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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
	)	
(Shoreham Nuclear Power Station, Unit 1)	)	

MOTION FOR SUMMARY DISPOSITION OF SC CONTENTIONS 4a(ii), (iii) & (xvii)

1. The following contentions were accepted by the Board only for purposes of discovery because they were insufficiently particularized:[1]

> 4a. Intervenors contend that the Applicant and Regulatory Staff have not adequately considered individually a number of generic light water [reactor] safety issues raised by NRC staff members and applicable to Shoreham in accordance with the backfitting requirements of 10 CFR Part 50.109 and/or the general design criteria of 10 CFR, Part 50, Appendix A. This contention includes . . . [2] the following design features for structures, systems, and components:
>
> . . . .
>
> ii. Lack of independence on [sic] ECCS valves.
>
> iii. Analysis of postulated reactor coolant pump rotor seizure incidents.

1/ See Board Order of March 8, 1978 at 2; Tr. 72.

2/ This ellipsis represents language deleted by the Board. See Tr. 72-73.

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. . . .

xvii. Improvement of BWR shutdown reactivity performance.

SC's Amended Petition to Intervene at 4-5 (Sept. 16, 1977).

2. In order to gain a better understanding of those contentions, the Applicant asked several questions. See Second Set of Applicant's Interrogatories to Suffolk County at 1-3 (Dec. 8, 1977). The County's answers provided some additional understanding of the issues that it is trying to raise in these contentions. See SC's Response to Applicant's Second Set of Interrogatories at 3-4 (Jan. 31, 1978) (SC's Interrogatory Response). These answers were largely reiterated in SC's Particularized Contentions at 4-5 (Nov. 30, 1978). These points are addressed below in the paragraphs on the applicable contentions.

3. For the reasons set out in ¶¶ 4-6 below, SC contentions 4a(ii), (iii) & (xvii), as amplified in SC's Interrogatory Response, raise no genuine issues of fact. Therefore, they are ripe for summary disposition under 10 CFR § 2.749.

4. SC Contention 4a(ii). -- "Lack of independence on [sic] ECCS valves." Apparently, this contention was spawned by issue no. 7 in NUREG-0138, "Staff Discussion of Fifteen Technical Issues Listed in Attachment to November 3, 1976 Memorandum from Director, NRR to NRR Staff." See SC's Interrogatory Response at 3-4. This contention raises no genuine issue of fact for the following reasons:

a. Contrary to SC's allegation, issue no. 2 in NUREG-0138 did not raise a safety concern regarding lack of independence of ECCS valves. Instead, the reference to certain redesign work at two PWR's to achieve independence of the ECCS valve interlocks was just used for illustrative purposes. At issue was the Staff's concern that, when it required some redesign on one plant during that plant's operating license review, the applicants for similar plants often did not learn about the Staff's decision until their operating license review. The late receipt of information on the Staff actions has resulted in some applicants having to redesign and backfit their plants, which is possibly more expensive than incorporating the modification before the design is finalized. The Staff summarized this issue as follows:

> The NRC should advise applicants of potential design problems that have been identified on similar designs in order to permit them to take appropriate action to avoid redesign at the OL stage and possibly more expensive resolution of the problem.

NUREG-0138 at 2-1. And the Staff's response:

> Although this is not a safety issue, the NRR will develop and implement, subject to budget constraints, procedures for systematically apprising utilities with plants under construction of potential design problems identified on similar designs so that they can give consideration to them early in the final design stage of their plants.

Id. at 2-2.

b. Although SC pointed to nothing allegedly wrong with Shoreham's ECCS valves, it suggested undertaking an

analysis of the independence of those valves. SC's Interrogatory Response at 3; SC's Particularized Contentions at 4-5. Such an analysis is unnecessary and would be repetitious because those valves were designed and that design was reviewed to ensure compliance with the NRC's independence requirements. Affidavit of David J. Robare on 4a(ii) at ¶¶ 2-4.

c. SC alleged that Shoreham's ECCS does not comply with 10 CFR Part 50, Appendix A, Criteria 5, 35, and 37. SC's Interrogatory Response at 1; SC's Particularized Contentions at 4-4. To the contrary, Shoreham's ECCS complies with these criteria to the full extent applicable. Criterion 5 applies only to multi-unit stations. Therefore, it is not applicable to Shoreham. Criterion 35 requires that the ECCS be designed such that a single failure will not jeopardize the functionability of the system. Compliance with this criterion is demonstrated in the Affidavit of David J. Robare on 4a(ii) at ¶¶ 2-4. Criterion 37 requires that the ECCS be designed to permit periodic functional testing both while the plant is operating and during shutdown periods. Shoreham meets this criterion. Id. at ¶ 5.

