).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:152	Out of context; not supported by citation	Tr. 16,767 (Narrow) (Mr. Narrow stated that he had no personal knowledge of this matter, but that the NRC I&E had reviewed the entire E&DCR program during this period).
QA:154	Unjustified inference	<u>See</u> Reply Finding RQA-34 (SC QA:154).
QA:156	Out of context; unjustified inference	Tr. 16,978-79 (Higgins) (item discussed is an unresolved item, not a violation; LILCO disputed the NRC's statement that E&DCRs were not adequately controlled).
QA:157	Out of context; unjustified inference	Tr. 11,438-39 (Museler); <u>see</u> Alexander et al., LILCO Ex. 21, at 179-81 (Suffolk County implies that a S&W problem at another site could have occurred at Shoreham; Museler states that the procedures used at Shoreham ensured that E&DCRs were properly implemented; the S&W problem at the other site, when finally checked, showed that one E&DCR out of 50,000 had not been implemented).
QA:158	Unjustified inference	<u>See</u> LILCO Proposed Findings QA-318, -321 (Suffolk County implies that many E&DCRs are not verified; all are verified as part of Final Inspection Program; E&DCR verification program is

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		an additional layer of assurance).
QA:160	Unjustified inference	Tr. 11,440-41 (Museler) (E&DCR Implementation Verification Program involves quality assurance personnel and is over and above Appendix B requirements).
QA:163	Not supported by citation	Staff Ex. 8, Attachment 2.a; see LILCO Proposed Finding QA-498 (I&E Report 79-16 cited LILCO for an "infraction," not a "violation"; in addition, I&E Report 79-16 cited certain noncompliances but did not contain the broad generalization that "LILCO failed to take actions to ensure compliance with the ANSI standard").
QA:167	Out of context	Tr. 11,712-14 (Museler) (storage and maintenance programs apply universally and not just to the safety related structures, systems and components covered by Appendix B).
QA:171	Not supported by citation; unjustified inference	Tr. 11,490-91 (Museler) (storage levels A through D are not the same as those specified in ANSI N45.2.2-1972, but they do "generally follow those classifications"); LILCO Proposed Finding QA-407; Tr. 11,835 (Arrington)

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		(contrary to the inference that storage level B requires heaters, the heat to maintain the minimum temperature may result from ambient conditions).
QA:174 QA:199	Out of context	See LILCO Proposed Findings QA-534, -537, -539, -541, -543, -548 to -549, -554 to -555, -557, -560, -561, -562; Tr. 16,533-37 (Higgins) (although the CAT inspectors observed a "number" of vent valves not plugged or capped, the condition was not significant enough to classify as a violation of Appendix B, a deviation from FSAR commitments, an observation on a weakness in LILCO's Quality Assurance Program or an unresolved item).
QA:199	Out of context	Tr. 16,534-36 (Higgins) (although this is an accurate compilation of Mr. Higgins' responses, he qualified this series of questions at their beginning by plainly stating that he was not the inspector who identified this finding nor was he involved in the decision not to cite it as a violation of Criterion II).

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QA:176

Out of context

See LILCO Proposed Finding QA-371 (contrary to the assertion that the LILCO witnesses attached "no significance" to the number of audit findings, the witnesses did not attach significance "relative to the quality of the plant" with respect to the number of storage-related observations).

QA:178

Unjustified inference

See Reply Finding RQA-42 (SC QA:178).

QA:180  
QA:183

Unjustified inference

See LILCO Proposed Finding QA-394 (even though Field Audit 444, Finding 4.2 addressed structural steel that exhibited corrosion, there was no damage as it was simply sandblasted and primed as was all structural steel taken from storage).

QA:187

Not supported by citation

See Reply Finding RQA-46 (SC QA:187).

QA:188  
QA:190  
QA:192

Unjustified inference

See Reply Finding RQA-47 (SC QA:188).

QA:201

Out of context

See LILCO Proposed Finding QA-562 (failure to seal completely electrical components was an unresolved item that received LILCO follow-up even though no response was required by the CAT Inspection Report and even though it was not a violation of Appendix B).



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Explanation

QA:208

Unjustified inference

Tr. 16,613-19 (Higgins) (contrary to the inference that corrosion in the plant is always unacceptable, corrosion is sometimes acceptable).

QA:210

Refuted by record

See Reply Finding RQA-54 (SC QA:210); Tr. 16,782 (Narrow) (the one instance where the proper dew point was not maintained was not, in witness Narrow's opinion, an example of a failure to maintain proper environmental conditions).

QA:211

Unjustified inference

See LILCO Proposed Finding QA-414; Staff Ex. 8, Attach. 2.b (contrary to the inference that the program for space heaters was inadequate, the inspector noted that the licensee appeared to have a very effective program for maintaining temporary heat on electric motors and generators, which included daily surveillance checks).

QA:229

Out of context

Tr. 17,304 (Higgins) (although witness Higgins was unaware of any employees facing disciplinary action for not complying with housekeeping requirements, he probably would not be aware of such action if it had occurred).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:236	Out of context	Tr. 16,461 (Gallo) (Inspector Nicholas did note some improvement between the CAT Inspection and I&E Report 82-27); LILCO Proposed Finding QA-437; Tr. 16,462 (Higgins) (construction activities were not decreasing at the time of I&E Report 82-27; when those construction activities have decreased and plant areas have received final cleanup in preparation for operation, I&E inspectors have identified no housekeeping problems).
QA:237	Unjustified inference	Tr. 16,463 (Higgins) (use of the word "ultimately" implies that LILCO eventually offered an explanation; witness Higgins did not use the word "ultimately," but instead stated that whenever the Staff raised the subject LILCO "always said" that they were in the construction mode with a lot of dirt-generating activities).
QA:239	Out of context	Tr. 16,472-73 (Higgins) (the proposed finding fails to reflect the accompanying testimony indicating that the cited occurrence regarding the control box is evidence that LILCO's program was working because it was discovered by LILCO

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
		during "storage and housekeeping inspections prior to even being turned over to the pre-operational group, which also would have identified it during the turnover inspection or during the initial pre-operational tests").
QA:240	Out of context; no citation	See Reply Finding RQA-62 (SC QA:240). (The final sentence asks the Board to draw a conclusion that has no factual basis).
QA:241	Not supported by citation	Tr. 16,475 (Higgins) (while witness Higgins stated that the dirt and disorder was "over the border," he added that it was "not much dirtier than we would expect").
QA:244	Out of context	See Reply Finding RQA-63 (SC QA:244).
QA:246	Unjustified inference	See Reply Finding RQA-65 (SC QA:246).
QA:247	Refuted by record	See LILCO Proposed Finding QA-421 (no basis in record for Suffolk County's conclusions as to premature aging; of the 16 housekeeping observations listed in Group V of LILCO Ex. 31, only one noted damage to equipment and that resulted from construction activity in the area and not from improper storage or housekeeping).

