LONG ISLAND LIGHTING COMPANY
SHOREHAM NUCLEAR POWER STATION
P.O. BOX 604, NORTH COUNTRY ROAD • WADING RIVER, N.Y. 11792

May 12, 1983

Mr. Richard C. DeYoung, Director
Office of Inspection
and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SNRC-884

NRC Enforcement Action 50-322/EA 83-20

Dear Sir:

This letter is LILCO's response, pursuant to 10 CFR § 2.201, to the violation set forth in the letter from Mr. James M. Allen, Acting Regional Administrator, Region I, to Long Island Lighting Company enclosing a Notice of Violation and Proposed Imposition of Civil Penalty, 50-322/EA 83-20. A separate letter will address the imposition of the fine as required by 10 CFR § 2.205.

I. FACTS

While the statement of facts contained in the Notice of Violation is essentially correct, LILCO believes that a review of additional facts presented herein place the circumstances noted by the I&E inspector in a different perspective. The second paragraph on the first page of the Notice of Violation

states that "data recorded at 15 minute intervals for the two hour period indicated a range of load values from 3500 KW to 3850 KW." While this statement is true, it is important to note that additional data were available and were actually used and relied upon by the Test Engineer in concluding that the test had met acceptance criteria. The cover letter to the Notice of Violation notes the existence of this data, but LILCO believes that an explanation of the nature and use of these data is important to an evaluation of the circumstances constituting the violation.

A high speed chart recorder (Honeywell Visirecorder) was used during the test as required by various steps in the approved test procedure. In addition, the test analysis report for the procedure describes the calibration and use of the high speed chart recorders in collecting and evaluating data. As noted in LILCO's March 16, 1983 letter (SNRC-859) concerning this violation (a copy of which is enclosed as Attachment A), strip chart data were recorded during the two hour load test and the Test Engineer did rely on those data in making the judgment that the acceptance criteria of the test had been met. The data obtained during the test are presented in the graph

entitled "Emergency Diesel Generator Load Test, Emergency Diesel Generator 102 -- Pt. 307.003B (Step 8.5.4)." This graph is enclosed as page 10 to Attachment A to this letter. This graph presents load data versus time for the diesel generator two hour test period. Data plotted on the graph were taken from both the control room indicator and from the Visirecorder strip charts. The Visirecorder data show a general load profile ranging from a high load of 3975 KW to a low load of 3650 KW. The Test Engineer properly believed the chart recorder is a more precise indication of the diesel generator load. The appropriateness of the Test Engineer's judgment in this regard is confirmed by the fact that the strip chart recorder has now been designated as the primary instrument to be used in all future load tests of the diesel. The integrated load profile (i.e., total KW hours) shown on the strip chart recorder for the two hour load test represents a load equivalent of more than 99% of the total load that would result from running the diesel generator for two hours at exactly 3900 KW. LILCO believes these facts are important to understanding why the Test Engineer accepted the diesel generator load test results.

II. RESPONSE

LILCO admits that the facts, including the information provided above, may constitute a violation. At the same time, however, LILCO believes these facts provide a basis for reconsideration of the severity level of the violation. LILCO also believes that where, as here, the licensee's review process is still in progress, this fact should be considered in evaluating whether to cite the applicant for a violation. Mr. Allen's cover letter to LILCO states that the guidance relied on to support the assignment in this instance of Severity Level III is contained in Section C.2 of Supplement II of the NRC's Enforcement Policy (10 CFR Part 2, Appendix C). This section defines a Severity Level III violation as a significant violation involving:

> Failure to confirm the design safety requirements of a structure or system as a result of inadequate preoperational test program implementation . . . .

The Notice of Violation concludes that LILCO's preoperational test program, as implemented, did not assure that testing was performed in accordance with procedures or that test

requirements had been satisfied. LILCO believes that the additional information presented below demonstrates that this situation does not represent a "failure to confirm the design safety requirements" of the diesel generator, nor does it represent a failure to perform a test in accordance with procedure. Rather, the facts reflect a failure to document proper and reasonable judgments made by the Test Engineer and a failure by reviewers to identify this lack of documentation in the review process which was still in progress at the time I&E noted this violation. The following factors are presented for NRC consideration.