5. SC Contention 4a(iii). -- "Analysis of postulated reactor coolant pump rotor seizure incidents." Apparently this contention is based on NUREG-0138, issue no. 5, which has the same title as this contention. In that issue, the Staff raised a concern about the possible effects of a simultaneous seizure of a reactor coolant pump rotor and loss of offsite power. This contention raises no genuine issue of fact for the

following reasons:

a. The following Staff response in NUREG-0138 indicates resolution of this issue:

> For the postulated locked rotor accident, it is most likely that offsite power will continue to be available. Less probable is the case with offsite power continuing only until such time as the turbine generator sheds it load. The most severe case of instantaneous loss of offsite power is quite unlikely; and, in addition, analysis of this more severe case shows that the results are more severe than for the more realistic cases, but still within 10 CFR 100 guidelines. Therefore, requiring an assumption of the instantaneous loss of offsite power concurrent with a locked rotor accident would not provide significant additional safety margins, and this combination is not considered to be a design basis accident.

NUREG-0138 at 5-2; see generally id. at 5-3 to 5-6.

b. An analysis of the transient caused by a seized recirculation pump rotor at Shoreham is described in FSAR § 15A.1.22. This analysis shows that the effects would be mild. Affidavit of David J. Robare on 4a(iii) at ¶ 2. In the very unlikely situation that offsite power were lost at the same time that a recirculation pump rotor seized, the effects of these simultaneous events would not be substantially greater than in the case of just the locked rotor. Moreover, any increase in offsite radiation would be well below the limits in 10 CFR Part 100. Id. at ¶ 3.

c. Although SC provided no reason to suggest that Shoreham would be susceptible to a simultaneous recirculation

pump rotor seizure and loss of offsite power, it suggested undertaking an analysis of these concurrent events. SC's Interrogatory Response at 3-4; SC's Particularized Contentions at 4-5 to -6. Such an analysis would serve no useful purpose for the reasons outlined in ¶ 5.b above.

d. In addition to SC's allegations based on issue no. 5, the County claimed that Shoreham violates 10 CFR Part 50, Appendix A, Criterion 10. SC's Interrogatory Response at 1; SC's Particularized Contentions at 4-4. Criterion 10 requires that a reactor's:

> protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.

As indicated in ¶¶ 2-3 of the Affidavit of David J. Robare on 4a(iii), no fuel design limits would be exceeded if a recirculation pump rotor seized or if that event occurred simultaneously with a loss of offsite power. Therefore, the Shoreham design meets Criterion 10.

6. <u>SC Contention 4a(xvii)</u>. -- "Improvement of BWR shutdown reactivity performance." Apparently this contention is based on NUREG-0153,[3] issue no. 26, which has the same title as this contention. In that issue, the Staff raised a concern regarding the reduced insertion rate of scram reactivity near

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3/ "Staff Discussion of Twelve Additional Technical Issues Raised by Response to November 3, 1976 Memorandum from Director, NRR to NRR Staff" (Dec. 1976).

the end of a fuel cycle when the control rods are almost fully withdrawn. This contention raises no genuine issue of fact for the following reasons:

a. The following Staff response from page 26-2 of NUREG-0153 indicates resolution of this issue:

> [T]his problem has been resolved as a safety issue by use of Technical Specifications which result in limitations on control rod withdrawal and/or power level. The limit on withdrawal keeps some control rods partially inserted and thus improves effective scram response time. Power level restrictions improve initial conditions for transients and may be either explicit to meet pressure margin requirements during isolation transients or implicit by having to meet minimum critical power ratios.

b. In keeping with the Staff's response quoted above, Shoreham's Technical Specifications will limit control rod withdrawal and/or power level to ensure that the scram response is sufficiently fast throughout the core life. Affidavit of David J. Robare on 4a(xvii) at ¶ 2.

c. SC also alleged in regard to this contention that Shoreham did not comply with 10 CFR Part 50, Appendix A, Criteria 13, 20, and 21. SC's Interrogatory Response at 2; SC's Particularized Contentions at 4-4. Contrary to the County's assertion, Shoreham's reactor protection system, which controls the rapid insertion of control rods, complies with the criteria cited by the County. See Affidavit of David J. Robare on 4a(xvii) at ¶ 3.

7. For the above reasons, SC contentions 4a(ii), (iii) & (xvii) raise no genuine issues of fact. Accordingly, under 10 CFR § 2.749, they are ripe for summary disposition in favor of the Applicant. We request that disposition.

Respectfully submitted,

LONG ISLAND LIGHTING COMPANY

F. Case Whittemore

F. Case Whittemore

W. Taylor Reveley, III
Hunton & Williams
P.O. Box 1535
Richmond, Virginia 23212

DATED: February 5, 1979

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
	)	
(Shoreham Nuclear Power Station, Unit 1)	)	

AFFIDAVIT OF DAVID J. ROBARE ON 4a(ii)

David J. Robare, being duly sworn, states as follows:

1. I am Senior Licensing Engineer within the Safety and Licensing Operation of General Electric Company. A statement of my professional qualifications is attached.