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QA:249  
QA:250  
QA:251  
QA:253  
QA:254

Refuted by record

See LILCO Proposed Finding QA-415 to -447 (these proposed findings are taken directly from Mr. Hubbard's pre-filed supplemental testimony on housekeeping, SC Ex. 89D, ff. Tr. 15,362 (Hubbard), and ignore the substantial amount of evidence refuting his opinions; i.e., they ignore the evidence establishing that the accumulation of litter and debris is expected during construction, LILCO Proposed Finding QA-416 to -17, that no damage resulted from the housekeeping observations, LILCO Proposed Finding QA-421, that LILCO management was concerned about housekeeping and conditions were improving, LILCO Proposed Finding QA-423, that the housekeeping conditions at Shoreham were described as not significantly worse than the Staff would have expected given the ongoing construction and the number of workers, LILCO Proposed Finding QA-427, that the Staff believed that the housekeeping checks and balances that exist at Shoreham are adequate and probably would be adequate for conditions worse than those at Shoreham, LILCO

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		Proposed Finding QA-429, that the Staff considered and found no safety implications resulting from the unsatisfactory housekeeping conditions, LILCO Proposed Finding QA-430, that LILCO has given cleanliness priority to certain areas nearing completion, LILCO Proposed Finding QA-437, and that the housekeeping concerns at Shoreham do not result from a lack of management attention, LILCO Proposed Finding QA-443, -446, -447).
QA:256	Not supported by citation	Tr. 11,955-56 (witness Museler did not state that Field Audit, Finding 4.5 was more important than others, he stated that it was in a different category).
QA:263	No citation	(While the first sentence in this proposed finding is acceptable, the second sentence is incomplete and has no citation to the record).
QA:264	Out of context	Tr. 12,463-65 (Kelly) (the unsatisfactory observations do not mean that the equipment was damaged; the unsatisfactory observations were expected because the surveillances covered items primarily stored in place with ongoing construction and work activity).

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QA:265

Not supported by  
citation

Tr. 12,465-66 (Kelly)  
(the openings category  
involved instrumentation  
in short-term storage and  
stored in place, not just  
short-term storage).

QA:270

Out of context;  
unjustified infer-  
ence

Staff Ex. 8, Attachment  
1.a (states "though their  
respective Change Notices  
were in effect;" omission  
of these words in this  
proposed finding at line  
3 incorrectly implies  
that procedures were in-  
adequate); see also Staff  
Ex. 8, Attachment 1.b at  
5 (notes that "the status  
of procedures could be  
readily determined since  
the Change Notices were  
filed in front of the af-  
fected procedures and the  
current index indicated  
what procedures were af-  
fected by outstanding  
CN's").

QA:271

Out of context;  
unjustified infer-  
ence

Staff Ex. 8, Attachment  
1.a (characterization of  
nature of problem is in-  
accurate for same reasons  
stated for QA:270 supra);  
Tr. 16,432, 16,435  
(Gallo) (testimony by  
Staff clearly referred to  
NRC-identified problems;  
but proposed finding  
implies that all failures  
to follow procedures vio-  
late Appendix B, even if  
discovered and corrected  
by LILCO); Tr. 16,730  
(Higgins) (Staff testimo-  
ny rejected this  
inference).

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LILCO Response

Explanation

QA:272	Out of context; unjustified inference	Staff Ex. 8, Attachment 1.b at 5 (problem was incorporation of Change Notices into text of EQAPs, not that a controlled manual had not been kept up-to-date as stated by lines 3-5 of this proposed finding); Tr. 16,730 (Higgins) (Staff testimony rejects inference made in last sentence of this proposed finding that similar problem found by LILCO violates Appendix B).
QA:275	Out of context	Tr. 16,507-08 (Higgins) (exclusion of testimony that 59 manuals reviewed by LILCO constituted <u>all</u> manuals on site incorrectly infers that problem was widespread beyond the scope reviewed by LILCO).
QA:279	Out of context	Tr. 16,739 (Higgins) (Staff testified that a significant difference was that licensee identified FQC 14 problem indicating licensee program was working).
QA:281	Not supported by citation	Tr. 14,514 (Eifer) (witness testified that condition "didn't in any way indicate any concerns with the adequacy of . . . " and therefore directly contradicts the last paragraph of this proposed finding).



<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:288	Refuted by record	See LILCO Proposed Findings QA-653, -667 (contrary to finding, FSAR is not a design document).
QA:289	Not supported by citation	Tr. 17,417-19 (Higgins) (FSAR interfaces with design documents, not "acts as an interface"; <u>control</u> of FSAR is tied to control of design); Tr. 17,343-44 (Gallo) (FSAR is not controlling document); <u>see also</u> LILCO Proposed Finding QA-653 (FSAR predominantly licensing document).
QA:290	Not supported by citation; out of context; refuted by record	See Reply Finding RQA-68 (SC QA:290 to :292).
QA:291	Not supported by citation; refuted by record	See Reply Finding RQA-68 (SC QA:290 to :292).
QA:292	Unjustified inference; refuted by record.	See Reply Finding RQA-68 (SC QA:290 to :292).
QA:293	Unjustified inference; out of context; refuted by record	See LILCO Proposed Findings QA-658, -662 (number of discrepancies small); Tr. 16,983-84 (Gallo) (contrary to implication, no indication NRR reviewing inaccurate design; no timing requirement on update).
QA:294 QA:297	Unjustified inference	See LILCO Proposed Finding QA-658 (such requests not unusual).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:300	Out of context	Tr. 17,496-500 (Higgins, Gallo); LILCO Proposed Findings QA-661 to -664 (witnesses went on to testify that "Deviations" involve commitments that are <u>not</u> legally binding).
QA:305	Not supported by citation	Tr. 13,690-91 (Museler) (witnesses did not call information in SPCR Reports "problems").
QA:310 to QA:312	Out of context	See Reply Finding RQA-70 (QA:310 to :312).
QA:318	Out of context	Tr. 17,049-50 (Gallo) (core spray is not related to drywell spray).
QA:319	Out of context; unjustified inference	Tr. 17,361-62 (Higgins) (finding fails to add qualification that Region I does not use important to safety); Tr. 17,334-37 (Higgins) (last sentence implies that a QA problem exists, but Mr. Higgins only testified more information needed).
QA:325 to QA:327	Out of context	Tr. 12,343-48 (Museler); LILCO Proposed Findings QA-659, -660 (findings omit testimony that items involved fine level of detail, frequently only clarifications needed).
QA:331	Unjustified inference	SC Ex. 89B, at 4-21, 4-22; Tr. 16,572 (Higgins) (the E&DCR noted supplemented the specification; the inspector noted only that