(1) The design safety requirements of the diesel generator in question were confirmed by the preoperational test which is the subject of this violation. As noted above, the integrated load for the two hour portion of the load test represents in excess of 99% of the two hour load that would be achieved had the diesel been maintained at exactly 3900 KW for two hours. Regulatory Guide 1.108, Revision 1, requires that the preoperational test program demonstrate the full load carrying capability of the diesel generators for 24 hours, of which two hours must be at a "load equivalent t the two hour

rating of the diesel generator." No guidance defines "load equivalent" as that term is used in Regulatory Guide 1.108. In the Test Engineer's judgment, the load profile obtained from the strip chart recorder, which represented in excess of 99% of the integrated two hour load, was a "load equivalent to the two hour rating" of the diesel generator and therefore demonstrated that the test requirements had been met.1/ Thus, the test results represent a confirmation that diesel generator design safety requirements had been met.

LILCO believes that the Test Engineer should have specifically noted in the test report that the test data observed on the control room load indicator and recorded in Table II of

---

1/ The term "equivalent," particularly in this context, reasonably connotes more than strict equality or identity; it includes the notion of essential or functional equivalency. This interpretation makes sense technically because it is not possible to attain the two hour load of 3900 KW without loading the emergency diesel generators on the LILCO grid. Load changes on the grid, which are unavoidable, will cause the diesel generator load to fluctuate above and below the desired load level. What is important is that the overall results be equivalent to the two hour load rating, though it need not be precisely equal to that rating for the entire two hour period. The test is, in fact, a better demonstration of generator capability when the unit is allowed to load follow as opposed to operator intervention to maintain near constant 3900 KW load.

the test procedure did not fall within the specifications required by the test procedure. The Test Engineer's judgment that the strip chart results demonstrated the acceptability of this test should have been documented in the test report. But LILCO also believes that this omission, although it may reasonably constitute a violation, does not merit the Severity Level III designation.

(2) In response to the NRC's initial concerns about the conduct of this test, LILCO agreed to repeat the 24 hour load test for Emergency Diesel Generator 102. This test has been successfully performed and the results are currently being reviewed. This subsequent test of the diesel generator was conducted using more stringent acceptance criteria than the original test and it resulted in a load equivalent in excess of the two hour rating. A preliminary analysis of these test results indicates that they confirm what had been demonstrated in the original test -- Emergency Diesel Generator 102 does meet its design requirements.

(3) A significant consideration in determining whether the facts reported in the Notice of Violation actually

constitute a violation and, if so, the severity level of that violation, is the status of the review process for the test results. Deficiencies in work or test results that have not received final review are not generally categorized as violations. This principle was confirmed by recent NRC Staff testimony in the Shoreham operating license hearings. Importantly, the facts here demonstrate that this is an instance where the final review had not occurred and, therefore, we are also requesting reconsideration of the severity level on this basis.

As reported in LILCO's March 16, 1983 letter (Attachment A), the review process for the test results in question had not been completed at the time the I&E inspector made his observations. The review process established by LILCO for the preoperational test program consists of reviews by (i) the Test Engineer, (ii) the Joint Test Group, (iii) Operational Quality Assurance, and (iv) the Review of Operations Committee. Each of these groups conducts an independent review. The test results had not been reviewed and accepted by the Plant Staff Review of Operations Committee and, although the test package had been witnessed by an OQA inspector, it had not been finally reviewed by OQA. In LILCO's view, the severity level of the

violation merits reconsideration in light of I&E's general practice not to cite licensees for violations involving reviews or inspections not yet complete, and the incomplete review status of these test results at the time of the inspection.

The cover letter accompanying the Notice of Violation stated:

> It is not clear to us, however, that these additional audit/reviews would have identified the problems. For example, the Chairman of the JTG, which approved the test data, also serves as Chairman of the ROC, and OQA personnel had previously reviewed and signed the test procedure.

LILCO believes, however, there is a substantial basis for concluding that these additional, required reviews would have properly documented and dispositioned the discrepancy between the Table II data and the acceptance criteria. First, these are independent reviews designed to ensure that errors and oversights which inevitably occur in a complex undertaking are identified and corrected. The philosophy reflected in LILCO's review process is consistent with the NRC's traditional view that multi-layer reviews are an effective means of minimizing deficiencies.