2. Emergency core cooling system (ECCS) valve independence is governed by Criterion 35 of 10 CFR Part 50, Appendix A. This criterion requires that a reactor plant's emergency core cooling system (ECCS) be designed with features, such as redundancy and separation, to assure that the system safety function can be accomplished, assuming a single failure. This criterion has been implemented by the detailed design requirements contained in § 4.2 of the Institute of Electrical and Electronics Engineers Criteria for Nuclear Power Plant Protection Systems (IEEE-279, 1971). See Regulatory Guide 1.53.

3. IEEE-279, 1971 § 4.2 requires that, when a single failure could compromise the integrity of two independent divisions, either that possibility must be eliminated or a backup must be provided so that a single failure would be acceptable. Section 4.2 permits sharing (commonality)

of some valves between ECCS subsystems provided that divisional integrity of the logic and sequencing is maintained. Also, interlocks between different logic divisions are allowed so long as the separation requirements approved by the NRC are met.

4. The design of Shoreham's ECCS complies with Criterion 35 because it meets the requirements in § 4.2 of IEEE-279, 1971. See FSAR at 7.3-65, 7.3-72 to 73, 7.3-85 to 86, 7.3-92 to 93, 7.3-103 to 104. The independence of the ECCS valves and interlocks was confirmed during the independent internal design review that is required by Engineering Assurance procedures.

5. Criterion 37 in 10 CFR Part 50, Appendix A requires that the ECCS be designed to permit periodic functional testing both while the plant is operating and when it is shutdown. Compliance with this criterion is demonstrated for the various ECCS subsystems in ¶ f of FSAR §§ 7.3.1.1.1-.4.

David J. Robare

David J. Robare

Subscribed and sworn to before me
this 1st day of February, 1979.

Ruthe M. Kinnamon

Notary Public

My commission expires: Mar 28 1981

OFFICIAL SEAL
RUTHE M. KINNAMON
NOTARY PUBLIC - CALIFORNIA
SANTA CLARA COUNTY
My comm. expires MAR 28, 1981

17 Curtner Ave., San Jose, CA 95125

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(Shoreham Nuclear Power Station,	)	
Unit 1)	)	

AFFIDAVIT OF DAVID J. ROBARE ON 4a(iii)

David J. Robare, being duly sworn, states as follows:

1. I am Senior Licensing Engineer within the Safety and Licensing Operation of General Electric Company. A statement of my professional qualifications is attached.

2. The effects of a Shoreham recirculation pump rotor seizure (when one rotor becomes locked in place and the other pump continues to operate) have been studied. This analysis, which is described in FSAR § 15A.1.22, indicates that the effects would be mild. There would be no significant increase in offsite radiation and there would be no fuel failures. See FSAR § 15A.1.22.5. Furthermore, no fuel design limits would be exceeded because the Minimum Critical Power Ratio would not decrease significantly. Id. at § 15A.1.22.3.3. Thus, for this transient, the Shoreham design complies with 10 CFR Part 50, Appendix A, Criterion 10, which requires that no fuel design limits be exceeded during anticipated operational occurrences.

3. In the very unlikely situation that offsite power were lost at the same time that the rotor seized in a recirculation pump, see NUREG-0138 at 5-2, then the rotor in the other pump would coast down rather than continue to operate as discussed in ¶ 2 above. GE has considered what would be the results of these simultaneous events and concluded that the effects would not be substantially greater than the effects of just the locked rotor. This led to the following conclusions: (a) that any increase in offsite radiation would be well below the limits of 10 CFR Part 100, (b) that no fuel design limits would be exceeded, and (c) that, therefore, a formal analysis of these simultaneous events would serve no useful purpose.

David J. Robare

David J. Robare

Subscribed and sworn to before me
this 1st day of February, 1979.

Ruthe M. Kinnamon

Notary Public

My commission expires: Mar. 28, 1981

OFFICIAL SEAL
RUTHE M. KINNAMON
NOTARY PUBLIC - CALIFORNIA
SANTA CLARA COUNTY
My comm. expires MAR 28, 1981

[illegible] ..., San Jose, CA [illegible]125

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AFFIDAVIT OF DAVID J. ROBARE ON 4a(xvii)

David J. Robare, being duly sworn, states as follows:

1. I am Senior Licensing Engineer within the Safety and Licensing Operation of General Electric Company. A statement of my professional qualifications is attached.