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		separation not maintained for the specific cable groupings mentioned).
QA:332	Out of context	Tr. 16,573-75 (Higgins) (additional reasons discussed why not Appendix B violation; because the program was ongoing there was room for debate over program adequacy).
QA:333	Out of context; unjustified inference	Tr. 16,580-81 (Narrow) (normal industry practice is to cover cable after installation if needed; tagging or noting not necessary given the LILCO program).
QA:334	Out of context; refuted by record	Tr. 16,589-90, 17,337-39 (Higgins) (Higgins not familiar with details; later, with more information, stated QA did have criteria to inspect to).
QA:335	No citation	Tr. 16,601 (no citation to witness).
QA:336	Out of context	Tr. 16,607-10 (Higgins, Gallo) (response given based on assumed conditions, hypothetical question).
QA:337	Out of context	Tr. 16,713-15 (Narrow, Higgins) (resolution of notice of violation involved technical disagreements with which witnesses were not familiar in detail).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:341	Out of context	Tr. 16,922 (Higgins) (Mr. Higgins also said LILCO realized the problem and put great effort into it); Tr. 16,926-27 (Higgins) (79-07 was <u>not</u> specifically a design control problem).
QA:346	Not supported by citation	Tr. 17,338-39 (Higgins) (QA/QC criteria existed but were different from current QA/QC criteria. The QA/QC criteria changed because technical separation criteria changed).
QA:347	Refuted by record	Gallo et al., Staff Ex. 8, at 22-23 (findings decreased after number of welders stabilized); <u>see also</u> Tr. 16,881-82 (Narrow) (combination of learning curve and increased welding made increase inevitable).
QA:348	Out of context	<u>See</u> Tr. 16,865-69 (Narrow) (small number of violations in comparison to attributes inspected).
QA:353	Out of context	Tr. 16,945 (Gallo) (witness could not tell whether removal of welds was necessary or whether LILCO replaced welds rather than wait for qualification of procedure).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:356	Unjustified inference	Gallo et al., Staff Ex. 8, at 23 (findings decreased after number of welders stabilized).
QA:358	Not supported by citation; refuted by record	See LILCO Proposed Findings QA-23, -450; Tr. 15,446 (Hubbard) (Mr. Hubbard testified only that I&E had not done a comprehensive review of QA program implementation; Staff testified that the I&E program was a systematic program for inspecting the major phases of the construction, covering a broad spectrum of activities); LILCO Proposed Findings QA-644 to -646 (SALP reports can include review of vendors, (e.g., General Electric, Stone & Webster)); Gallo et al., Staff Ex. B, at 40-41 (baseline criteria are used even though sound technical judgment is considered more useful).
QA:361	Out of context	See LILCO Proposed Finding QA-637; Tr. 16,316 (Gallo) (prior to a formalized SALP process, informal reviews of licensee performance were conducted).
QA:368	Not supported by citation	SC Ex. 89A, at 60 (statement is by Mr. Denton, Director of NRR).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:369	Out of context	Tr. 15,834-35 (statement is Mr. Hubbard's characterization of Mr. DeYoung's remarks).
QA:370	Out of context	Tr. 15,834 (Hubbard); <u>see also</u> LILCO Proposed Findings QA-25, -26 (Mr. Hubbard was testifying solely from his own experience that LCVIP was not a detailed review of implementation, but rather a review of whether procedures were in place).
QA:379	Unjustified inference	Tr. 16,361-63 (Higgins), 17,093-94 (Gallo, Higgins) (proposed finding implies negligence by Region I in not specifically notifying Region IV of the E&DCR problem; E&DCRs were an area for improvement; they were not a violation of regulatory requirements; with respect to at least one other plant, Region I found it necessary to notify Region IV of a problem; Region I has never found it necessary to notify Region IV of problems at Shoreham; Region IV did receive SALP Report which included the E&DCR weakness written up in the CAT Report).
QA:386	Refuted by record	<u>See</u> SC Proposed Finding QA:384; LILCO Proposed Findings QA-483, -484 (NRC Staff Region IV has

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QA:387

Unjustified inference

reviewed the implementation of the design process by the nuclear reactor vendor and the architect/engineer); Tr. 15,812-25, 15,929-31 (Hubbard) (proposed finding reflects only Mr. Hubbard's conclusions as to the relationship between the breakdowns at other plants and the effectiveness of the I&E inspection program; Mr. Hubbard's conclusions as to the results of the Sandia and 1978 GAO Report are his own and not those expressed in the reports themselves).

Tr. 16,318-19, 16,322-23, 16,352 (Higgins, Narrow, Gallo) (the use of "however" erroneously implies that the NRC Staff should have reviewed all of the FQC audits and all of the field quality assurance group audits; Region I inspectors reviewed some of the audits in the course of inspecting construction).

QA:388

Unjustified inference; out of context; not supported by citation

Tr. 16,320-25 (Higgins, Narrow, Gallo) (contrary to proposed finding, Mr. Gallo's testimony clearly indicates that subsequent to the preparation of the prefiled testimony he, at least, looked at engineering audits that were discussed in the



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		proceeding, including audits contained in SC Ex. 51; Staff witnesses were not asked questions about specific audit reports).
QA:390	Out of context	Tr. 16,326-28 (Gallo, Higgins) (contrary to implication raised by the proposed finding, Staff is not required to review LILCO quarterly reports as part of the I&E program).
QA:398 QA:399	Unjustified inference	Tr. 16,732-35 (Narrow, Gallo) (proposed finding implies a deficiency in the Staff witnesses' knowledge of the contents of EA and FQC audits done by the Boston office of Stone & Webster; however, Staff does not regularly review EA and FQC audit reports done by the Boston office of Stone & Webster; review of those audits is not part of Region IV's inspections of Stone & Webster; however, FQC audits were reviewed by Region I as part of their inspection program).
QA:405	Refuted by record	See LILCO Proposed Findings QA-635 to -652, -859; Gallo et al., Staff Ex. 8, at 40-41 (Staff, as it interprets the term, does use "objective baseline criteria" such as regulations,

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		regulatory guides, industry standards, licensee commitments and technical judgment of inspectors, though Staff indicated that technical judgment was more significant in determining effectiveness of a quality program; Staff also uses SALP process to evaluate Shoreham).
QA:406	Refuted by record	<u>E.g.</u> , LILCO Proposed Findings QA-450, -459 to -462, -474, -475, -858; Gallo <u>et al.</u> , Staff Ex. 8, at 41 (proposed finding rests solely on Mr. Hubbard's prefiled testimony, which was overwhelmingly rebutted by Staff and LILCO witnesses).
QA:409	Refuted by record	<u>See</u> , <u>e.g.</u> , LILCO Proposed Findings QA-461, -475, -857, -858, -859, -864, -868; Reply Finding RQA-3 (SC QA:419); Gallo <u>et al.</u> , Staff Ex. 8, at 41 (I&E selects samples based on judgment, experience, safety significance and complexity; this method of sample selection is superior to statistically based selection; Staff program adequate to support conclusion that Shoreham QA effective).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:411	Refuted by record; unjustified inference	<u>See</u> Reply Finding RQA-1 (SC QA:411).
QA:415	Out of context; unjustified inference	<u>See</u> Reply Finding RQA-2 (SC QA:415).
QA:416	Refuted by record	<u>See, e.g.,</u> LILCO Proposed Findings QA-860 to -863 (proposed findings based solely on Mr. Hubbard's views; County fails to acknowledge substantial contrary testimony; supporting validity of audit methodology).
QA:417	Unjustified inference	<u>See</u> LILCO Proposed Findings QA-858, -859; SC Proposed Finding QA:419 (conclusion of proposed finding is speculative legal argument that is contrary to Staff practice and industry experience).
QA:419	Out of context	<u>See</u> Reply Finding RQA-3 (SC QA:419).
QA:420	Out of context; unjustified inference	Tr. 17,280-81 (Higgins) (explains that limited use of statistics in leak rate test was unrelated to and different from its applicability in I&E inspection sample selection, where use of statistics not appropriate). <u>See also</u> LILCO Proposed Findings QA-856 to -859.

