



LONG ISLAND LIGHTING COMPANY

SHOREHAM NUCLEAR POWER STATION

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Direct Dial Number

June 24, 1983

SNRC-911

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Environmental Qualification
Shoreham Nuclear Power Station - Unit 1
Docket No. 50-322

Dear Mr. Denton:

On January 21, 1983, the final rule on environmental qualification of electric equipment important to safety for nuclear power plants, 10CFR § 50.49, was published in the Federal Register (48F.R.2729). Shortly thereafter, on January 26, 27 and 31, 1983, issues relating to environmental qualification at Shoreham were litigated before the Atomic Safety and Licensing Board. At that time, LILCO witnesses stated that, in their view, the entire scope of equipment covered by 10CFR § 50.49 had either been included in the Shoreham environmental qualification program or been suitably isolated from the performance of safety functions so as not to require environmental qualification. LILCO witnesses also stated that they intended to perform a further review of their conclusion as of that time. This letter reports on the results of that further review which confirms the conclusions expressed in January.

The final Environmental Qualification rule established a new licensing requirement of identifying and qualifying a category of equipment important to safety which includes "nonsafety-related electric equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions specified in subparagraphs (i) through (iii) of paragraph (b) (1) of this section by the safety-related equipment." LILCO evaluated this specific requirement of the rule, as discussed in Enclosure 1 and verified that there is no equipment at Shoreham that satisfies this condition. Therefore, there is no equipment installed at Shoreham that falls into this category (i.e., 10CFR50.49 (b) (2)). In addition, electric equipment important to safety covered by this rule includes "certain post accident monitoring equipment" in accordance with

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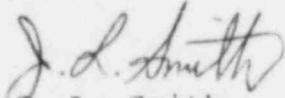
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the specific guidance provided in Regulatory Guide 1.97, Rev. 2. LILCO included this electric equipment in our Equipment Qualification Program as described in our submittal dated April 14, 1983, SNRC-863, Attachment C. We wish to point out that (a) these nonsafety-related electric equipment were included in the program to ensure compliance with the commission's regulations and (b) these same nonsafety-related equipment were evaluated to ensure that their failure under postulated accident conditions could not prevent safety-related electrical equipment from performing their intended function.

Should you have any questions regarding this matter, do not hesitate to contact this office.

Very truly yours,



J. L. Smith

Manager, Special Projects
Shoreham Nuclear Power Station

GJG/law
Enclosures

cc: J. Higgins
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All Parties Listed in Attachment 1

ATTACHMENT 1

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Enclosure 1
Summary of LILCO's Evaluation
On Environmental Qualification
10CFR50.49
Shoreham Nuclear Power Station
Long Island Lighting Company

The LILCO program for environmental qualification of electrical equipment important to safety has been reviewed against the requirements of 10CFR50.49 (Enclosure 2). It has been concluded that the existing program for Shoreham equipment qualification complies with the intent and scope of 10CFR50.49.

The final rule establishes a new licensing requirement of identifying and qualifying a category of equipment important to safety which includes "nonsafety-related electric equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions..." (paragraph (b) (2), 10CFR50.49). LILCO's conclusion is that the Shoreham plant design is such that there is no equipment in this category.

Equipment for Shoreham has been classified as either "safety-related" or "nonsafety-related". Safety-related structures, systems and components must be designed to ensure accomplishment of the three basic safety functions:

1. the integrity of the reactor coolant pressure boundary,
2. the capability to shut down the reactor and maintain it in a safe shutdown condition, or
3. the capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to the guideline exposures of (10CFR Part 100).

Thus, in accordance with 10CFR50.49, a structure, system, or component at Shoreham is "safety-related" if required to assure one of these three safety-related functions. Conversely, any structure, system, or component that is not required to assure any of these safety-related functions is classified as "nonsafety-related".

Throughout the design and classification process, equipment which had the potential for affecting any of these safety functions was either classified as safety-related or isolated in such a manner as to assure no unacceptable interaction with respect to the safety functions listed above. When evaluating the design from the standpoint of proper isolation postulated failure mechanisms of the nonsafety-related equipment were considered.

Recently, Shoreham has conducted certain system interaction studies as required by the NRC which reconfirmed (for the scope of

these studies) that the classification system provided proper isolation and separation between safety and nonsafety equipment. Two studies in particular are important in that respect. The Control Systems Failure (SCF) study and the High Energy Line Break/Control System Failure Analysis (HELB/CSFA) study examine the consequences of failure of nonsafety-related equipment.

