COMMONWEALTH OF PENNSYLVANIA :

: ss.

COUNTY OF CHESTER :

D. R. Helwig being first duly sworn, deposes and says:

That he is Vice President of PECO Energy Company, the Applicant herein; that he has read the enclosed response to the NRC Request for Additional Information involving Power Rerate discussed on October 28, 1994, concerning Operating License Change Request No. 93-24-0 for Limerick Generating Station Facility Operating License Nos. NPF-39 and NPF-85, and knows the contents thereof; and that the statements and matters set forth therein are true and correct to the best of his knowledge, information and belief.

D R Helwig

Vice President

Subscribed and sworn to
before me this 15th day
of November 1994.

Notary Public

Notarial Seal
Erica A. Stanton, Notary Public
Tredyffrin Twp., Chester County
My Commission Expires July 10, 1995

Docket Nos. 50-352
50-353
License Nos. NPF-39
NPF-85

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION (RAI-4)
LIMERICK GENERATING STATION, UNITS 1 AND 2
(Per Telecon dated October 28, 1994)

OPERATING LICENSE CHANGE REQUEST NO. 93-24-0

Question 1:

Due to the concern about the increase in the recirculation pump speed at power rerate conditions (i.e., approximately 1% to achieve the same core flow), and the potential for vibrations of the recirculation system, state how such vibrations will be monitored at LGS.

Response 1:

The implementation of the power rerate program does not require an increase in reactor core flow. Implementation of power rerate will, however, result in recirculation pump speed increases of approximately 1% to achieve the same core flow.

Maximum pump speeds are expected to occur during operation at power rerate conditions in conjunction with increased core flow (ICF) near the end of cycle, and, to a lesser extent, during end-of-cycle coastdown. Under power rerate conditions, maximum pump speed is expected to be approximately 1580-1600 RPM. During LGS Unit 2 ICF operation and coastdown, PECO Energy plans to monitor for any significant increases in vibration levels. This will be accomplished by using installed plant instrumentation and periodic walkdowns of the Unit 2 reactor enclosure.

Question 2:

Section 3.7, "Main Steam Isolation Valves (MSIV)", of GE report NEDC-32225P states that Limerick Generating Station (LGS), Units 1 and 2 reactor operating pressure and temperature are higher than those used in the generic evaluation for power uprate. State the basis for assessing the differences as "insignificant".

Response 2:

The Main Steam Isolation Valves (MSIVs) installed at LGS, Units 1 and 2 were designed to 1250 psig at 575 degrees F. The thermodynamic parameters of the steam when LGS reactors are operating at power rerate conditions are 1060 psig at 551.7 degrees F. These parameters are enveloped by the design pressure and

temperature of the MSIVs. Even though they are higher than the steam parameters used in the generic evaluation for MSIVs, the increases are still insignificant.

Question 3:

The last paragraph of Section 2.5.2 of the NRC's "Safety Evaluation of General Electric Boiling Water Reactor Power Uprate Generic Analyses," dated July 31, 1992, identifies several High Pressure Coolant Injection (HPCI) system issues and Reactor Core Isolation Cooling (RCIC) system issues that must be addressed. Specifically, provide:

- Assurance that HPCI and RCIC systems will be capable of injecting their design flow rates at the higher reactor operating pressure.

- Assurance that the reliability of these systems will not be decreased by the higher loads placed on these systems or because of any modifications made to these systems to compensate for these increased loads.

Response 3:

- System Capability:

  For the HPCI system, the increase in reactor operating pressure with power rerate was found to be less than the calculated existing system operating margin. The introduction of the HPCI flow split modification (Core Spray and Feedwater systems) during the plant design phase resulted in a reduction in the system flow losses and in the required system injection pressure. No changes were made to the equipment specifications or their capabilities as the result of this system modification.

  For the RCIC system, the increase in reactor operating pressure with power rerate required an increase in the pump total dynamic head (TDH) to maintain the same injection rate to the reactor. This was accomplished through an increase in the RCIC pump speed. Vendor pump test data for the LGS RCIC pumps and the affinity laws for centrifugal pumps were used to determine the new speed and horsepower requirements for the pump. Operation of the pump at the higher speed does not result in the pump or system components exceeding their specified design pressures. Turbine performance curves indicate that the unit has more than adequate speed and horsepower capability to drive the pump at its new operating point.

System Reliability:

The modifications to the HPCI and RCIC turbine assemblies, as described in GE service information letter (SIL) No. 480 for the HPCI turbine, and SIL No. 377 for the RCIC turbine, are for improvement of the turbine startup transient response. Both of these modifications are in use on a number of turbine assemblies and have performed very satisfactorily and reliably in the industry. SIL 480 has already been implemented at LGS Units 1 and 2, and SIL 377 will be implemented, as part of the power rerate program. The implementation of these modifications effectively limits the initial response of the turbine speed on startup at high reactor pressures. This reduces the probability of turbine overspeed trips, as well as reducing cyclic pressure forces and loads on certain components, thus improving overall system reliability. Consequently, these modifications result in the higher power rerate reactor steam pressure having an insignificant impact on the turbine startup transient response.

The change to the RCIC turbine control system to increase its maximum rated speed from 4500 RPM to 4575 RPM will have no adverse effect on system reliability. This maximum rated speed forms part of the turbine controller calibration and will only be limiting when the system is operating at its maximum design injection pressure as established by the safety relief valve setpoint and upper tolerance limits. The majority of RCIC system operation occurs at reactor pressures equal to or less than the reactor normal operating pressure.

A flow test of both HPCI system and RCIC system injection capabilities will be included in the testing program. This flow test will involve HPCI and RCIC returning flow to the condensate storage tank. This testing is in conformance with the Power Rerate Startup Testing Program recommended by General Electric.