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JOHN D. LEONARD, JR.
VICE PRESIDENT · NUCLEAR OPERATIONS

October 26, 1984 SNRC-1097

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

On-site Oil Storage Tank
Thermal Flux Calculation
Shoreham Nuclear Power Station - Unit 1
Docket No. 50-322

References:
1. Letter to J. D. Leonard (LILCO) from A. Schwencer (NRC) dated September 4, 1984. NRC Requests 311.10 and 311.11
2. SNRC-1081 dated September 24, 1984

Dear Mr. Denton:

Attached please find a calculation summary providing the thermal flux produced by a postulated fire in the on-site fuel oil tank. This is per LILCO's commitment in the Reference 2 letter (to forward the results of this calculation) and it supplements LILCO's response to the reference 1 letter.

The thermal flux on the nearest safety-related structure, the Reactor Building, was determined to be 10.18 kW/m² for approximately 7.4 hours. This incident flux would not produce a wall temperature exceeding the maximum allowed by the American Concrete Institute or the American Society of Mechanical Engineers standards. Consequently, the thermal flux produced by such a fire would not adversely affect safety-related structures.

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We trust this submittal and the Reference 2 letter are responsive to NRC Requests 311.10 and 311.11. If additional information is required, do not hesitate to contact this office.

Very truly yours,

John D. Leonard, Jr.
Vice President - Nuclear Operations

NRL:ck

Attachment

cc: P. Eselgroth
C. Petrone

Attachment I - SNRC-1097

Summary of Heat Flux Calculation on Safety-Related Structures

OBJECTIVE: This calculation was performed in order to determine the heat flux on the safety-related structures generated by a postulated fuel oil fire . The fuel oil in question is stored in the on-site oil storage tank located 129.5 meters (424.9 feet) southwest of the Reactor Building.

RESULTS: The Reactor Building (the nearest safety-related structure) is subjected to a calculated thermal flux of 10.18 kW/m^2 for estimated 7.4 hours, based on an oil burn-up rate of 12 inches/hour.

DATA:

1. The combustible material is No. 2 fuel oil.
2. The storage tank is 46 ft. high x 60 ft. dia. and has a nominal capacity of 970,000 gallons.
3. The dike is 8 ft. high x 150 ft. dia. and completely surrounds the tank.
4. The nearest safety-related structure is the Reactor Building at 129.5 m (424.9 ft.) northeast of the tank.

ASSUMPTIONS:

1. The entire contents of the tank flows into the space contained by the dike.
2. All of the oil is contained by the dike.
3. Ignition of the oil occurs after the oil stops flowing (dike is full).

DISCUSSION: The calculation was performed using NUREG CR-3330, "Vulnerability of Nuclear Power Plant Structures to Large External Fires" as a technical basis. By comparing with the results reported in NUREG CR-3330, it can be shown that an incident thermal flux of 10.18 kW/m^2 over 7.4 hours would not produce a wall temperature exceeding the maximum allowed by ACI and ASME codes.

CONCLUSION: The heat generated by a fuel oil fire would not adversely affect the safety-related structures.