The CSF study examined those control grade (nonsafety) systems with the potential to affect reactor pressure, water level, or power. Two possible failure mechanisms which could affect multiple control grade systems were postulated; failure of a common power supply or failure of a common impulse line. The study confirmed that, for all cases examined, previously defined transient and accident limits (Chapter 15 of the Shoreham FSAR) are bounding. The HELB/CSFA study addresses this concern even more directly. This study determined the hypothetical effect on nonsafety control systems resulting from postulated high energy line breaks. Once again it was concluded that previously defined accident and transient limits are bounding. Both of these studies envelope postulated failures resulting from adverse environmental conditions and further support LILCO's position on this issue.

The electrical isolation design philosophy at Shoreham provides an additional assurance that nonsafety-related electrical equipment cannot fail in such a manner as to prevent accomplishment of the above referenced safety functions. This design assurance also takes into consideration the single failure of a safety-related component. Shoreham's compliance with the electrical separation requirements of Regulatory Guide 1.75, Revision 1 and IEEE standard 384-1975 is detailed in the FSAR, specifically, in answer to NRC requests 223.12 and 223.67. These FSAR references demonstrate that the electrical separation design for the safety-related power circuits and control circuits is such that no single failure can prevent operation of an engineered safeguard function. Therefore, there is no single credible event which is capable of disabling sufficient equipment to prevent accomplishment of the three basic safety functions described above.

ENCLOSURE 2

Review of Final EQ Rule

10CFR50.49 SECTION

SHOREHAM EQ PROGRAM

a. Applicant for a license shall establish an EQ Program for paragraph (b) equipment.

The Qualification Program is established.

b. Electric equipment important to safety must be addressed and includes:

(b) (1) Qualify safety-related electric equipment relied on to remain functional during and after design basis events to ensure:

Shoreham EQ Program identified safety-related equipment and assigned operability codes "A", "B", "C" and "D" as per NUREG-0588, Appendix E, for LOCA and PBOC.

- (i) integrity of pressure boundary
- (ii) shutdown plant
- (iii) limit offsite exposure

(b) (2) Qualify nonsafety-related equipment whose failure, under postulated environmental conditions, could prevent satisfactory accomplishment of safety functions (i), (ii), and (iii) in (b) (1).

Shoreham design precludes nonsafety-related equipment preventing the accomplishment of the three basic safety functions.

(b) (3) Qualify post-accident monitoring equipment.

Equipment required for implementation of Reg. Guide 1.97, Rev. 2, is designated in LILCO submittal dated April 14, 1983, SNRC-863, Attachment C and qualification commitments are stated therein.

c. Requirements for (i) dynamic and seismic qualification, (ii) protection against "other" phenomena, and (iii) mild environment qualification not included in the scope of the final rule.

No new requirements defined in this rule.

10CFR50.49 SECTION

- d) Prepare list of important to safety equipment identified in (b) (1), (b) (2), and (b) (3).
 - (d) (1) Performance specifications under conditions during and following design basis accidents.
 - (d) (2) Electrical characteristics to meet performance requirements of (d) (1).
 - (d) (3) Environmental conditions defined.
- e) Qualification program shall include assessment of electric equipment to temperature, pressure, humidity, chemical effects, radiation, aging, submergence, synergistic effects, and margins.
- f) Qualification methods defined for electric equipment.
- g) Holder of an operating license shall identify equipment important to safety with schedule for qualification by May 20, 1983.
- h) Notification to NRC of significant problems to meet EQ schedule.
- i) Applicant for licenses shall submit interim justifications for equipment not qualified prior to fuel load.
- j) Record qualification shall be maintained in an auditable form.

SHOREHAM EQ PROGRAM

This is Appendix F of the Shoreham environmental Qualification Report.

Shoreham includes these requirements in equipment documentation files.

Shoreham includes these characteristics in equipment documentation files.

Environmental conditions are defined by zone for equipment items.

Shoreham EQ program complies.

Shoreham EQ program complies.

All equipment will be qualified by the first refueling outage in accordance with this rule.

Shoreham will comply as required.

This is Appendix H of the Shoreham Environmental Qualification Report.

Qualification document packages are included in Shoreham's document control system.

10CFR50.49 SECTION

SHOREHAM EQ PROGRAM

- k) No requirement to requalify if NUREG 0588 was the previous basis for qualification.
- l) Replacement equipment is required to be qualified to final rule unless sound reasons to contrary exist.

Shoreham EQ program complies.

Shoreham EQ program complies.