UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION



Before the Commission

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| In the Matter of | ) | |
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| LONG ISLAND LIGHTING COMPANY | ) | Docket No. 50-322-OL-4 |
| | ) | (Low Power) |
| (Shoreham Nuclear Power Station, Unit 1) | ) | |

MOTION FOR SUMMARY
DISPOSITION ON PHASE II LOW POWER TESTING

On March 20, 1984, LILCO filed its Supplemental Motion for Low Power Operating License which requested the approval of a license to conduct four phases of low power testing. LILCO hereby renews its March 20 motion and, pursuant to 10 CFR § 2.749, seeks summary disposition with respect to Phase II of the low power testing program.

I. Basis for Summary Disposition

Phase II of low power testing includes cold criticality testing of the plant at essentially ambient temperature and atmospheric pressure. See attached Statement of Material Facts, Material Fact 1. The testing involves a specified control rod withdrawal sequence that results in achieving reactor criticality at extremely low power levels, in the range of 0.0001% to 0.001% of rated thermal power. Material Fact 2. The primary purpose of Phase II testing is to verify the shutdown

margin calculations. Material Fact 4. In order to accomplish this, plant personnel must first install vessel internals and place all refuel floor constraints in place. Expansion and vibration instrumentation is installed and cold baseline data are obtained for later comparison to data obtained during heatup. Material Fact 3.

To obtain the shutdown margin test data, control rods are withdrawn in the proper sequence until criticality is achieved. The necessary test data can be taken within 5 minutes of reaching criticality. The control rods are then reinserted and the reactor is shut down. Material Fact 4.

The extremely low risk of conducting Phase II activities, even without onsite AC power sources available, is demonstrated by a review of the accident and transient events contained in Chapter 15 of the Shoreham FSAR. Under plant conditions during Phase II, 23 of the 38 Chapter 15 events are possible. Material Fact 5-6. Of the 23 possible events, the standard safety analysis does not require the assumption of loss or unavailability of offsite AC power for 20 of them. Therefore, the consequences of these events are unaffected by the unavailability of the TDI diesels. Material Fact 6.

For the three events that do assume loss or unavailability of offsite power, pipe breaks inside containment (loss of coolant accident or LOCA), feedwater system piping break and

the loss of AC power event, there are no consequences even assuming no onsite AC power source. Material Facts 7-10, 12.

As in Phase I, the lack of any accident consequences is attributable to the level of fission products in the core. The extremely low power levels achieved during Phase II, and the extremely short amount of time at those power levels result in essentially no fission products in the core and very little decay heat. Material Facts 4, 8-9. Accordingly, in the event a LOCA occurs,[1/] only a small amount of decay heat is present to heat up the core. Essentially unlimited time is available before core cooling would have to be restored. Thus, there is no need for any AC power, including the TDI diesels. Material Fact 9.

With respect to the feedwater system break event and the loss of offsite power event, the reactor coolant inventory is not lost. This provides additional cooling capability and further ensures that no AC power is needed for core cooling. Material Fact 10.

As in Phase I, diesel generators are not necessary to satisfy the Commission's regulations. The necessity for diesel generators derives from GDC 17, which states in pertinent part:

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1/ Pipe breaks of the sort postulated in the LOCA or feedwater system break events are highly unlikely under Phase II conditions. Material Fact 11.

> An onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning, shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

10 C.F.R. Part 50, Appendix A, Criterion 17 (emphasis added). In other words, the onsite AC power source must be of sufficient capacity to assure the performance of specified safety functions. As demonstrated above, the Chapter 15 accident and transient events do not have any consequences, even assuming the unavailability of the TDI diesels. In fact, no AC power is required to protect the core. Material Fact 13.

Thus, the Commission's analysis with respect to fuel load and precriticality testing for the Diablo Canyon plant is useful here. As the Commission noted in that decision:

> The risk to public health and safety from fuel loading and pre-criticality testing is extremely low since no self-sustaining nuclear chain reaction will take place under the terms of the license and therefore no radioactive fission products will be produced.

Pacific Gas & Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 & 2), CLI-83-27, 18 NRC 1146, slip op. at 5 (November 8,

1983). As already noted, self-sustaining nuclear reaction will be conducted at extremely low power levels and for very short periods of time. The radioactive fission products produced under these circumstances are negligible. Thus, operation of the plant during Phase II presents no significant safety issue. See Diablo Canyon, 18 NRC at 1146, slip op. at 6.

The rationale for the Commission's grant of a license to Diablo Canyon also applies with respect to Phase II activities at Shoreham. At the time the Commission granted Diablo Canyon a low power testing license, quality assurance litigation concerning Diablo Canyon was still ongoing. In contrast, Shoreham has already been the subject of a lengthy, favorable Partial Initial Decision on all safety issues except those concerning those its existing diesel generators. See Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1) LBP-83-57, 18 NRC 445 (1983) (Opinion), and unpublished Board Findings of Fact and Appendices. Since there is no need for diesel generators during Phase II, the assurance of no risks to public health and safety from Phase II activities is even greater at Shoreham than at Diablo Canyon because all quality assurance issues at Shoreham have been favorably resolved.

## II. Conclusion

During cold criticality testing conducted during Phase II, no AC power is required to perform the safety functions specified in GDC 17. For the above stated reasons, LILCO's Motion for Summary

Disposition of LILCO's Supplemental Motion for Low Power Operating License for Phase II low power testing should be granted.