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:421	Out of context; unjustified inference	See Reply Finding RQA-4 (SC QA:421).
QA:429	Out of context; refuted by record	Staff Ex. 13 cover letter, at 2; Tr. 19,783 (Greenman) (Staff concerned by apparent overreliance; did not conclude that additional action necessary); <u>see also</u> Tr. 20,094 (Higgins) (rework rate lower than raw statistics indicate); Tr. 19,799-800 (Arrington) (RAT Inspection Report used raw data).
QA:430	Not supported by citation	See Reply Finding RQA-79 (SC QA:430).
QA:436	Not supported by citation; out of context	See Reply Finding RQA-83 (SC QA:436).
QA:438	No citation; refuted by record	See LILCO Proposed Finding QA-617.
QA:440	Out of context; not supported by citation	See Reply Finding RQA-85 (SC QA:440).
QA:442	No citation; refuted by record	See, e.g., Museler <u>et al.</u> , ff. Tr. 19,757, at 25 (rejection rate not excessive); <u>see also</u> Tr. 20,094 (Higgins) (raw data does not reflect actual rework).
QA:444	Out of context	Tr. 20,002-03 (Kelly, Museler) (items awaiting disposition are not any different from those

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		already dispositioned; unlikely that percentages would increase).
QA:445	No citation; re- futed by record	<u>See</u> LILCO Proposed Find- ings QA-616, -617, -630.
QA:447	Out of context	Tr. 20,036 (Arrington) (proposed finding ignores fact that some inspectors hired just prior to RAT); Tr. 19,899-900 (Arrington) (average was approximately 14 hours of overtime, not 20).
QA:448	Unjustified infer- ence	<u>See</u> LILCO Proposed Find- ing QA-617 (proposed finding ignores correc- tive action taken by LILCO to add inspectors; Staff considers LILCO actions responsive).
QA:449	No citation; out of context	Tr. 20,066 (Arrington) (LILCO evaluates inspectors' performance as well as hours worked).
QA:452	Refuted by record	<u>See</u> LILCO Proposed Find- ings QA-576, -585, -589 (proposed finding does not reflect LILCO testi- mony and cross-examination demonstrating that not all of the conditions in- volved in violation A in- volved inspection fail- ures).
QA:453	Refuted by record; no citation	<u>See</u> LILCO Proposed Find- ings QA-580, -591 (some inspection errors were isolated instances that

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		do not reflect overreliance on final inspections).
QA:455	No citation	First sentence of proposed finding not supported by citation to the record.
QA:461	No citation; not supported by citation	Tr. 19,807-08 (first two sentences not supported by citation); <u>see</u> Tr. 19,812 (Higgins), 19,808, 19,814 (Museler) (Higgins not familiar with details; Museler testified that I&E 79-07 was significantly different).
QA:463	No citation	No witness testified that changes to design document beyond those being made by LILCO ( <u>see</u> Museler <u>et al.</u> , ff. Tr. 19,757, at 3) are necessary.
QA:469	Out of context	<u>See</u> LILCO Proposed Finding QA-578 (one pipe support was a temporary installation).
QA:470	Out of context	<u>See</u> Reply Finding RQA-88 (SC QA:470 to :472); Tr. 18,827-28 (Museler) (Museler opined that the pipe support had not been turned over to EQC).
QA:473	Not supported by citation	Tr. 19,836-37 (Museler) (equipment mountings discussed not required to be hand tight).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:474	No citation	See LILCO Proposed Finding QA-576; SC Proposed Finding QA-471 (evidence to the contrary).
QA:475	Out of context; no citation	Tr. 19,834 (Arrington) (engineers did not find condition unusual); see also LILCO Proposed Finding QA-576; no citation to support second sentence.
QA:476	Out of context; unjustified inference	Tr. 19,842 (Museler) (basis for LILCO's conclusion regarding error; FQC did inspect for full bearing but judged bearing acceptable); see also Tr. 20,040-41 (Arrington).
QA:480	No citation	See LILCO Proposed Finding QA-580 (this condition was an explainable, isolated instance).
QA:481	No citation	No citation to the record to support the second sentence; see LILCO Proposed Findings QA-581, -582.
QA:484	No citation	Tr. 19,848, 20,062 (Arrington) (inspectors are adequately trained); see also Tr. 19,895-96 (Museler, Arrington).
QA:487	Improper inference; no citation	See LILCO Proposed Finding QA-583; see also Tr. 19,830 (Higgins) (LILCO presented type of information Staff wanted); no citation to support second sentence.



<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:491	Not supported by citation	See, e.g., Museler et al., ff. Tr. 19,757, at 8 (the words "governing their construction" were not used by inspector, Staff Ex. 13, at 13, and are not accurate; record reflects supports were installed in accordance with design documents).
QA:492	Out of context	Tr. 19,855 (Higgins) (Mr. Higgins not completely sure if cable tray supports passed through CABTRAP).
QA:496	Not supported by citation	Tr. 19,867 (Museler) (only a single drafting error was involved).
QA:497	Unjustified inference; not supported by citation	Tr. 19,864 (Higgins) (hypothetical question); Tr. 19,866-68 (Museler) (Museler disagreed).
QA:498	Out of context	Tr. 19,866-67 (Museler) (a checker reviews draftsmen's work; Stone & Webster's EA reviews as-built program).
QA:501	Out of context	Tr. 19,874, 19,879 (Arrington, Museler) (brace installed and inspected in accordance with E&DCR requirements).
QA:502	Out of context	Tr. 19,874, 19,879 (Arrington, Museler) (brace installed and inspected in accordance with E&DCR requirements).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:503	Out of context	Tr. 19,875-76 (Museler) (minor discrepancy not similar to drafting errors noted in violation).
QA:505	Out of context	Museler <u>et al.</u> , ff. Tr. 17,957, at 10 (reinspection of hardware occurred, but did not check location).
QA:506	Out of context; not supported by citation	Tr. 19,890 (Museler) ( <u>very few</u> instances of changes in components after inspection without approval); <u>see also</u> Tr. 19,886-87, 19,889 (Museler) (error by construction personnel not FQC).
QA:507	Not supported by citation	Tr. 19,889 (Museler) (one discrepancy involved).
QA:508	Not supported by citation	Tr. 19,894 (Museler) (does not mention removal of hardware); <u>see also</u> Tr. 19,889 (Museler) (replacement of hardware authorized by DCO).
QA:509	Out of context	Tr. 19,896 (Greenman) (proposed finding incorrectly implies violation A(3) constituted a serious problem; contradicted by Mr. Greenman's testimony).
QA:510	No citation	

