

January 16, 1991

Docket No. 50-528

Mr. William F. Conway  
Executive Vice President, Nuclear  
Arizona Public Service Company  
Post Office Box 53999  
Phoenix, Arizona 85072-3999

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Dear Mr. Conway:

SUBJECT: ISSUANCE OF AMENDMENT NO.53 TO FACILITY OPERATING LICENSE,  
PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 1 (TAC NO. 79071)

The Commission has issued the enclosed Amendment No. 53 to the Facility Operating License for Palo Verde Nuclear Generating Station, Unit No. 1. The amendment consists of changes to the Technical Specifications in response to your application dated November 14, 1990, as supplemented December 27, 1990 and January 11, 1991.

The amendment extends the date for the next steam generator eddy-current examination from July 1991 until the next scheduled refueling outage (February 1992) but not later than 32 months since the last inspection (not later than March 1992).

A copy of the related Safety Evaluation is also enclosed. A notice of issuance will be included in the Commission's next regular biweekly Federal Register notice.

Sincerely,

Original signed by

Charles M. Trammell, Senior Project Manager  
Project Directorate V  
Division of Reactor Projects III/IV/V  
Office of Nuclear Reactor Regulation

Enclosures:

- Amendment No. 53 to NPF-41
- Safety Evaluation

cc w/enclosures:  
See next page

\*See previous concurrence

*Subject to change. See note. J.M.*

*CP-1*

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Mr. William F. Conway  
Arizona Public Service Company

Palo Verde

cc:

Arthur C. Gehr, Esq.  
Snell & Wilmer  
3100 Valley Center  
Phoenix, Arizona 85073

Jack R. Newman, Esq.  
Newman & Holtzinger, P.C.  
1615 L Street, N.W., Suite 1000  
Washington, D.C. 20036

James A. Beoletto, Esq.  
Southern California Edison Company  
P. O. Box 800  
Rosemead, California 91770

Senior Resident Inspector  
U.S. Nuclear Regulatory Commission  
HC-03 Box 293-NR  
Buckeye, Arizona 85326

Regional Administrator, Region V  
U. S. Nuclear Regulatory Commission  
1450 Maria Lane  
Suite 210  
Walnut Creek, California 94596

Mr. Charles B. Brinkman  
Washington Nuclear Operations  
Combustion Engineering, Inc.  
12300 Twinbrook Parkway, Suite 330  
Rockville, Maryland 20852

Mr. Charles Tedford, Director  
Arizona Radiation Regulatory Agency  
4814 South 40 Street  
Phoenix, Arizona 85040

Chairman  
Maricopa County Board of Supervisors  
111 South Third Avenue  
Phoenix, Arizona 85003

(8)



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

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-528

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 53  
License No. NPF-41

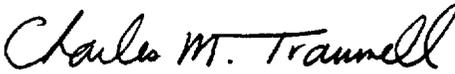
1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Arizona Public Service Company on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority (licensees), dated November 14, 1990, as supplemented December 27, 1990 and January 11, 1991, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. NPF-41 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 53, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of issuance and must be fully implemented no later than 45 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

*for*   
James E. Dyer, Director  
Project Directorate V  
Division of Reactor Projects III/IV/V  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: January 16, 1991

ATTACHMENT TO LICENSE AMENDMENT NO. 53  
TO FACILITY OPERATING LICENSE NO. NPF-41  
DOCKET NO. STN 50-528

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove

3/4 4-13

Insert

3/4 4-13

## REACTOR COOLANT SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

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4.4.4.3 Inspection Frequencies - The above required inservice inspections of steam generator tubes shall be performed at the following frequencies:

- a. The first inservice inspection shall be performed after 6 Effective Full Power Months but within 24 calendar months of initial criticality. Subsequent inservice inspections shall be performed at intervals of not less than 12 nor more than 24 calendar months after the previous inspection.\* If two consecutive inspections following service under AVT conditions, not including the preservice inspection, result in all inspection results falling into the C-1 category or if two consecutive inspections demonstrate that previously observed degradation has not continued and no additional degradation has occurred, the inspection interval may be extended to a maximum of once per 40 months.
- b. If the results of the inservice inspection of a steam generator conducted in accordance with Table 4.4-2 at 40 month intervals fall into Category C-3, the inspection frequency shall be increased to at least once per 20 months. The increase in inspection frequency shall apply until the subsequent inspections satisfy the criteria of Specification 4.4.4.3a.; the interval may then be extended to a maximum of once per 40 months.
- c. Additional, unscheduled inservice inspections shall be performed on each steam generator in accordance with the first sample inspection specified in Table 4.4-2 during the shutdown subsequent to any of the following conditions:
  1. Primary-to-secondary tubes leaks (not including leaks originating from tube-to-tube sheet welds) in excess of the limits of Specification 3.4.5.2.
  2. A seismic occurrence greater than the Operating Basis Earthquake.
  3. A loss-of-coolant accident requiring actuation of the engineered safeguards.
  4. A main steam line or feedwater line break.

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\*Except that the inservice inspection due not later than July 1991 may be deferred until the end of fuel Cycle 3, but not beyond March 1992.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 53 TO FACILITY OPERATING LICENSE NO. NPF-41

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 1

DOCKET NO. STN 50-528

1.0 INTRODUCTION

By letter dated November 14, 1990, as supplemented December 27, 1990 and January 11, 1991, Arizona Public Service Company (APS) 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 (licensees), requested changes to the Technical Specifications for the Palo Verde Nuclear Generating Station, Unit No. 1, located in Maricopa County, Arizona. The proposed changes would extend the date for the next steam generator tube eddy-current examination from July 1991 until the next scheduled refueling outage (February 1992) but not later than 32 months since the last inspection (not beyond March 1992).