Second, there is specific justification for concluding that additional reviews would have been effective. The review by the Review of Operations Committee is not solely a review by its Chairman. Prior to this violation, LILCO had established a Preoperational Test Results Review Subcommittee (PTRRS) within the Review of Operations Committee to ensure a comprehensive review of all test results. This Subcommittee consists of four highly skilled, technically oriented and experienced members of the plant staff: the Operating Engineer, the Maintenance Engineer, the Reactor Engineer, and the Instrumentation and Control Engineer. These individuals are independent of the LILCO Start-Up organization and the JTG, and their review focuses solely on the technical adequacy of the test results. Thus, this Subcommittee would have scrutinized the data; it is reasonable to assume that their review would have disclosed the discrepancy between the data and the acceptance criteria. Moreover, since this Subcommittee has no members in common with the Joint Test Group, it constitutes a wholly independent review of the test results.

The existence of review by this Subcommittee also gives a measure of confidence that the absence of the Test Engineer's

explanation of his use of strip chart data would have been noted and reviewed. Each member of the Subcommittee receives a full set of the test results and provides comments on the tests. The Subcommittee then meets to discuss these comments, and ensures their resolution by the Test Engineer. The results of this Subcommittee review process are subsequently presented to the full Review of Operations Committee as part of a total system turnover package for approval. Therefore, LILCO believes that this additional review would have disclosed and documented the Test Engineer's reliance on the strip chart data. LILCO also believes that this Subcommittee, the full Review of Operations Committee and all review groups, when presented with the basis on which the Test Engineer approved the test, would have concurred in his approval.

Finally, the Notice of Violation relies on FSAR paragraph 14.1.1.1 which states that the Joint Test Group reviews and approves completed preoperational tests. FSAR paragraph 14.1.1.1 does describe the JTG's organizational responsibilities, but FSAR paragraph 14.1.1.4, which describes the evaluation, documentation, and approval process for preoperational test results, is also applicable. This section

makes clear that the final OQA audit of test results and the final acceptance by the Plant Manager, which is accomplished following the ROC review procedure described above, constitute part of the acceptance process for preoperational test results. Therefore, the JTG review and approval is not the final step in LILCO's review cycle and, as described above, important review steps had not yet occurred at the time of the violation.

(4) With respect to I&E's concern that these circumstances indicate a general lack of aggressiveness and attention to detail, LILCO believes that the following facts provide confidence in the preoperational test program. Fifty-three (53) completed test procedures were reviewed by Torrey Pines Technology (TPT) as part of an independent assessment of the Shoreham facility performed during 1982. This number represented 100% of the test procedures completed and approved by the Joint Test Group at the time of the independent assessment.2/ The results of the Torrey Pines preoperational test review, which took in excess of 450 manhours to complete,

---

2/ It should be noted that the diesel generator test involved in this violation had not been completed at the time of the Torrey Pines independent verification.

showed no instances where preoperational test results did not meet acceptance criteria. Torrey Pines concluded that the "results of the review indicated that the [preoperational tests] were properly conducted and that the systems tested met the functional requirements of the tests."

In addition, I&E has performed a substantial review involving preoperational tests performed at Shoreham. As of March 4, 1983, I&E inspectors had reviewed 93% of the completed preoperational tests approved by the Joint Test Group. This review has identified no other instances of failure to meet acceptance criteria. Since March 4, 1983, I&E has reviewed five additional completed test procedures and no instances of failure to meet acceptance criteria were identified in these procedures. Review by TPT and I&E supports LILCO's view that the preoperational test program at Shoreham is not programmatically deficient and shows that this test program confirms the design safety requirements of structures and systems within the scope of that program.