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:511	Out of context	Tr. 19,863 (Higgins) (cable tray findings; required drawing correction not hardware corrections).
QA:512	Unjustified inference; out of context	Tr. 19,875 (Museler) (LILCO conducted sample reinspection); Tr. 19,891-92 (Museler) (reinspection for some attributes conducted during system turnover).
QA:513	No citation; out of context; not supported by citation	No citation for first sentence; <u>see</u> Museler <u>et al.</u> , ff. Tr. 19,757, at 9 (all inspectors involved in electrical as-built program received training); Tr. 19,881 (Arrington) (reemphasized need to identify discrepancies).
QA:514	No citation	Conclusion in last sentence unsupported by record.
QA:515	Not supported by citation; no citation	Tr. 19,862 (Higgins) (conclusion concerning significance not supported by the citation, the conclusions reached in the remainder of the proposed finding are not supported by the record); <u>see</u> LILCO Proposed Findings QA-617, -627 to -629.
QA:517 QA:518	Refuted by record	<u>See</u> LILCO Proposed Findings QA-606, -607 (two conditions are essentially the same).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:521	Unjustified inference	Tr. 19,909 (Museler) (inference that some impropriety existed is incorrect).
QA:522	Refuted by record	Museler <u>et al.</u> , ff. Tr. 19,757, at 18 (weld technique qualified for the three-sided weld actually performed).
QA:523	Out of context; unjustified inference	Tr. 19,912 (Higgins) ("some aspects of similarity . . . I'm not really qualified to go into the details and compare them, however."); Tr. 19,912-13 (Museler) (similar only in that they relate generally to weld qualifications).
QA:526	Out of context	Tr. 19,934 (Higgins) ("that has eliminated our concern to some extent but not completely . . . the personnel do receive training . . . a lot of them are qualified in construction inspection . . .").
QA:527	Out of context; unjustified inference; no citation	Tr. 19,932-33 (Museler) (startup personnel precluded from working on permanent plant equipment until reinstructed); LILCO Proposed Finding QA-614 (other actions taken to verify adequacy of OQA and startup work); no citation to support last sentence.

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:528	Unjustified inference	Tr. 19,934 (Higgins) ("that has eliminated our concerns to some extent but not completely . . . the personnel do receive training . . . a lot of them are qualified in construction inspection . . . "); <u>see also</u> LILCO Proposed Finding QA-614.
QA:529	No citation; refuted by record	No citations are given to support finding; <u>see</u> SC Ex. 89C, at 3 (changing SC Ex. 89A, at 78 to delete statement concerning inadequate qualifications); <u>see also</u> Tr. 15,337 (Hubbard); LILCO Ex. 73, ff. Tr. 21,000 (settlement agreement on SC 13(d) which raised issue of qualifications and staffing).
QA:530	No citation	
QA:532	Unjustified inference; not supported by citation	Tr. 19,942 (Museler) (no testimony to support implication that use of construction management inappropriate); <u>see also</u> Tr. 19,943 (Higgins) (NRC preliminary view was that program acceptable); Tr. 19,944 (Museler) (does not support implication that rework being done by wrong organization).
QA:533	No citation	Tr. 20,293-94 (Brenner) (proposed finding relies on portions of RAT Report not admitted into evidence).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:534	Unjustified inferences	No citation to the record to support last sentence; no witness suggests this conclusion; <u>see also</u> LILCO Proposed Finding QA-595 (cold set condition was being tracked).
QA:535	No citation	
QA:542	Out of context; unjustified inference	Tr. 19,957-60 (Museler, Arrington) (although E&DCR may not trigger immediate reinspection, issuance ensures ultimate reinspection).
QA:544	Out of context	Tr. 19,970-71 (Museler) (tagging not necessary for equipment).
QA:546	No citation	Second sentence is unsupported; <u>see also</u> Reply Finding RQA-80 (SC QA:432).
QA:547	No citation	
QA:548	Not supported by citation	<u>See</u> Reply Finding RQA-92 (SC QA:548, :552).
QA:552	No citation	
QA:556	Out of context	Tr. 20,010 (Museler) (regulations do not address timing of cleanup).
QA:558	Not supported by citation	Tr. 20,054-55 (Greenman) (cleanliness was appropriate in areas essentially complete).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:562	Out of context	<u>See</u> Reply Finding RQA-8 (SC QA:562).
QA:563	Out of context	<u>See</u> Reply Finding RQA-9 (SC QA:563).
QA:564	Unjustified inference	<u>See</u> Reply Finding RQA-10 (SC QA:564 to :566).
QA:565	Not supported by citation; out of context	Tr. 15,999-16,004 (Hubbard) (Mr. Hubbard's opinion was that there was no systematic program; the General Electric program covered non-safety related items to some extent; Hubbard's knowledge was not current).
QA:566	Unjustified inference	<u>See</u> Reply Finding RQA-10 (SC QA:564 to :566).
QA:567	Unjustified inference	<u>See</u> Reply Finding RQA-11 (SC QA:567).
QA:568	Not supported by citation	<u>See</u> Reply Finding RQA-12 (SC QA:568).
QA:569	Not supported by citation	<u>See</u> Reply Finding RQA-13 (SC QA:569).
QA:574	Not supported by citation	<u>See</u> Reply Finding RQA-14 (SC QA:574).
QA:586	Out of context; unjustified inference	LILCO Ex. 59, Vol. II, at 1-5; LILCO Proposed Findings QA-695, -697, -698 (This proposed finding fails to reflect that Task A involved a 100% review of current construction control process; Tasks A-E, taken as whole, provided basis



<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
		to assess adequacy of construction).
QA:590	Not supported by citation; out of context	Novarro, LILCO Ex. 58, at 96 (TPT was on list of companies acceptable to County; other companies with BWR experience had previous involvement with Shoreham; cited page silent whether LILCO contacted other organizations); <u>see also</u> LILCO Proposed Findings QA-677 to -681 (TPT's technical qualifications).
QA:592	Not supported by citation; out of context; unjustified inference	<u>See</u> Reply Finding RQA-113 (SC QA: 592).
QA:593	Unjustified inference	<u>See</u> LILCO Proposed Findings QA-682, -683 (contrary to the inference in the proposed finding, there was an adequate level of independence of TPT from LILCO).
QA:594	Unjustified inference	Novarro, LILCO Ex. 58, at 82-83, 86 (LILCO first contacted TPT in last week of April 1982 in response to requests from County).
QA:595 QA:596 QA:597 QA:598 QA:599 QA:600	Out of context; refuted by record; unjustified inference	<u>See</u> LILCO Proposed Findings QA-687 to -693, -729 to -733 (contrary to the inference in these proposed findings that LILCO influenced TPT, the TPT inspection was, in fact,

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:601	Unjustified inference	<p>independent in all significant respects).</p> <p>Hubbard, SC Ex. 112, at 154 (contrary to the inference that an examination of the procedures would have disclosed problems, County witness Hubbard stated it was equally likely that review of procedures would not disclose problems).</p>
QA:602	Refuted by record; no citation	<p>See LILCO Proposed Findings QA-681, -687 to -693, -729 to -733 (TPT was acceptably independent from LILCO and operated under an acceptable protocol). Compare SC Proposed Findings QA:596, :602 (TPT allegedly not independent because relationship solely with LILCO) with Tr. 19,171-74 (Hubbard) (Mr. Hubbard claimed he was free to express his independent technical judgment even though he is employed by County and reports only to County).</p>
QA:604	Refuted by record	<p>See LILCO Proposed Findings QA-684 to -693 (scope of the TPT review was adequate and substantially determined by TPT); see also Tr. 19,277-79 (Hubbard) (Mr. Hubbard could not identify any construction verification of the magnitude of the TPT effort).</p>

SC Proposed  
Finding

LILCO Response

Explanation

QA:605

Not supported by  
citation; refuted  
by record; un-  
justified infer-  
ence

Novarro, LILCO Ex. 58, at 106-07, 112-13 (TPT, not LILCO, decided scope of review); LILCO Proposed Finding QA-602 (inclusion of pipe supports at LILCO's request only aspect of scope decided by LILCO, and the inclusion of large-bore pipe supports resulted in no consequent reduction in remainder of scope); Johnson, LILCO Ex. 57, at 208 (immaterial, with respect to validity of TPT's conclusions, that pipe supports not completely installed at time of inspection).