2.0 DISCUSSION AND EVALUATION

The steam generators were last examined in July 1989, during the unit's second refueling outage. All of the tubes in both steam generators were eddy-current tested. There are approximately 11,000 tubes in each steam generator. The types of tube problems that were found were summarized by the licensee as follows:

- lower eggcrate wear
- minor dents and dings
- minor denting around the flow distribution baffle
- possible loose parts indications
- minor batwing and vertical strip wear

Based on the results of the inspection, 12 tubes in steam generator 1 and 7 tubes in steam generator 2 were plugged. All degradation was the result of mechanical wear; no corrosion degradation was detected. The mechanical wear is due to vibration associated with normal plant operation.

The unit resumed full power operation in July 1990 about one year after the eddy-current inspection. During this period of time while in shutdown, the steam generators were not subject to the types of mechanical wear found during the July 1989 inspection because the steam generators were not in operation.

The inspection schedule currently in the technical specifications is based on Regulatory Guide 1.83, "Inservice Inspection of PWR Steam Generator Tubes". This calls for an inspection between 12 and 24 months since the last inspection. Thus, the next inspection would be due no later than July 1991, which is 24 months after the July 1989 inspection.

The licensee proposes to defer this inspection on a one-time basis until February 1992, which would coincide with the unit's third refueling outage. In any case, the licensee would limit the calendar period to 32 months, maximum, which would extend to March 1992. The requested time extension corresponds to the time Unit 1 was shutdown during the extended 1989 outage.

From the standpoint of mechanical tube wear, this proposal is within the normal operating period of 24 months between inspections. The unit was shutdown for about 12 months of this period. Therefore, under the licensee's proposal, the operating time would be about 20 months, well within the 24 months allowed in Regulatory Guide 1.83 and the current technical specifications.

The licensee reports that wear indications consist of cold leg corner wear, central cavity batwing wear, and eggcrate and vertical support wear. For the first two types, it has been the licensee's practice to plug all tubes in these regions with any measurable wear since the discovery of this wear pattern. This resulted in seven tubes being plugged.

Random tube wear has been observed in the eggcrate and vertical support areas. The licensee has adopted a 30% through-wall plugging limit for these areas, based on a 500 day operating cycle\*, to ensure that wear would progress to a maximum of 40% during the operating cycle, which is the plugging limit contained in the technical specifications. The licensee's requested extension falls within the 500 day operating cycle assumed in this analysis.

Using this 30% plugging limit for this area resulted in 5 tubes being plugged. All had indications between 30 and 36%. Thus, using this limited data, no tubes fell outside the wear model used by the licensee, and all tubes were removed from service before the technical specification plugging limit of 40% was reached. This licensee's program for controlling tube wear in these areas appears to be acceptable.

The foreign objects (3) that have been identified have had the surrounding tubes plugged. Inspection of nearby unplugged tubes for one object during the most recent inspection revealed no damage caused by the foreign object and it is apparently stable and locked in place. The other two were discovered during the most recent inspection. As with the first object, the licensee will be examining tubes nearby in future inspections. This is acceptable.

\*The licensee clarified this to mean a 500 effective full-power day operating cycle.

The other aspect of extending the inspection interval involves possible corrosion which might have taken place during the extended shutdown. Steam generator chemistry control was well maintained during this period, with the steam generators under wet-layup conditions. There was an extended period of time, however, (ten months) when maintenance of the nitrogen overpressure was not possible so as to allow work on the atmospheric dump valves. Also, steam generator sampling was discontinued for two months while the wet-layup recirculation line was out of service to repair a valve in this line. The licensee requested the steam generator manufacturer to evaluate the impact of these two periods on corrosion in the steam generator. This review concluded that no corrosion mechanisms should have been initiated which would require examination prior to the next refueling, as proposed. During the period of time that the nitrogen blanket was removed, all other wet-layup chemistry specifications were maintained (pH 9.8 to 10.2; hydrazine 75-200 ppm; sodium, chloride and phosphate less than 1 ppm) except for one day when the pH was 9.7. The one day that the pH was out of range would not have any effect on the steam generator tube corrosion. After the sampling line was returned to service, the steam generator chemistry was found to be acceptable, thus demonstrating that proper chemistry was maintained throughout the period that sampling was not possible.

In reviewing the data from the July 1989 inspection (report dated October 25, 1989), the licensee found that two tubes having through-wall defects of 92% and 87% were inadvertently not plugged following the initial pre-service inspection conducted in August 1981. As a result of this discovery, the NRC staff requested the licensee to provide an explanation as to how this occurred and to provide a description of the quality assurance measures in place today to ensure that the defective tubes are identified and plugged.

In a supplemental letter dated January 11, 1991, the licensee provided the requested information. APS states that the cause of the error was due to not having the data independently verified. Present requirements include independent review of the data as well as independent verification that tube plugs have been placed in the correct locations. This is acceptable.

Based on the foregoing, the NRC staff finds the licensee's proposal to defer the next steam generator inservice inspection until the next refueling outage (February 1992) but not later than 32 months since the last inspection (not later than March 1992) is acceptable.

### 3.0 ENVIRONMENTAL CONSIDERATION

The amendment involves changes with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20, or changes a surveillance requirement. The 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. 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.

#### 4.0 CONCLUSION

The staff 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, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: H. Conrad  
C. Trammell  
S. Koscielny

Dated: January 16, 1991