(5) As noted above, LILCO believes that the cause of this violation was the Test Engineer's failure to document the

judgments he made in determining the acceptability of the diesel generator load test. Although the Joint Test Group review of these results did not note the discrepancy between the raw data and the acceptance criteria, that review was, nonetheless, quite extensive. The review process generated extensive comments on the completed test package. In fact, the package was subjected to two rounds of review by the Joint Test Group to ensure that all comments made by the members of the Joint Test Group had been adequately addressed. Significantly, therefore, this review was not merely a formality or a cursory review; it was a substantial one. The oversight of the Joint Test Group in this particular instance is not an indication of inattention to the Shoreham test program. Rather, there has been significant involvement by the Joint Test Group in diesel generator testing since it began. An important example of this involvement is the action taken in November 1982 by the Joint Test Group to add an extended 72 hour test run on all three emergency diesel generators to provide further assurance that the engines will operate as designed. These runs are conducted at a load consistent with that expected during a long-term LOCA event.3/ The decision to conduct these additional tests

---

3/ All three of the emergency diesel generators have now successfully completed these 72 hour runs. The test data are currently undergoing review.

preceded I&E's identification of the concerns reported in this Notice of Violation. Thus, LILCO management has aggressively pursued, identified and resolved problems associated with the reliability of the diesel generators.

III. CAUSE

As already noted, the cause of this violation was the Test Engineer's failure to document a discrepancy between the Table II data and the acceptance criteria and the judgment made in determining the acceptability of the diesel generator load test. Had the Test Engineer's judgment been fully documented, his decision would have been reviewed by the JTG. LILCO is confident that the JTG would have approved his decision to accept the test. An additional cause of the violation was the failure by the OQA inspector and the JTG to note the potential discrepancy in their respective reviews. Although these oversights are undesirable, additional reviews were still required by LILCO's procedures, as described in the FSAR, before final acceptance of the test and LILCO believes this additional review would have disclosed the discrepancy.

IV. LILCO CORRECTIVE ACTION AND RESULTS AND ACTION TAKEN TO PREVENT RECURRENCE

(1) LILCO agreed to conduct again all testing of Emergency Diesel Generator 102 under PT-307.003B, including the 24 hour load test run to confirm the ability of that diesel generator to operate successfully under maximum service conditions. This re-test has been successfully completed using even more stringent load limitations than the original test. Although the test package review cycle has not been completed for this re-test, preliminary analysis indicates that the results meet the test criteria and demonstrate that Emergency Diesel Generator 102 can carry a load in excess of the two hour load equivalent.

(2) LILCO's March 16 letter also reported that the following corrective action had been taken:

> (a) The Start-Up Manager reviewed the concerns expressed in the original inspection report with the Shoreham Start-Up Staff (including the Test Engineers and Start-Up Management), the Joint Test Group and the ROC-PTRRS. The review stressed the need to document adequately any judgments made during testing. The review also emphasized that test reviewers must ensure that raw data is reviewed to ensure it supports the conclusions stated in the test procedure and Test

Analysis Report and that adequate justification is presented for any test exceptions noted.

(b) The OQA Engineer reviewed the inspection report with the OQA inspectors involved in the test in question as well as other OQA inspectors involved in the diesel generator test program emphasizing the need to verify the acceptability of the test results.

Following the issuance of the Notice of Violation on April 12, LILCO conducted an additional review session for personnel from all organizations involved in the preoperational test program, including LILCO Start-Up, Operational Quality Assurance and the Plant Staff Review of Operations Committee. This session included a review of the violation, stressing the need for attention to detail when performing, witnessing and/or reviewing preoperational tests. The presentation also emphasized the importance of documenting test exceptions and any judgments made in conducting the test to ensure proper engineering disposition of any deviations from requirements. This documentation will also ensure that these judgments are brought to the attention of reviewers for their consideration.

(3) As mentioned in the Preventive Action section of LILCO's March 16, 1983 letter, four preoperational tests that had not yet received complete review were reviewed by a certified Level III Test Engineer (from Stone & Webster, Boston). The Emergency Diesel Generator 102 electrical preoperational test package was one of the procedures reviewed. This test package is the same one that is the subject of the Notice of Violation. The review of this package disclosed that during a 1 hour test of fuel oil booster pump capacity conducted by the same test engineer, one data point was 3400 KW -- 50 KW low. This small discrepancy had no effect on the acceptability of the test results because the small difference in load has no measurable input on the pump's acceptance criteria. The acceptance criteria is pump discharge pressure which has been shown to vary only .7 psi between 3000 KW and 3500 KW and is well within the required pressure range of 20-35 psi. Nevertheless, because this minor deviation involved the same test package and the same test engineer as were involved in the Notice of Violation, LILCO decided to re-review all approved preoperational and acceptance test procedures for which this Test Engineer was responsible. LILCO has determined that this Test Engineer was

responsible for four approved acceptance tests. These four acceptance tests will be re-reviewed.

