



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO PRIMARY PROPERTY DAMAGE INSURANCE EXEMPTION

LONG ISLAND LIGHTING COMPANY

SHOREHAM NUCLEAR POWER STATION

DOCKET NO. 50-322

1.0 INTRODUCTION

By letter dated November 23, 1987, the Long Island Lighting Power Company (LILCO, the licensee), operator of the Shoreham Nuclear Power Station (SNPS) requested a temporary exemption from the minimum coverage requirements of 10 CFR 50.54(w) until it is allowed to operate the SNPS at a power level, greater than five percent of full rated power (thermal). 10 CFR 50.54(w) as amended¹ requires, in part, that each electric utility licensee take reasonable steps to obtain on-site property damage insurance. This insurance must have a minimum coverage limit for the reactor station site of either 1.06 billion dollars or whatever amount of insurance is generally available from private sources, whichever is less.

LILCO's request for this schedular exemption was made pursuant to the provisions of 10 CFR 50.12, "Specific Exemptions," which in part, states that the Commission may, upon application, grant exemptions from the requirements of the regulations of this part, which are:

- (1) Authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security, and
- (2) The Commission will not consider granting an exemption unless special circumstances are present. Special circumstances are present whenever - ... (iii) Compliance would result in undue hardship or other

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costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by other similarly situated.

2.0 DISCUSSION

LILCO requested a schedular exemption only from the minimum insurance coverage requirements of 10 CFR 50.54(w) until it is authorized to operate SNPS at power levels greater than five percent of full rated power. LILCO made this request pursuant to the provisions of 10 CFR 50.12, "Specific Exemptions."

The insurance coverage requirements of 10 CFR 50.54(w) are intended to provide financial security to support stabilizing and decontaminating activities at a nuclear facility following a postulated accident. To ensure this security 10 CFR 50.54(w) establishes three financial and procedural requirements. First, a minimum amount of insurance must be carried (1.06 billion dollars). Second, by October 4, 1988, the insurance funds must be payable to a separate trust dedicated for cleanup cost. Finally, the licensee, in the event of an accident, must provide a decontamination plan to the Commission for its review.

The required 1.06 billion dollars coverage is based on analyses developed for the Commission by Pacific Northwest Laboratory (PNL). The PNL results were published as a NRC document, NUREG/CR-2601². This analyses assumed an accident (i.e., large LOCA) occurred while a facility is operating at full reactor power and delayed emergency core cooling systems operation. Additional conservative assumptions made in this analysis include one hundred percent fuel cladding failure, fifty percent of the fuel melting, severe core damage and considerable damage and contamination of the reactor building. The costs assumed for stabilization and decontamination were further modified with correction factors for uncertainties. The analysis resulted in a 404.5 million dollar cleanup cost for a large PWR operating at full power. Additional cost considerations were added to the NUREG/CR-2601 results to obtain a minimum insurance coverage requirement of 1.06 billion dollars.

On December 7, 1984, LILCO was granted a license authorizing loading of fuel into the reactor and cold criticality testing with reactor core power levels not to exceed 24.36 kilowatts thermal. On July 3, 1985, LILCO was granted a license authorizing power operation up to 121.8 megawatts thermal (five percent of full rated power) for the purpose of low power testing. All testing has been completed. The issuance of a full power license is delayed due to the unprecedented and continuing litigation of the SNPS emergency plan and the continuing refusal of State and local governments to participate in emergency planning make it impossible to predict when LILCO will be granted a license to operate SNPS at a power level greater than five percent of rated full power.

10 CFR 50.12 allows the Commission under special circumstances to grant exemptions to regulations in 10 CFR Part 50 providing that the exemption does not result in an undue risk to the public health and safety and is consistent with the common defense and security. LILCO's request, pursuant to the provisions of 10 CFR 50.12 for an exemption from the minimum coverage requirement, is based on special circumstances. LILCO cited the following special circumstances as applicable to its request, because of the current operating license prohibiting operation of SNPS at power levels greater than five percent of full rated power:

- (1) Undue hardship based on New York State required accounting procedures,
- (2) Costs that are significantly in excess of those contemplated when the regulation was adopted based on current operating license, and
- (3) The costs are significantly in excess of those incurred by others similarly situated.

