

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 64 TO FACILITY OPERATING LICENSE NO. NPF-1

PORTLAND GENERAL ELECTRIC COMPANY

THE CITY OF EUGENE, OREGON

PACIFIC POWER AND LIGHT COMPANY

TROJAN NUCLEAR PLANT

DOCKET NO. 50-344

Introduction

During a reanalysis of the Boron Dilution Event for hot and cold shutdown modes at the Millstone Unit 2 facility in early 1980, it was discovered that an incorrect assumption had been made (Reference 1). The analysis of this event while in Mode 5 (cold shutdown) had assumed a full reactor coolant system and a 1% shutdown margin. The results of this analysis showed that it would take 20 minutes of uncontrolled boron dilution before the reactor returned to criticality. This satisfied the 15 minute minimum time interval assumed for the operators to recognize the situation and take appropriate action. However, the analysis had not considered the fact that Mode 5 operation is permitted with the reactor coolant system drained to the centerline of the hot leg. Including this reduced volume of reactor coolant to be diluted in the analysis results in a time to reach criticality of less than 15 minutes.

The Millstone facility corrected this problem by revising their Technical Specifications to require a minimum 2% shutdown margin while in Mode 5. By making this change, a time to criticality of greater than 15 minutes was established.

The staff requested the Trojan licensee to review their boron dilution event to verify that they had assumed a reduced reactor coolant system volume in their analysis (Reference 2). The licensee's response (Reference 3 and 4) states that since Trojan's procedures have always required 100 ppm boron more than that needed for the nominal margin required by the Technical Specifications, no revisions to plant procedures are necessary. However, since the Technical Specification requirements alone do not guarantee an adequate shutdown margin during Mode 5, the licensee submitted a proposed Technical Specification change (Reference 4) to increase the Mode 5 shutdown margin.

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### Evaluation

The licensee reanalyzed the boron dilution event assuming a drained down reduced reactor coolant system volume and the most reactive control rod stuck out of the core. The maximum dilution capability is limited by the design flow of the Primary Makeup Water pumps which total 300 gpm when both pumps are running.

The licensee's analysis concludes that the most limiting conditions with regard to reduction of shutdown margin occurs for the case of one RHR pump running and the maximum dilution flow. During Mode 5 operation, the minimum Technical Specification requirements do not guarantee an adequate shutdown margin during periods of FCS boron concentration greater than approximately 1250 ppm.

The licensee has proposed revising Technical Specification 3/4 .1.1.1, which requires a minimum shutdown margin of 1.6%  $\Delta k/k$  for plant operating Modes 1 through 4, to also include plant operating Mode 5. Technical Specification 3/4.1.1.2, which requires a 1.0%  $\Delta k/k$  for Mode 5 operation, would be deleted. The Technical Specification Bases has also been modified to state that the boron dilution event is the limiting condition for Mode 5 operation ( $T_{avg} \leq 200^\circ F$ ).

We have reviewed the licensee's submittal and conclude that a conservative boron dilution event has been analyzed. Assuming a conservatively low value for the reactor coolant system volume and the maximum boron dilution rate, the licensee has shown that by increasing the Mode 5 shutdown margin to 1.6%  $\Delta k/k$ , there will be at least 15 minutes (as required by SRP 15.4.6) before the reactor returns to criticality. The Trojan operating procedures also calls for maintaining 100 ppm boron more than the minimum Technical Specification requirements so that additional margin will be available.

Therefore, we conclude that the proposed Technical Specification changes are acceptable.

### Environmental Consideration

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: June 23, 1981

References

1. Millstone Unit 2 LER 80-05/1T-0
2. Letter from NRC to Portland General Electric Company, dated September 30, 1980.
3. Letter from Portland General Electric Company to NRC (B.D. Withers to Director, NRR) dated November 26, 1980.
4. Letter from Portland General Electric Company to NRC (B.D. Withers to Director, NRR) dated March 16, 1981.