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SHOREHAM NUCLEAR POWER STATION
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JOHN D. LEONARD, JR.
VICE PRESIDENT - NUCLEAR OPERATIONS

November 29, 1984 SNRC-1118

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

Additional Questions
Qualified Load - TDI Diesel Generators
Shoreham Nuclear Power Station - Unit 1
Docket No. 50-322

Dear Mr. Denton:

On November 26, 1984 members of my staff participated in a telecon with Mr. R. Caruso of your staff to discuss several additional concerns with respect to our submittal SNRC-1104. During that discussion Mr. Caruso requested that certain information be assembled and formally docketed.

Attachment 2 is a list of these concerns and our responses to them.

While we anticipate that you will find these responses acceptable, please do not hesitate to call my office or members of my staff should you require additional information or clarification regarding our reply.

Very truly yours,

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

TD:ck

cc: P. Eselgroth
All Parties Listed in Attachment I

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ATTACHMENT I

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Attachment #2

I Arithmetic Discrepancy

During a telecon of 10/26/84 between members of my staff and Mr. R. Caruso and Mr. J. Knox of your staff, we stated that the load on each diesel during a LOOP would be 2924.5 kW for DG-101, 2749.5 kW for DG-102 and 2706 kW for DG-103. A detailed discussion of the development of these LOOP loads followed, in which it was determined that these values needed to be adjusted. The following is a description of the adjustments made to the LOOP load for DG-101.

First, the original LOOP load for DG-101 of 2924.5 kW given verbally during telecon of 10/26/84 relied upon nameplate values for the Emergency Switchgear, Relay and Computer Room Air Conditioning Units, rather that on the actual measured load values. The total actual measured load for this equipment is 2.5 kW higher than the FSAR values. Although this difference is insignificant, LILCO nonetheless adjusted the load values accordingly. Second, a reduction of the total load was made to reflect a difference in nameplate versus the actual measured value of the 480 volt MG-set (LPCI) because the LPCI valves do not operate during a LOOP. This reduction of 141 kW consists of 106 kW for the MOV load and 35 kW for MG set. The result is a revised LOOP load of 2786 kW for DG-101, which agrees with the load submitted for a LOOP event in SNRC-1104.

For DG-101	FSAR Table 8.3.1-1	FSAR Table 8.3.1-1A	Delta
Emergency Switchgear, Relay Computer Room A.C. Units	33.9 kW	36.4 kW	+2.5 kW
480 Volt MG Set	160 kW	19 kW	-141 kW
Original LOOP value for DG-101			2924.5 kW
Difference between nameplate & Actual (A.C. Units)			+ 2.5 kW
			2927 kW
Difference in 480 volt MG load (Loop-LPCI does not operate)			-141 kW
Properly Adjusted LOOP load (Per SNRC-1104)			2786 kW

II Main Turbine & Feed Pump Turbine Turning Gear and Lube Oil Systems

The main turbine and feedwater pump turbine turning gear drives and associated oil pumps, main turbine bearing lift pumps and main turbine piggyback turning gear drive are tripped only during a LOCA coincident with a LOOP. Once tripped, the breakers for these loads must be manually reset prior to reenergizing any of this equipment. All of these loads associated with the main turbine and feedwater pump turbine lube oil and turning gear systems have been incorporated in the LOOP load for each diesel.

Once tripped the turbines will start to coast down. During this period a D.C. motor driven emergency oil pump will be used to insure a safe turbine coast down. The main turbine takes approximately 30 minutes with a vacuum present and 23 minutes without a vacuum to coast down. The turbine manufacturer (G.E.) recommends that the turbine be placed on turning gear within 10 to 15 minutes after coast down but it is not mandatory. Operators will be trained to reclose the appropriate supply breakers and establish AC power to all of the above equipment only if the load on the diesels is sufficiently below the qualified load such that the addition of these loads will not cause the diesels to be loaded above the qualified load. It should be noted that the main turbine shaft can be manually rotated using the turning gear hand wind.

