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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 35 TO FACILITY OPERATING LICENSE NO. NPF-74

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 3

DOCKET NO. STN 50-530

1.0 INTRODUCTION

By letter dated December 20, 1991, Arizona Public Service Company (APS or the licensee) submitted a request for changes to the Palo Verde Nuclear Generating Station, Unit No. 3 Technical Specifications (TS). The Arizona Public Service Company submitted this request on behalf of itself and 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 allow two demonstration assemblies to be loaded into Palo Verde Unit 3, Cycles 4, 5, and 6. The demonstration assemblies contain up to 80 fuel rods with zirconium based advanced alloy manufactured by ABB Combustion Engineering Nuclear Power Company. The purpose of the demonstration program is to explore new clad compositions that may be more cladding corrosion resistant, and improve cladding performance in high burnups.

2.0 EVALUATION

The licensee analyzed the advanced alloy cladding material properties and performance. The licensee confirmed that there was a 5% safety margin to power peaking for each assembly. The licensee concluded that the results of testing and evaluations support the safety of the planned irradiations of the two demonstration assemblies in reactor service. Inasmuch as these two assemblies are test assemblies, the data from these assemblies will be used to achieve improved performance for future fuel rod material and there are only 80 fuel rods with advanced alloy involved in the two assemblies, we conclude that the licensee has provided adequate assurance of safety for the proposed use of these two assemblies in Palo Verde Unit 3, Cycles 4, 5, and 6.

The staff considers these two demonstration assemblies as lead test assemblies (LTAs). In general, there are two criteria governing the use of LTAs: (1) the total number of demonstration assemblies in one core should be limited, and (2) the demonstration assemblies should not be loaded in limiting positions. The licensee's demonstration program conforms to these criteria. We thus conclude that these two demonstration assemblies are acceptable for

Palo Verde Unit 3 Cycles 4, 5, and 6.

The licensee requested an exemption from the requirements of 10 CFR 50 46, 10 CFR 50.44, and Appendix K on the basis that there is no clear indication in the regulations that the use of cladding material deviating from zircaloy is permissible. The staff determined that the use of advanced alloy on fuel rods involves the requirements of 10 CFR 50.44, 50.46, and Appendix K and has separately granted a related exemption from the requirements of 10 CFR 50.44, 50.46, and Appendix K for Palo Verde Unit 3, Cycles 4, 5, and 6.

The fuel rods clad with the advanced zirconium-based alloys will be identical in design and dimension to the fuel rods clad with conventional Zircaloy-4. The advanced cladding materials used in the demonstration fuel assemblies were chosen based on the improved corrosion resistance exhibited in ex-reactor autoclave corrosion tests in both high-temperature water and steam environments. Fuel rods clad with similar types of advanced zirconium-based alloys have been successfully irradiated in high-temperature PWRs in Europe.

The mechanical properties of the clad made from the advanced zirconium-based alloys meet all the mechanical requirements of the conventional Zircaloy-4 procurement specifications. Thus, the cladding and structural integrity of the fuel rods and fuel assemblies that have the advanced zirconium-based alloys will be maintained. Therefore, due to these similarities between advanced zirconium-based alloys and Zircaloy-4, the advanced alloys are expected to result in clad and fuel performance similar to Zircaloy-4.

We have reviewed the licensee submittal of the Technical Specification change for Palo Verde Unit 3, Cycles 4, 5, and 6. Based on the staff evaluation of the advanced alloy requirements, we find that the use of two demonstration assemblies and the Technical Specification change to be acceptable.

3.0 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.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes 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. The NRC staff has determined that the amendment involves 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

amendment involves no significant hazards consideration, and there has been no public comment on such finding (57 FR 6034). Accordingly, the amendment meets 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 amendment.

5.0 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: July 20, 1992