LILCO has proposed that the required amount of insurance coverage for SNPS be set at 337 million dollars. This amount was based on NUREG/CR-2601 results and considerations of SNPS operational limits.

3.0 EVALUATION

3.1 Undue Hardship

LILCO contends that current New York State required accounting procedures, coupled with requiring insurance coverage in excess of potential risk and damage estimates of SNPS, place an undue hardship on it.

Currently all SNPS expenses, including insurance payments, are capitalized (i.e., included in the cost of the plant) rather than considered as operating cost, as is the case for most operating plants. This is due to current New York State required accounting procedures. LILCO now maintains 620 million dollars of on-site property insurance coverage. This coverage has been in effect for approximately 2.5 years at an average yearly premium of 3.3 million dollars. If LILCO were to procure the 50.54(w) required 1.06 billion dollar coverage, its yearly insurance premium would rise to approximately 4.4 million dollars. LILCO estimates that a policy with 337 million dollars coverage would have a yearly premium of 2 million dollars. Thus, an exemption could reduce LILCO's yearly insurance cost by approximately 2.4 million dollars. LILCO contends that by requiring it to procure the current regulatory minimum amount of coverage (1.06 billion dollars), the Commission would unduly increase the capital cost of SNPS by 2.4 million dollars for each year the plant operation is limited to five percent of full rated power. By allowing LILCO to procure insurance coverage commensurate with the risk and damage estimates for low power operation, the capital cost of SNPS would reflect only justified insurance expenses. Hence, the imposition of the current regulatory requirement on LILCO would impose an undue economic burden.

The staff finds, based on the above considerations, that assigning an insurance coverage not commensurate with the risk and damage estimates realistically associated with SNPS as currently licensed coupled with the New York State required accounting procedures is imposing an undue hardship on LILCO.

3.2 Cost Contemplated When Regulation Adopted

LILCO contends that the required minimum insurance coverage of 1.06 billion dollars results in a cost significantly in excess of those contemplated when the regulation was adopted based on the SNPS's current five percent of full rated power operating limitation. LILCO's contention is based on the analysis which resulted in minimum insurance coverage derived from NUREG/CR-2601 and additional added costs. The amount assumed for NUREG/CR-2601 was based on a typical large PWR design operating at full power. LILCO proposes a 337 million dollars insurance coverage amount in lieu of the required 1.06 billion dollars amount based on NUREG/CR-2601 accident costs and additional added costs.

NUREG/CR-2601 which analyzed the cost of stabilization and decontamination activities at large power reactors considered three different accident scenarios. The postulated accident scenarios, numbered in increasing order of difficulty of the post accident cleanup are summarized below:

Table 3.2-1

Summary of Accident Parameters from NUREG/CR-2601 Accidents Scenarios

<u>Parameter</u>	<u>Scenario 1</u>	<u>Scenario 2</u>	<u>Scenario 3</u>
Accident description	Small LOCA; ECCS functions	Small LOCA; ECCS delayed	Large LOCA; ECCS delayed
% Fuel cladding Failure	10	50	100
% Fuel melting	0	5	50
Reactor coolant released (M ³)	200	1000	1600
Core Damage	Minor	Moderate	Severe
Physical damage to reactor building	None	Minor damage to valves & equipment. Contamination of bldg. ventilation system	Loss of elec. & other services. Major damage to bldg. components

The underlying assumption of all these scenarios is that the accident begins with the plant operating at full reactor power. Thus, large fission product inventories exist and the operators are limited both in time to diagnose and respond to the event and in the capability of safety systems for combating the accident. These factors increase the possibility of core damage depending upon the type of initiating occurrence (small and large LOCA) and the functioning of safety systems.

