STATEMENT OF MATERIAL FACTS AS TO WHICH THERE IS NO GENUINE ISSUE TO BE HEARD ON PHASE I 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 I low power testing:2/

1. Phase I Fuel Loading and Precriticality Testing involves placing fuel in the reactor vessel and conducting tests of reactor systems and support systems. Gunther, Tr. 201-02; Notaro Affidavit at ¶ 6.

2. Initial core loading involves the placement of 560 fuel bundles in specified locations within the reactor vessel. Id.

3. The following testing is associated with initial core loading:

(a) water chemistry surveillance testing

(b) control rod drive stroke time and friction tests

(c) installation, calibration, and utilization of special startup neutron instrumentation

(d) core verification instrument operability check

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 4, 1984, which is attached.

Gunther, Tr. 202; Notaro Affidavit at ¶ 6.

4. Following placement of fuel in the vessel, tests are performed to verify the operability of systems. This precriticality testing includes the following:

(a) local power range monitor (LPRM) sensitivity data

(b) zero power radiation survey for background readings

(c) recirculation system instrument to calibration check

(d) control rod drive scram time testing

(e) cold main steam isolation valves (MSIV) timing

Gunther, Tr. 202; Notaro Affidavit at ¶ 7.

5. During all of the activities in Phase I, the reactor will remain at essentially ambient temperature and atmospheric pressure. The reactor will not be taken critical. Any increase in temperature beyond ambient conditions will be due only to external heat sources such as recirculation pump heat. There will be no heat generation in the core. Rao, et al., Tr. 279; Sherwood Affidavit at ¶ 7; Hodges Affidavit at ¶ 3.

6. Of the 38 accident or transient events addressed in FSAR Chapter 15, 18 of the events could not occur during Phase I because of the operating conditions of the plant. An additional 6 events could physically occur, but given the plant conditions, would not cause the phenomena of interest in the Chapter 15 safety analysis. The remaining 14 events could possibly occur, although

occurrence is highly unlikely given the plant conditions. The potential consequences of these 14 events would be trivial. Rao, et al., Tr. 279-84; Sherwood Affidavit at ¶¶ 8-11; Hodges Affidavit at ¶ 4.

7. During Phase I fuel loading and precriticality testing, there are no fission products in the core and no decay heat exists. Therefore, core cooling is not required. In addition, with no fission product inventory, there are no fission product releases possible. Rao, et al., Tr. 283-84; Sherwood Affidavit at ¶ 11; Hodges Affidavit at ¶ 4.

8. Even a loss of coolant accident would have no consequences during Phase I since no core cooling is required. No fission products exist and therefore no decay heat is available to heat up the core. The fuel simply would not be challenged even by a complete drain down of the reactor vessel for an unlimited period of time. Rao, et al., Tr. 284; Sherwood Affidavit at ¶ 9; Hodges Affidavit at ¶ 4.

9. No core cooling is required during Phase I and, therefore, no AC power is necessary during Phase I to cool the core. Rao, et al., Tr. 285; Sherwood Affidavit at ¶ 13; Hodges Affidavit at ¶ 3.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

AFFIDAVIT OF MARVIN W. HODGES
CONCERNING THE SUPPLEMENTAL MOTION FOR
LOW POWER OPERATION, PHASE I AND II, AT SHOREHAM

I, Marvin W. (Wayne) Hodges, being duly sworn, state as follows:

1. I am a Section Leader in the Reactor Systems Branch of the Office of Nuclear Reactor Regulation. A copy of my professional qualifications is attached.

2. Long Island Lighting Company (LILCO) filed a Supplemental Motion for Low Power Operating License dated March 20, 1984. In that motion, LILCO proposed a phased program for low power operation at Shoreham. The four phases proposed are:

   a) Phase I: fuel load and precriticality testing,

   b) Phase II: cold criticality testing,

   c) Phase III: heatup and low power testing to rated pressure/temperature conditions (approximately 1% rated power); and

   d) Phase IV: low power testing (1-5% rated power)

The purpose of this affidavit is to address the impact on the health and safety of the public of operation in Phases I and II.