Respectfully submitted,

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STATEMENT OF MATERIAL FACTS
AS TO WHICH THERE IS NO GENUINE ISSUE
TO BE HEARD ON PHASE II LOW POWER TESTING

The following is the Statement of Material Facts as to which LILCO contends there is no genuine issue to be heard concerning Phase II low power testing:[2/]

1. Phase II of low power testing includes cold criticality testing of the plant at essentially ambient temperature and atmospheric pressure. Rao, et al., Tr. 285-86; Sherwood Affidavit at ¶ 14; Hodges Affidavit at ¶ 15.

2. Phase II testing involves a specified control rod withdrawl sequence that results in achieving reactor criticality at extremely low power levels, in the range of 0.0001% to 0.001% of rated thermal power. During this phase, reactor operators withdraw each of the 137 control rods and monitor the effect of its withdrawl in terms of neutron flux. By analysis and calculation, Reactor Engineering personnel are able to assign a "worth to each control rod, that is, the effectiveness of each rod in controlling reactivity." Gunther, Tr. 204-06; Notaro Affidavit at ¶ 8; Hodges Affidavit at ¶ 5.

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2/ These facts appear in the record in the affidavits filed with LILCO's Supplemental Motion for Low Power License dated March 20 and in the testimony of the seven witnesses who testified on April 24 and 25 before the Licensing Board. Since these documents are readily available, copies have not been attached. Facts also appear in an affidavit of Wayne W. Hodges, dated April 3, 1984, which is attached.

3. Cold criticality testing requires plant maintenance personnel to install vessel internals in accordance with station procedure and with all refuel floor constraints in place. Expansion and vibration instrumentation is also installed. Cold baseline data are obtained to determine pipe movement as heatup occurs later in the low power test program. Gunther, Tr. 205; Notaro Affidavit at ¶ 8.

4. The primary purpose of Phase II testing is to verify shutdown margin calculations. The shutdown margin is measured by withdrawing the analytically strongest rod or the equivalent and one or more additional rods until criticality is reached. This procedure is completed and the necessary data obtained with 5 minutes after going critical. After the conclusion of the procedure, the control rods are reinserted into the core, thereby stopping the reaction and returning the core to subcritical status. Gunther, Tr. 205-06.

5. Under the plant conditions present in Phase II, many events analyzed in FSAR Chapter 15 could not occur or would be very unlikely. Even the possible Chapter 15 events would have no impact on public health and safety regardless of the availability of the TDI diesels. Rao, et al., Tr. 286-89, 295; Sherwood Affidavit at ¶¶ 15-17, 22; Hodges Affidavit at ¶ 6.

6. Of the 23 possible Chapter 15 events reviewed, 20 do not require the assumption of loss or unavailability of off-site AC

power. Therefore, the consequences of these events are unaffected by the unavailability of the TDI diesels. Rao, et al., Tr. 291; Sherwood Affidavit at ¶ 18.

7. The three events that do assume loss or the unavailability of off-site AC power are: pipe breaks inside the primary containment, feedwater system pipe break, and the loss of AC power event. Rao, et al., Tr. 292; Sherwood Affidavit at ¶ 19.

8. Because of the extremely low power levels reached during Phase II testing, fission product inventory in the core will be only a small fraction of that assumed for the Chapter 15 analysis. The FSAR assumes operation at 100% power for 1,000 days in calculating fission product inventory; inventory during Phase II lower power testing will be less than 1/100,000 (0.00001) of the fission product inventory assumed in the FSAR. Rao, et al., Tr. 295; Sherwood Affidavit at ¶ 17.

9. If a LOCA did occur during the cold criticality testing phase (Phase II), there would be time on the order of months available to restore make-up water for core cooling. At the power levels achieved during Phase II, fission product inventory is very low. At most, the average power output will be a fraction of a watt-per-rod, with no single rod exceeding approximately two watts. With these low decay heat levels, the fuel cladding temperature would not exceed the limits of 10 C.F.R. § 50.46 even after months without restoring coolant and without and source of

AC power. Thus, there is no need to rely on the TDI diesel generators, or any source of AC power. Rao, et al., Tr. 292-94; Sherwood Affidavit at ¶ 19; Hodges Affidavit at ¶ 8.

10. During Phase II cold criticality testing conditions, there is no reliance on the diesel generators for mitigation of the loss of AC power event or the feedwater system piping break event. For these events, no loss of coolant occurs and the decay heat is minimal. Core cooling can be achieved for unlimited periods of time without AC power using the existing core water inventory and heat losses to ambient. Rao, et al., Tr. 293-94; Sherwood Affidavit at ¶ 20; Hodges Affidavit at ¶ 6.

11. The LOCA and the feedwater system piping break postulate the double ended ruptures of a piping system. Because the reactor will be at essentially ambient temperature and atmospheric pressure during Phase II, it is extremely unlikely that such a pipe break would ever occur. The NRC Staff does not require double ended ruptures to be postulated for low temperature and low pressure systems in safety analyses. Rao, et al., Tr. 294; Sherwood Affidavit at ¶ 21; Hodges Affidavit at ¶ 7.

12. None of the events analysed in Chapter 15 could result in a release of radioactivity during cold criticality testing that would endanger the public health and safety. Rao, et al., Tr. 305; Sherwood Affidavit at ¶ 17.

13. Even if AC power were not available for extending periods of time, fuel design limits and design conditions of the reactor coolant pressure boundary would not be approached or exceeded as a result of anticipated operational occurrences, and the core would be adequately cooled in the unlikely event of a postulated accident. Rao, et al., Tr. 295-96; Sherwood Affidavit at ¶ 22.