The calculated costs of stabilization and decontamination activities for each of these scenarios are as follows:

Table 3.2-2

Summary of Cleanup Cost for a Reference
Pressurization Water Reactor (PWR) and Boiling Water Reactor (BWR)

Cost (in millions)

<u>Plant Type</u>	<u>Scenario 1</u>	<u>Scenario 2</u>	<u>Scenario 3</u>
PWR	105.2	223.8	404.5
BWR	128.5	228.2	420.9

The \$1.06 billion given in section 50.54(w)(1) was established using the PWR Scenario 3 cleanup costs of 404.5 million dollars and increasing this amount by assumed operation and maintenance expenses of 125 million dollars, cost escalation of 290 million dollars, and miscellaneous expenses of 323 million dollars.⁵

LILCO contends that an accident which results in 100% fuel cladding failure and 50% fuel melting is highly unlikely during low power operation at SNPS. Thus, the cost estimates for a Scenario 3 accident for SNPS operating at low power are excessive. LILCO similarly contends that a Scenario 2 accident assumes fuel clad failure and melting. This scenario is also inappropriate in determining clean up costs for SNPS operating at five percent of full rated power.

LILCO noted that in October, 1984, an NRC Licensing Board granted LILCO an exemption to the onsite power requirements of 10 CFR Part 50, Appendix A.⁶ The analysis, which supported the granting of the exemption, considered the Updated Safety Analysis Report (USAR) Chapter 15 events and discussed the effect of five percent of full power operation on public health and safety in the absence of licensed diesel generators. The analysis demonstrated that based on accident risk estimates the alternate AC power sources installed at that time were adequate compensation for the then unlicensed TDI diesel generators.

LILCO also contends that the same analysis is applicable here, particularly since the worst case accident considered (i.e. DBA-LOCA coincident with a loss of AC power) is directly comparable with the scenario's considered in NUREG/CR-2601. The results of the five percent of full power analysis show that risk estimates at this power level are significantly lower than those calculated for full power operation. Moreover, the analysis demonstrates that fuel failure will not occur following a DBA-LOCA coincident with a loss of offsite power during low power operation.

LILCO determined that based on the five percent of full power analysis performed, of all the accidents and transients analyzed under Chapter 15 of the USAR, the loss of coolant accident (LOCA) is the most limiting when considering loss of AC power. Inherent in the loss of AC power scenario is the assumption that the ECCs pumps are unavailable. Calculations to determine the time to reach 10 CFR 50.46 limits were performed for four distinct variations of this accident scenario. These calculations, the results of which were endorsed by the staff⁷, each resulted in a determination that no fuel failures were predicted to occur when the 10 CFR 50.46 limit was reached. Further, the analysis showed that delays in ECCS operation from one to four hours could be tolerated with no fuel failure predicted to occur.

Since the SNPS specific five percent of full power analysis was performed, the TDI diesel generators have been licensed. In addition, LILCO has made a number of major modification and procedure changes which enhance safety during all modes of operation. These include:

- ° The addition of Colt diesel generators on site which can supply 4160 V AC power through the 69 KV switchyard.
- ° Highly enriched sodium pentaborate used in the Standby Liquid Control (SLC) system increases the allowable time for successful initiation of the alternative reactivity control measures and ATWS mitigation.

- ° Installation of an Automatic Depressurization System (ADS) inhibit switch provides the operating staff with an easy means to avoid automatic depressurization when it would produce unacceptable plant effects.
- ° Revision of the Shoreham emergency operating procedures permits throttled low pressure Emergency Core Cooling Systems (ECCS) and condensate to be used during ATWS events as part of the enhanced reactivity control procedure.

Given that fuel cladding failure is not predicted to occur during low power operation at SNPS, LILCO contends that a prudent application of NUREG/CR-2601 results to SNPS would be to assume a small break LOCA, in which minimal fuel cladding failure and no fuel melt is expected to occur. Therefore, LILCO concludes that accident Scenario 1 is the most appropriate in determining the required insurance coverage for Shoreham.

Based on NUREG/CR-2601, the cost of stabilization and decontamination activities following a Scenario 1 accident is \$128.5 million (Table 3.2-2). Similar to the method used by the NRC in establishing the 1.06 billion dollars requirement, the \$128.5 million should also be increased to include operation and maintenance costs, miscellaneous expenses, and potential cost escalation. By using scaling factors, the 128.5 million dollar amount is increased to a total cleanup cost of 337 million dollars.

