

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-528/88-26, 50-529/88-25, 50-530/88-24

Docket Nos. 50-528, 50-529, 50-530

License Nos. NPF-41, NPF-51, NPF-74

Licensee: Arizona Nuclear Power Project  
P. O. Box 52034  
Phoenix, Arizona 85072-2034

Facility Name: Palo Verde Nuclear Generating Station, Units 1, 2 and 3

Inspection at: Palo Verde Site, Wintersburg, Arizona

Inspection Conducted: August 1-5, 1988

Inspected by:

*W. K. TenBrook*

W. K. TenBrook, Radiation Specialist

*8/15/88*

Date Signed

Approved by:

*G. P. Yuhas*

G. P. Yuhas, Chief  
Emergency Preparedness and  
Radiological Protection Branch

*8/18/88*

Date Signed

Summary:

Areas Inspected: Routine unannounced inspection of a follow-up item involving plant water chemical analysis and an item of noncompliance involving radiological effluent sampling and analysis. Inspection procedures 92701 and 92702 were used.

Results: The sensitivity of the licensee's reactor coolant system (RCS) water chemistry analyses has improved since the previous inspection, with additional improvement warranted for RCS chloride analysis. Corrective actions to prevent violation of radiological effluent technical specification lower limits of detection (LLDs) were adequate and complete.

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## DETAILS

### 1. Persons Contacted

#### Licensee

- \*J. Allen, Plant Manager, Unit 1
- \*B. Cederquist, Supervisor, Chemistry Standards
- \*P. Coffin, Compliance Liaison
- \*R. Ferro, Chemistry Manager, Unit 2
- \*R. Goodwin, Acting Chemistry Manager, Unit 1
- C. Gray, Lead Chemistry Technician, Unit 3
- \*E. Griswold, Acting Radiation Protection Manager, Unit 2
- R. Johnson, Chemistry Evaluator, Chemistry Standards
- S. Karimi, Compliance Engineer
- \*J. Kester, Supervisor, Radwaste Support
- K. Kutner, Engineer, Radiation Protection Standards
- \*J. Mann, Acting Manager, Chemistry and Radiation Protection
- \*K. Oberdorf, Radiation Protection Manager, Unit 1
- \*R. Rouse, Compliance Engineer
- \*J. Schlag, Supervisor, Radwaste Standards
- \*J. Scott, Chemistry Manager, Unit 3
- \*T. Shriver, Compliance Manager
- \*J. Sills, Supervisor, Radiation Protection Standards
- \*W. Sneed, Radiation Protection Manager, Unit 3
- R. Sorensen, Lead Chemistry Technician, Unit 2
- \*L. Souza, Manager, Quality Audits & Monitoring
- \*G. Sowers, Manager, Engineering Evaluations
- D. Whitcomb, Senior Scientist, Chemistry Standards

\*Denotes attendance at exit meeting August 5, 1988.

### 2. Follow-up of Open Items (92701)

Open Item 50-529/88-08-01 (OPEN): This item concerned sensitivity limits for RCS water chemistry surveillances pursuant to technical specification 4.4.6, as reflected in "less than" levels for chloride and fluoride analyses recorded in daily logs. The licensee had improved the specific ion electrode technique for fluoride analysis at Units 1 and 2. RCS fluoride during power operation was consistently reported as < 50 ppb using the specific ion electrode at Units 1 and 2. These results were consistent with "typical" fluoride values recommended in Electric Power Research Institute (EPRI) guidelines. The improved fluoride analysis sensitivity provided a margin consistent with the industry norm between detected operating concentrations and action levels established to protect zircalloy fuel cladding during nucleate boiling.

EPRI guidance provides a "typical" RCS chloride concentration of < 50 ppb. The approved licensee procedure provided a sensitivity limit of < 50 ppb for the titration employed. However, the Unit 2 staff preferred to report a more conservative sensitivity limit of < 100 ppb for routine work based on their particular experience with the technique. Unit 3 employs ion chromatography for RCS chloride and fluoride analysis,

consistently reporting each analyte at < 10 ppb. Ion chromatographs had been procured for Units 1 and 2 for this application, but had not been delivered at the time of the inspection. This item will remain open pending further improvement in the licensee's methods for RCS Chloride analyses at Units 1 and 2.

3. Follow-up on Items of Noncompliance (92702)

Enforcement Item 50-529/88-08-02 (CLOSED): This item concerned a failure to achieve the procedural lower limit of detection (LLD) for noble gases for a waste gas decay tank grab sample. The licensee submitted a Response to the Notice of Violation within the required time. The inspector reviewed action taken for each commitment described in the Response.

The chemistry standards group and radiation protection standards group had submitted changes to liquid sampling procedure 74ST-9ZZ02 and radiation monitoring system sampling procedure 75RP-9ZZ64 to reflect minimum sampling volumes required to meet LLDs for principle gamma emitters. Minimum sample volumes and analysis parameters for gaseous grab samples and filter media were posted in counting laboratories. The inspector verified that the minimum parameters chosen were adequate to meet the LLDs for principle gamma emitters specified in TS 4.11-2.

Chemistry personnel at each unit had been counselled to maintain careful attention to detail in review of information in release permits and to ensure sensitive measurements of effluent samples. Effluent release permit checklists had been modified to require specific checks of each significant sample analysis parameter and spectral data acquired, including LLDs. The inspector did not observe any inadequate analytical data in selected release permits.

The licensee had taken effective action to ensure radionuclides in effluent are identified and quantified at the required sensitivity for dose and dose rate calculation and tracking. This item is closed.

4. Exit Interview

The inspector met with licensee management on August 5, 1988 to discuss the preliminary findings of the inspection. The licensee was informed that the enforcement item would be closed and the follow-up item would remain open pending further licensee action.