QA:606

Not supported by  
citation; un-  
justified infer-  
ence

Johnson, LILCO Ex. 57, at 49-50, 76-77, 78, 85-87, 92 (characterization of inspection as "limited" not supported by cited, or any other, testimony; inference that LILCO determined scope of TPT's review is unjustified as there was significant expansion of program and scope by TPT).

QA:607

Refuted by record

See LILCO's Response to SC QA:711 to :732.

QA:608

Not supported by  
citation; refuted  
by record; un-  
justified infer-  
ence

Tr. 17,696-97, 17,702 (Johnson) (no mention in testimony of "important to safety," focus in questioning on safety related and non-safety related components); Tr. 17,697, 18,899 (Johnson)

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:609 QA:610	Out of context; unjustified inference	(TPT independently decided what to examine).  See LILCO Proposed Findings QA-696 to -699 (100% review of current construction program and review of 20 prior procedures was appropriate assessment of construction quality assurance program).
QA:611 QA:612	Out of context; unjustified inference; not supported by citation	See LILCO Proposed Findings QA-700 to -702 (appropriate to focus on LILCO and Stone & Webster QA programs because those programs provided framework within which other programs operated); Tr. 18,980 (Johnson) (no discussion of NISCO QA program, TPT saw Reactor Controls product in Task C).
QA:614 QA:615	Not supported by citation; out of context	Tr. 18,023-24 (Novarro), 18,049 (Johnson) (contrary to proposed finding, scope of Task B was adequate); Tr. 18,016 (Johnson) (use of the current, more stringent, procedures to judge documents looked at in Task B assured adequacy); see also LILCO Proposed Finding QA-707.
QA:617	Out of context	Tr. 18,042-43 (Johnson) (even though all Task B discrepancies were not correlated to particular component document

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Explanation

		packages, Task B reviewers would have been aware if all discrepancies occurred in one year or regarding one component).
QA:618	Not supported by citation; out of context	Tr. 18,038-40 (Johnson); LILCO Ex. 59, Vol. II, at 3-7 (TPT, contrary to the assertion in the proposed finding, noted only one untimely incorporated E&DCR; contrary to statement in proposed opinion, cited testimony does not state that timely incorporation required by Appendix B; TPT established that all E&DCRs available for and considered in final inspection).
QA:619	No citation; out of context	Statement that Task C "improperly restricted" not supported by any citation, nor does the record support such a statement; LILCO Ex. 59, Vol. II, at 4-2 (proposed finding omits fact that over 100,000 separate particulars were checked in Task C).
QA:621	Not supported by citation; unjustified inference	Tr. 18,096-97 (Novarro) (contrary to statement that condensate and feedwater system "is used" to get cold shutdown, witness stated that system "could be used to get to cold shutdown, but there are other ways"); <u>see also</u> Tr. 18,908,

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Explanation

		18,911-12 (Johnson) (none of 5 systems not inspected required to achieve cold shutdown on path selected by TPT, which was most likely path); Tr. 18,908-09 (Novarro) (only a few portions of the 5 systems are safety related); Tr. 18,144A-53 (Johnson) (explains why certain systems not inspected; for example, many not required to achieve cold shutdown).
QA:622	Refuted by record; unjustified inference	See LILCO Proposed Findings QA-687 to -689, -691 to -692 (contrary to this proposed finding, except regarding large-bore pipe supports, TPT was the final arbiter as to scope of verification).
QA:626	Not supported by citation	Tr. 18,175 (Johnson) ("roughly one-third to one-half" of Task C involved in walkdown package preparation).
QA:627	Out of context; refuted by record	Tr. 18,198-99 (Johnson) (TPT considered the variety among flow element types in selecting the four chosen for inspection); LILCO Ex. 59, Vol. II, at 4-193; Tr. 18,176 (Johnson) (examination of one loop adequate because all components are plug-in type made from similar equipment by one vendor); <u>see also</u> LILCO

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Explanation

		Proposed Findings QA-723 to -728 (judgment-based sampling methodology appropriate).
QA:628	Unjustified inference	See SC Proposed Finding QA:626; LILCO Proposed Finding QA-711 (equal and appropriate division of effort among electrical, mechanical and piping components in Task C).
QA:629	Refuted by record	LILCO Ex. 59, Vol. II, at 7-25 to -26 (TPT personnel, who actually performed the inspections, more reliable judge than Mr. Hubbard of relative complexity of electrical, mechanical and piping components).
QA:630	Out of context	Novarro, LILCO Ex. 58, at 149-51 (sufficient number of electrical components inspected in relation to number of piping and mechanical components); <u>see also</u> LILCO Proposed Finding QA-711.
QA:632	Refuted by record	See LILCO Proposed Findings QA-723 to -728 (judgment-based sampling methodology appropriate).
QA:633	Out of context; refuted by record	See LILCO Proposed Findings QA-723 to -728 (judgment-based sampling methodology appropriate); Tr. 18,207-08 (Johnson), 18,932-33 (Novarro, Johnson) (TPT did not "assume" construction



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QA:634  
QA:635  
QA:636  
QA:637  
QA:638

No citation; re-  
futed by record

control program would ensure completion of pipe supports, rather it found evidence of control process working, and, where it was not working, the PFR process was pursued).

First two sentences of SC Proposed Finding QA:634 lack citation; see LILCO Proposed Findings QA-712, -713, -715 (75 welds inspected visually and ultrasonically, over 1600 Certified Material Test Reports compared against ASME Code requirements); LILCO Proposed Findings QA-723 to -728 (judgment-based sampling methodology appropriate); criticism in Proposed Finding QA:635 unfounded, as it is impossible to inspect those welds that are inaccessible.

QA:639

Refuted by record;  
no citation

See LILCO Proposed Findings QA-684 (TPT review not intended to be design or OQA review), -699 (QA manuals and procedures reviewed against regulatory requirements and FSAR); conclusory proposed finding not supported by citation to record nor is it an accurate summary of the record.

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QA:640

Refuted by record;  
no citation

See LILCO Responses to SC Proposed Findings QA:608, :611, :612, :628, :630; conclusory proposed finding not supported by citation to record nor is it an accurate summary of the record.