The staff, based on the above, agrees with LILCO that the current required amount of insurance (1.06 billion dollars) results in costs significantly in excess of those contemplated when 10 CFR 50.54(w)(1) was adopted based on SNPS current operational limits and plant specific safety enhancements. The staff also finds that the 337 million dollars insurance on-site property damage insurance coverage to be adequate to provide financial security to support stabilizing cleanup or decontaminating activities following a postulated accident.

3.3 Cost Incurred by Other Similarly Situated

LILCO contends that the amount of insurance coverage required by 10 CFR 50.54(w) results in a cost significantly in excess of others similarly situated. In its request for a schedular exemption LILCO noted that the Commission has already granted relief from the amount of insurance coverage requirements of 10 CFR 50.54(w) for several smaller licensed power plants. The exemptions previously granted are summarized in Table 3.3-1. SNPS, as currently licensed, can produce up to approximately 40 MW(e). This is less than the rated power levels for those plants already granted an exemption. Thus, LILCO contends that requiring a 1.06 billion dollars minimum insurance coverage for SNPS results in a cost significantly in excess of those incurred by others similarly situated.

TABLE 3.3-1

SUMMARY OF PREVIOUS 10 CFR 50.54(w) EXEMPTIONS GRANTED

<u>Licensee/Reactor (Size)</u>	<u>Required Insurance Coverage</u>
Pacific Gas & Electric Co./ Humbolt Bay (63MW (e))	\$100,000,000
Yankee Atomic Electric Co./ Yankee Nuclear (175MW (e))	\$500,000,000
Consumers Power Co./ Big Rock Point (72MW (e))	\$500,000,000
Public Service Co. of Colorado/ Fort St. Vain (300MW (e))	\$500,000,000
Dairyland Power Corp./ LaCrosse (50MW (e))	\$500,000,000

Dairyland Power Corp./
LaCrosse (50MW (e))

\$180,000,000

The staff, based on the above, agrees with LILCO that the current required amount of insurance (1.06 billion dollars) results in an insurance cost significantly in excess of those incurred by other licensees similarly situated (i.e., with similar operating power levels).

4.0 CONCLUSION

Currently operation of SNPS is limited to five percent of full rated power (121.8 megawatts thermal). The staff has previously reviewed the effects of the most limiting accidents that could occur at SNPS, as currently licensed, and determined that no fuel failure would occur when the 10 CFR 50.46 limits were reached. Since this worst-case analyzed accident is similar to NUREG/CR-2601 Scenario 1, the cost estimate of this scenario with appropriate additional costs are determined to be sufficient to support stabilizing, clean-up or decontaminating activities following the postulated worst-case accident.

Adherence to the 1.06 billion dollars insurance coverage requirements of 10 CFR 50.54(w) is not necessary to meet the intent of the rule and would place an undue economic burden on LILCO.

In addition, this proposed exemption affects only the amount of on-site property damage insurance coverage and does not affect the manner of normal facility operation or the risk of facility accidents. While the change in insurance coverage may affect the financial arrangements of the licensee and have some economic consequences, the possibility that the health and safety of the public would be altered by changes in insurance coverage is extremely remote. The exemption in question would not authorize construction or operation and would not authorize a change in licensed activities.

Therefore, the staff finds that the licensee's request for a schedular exemption from the requirements of 10 CFR 50.54(w)(1) to reduce on-site property damage insurance from 1.06 billion dollars to 377 million dollars should be granted until such time that LILCO is authorized to operate SNPS above the current five percent of full power limit.

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Dated: May 31, 1988

REFERENCES

1. 10 CFR paragraph 50.54(w). Final rule published August 5, 1987, (52 Federal Register 28963).
2. Technology, Safety and Cost of Decommissioning Reference Light Water Reactor Following Postulated Accidents, Pacific Northwest Laboratory, NUREG/CR-2601, dated November 1982.
3. J. Leonard (LILCO) letter to NRC, SNRC-1385, dated October 3, 1987.
4. J. Leonard (LILCO) letter to NRC, SNRC-1393, dated November 23, 1987.
5. (52 Federal Register 28963, 28964, Column 2).
6. Long Island Lighting Company (Shoreham Nuclear Power Station, Unit 1) LBP-84-45, 20NRC1343. Made effective by Commission Order CLI-85-01.
7. USNRC NUREG 0420 Supplement No. 6 dated August 9, 1984.