2. If certain transients occur at Shoreham, such as those initiated by a turbine trip or generator load rejection when the plant is above 30% power level, the control rods must be inserted rapidly (scrammed) to shut down the reactor. The following procedures and design features act in combination to ensure that the negative reactivity insertion rate is sufficiently high at all times:

a. Shoreham's Technical Specifications provide for the surveillance of reactivity control systems, the reactor protection system instrumentation, power distribution limits, and the safety/relief valve performance to ensure proper scram response throughout core life. Shoreham's Proposed Technical Specifications §§ 3/4.1-.4.

b. The reactor protection system inserts the control rods rapidly upon receipt of a signal indicating the beginning of a transient. See ¶ 3 below.

c. The effects of the transient are mitigated by the actuation of the recirculation pump trip system and the automatic lifting of the safety/relief valves. See ¶ 4 below.

3. The Shoreham reactor protection system (RPS) is described in detail in FSAR §§ 7.2 and 4.3.2.6.3. The RPS complies with the following criteria from 10 CFR Part 50, Appendix A:

a. Criterion 13 requires that instrumentation and control be provided to ensure adequate safety during anticipated operational occurrences and any accident conditions. The RPS meets this criterion because (1) all input signals to the RPS are monitored and displayed in the control room, and (2) the RPS provides the control to rapidly scram all rods, if necessary. FSAR § 7.2.1.1.1; see generally id. at § 7.2.1.

b. Criterion 20 requires that a reactor protection system be designed to automatically initiate a scram so that the fuel design limits will not be exceeded as a result of anticipated operational occurrences and to maintain safety during an accident. The RPS complies with this criterion because it constantly monitors the appropriate plant variables and will automatically initiate a scram if those variables exceed setpoints that are established to comply with this criterion. Id. at §§ 7.2.1.1.3(1)-(2).

c. Criterion 21 requires that a reactor protection system have (1) sufficient functional reliability that a single failure or removal of a component (or channel) will not result in loss of the protection function and (2) the capability to test channels independently when the reactor is operating. The RPS complies with this criterion because it is designed with four independent and separated input channels and four similarly designed output channels. No single failure operator action can prevent a scram. Id. at §§ 7.2.1.1.3(5), (7).

Moreover, each channel can be tested independently during plant operation. Id. at § 7.2.1.1.3(8).

4. If any of the events noted in ¶ 2 above occurs, certain plant features will mitigate the effects of the resulting transient. The first feature is the recirculation pump trip (RPT) system, which is described in FSAR §§ 7.6.1.4 and 7.6.2.4. When the RPT system receives a signal indicating the initiation of one of these transients, it causes the main power to be disconnected from both recirculation pump motors. This results in a rapid core flow reduction, which (a) keeps the core within the thermal-hydraulic safety limits during the transient, and (b) increases the void content. The higher void content supplements the reactivity reduction caused by scramming the control rods. The effects are also mitigated by the safety/relief valves, which are described in the FSAR in NRC Request and Response 212.51. These valves will lift automatically at predetermined pressures and are sized to ensure that during the transients the primary system pressure will not exceed the requirements of the ASME boiler and pressure vessel code Section III, Nuclear Vessels, which is invoked by 10 CFR § 50.55a(f).

David J. Robare

David J. Robare

Subscribed and sworn to before me
this 28 day of February 1979.

Ruthe M. Kinnamon

Notary Public

My commission expires: Mar 28 1981

OFFICIAL SEAL
RUTHE M. KINNAMON
NOTARY PUBLIC - CALIFORNIA
SANTA CLARA COUNTY
My comm. expires MAR 28, 1981

[illegible], San Jose, CA 95125

QUALIFICATIONS OF DAVID J. ROBARE

My name is David J. Robare. My business address is General Electric Company, 175 Curtner Avenue, San Jose, California 95125. I am currently Senior Licensing Engineer on the Shoreham project. As such, I am responsible for all technical support work for GE's licensing interfaces with the NRC, LILCO, and Stone & Webster.

I received a Bachelor of Science degree in Electrical Engineering from the University of Massachusetts in 1963. I worked for GE as a design engineer in the Large Generator Motor Operation from 1963 to 1967 and as project manager for the Rolling Mill Drive Systems Operation from 1967 to 1970.

In 1970 I became a project application engineer in GE's Nuclear Instrumentation Department. Then in 1972 I was appointed project manager for control and instrumentation systems at reactor sites. From 1974 to 1975 I was lead application engineer in the BWR Projects Department. And in 1975 I assumed my current position as Senior Licensing Engineer.

In my current capacity I have been responsible for the licensibility of Shoreham's nuclear safety systems, the LOCA and transient analyses, as well as the technical specifications. I am also responsible for the licensing effort associated with GE's programs concerning loose parts monitoring, recirculation pump performance under accident conditions, and checking for vibration of reactor internals before plant startup.

I am a licensed professional nuclear engineer in the State of California.