UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 60 TO FACILITY OPERATING LICENSE NO. NPF-41,

AMENDMENT NO. 47 TO FACILITY OPERATING LICENSE NO. NPF-51,

AND AMENDMENT NO. 33 TO FACILITY OPERATING LICENSE NO. NPF-74

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

PALO VERDE NUCLEAR GENERATING STATION, UNIT NOS. 1, 2, AND 3

DOCKET NOS. STN 50-528, STN 50-529, AND STN 50-530

1.0 INTRODUCTION

By letter dated November 20, 1990, the Arizona Public Service Company (APS or the licensee) submitted a request for changes to the Technical Specifications (TS) for the Palo Verde Nuclear Generating Station, Units 1, 2, and 3 (Appendix A to Facility Operating License Nos. NPF-41, NPF-51, and NPF-74, respectively). The Arizona Public Service Company submitted this request on behalf of itself, the Salt River Project Agricultural Improvement and Power District, Southern California Edison Company, El Paso Electric Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority. The proposed changes would reduce the minimum shutdown cooling flow from 4,000 gallons per minute (gpm) to 3,780 gpm.

2.0 DISCUSSION

The current TS 4.4.1.4.1.2, 4.4.1.4.2, 4.9.8.1, and 4.9.8.2 applicable during Modes 5 and 6 at Palo Verde Unit Nos. 1, 2, and 3 state that at least one shutdown cooling loop shall be verified at least once per 12 hours to be in operation and circulating reactor coolant at a flowrate of greater than or equal to 4,000 gpm.

By letter dated November 20, 1990, the licensee proposed changes to the minimum shutdown cooling flow surveillance requirements during Modes 5 and 6 from 4,000 gpm to 3,780 gpm. This request for changes of TS addresses the recommendation raised by the NRC staff in the Programmed Enhancement section of Generic Letter 88-17, "Loss of Decay Heat Removal." The purpose of these changes is to provide additional margin between the minimum flow requirements for shutdown cooling and the onset of vortex formation in the shutdown cooling suction nozzles during reduced reactor coolant system inventory operation.

3.0 EVALUATION

The purpose of TS 4.4.1.4.1.2, 4.4.1.4.2., 4.9.8.1, and 4.9.8.2, applicable in Modes 5 and 6, is to ensure adequate shutdown cooling flow for decay heat removal. These minimum flow requirements also provide adequate flow to ensure proper boron mixing in the reactor coolant system, prevent boron stratification, and minimize the effects of a boron dilution event.

The staff identified its concern regarding potential vortexing and air entrainment at the shutdown cooling pump suction in NRC Generic Letter 88-17. The formation of vortexes in the shutdown cooling suction has the potential to air bind the shutdown cooling pump, thus rendering the system inoperable. The licensee by letter dated November 20, 1990, indicated that entrainment of air in the shutdown cooling system has been observed at shutdown cooling flow above 4,100 gpm, which allows only a 100 gpm margin for safe operation of the shutdown cooling system from the 4,000 gpm minimum flow technical specification limit. The licensee proposes changes to the stated Technical Specifications to allow a minimum shutdown cooling flowrate of 3,780 gpm.. This proposed minimum flowrate would increase the margin to 320 gpm below the flowrate of 4,100 gpm where air entrainment has been observed to occur in the shutdown cooling system.

The results of the licensee's analyses show that a minimum shutdown cooling flowrate of 3,400 gpm is sufficient to provide adequate decay heat removal and minimize the effects of a boron dilution event during Modes 5 and 6. Therefore, a shutdown cooling flowrate of 3,400 gpm is sufficient in Modes 5 and 6 to satisfy the purpose of Technical Specifications at Palo Verde Units. The licensee proposed minimum shutdown cooling flowrate of 3,780 gpm in the Technical Specifications includes all instrument uncertainties. In addition, this proposed minimum flowrate is above the range of 2,800 to 3,400 gpm in which an acoustic rumble was observed by the licensee at the Palo Verde units.

The staff has reviewed the licensee's submittal and concluded that the proposed changes to Technical Specifications 4.4.1.4.1.2, 4.4.1.4.2, 4.9.8.1, and 4.9.8.2 are consistent with the results of their supporting analysis and, therefore, are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Arizona State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released

offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (55 FR 52337 dated December 21, 1990). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date: March 31, 1992