QA:641

Refuted by record;  
no citation

See LILCO Proposed Findings QA-723 to -728 (judgment-based sampling methodology appropriate); conclusory proposed finding not supported by citation to record nor is it an accurate summary of record.

QA:642

Out of context; no  
citation

Johnson, ff. Tr. 18,313, at 2-6 (only similar multiple discrepancies and DRs grouped in single DRs and PFRs, respectively; this practice consistent with TPT procedures; TPT took into account all deviations in reaching its conclusions); last sentence of this proposed finding lacks citation and is refuted by fact that TPT Final Report, from which County derived its information, identified all discrepancies, see, e.g., LILCO Ex. 59, Vol. III, Book 2, at DR-006.

QA:643  
QA:644  
QA:645

Not supported by  
citation; out of  
context; refuted  
by record; no ci-  
tation

First sentence of SC Proposed Finding QA:643 lacks citation, it is not supported by other cites in proposed finding; and

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it is not an accurate reflection of the record, see, e.g., Hubbard and Samaniego, ff. Tr. 19,068, at 14 ("no way to make an accurate prediction" whether DRs allegedly invalidated improperly might have become PFRs, Observations or Findings); see also Johnson, ff. Tr. 18,313, at 10; Tr. 18,354-55, 18,356-59 (Johnson) (invalidation of the vent and drain DRs listed in Mr. Hubbard's prefiled testimony at 13 was proper; invalidation not, as suggested by Mr. Hubbard, because no effect on system performance, but because later reference to isometric drawings confirmed correct installation); Tr. 18,359-64 (Johnson) (some items reinspected against isometric drawings as part of Level 3 walkdown; not necessary to reinspect completely to satisfy goal of Level 1 walkdown).

QA:646

Not supported by citation; out of context

E.g., Johnson, ff. Tr. 18,313, at 9 (invalidation of DRs 042 and 047 not because TPT used flow diagrams, but because no difference between observed and required condition; subsequent inspection of flanges and flex lines

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Explanation

QA:647

Unjustified inference

that were subject of DRs 042 and 047 confirmed proper installation).

Tr. 18,383-85 (Johnson) (TPT did not "assume" subsequent resolution of these DRs was part of normal construction process, but concluded that this was so based on explicit precautions TPT took to avoid prematurely leaking information about DRs so that cited DRs would not receive particular attention); see also Tr. 18,550 (Johnson).

QA:648  
QA:649

Out of context; unjustified inference

Johnson, ff. Tr. 18,313, at 11-12 (DRs regarding secondary pipe supports properly invalidated because purpose of walkdown that generated these DRs was to confirm large bore pipe supports; thus, isometrics necessary for this task not required to show location of secondary supports; DRs properly invalidated because no difference between observed and required condition); see also 18,392-98 (Johnson, Novarro), 18,401-02, 18,919-20 (Johnson) (to find E&DCR for secondary supports, only need to "look through the design in sequence, all of which [are] tied together").

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QA:650

Out of context

Tr. 18,408-14 (Johnson) (TPT looked for trends by examining all valid DRs; focusing on individual DRs in terms of QA compliance not helpful; TPT did cumulative assessment in order to assess "repetitive aspects of QA-QC effectiveness").

QA:651

Not supported by citation; out of context

Tr. 18,340-44 (by definition, existence of design document such as E&DCR that confirmed correctness of observed condition would establish that condition was not "discrepant;" thus no need to do anything further).

QA:653

Not supported by citation

Tr. 18,414, 18,418 (Johnson) (proposed finding lists a number of DRs that TPT allegedly did not review for compliance with Appendix B, yet, with the exception of DRs 144 and 145, the record does not address whether TPT did or did not make such a review of the listed DRs); Tr. 18,418-25, 18,427-28, 18,920-23 (Johnson) (Appendix B requires QA program commensurate with safety function; Shoreham construction control program met Appendix B requirements).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:654	Refuted by record	Tr. 18,926-30 (Johnson, Novarro) (the process for locating, analyzing and documenting construction of large-bore pipe supports explains why there were pipe support location DRs and why those DRs do not evidence a QA deficiency).
QA:655	Unjustified inference; refuted by record	Tr. 18,933-34 (Johnson) (location of instrument line hangers and conduit supports adequately controlled by construction control process; procedure allowed adding instrument supports to larger hangers).
QA:657	No citation	The third sentence of this proposed finding stating that LILCO's measures for identification and control of materials and components were inadequate has no citation to the record nor is it an accurate reflection of any part of the record.
QA:659	Out of context	Tr. 18,486-89 (Johnson) (TPT observed many examples of compliance with the torquing procedure and considered DR 230 in this overall context).
QA:661	Unjustified inference	Tr. 18,335-37, 18,339-41 (Johnson) (explains that E&DCR attached to DR 281 resolved General Electric/Stone & Webster



<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
		classification differences; therefore not a safety concern).
QA:662	Out of context	Tr. 18,958-59 (Novarro) (LILCO confirmed that construction control program was controlling the missing supports); Tr. 18,989 (Johnson) (TPT conclusion that supports would be correctly installed based on "significant evidence"); <u>see also</u> Tr. 18,517-18 (Johnson) ("large body of evidence" supporting conclusion that construction control program was functioning properly with respect to secondary supports).
QA:663 QA:664	Out of context; unjustified inference	Tr. 18,512-16 (Johnson) (appropriate to designate only one of many temporary pipe support PFRs as Finding because all based on absence of single procedure; also, TPT saw evidence that, in practice, temporary supports were removed during final inspection).
QA:666	Out of context; unjustified inference	Tr. 18,553 (Johnson); LILCO Ex. 59, Vol. III, Book 1, at PFR 016 (E&DCR that resolved PFR 065 and RRR that resolved PFR 016 prepared before LILCO aware of discrepant condition).



<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:668 QA:669	Unjustified inference	Tr. 18,383-85 (Johnson) (contrary to the inference in the proposed findings, there is no evidence contrary to TPT's conclusion that discrepant conditions underlying referenced PFRs were resolved without knowledge of DRs or PFRs).
QA:670 QA:671	Refuted by record; no citation	See LILCO Responses to SC Proposed Findings QA:642 to :669; conclusory proposed finding contains no citation and is not an accurate reflection of the record.
QA:674	Refuted by record	See Reply Finding RQA-115 (SC QA:674).
QA:677	Out of context	Tr. 18,604-05, 18,606-08 (Novarro); Novarro, ff. Tr. 17,588, at 13-14 (missing fillet welds on pipe support was, in fact, isolated instance, as verified by reinspection by LILCO).
QA:678	Unjustified inference	See LILCO Proposed Findings QA-597 to -599 (explanation of lack of full notification to FQC; Procedure 15.4 is redundant control; FQC had actual notice from documents controlling rework).
QA:679	Refuted by record; unjustified inference	Tr. 18,612 (Novarro), 18,618-19 (Johnson) Novarro, ff. Tr. 17,588, at 15; LILCO Ex. 59, Vol.