3. In Phase I, fuel loading and precriticality testing, the reactor will not be taken critical. There will be no heat generation in the core. There will be no fission products. Because there will have been no power generation and, consequently, no decay heat, there will be no need for cooling systems to remove decay heat.

4. In its supplemental motion, LILCO examined the 38 accident and transient events addressed in Chapter 15 of the FSAR. I have reviewed the 38 transients and accidents listed and I agree with LILCO that many of the events could not occur because of the operating conditions of the plant (e.g., a turbine trip or a load rejection transient cannot occur when the turbine is not in operation and there is no load on the generator). Of the events that could occur (e.g., loss of AC power), there are no safety concerns because of the absence of power generation.

5. Phase II, cold criticality testing, will involve testing in the power range of .0001% to .001% of rated power at essentially ambient temperature and atmospheric pressure. Because of the low power level and the limited duration of testing, fission product inventory and decay heat will be very low.

6. As for Phase I, many of the Phase II transients and accident analyzed in Chapter 15 of the FSAR cannot occur. For those transients and accident which can occur, other than a loss-of-coolant accident, core cooling can be achieved, even without AC power, using the existing core water inventory and passive heat loss to the environment. Therefore, there would be no threat to the health and safety of the public.

7. Because of the low pressure conditions, it is not reasonable to postulate a loss-of-coolant accident during Phases I and II operation. The NRC normally postulates breaks only in high energy lines; for Phases I and II, there are no high energy lines. However, even if a loss-of-coolant accident should occur during Phase II operation, there is plenty of time available for restoring offsite power should onsite power not be available.

8. If a loss-of-coolant accident should occur during Phase II testing, LILCO states that there would be time on the order of months available to restore make-up water for core cooling. At the decay heat levels which would exist under these conditions, heat transfer to the environment would remove a significant fraction of the decay heat. However, even if no heat transfer from the fuel rods is assumed and equilibrium fission products are assumed (i.e.,

inifinite operation at .001% power), then more than 9 days are available to restore cooling prior to exceeding a temperature of 2200°F. Therefore, even assuming the unavailability of onsite power sources, there is a high probability of restoring AC power and cooling the core.

Marvin W. Hodges

Marvin W. (Wayne) Hodges

Subscribed and sworn to before me this 3rd day of April, 1984.

Claire A. [illegible]

Notary Public

My Commission Expires: July 1, 1986

Marvin W. (Wayne) Hodges

Professional Qualifications

Reactor Systems Branch

Division of Systems Integration

U. S. Nuclear Regulatory Commission

I am employed as a Section Leader in Section B of the Reactor Systems Branch, DSI.

I graduated from Auburn University with a Mechanical Engineering Degree in 1965. I received a Master of Science degree in Mechanical Engineering from Auburn University in 1967. I am a registered Professional Engineer in the state of Maryland (#13446).

In my present work assignment at the NRC, I supervise the work of 6 graduate engineers; my section is responsible for the review of primary and safety systems for BWRs. I have served as principal reviewer in the area of boiling water reactor systems. I have also participated in the review of analytical models use in the licensing evaluations of boiling water reactors and I have the technical review responsibility for many of the modifications and analyses being implemented on boiling water reactors post the Three Mile Island, Unit-2 accident.

As a member of the Bulletin and Orders Task Force which was formed after the TMI-2 accident, I was responsible for the review of the capability of BWR systems to cope with loss of feedwater transient and small break loss-of-coolant accidents.

I have also served at the NRC as a reviewer in the Analysis Branch of the NRC in the area of thermal-hydraulic performance of the reactor core. I served as a consultant to the RES representative to the program management group for the BWR Blowdown/Emergency Core Cooling Program.

Prior to joining the NRC staff in March, 1974, I was employed by E. I. DuPont at the Savannah River Laboratory as a research engineer. At SRL, I conducted hydraulic and heat transfer testing to support operation of the reactors at the Savannah River Plant. I also performed safety limit calculations and participated in the development of analytical models for use in transient analyses at Savannah River. My tenure at SRL was from June 1967 to March 1974.

From September 1965 to June 1967, while in graduate school, I taught courses in thermodynamics, statics, mechanical engineering measurements, computer programming and assisted in a course in the history of engineering. During the summer of 1966, I worked at the Savannah River Laboratory doing hydraulic testing.