Two of the other three tests were reviewed and all comments on these test results have been satisfactorily resolved. A review of the third test has identified a comment relating to the test objective. This comment is being fully evaluated and will be discussed with I&E when the evaluation is completed.

(4) The diesel generator preoperational test program uses comprehensive and complex test procedures to verify that the Emergency Diesel Generators will perform as intended. Because these procedures are complex, the Joint Test Group has, in the past, requested that Test Engineers address certain issues at Joint Test Group meetings. LILCO has decided to extend this practice and require that the responsible Test Engineer attend the relevant portions of all future Joint Test Group meetings addressing diesel generator preoperational tests. This practice has been used successfully by LILCO on a case-by-case basis in the past for other types of test procedures.

(5) As explained in LILCO's response, strip chart data are taken as part of the diesel generator load tests. To facilitate and improve the review of diesel generator electric load test results recorded on strip charts, LILCO now prepares

a graphical presentation of the 24 hour load test data, similar to the graph attached to LILCO's March 16 response. The charts are attached to the test package for review.

(6) In order to ensure a comprehensive technical review by the Operational Quality Assurance organization, the following steps will be modified in the OQA review process for preoperational tests:

(a) Review of all future preoperational test results to confirm that acceptance criteria have been met will be modified to require the review be conducted by the Operational Quality Assurance Engineer, or one of his two principal assistants, the Quality Assurance Engineer or the Quality Control Engineer. Further, this review will specifically require a review of all strip charts, tables and graphs related to Section 10.0, Acceptance Criteria Review, of the preoperational tests. This review will be documented by the reviewer's signature and date on Section 10 of the test procedure and all charts, tables and graphs.

(b) In addition to the current OQA audit checklist requirements for preoperational tests, LILCO will add specific checklist items to ensure the above additional reviews have been conducted.

(7) Significantly, LILCO took actions responsive to the concerns raised in this violation even before it was identified by I&E. As noted, the LILCO Joint Test Group added a 72 hour test of the diesel to give further assurance that the diesel will be capable of operating under accident conditions. The decision to take this action was made in November 1982, prior to the time the NRC identified the concerns discussed in this inspection report. This underscores LILCO's commitment to ensure reliable operation of the Emergency Diesel Generators. Also, prior to the identification of the NRC's concern in this matter, LILCO recognized the need to ensure thorough and timely review of completed test procedures during the busy period prior to fuel load. In November 1982, ROC still had to review over half of the total preoperational tests prior to fuel load. Therefore on December 10, 1982 LILCO created the Preoperation Test Results Review Subcommittee of the ROC already discussed.

V. DATE WHEN FULL COMPLIANCE WILL BE MET

LILCO's Preoperational Test Program is in full compliance with all NRC requirements. Program changes and commitments made by the various organizations will be complete by June 15, 1983.

We appreciate the careful consideration we know you will give this response.

Very truly yours,

W. J. Museler

William J. Museler
Director, Office of Nuclear

cc: J. M. Allen
J. Higgins
M. S. Pollock
All Parties

COMMONWEALTH OF MASSACHUSETTS)
: ss.:
COUNTY OF SUFFOLK)

WILLIAM J. MUSELER, being duly sworn, deposes and says that I am Director of the Office of Nuclear, Long Island Lighting Company, the owner of the Shoreham Nuclear Power Station. I have read the Notice of Violation and Proposed Imposition of Civil Penalty dated April 12, 1983, and also the responses thereto prepared under my direction dated May 12, 1983. The facts set forth in the response to the Notice of Violation and the response to the Proposed Imposition of Civil Penalty are based upon reports and information provided to me by the employees, agents and representatives of Long Island Lighting Company responsible for the activities described in said Notice of Violation and in said response. I believe the facts set forth in said response are true.

W. J. Museler
WILLIAM J. MUSELER

Sworn to before me this
12th day of May, 1983

Albert S. Kreponetsky