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		III, Book 1, PFR 048, at Attachment 3 (page 1) (LILCO had, on its own, already identified the problems with recirculation pump motor; inspections were in fact performed, complete documentation not prepared because motor initially classified as Category II).
QA:681	Out of context; refuted by record	Tr. 18,645-46 (Novarro) (problem arose at installation; thus, procurement and receipt inspections could not have detected problem, and were not "missed gates," as they preceded installation); Novarro, ff. Tr. 17,588, at 19; Tr. 18,645 (Novarro) (valve operated properly; if it failed it would fail in safe mode; thus no safety significance).
QA:685	Out of context	Hubbard and Samaniego, ff. Tr. 19,068, at 19; LILCO Ex. 59, Vol. III Book 2, PFR 092, at 3 (location of temperature elements acceptable; E&DCR documents as-built condition).
QA:686	Out of context; refuted by record	Tr. 18,665-67 (Johnson) (TPT evaluated all Findings and Observations and their safety significance in assessing adequacy of QA process; failures resulting in discrepancies

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Explanation

		determined to be human mistakes, not programmatic problems); <u>see</u> , <u>e.g.</u> , Tr. 18,898-99 (Johnson).
QA:688	Unjustified inference	Use of word "invariably" in proposed finding implies that TPT's conclusions regarding a lack of safety significance were not based on evidence, yet the County failed to rebut substantial testimony that discrepancies identified by TPT, in fact, had little safety significance; Hubbard and Samaniego, SC Ex. 112, at 197-98 (County's expert did not undertake to assess safety importance of valid DRs).
QA:689 QA:690	Refuted by record; no citation	<u>See</u> LILCO Responses to SC Proposed Findings QA:674 to :688; proposed findings have no citation to the record and are not accurate reflections of the record.
QA:691	Unjustified inference	<u>See</u> LILCO Proposed Finding QA-736; Tr. 18,787, 18,932 (Novarro) (LILCO and contractor personnel reviewed all PFRs and valid DRs, which, by definition, included those that became Observations and concluded that none were of substantial safety significance and that no

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
		hardware modifications were necessary).
QA:692	Out of context; unjustified inference	Tr. 18,884-85 (Johnson) (though TPT not fully satisfied with "form" of two CAPs, TPT found "content" of all to be satisfactory).
QA:693 QA:694	Refuted by record	See LILCO Proposed Finding QA-742.
QA:695	Out of context; refuted by record	Tr. 18,732 (Novarro) (all information on CAP 1 provided by LILCO, portions typed by TPT); Novarro, ff. Tr. 17,588, at 12; Tr. 18,736, 18,738 (Novarro), 18,749-50, 18,752-53 (Johnson) (discrepancy was isolated; LILCO looked at document packages for all similar 6,000 lb. fittings and found no other mistakes; TPT found no similar problems in its review of over 1600 Certified Material Test Reports (Task E1)).
QA:696	Out of context	Tr. 18,744-46 (Novarro) (though CAP 1 did not contain explicit requirement that receipt inspectors be reminded of relevant procedure, QA personnel keenly aware of it).
QA:697	Out of context	Tr. 18,754-56 (Novarro) (though CAP 2 does not have explicit consideration of cause, the cause

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Explanation

QA:698  
QA:699

Out of context

was considered in CAP's preparation and in the original design organization response); Tr. 18,778 (Novarro), 18,785-87 (Johnson) (requirement to update flow diagrams did exist; reference on Attachment 6 to PFR 009 means only that Stone & Webster site engineering office did not think requirement applicable to this situation).

Tr. 18,761-62 (Novarro) (no need to review other ducting configurations because systems had been tested and were operating successfully); Tr. 18,763, 18,782-83 (Johnson) (this condition only one of its kind found by TPT, additional evidence found by TPT that flow diagrams matched as-built hardware); Tr. 18,767-68 (Novarro) (flow diagrams used in only a "very limited way" by operating staff); Tr. 18,772-79 (Novarro) (LILCO prefiled testimony regarding program to update drawings not contradicted by testimony regarding CAP 2); Tr. 18,781-82 (Navarro) (LILCO did not reexamine Stone & Webster's procedure because of evidence that it was in fact working); see also Tr. 18,877-79 (Johnson, Novarro).

<u>SC Proposed Finding</u>	<u>LILCO Response</u>	<u>Explanation</u>
QA:700	Out of context; no citation	Tr. 18,831-32, 18,837 (Novarro) (CAP 4 identified cause of discrepancy as human error; whole population reinspected to ensure no repetition); Tr. 18,842-43 (Novarro) (no "special memorandum" informing FQC and construction of changes in drawings; drawing is re-issued and FQC tracks all issuances and maintains set of marked-up drawings that show latest revision); Tr. 18,840-41 (Johnson) (FQC did perform the required inspection, but missed the new fillet weld requirement); allegation that LILCO thought it "unnecessary to implement any measure . . ." lacks citation; Tr. 18,830 (Johnson) (TPT's Mr. Vollman incorrect in checking box on PFR indicating possible generic problem); <u>see also</u> Tr. 18,881-83 (Johnson).
QA:701	Refuted by record	<u>See</u> LILCO Response to SC Proposed Finding QA:678.
QA:703 QA:704 QA:705	Out of context; refuted by record	Tr. 18,846-47 (Novarro) (establishes that LILCO considered possible causes of debris in HVAC ducting but concluded that it was not possible to identify cause with certainty); Tr. 18,848-49 (Novarro, Johnson) (though CAP 11 did not



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Explanation

QA:707

Out of context;  
not supported by  
citation

"explicitly" include measures to prevent repetition, Mr. Novarro talked with engineers responsible for system operation and "verified . . . that [post-construction] inspections were in fact done and documented;" also, HVAC system complete and operating properly, thus appropriate to conclude isolated instance).

Tr. 18,852-53 (Novarro) (LILCO determined cause of discrepant condition to be mistake at installation and during inspection, probably explained (but not excused) by complexity of installation); Tr. 18,861 (Novarro) (to ensure no repetition, LILCO reinspected all similar solenoid operated valves and found all others to be correct; thus, reinspection not "limited" and discrepancy proved to be isolated); Tr. 18,861-63 (Navarro) (not necessary to take separate action to ensure installation of components complies with manufacturers' specifications).

QA:709  
QA:710

Refuted by record;  
no citation

See LILCO Responses to SC Proposed Findings QA:691 to :707; Reply Finding RQA-116 (SC QA:710);



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LILCO Response

Explanation

		these proposed findings contain no citation to the record nor are they accurate reflections of the record.
QA:711	Refuted by record	See LILCO Proposed Findings QA-724, -727 (no "widely-accepted, probability-based sampling methods . . ." developed for use in comprehensive construction and quality assurance review of nuclear power station).
QA:713	Refuted by record	Tr. 18,217-18, 18,243 (Johnson) (TPT did not "extrapolate," but rendered judgment regarding whole plant based upon their assessment that the construction control process was adequate and working).
QA:714	Not supported by citation	Tr. 18,234-36 (Johnson) (no evidence here, or elsewhere in record, that TPT used its judgment "to minimize the impact of discrepancies"); <u>see also supra</u> LILCO Response to SC Proposed Finding QA:713.
QA:715 to QA:732	Refuted by record	See LILCO Proposed Findings QA-723 to -728; (proposed findings ignore evidence establishing that TPT's sampling methodology was adequate).