With the operator training and procedure changes that will be practiced at Shoreham and the main turbine coast down time, it would be unlikely for an operator to place these loads (turning gear and lube oil) on the diesels at a time when the qualified load of 3300 kW could be exceeded. It takes the main turbine 23 minutes to coast down to a speed at which it could be placed onto turning gear. By this time the operator would have throttled back on RHR flow (from runout to design) which would reduce the load of all three diesels to levels below 3200 kW.

III. Lighting

In a telecon on November 25, the NRC staff expressed concern that operators may attempt to re-energize the lighting load shown in FSAR Table 8.3.1-1 in order to restore illumination following an accident, and thereby exceed the qualified load. This will not occur.

Following a LOOP event, the lighting loads do not trip and

therefore remain energized when the diesels come on line. Consequently, these lighting loads have been included in the total diesel loads for a LOOP provided to the NRC.

In a LOOP/LOCA event, this lighting load is intentionally tripped automatically because it is not needed to mitigate the consequences of the accident. LILCO has verified that DC powered emergency lighting is automatically available in each of the areas supplied by the AC lighting load in question. Thus operators will not need to reenergize the lighting loads.

IV. Time Histories For Automatically Actuated Valves

In a telecon on November 25, the NRC staff requested further information concerning the intermittent loads attributable to automatically actuated motor operated valves. In order to demonstrate the insignificance of these loads on the operation of the diesel, LILCO performed a conservative assessment of the operation of these valves. LILCO conservatively assumed that all the automatically actuated valves would operate simultaneously. This approach is conservative because (1) it is unlikely that all of the automatically actuated motor operated valves would need to operate (e.g. some containment isolation valves are normally closed), (2) Even if all valves did operate it is unlikely that all valves would operate simultaneously (e.g. LPCI and core spray valve operation would be delayed until permissible interlocks are met), and (3) the valves, even if all operated, have different stroke times and would not operate simultaneously.

Using this conservative approach, LILCO analyzed the valve loads listed in FSAR Table 8.3.1-1 and confirmed that it was appropriate to exclude these intermittent loads from the qualified load. FSAR Table 8.3.1-1 contains two entries for automatically actuated valves: a) 480V M-G Set, and b) Motor Operated Valves. The 480 MG-set load can be further subdivided into the load for the MG-set itself and the load for the associated valves. Actual test data shows that the unloaded 480V M-G Set represents a load of 19 kW each. Based on the nameplate rating for each of the 4 valves powered by the 480 V MG set, the maximum coincident loading for the valves is less than 46 kW. All valves complete their operation within 1 minute. It should be noted that the 19kW load for each MG-set is included in the qualified load. Therefore, the maximum contribution from the MG-set valves, is a load of 46 kW for a period of less than 1 minute.

With respect to motor operated valves, table 8.3.1-1 shows values of 19.7, 18.3 and 0.7 kW on DG-101, 102 and 103, respectively. By simply adding these MOV loads and 480 V MG sets valve loads to the summation of the loads in Table 8.3.1-1A (3253.3, 3208.7 and 3225.5 on DG-101, 102 and 103), the maximum loads that could result are 3319, 3273 and 3272.2 kW on DG-101, 102 and 103. The loads due to operation of the automatic MOV's will not last more than one minute and will occur during the first ten minutes of the Design Basis Accident. As already noted, it is highly unlikely that these peak loads would be reached in an actual accident. In addition, it is likely that any peak that is reached would last less than one minute since a number of the valves have short stroke times. In effect the intermittent operation of these automatic MOV's is similar to the spiking effect discussed in SNRC-1104. As noted there, the extensive preoperational testing of the Shoreham diesels at and above 3300 kW, demonstrates that short duration loads of these magnitudes will have no adverse effect on the steady state capabilities of the diesels during an accident. Consequently, it is appropriate to exclude these intermittent loads in developing the qualified loads for the Shoreham diesels.