ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

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License Nos.:	NPF-41 NPF-51 NPF-74
Report No.:	50-528/99-03 50-529/99-03 50-530/99-03
Licensee:	Arizona Public Service Company
Facility:	Palo Verde Nuclear Generating Station, Units 1, 2, and 3
Location:	5951 S. Wintersburg Road Tonopah, Arizona
Dates:	January 25-29, 1999
Inspector(s):	Larry Ricketson, P. E., Senior Radiation Specialist Plant Support Branch
Approved By:	Gail M. Good, Chief, Plant Support Branch Division of Reactor Safety
Attachment:	Supplemental Information

EXECUTIVE SUMMARY

Palo Verde Nuclear Generating Station, Units 1, 2, and 3
NRC Inspection Report No. 50-528/99-03; 50-529/99-03; 50-530/99-03

This announced, routine inspection reviewed engineered safety feature filtered ventilation systems design, maintenance, and in-place filter testing; implementation of the liquid, gaseous, and particulate radioactive effluent monitoring program; status of effluent monitors and chemistry counting equipment; training and qualifications of personnel; and quality assurance oversight.

Maintenance

- The licensee's engineered safety feature filtered ventilation systems were properly designed and maintained (Section M2).
- A good ventilation filter testing program was implemented. The engineered safety feature filtered ventilation systems were routinely tested within the intervals required by technical specifications. Test procedures followed regulatory guidance. (Section M3).
- Individuals performing in-place filter testing had received related training and were knowledgeable of testing requirements and acceptance criteria (Section M5).

Engineering

- System engineers demonstrated a good knowledge of equipment status and of industry events related to air cleaning systems (Section E4).

Plant Support

- The licensee implemented a good radioactive effluent management program. The licensee's radioactive effluent sampling, analysis, and dose projection program met the requirements of the Offsite Dose Calculation Manual. Releases of radioactive effluents were within regulatory requirements and did not exceed the commitments within the Final Safety Analysis Report (Section R1.1).
- The licensee calibrated the effluent monitors correctly and maintained them well, particularly in view of the lack of manufacturer's support (Section R2.1).
- Chemistry technicians who prepared radioactive effluent release permits were qualified in accordance to procedural requirements and regulatory guidance (Section R5).
- The licensee provided good oversight of the radioactive effluent monitoring program. Nuclear assurance division audits were comprehensive, and the audit team had the proper technical expertise to provide insightful observations. The self-assessment of radiation monitoring activities demonstrated the licensee's ability to be self-critical and to identify areas in need of improvement (Section R7).

Report Details

II. Maintenance

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Engineered Safety Feature Filtered Ventilation Systems

a. Inspection Scope (84750)

The inspector performed visual inspections of the control room essential filtration system and the engineered safety feature pump room exhaust air cleanup system (also known as the auxiliary/fuel building essential filtration system) in Unit 3 and interviewed the engineers responsible for the systems.

b. Observations and Findings

There was no obvious physical damage to the air cleaning systems that would have prevented them from performing their required functions. The air cleaning equipment appeared to have been properly maintained. Redundant systems were available, as required. Permanent test ports for in-place filter testing were installed and relatively easy to access. The engineered safety feature filtered ventilation systems met the general design criteria outlined in Regulatory Guide 1.52, Revision 2, and ASME N509-1980.

c. Conclusions

The licensee's engineered safety feature filtered ventilation systems were properly designed and maintained.

M3 Maintenance Procedures and Documentation

M3.1 Engineered Safety Feature Filtered Ventilation System Equipment Testing Results

a. Inspection Scope (84750)

The inspector reviewed the following:

- Records of in-place filter testing of high efficiency particulate air filters and charcoal adsorbers
- Records of laboratory tests of charcoal adsorbers

b. Observations and Findings

Through a review of test results, the inspector confirmed that the licensee complied with Technical Specifications 3.7.11.2, 3.7.13.2, and 5.5.11. The licensee's surveillance procedures for in-place testing of high efficiency particulate air filters and charcoal adsorbers implemented the guidance in Regulatory Guide 1.52, Revision 2; and ANSI/ASME N 510-1980. The licensee performed surveillances on the air cleaning systems once per 18 months and demonstrated that high efficiency particulate air filters and charcoal adsorbers allowed less than 1 percent penetration and bypass.

The inspector also confirmed that laboratory testing of charcoal adsorber samples was performed in accordance with Test Procedure ASTM D3803-1979, as required by Technical Specification 5.5.11(c). The inspector noted that the licensee performed additional testing on charcoal samples, in accordance to the requirements of ASTM D3803-89. The licensee's ventilation filter testing program document stated that this was for "trending purposes only." The charcoal samples met the acceptance criteria of both the older and the newer test specifications.

Additionally, system engineers indicated they were familiar with NRC Information Notice 99-01, "Deterioration of High Efficiency Particulate Air Filters in a Pressurized Water Reactor Containment Fan Cooler Unit." They were reviewing the information for applicability and would determine if further action was necessary to ensure that such filters performed as designed.

c. Conclusions

A good ventilation filter testing program was implemented. The engineered safety feature filtered ventilation systems were routinely tested within the intervals required by Technical Specifications. Test procedures followed regulatory guidance.

M5 Maintenance Staff Training and Qualification

a. Inspection Scope (84750)

The inspector interviewed maintenance personnel who performed in-place filter testing and reviewed training and qualification records for selected maintenance personnel.

b. Observations and Findings

In-place filter testing of the engineered safety feature filtered ventilation systems was performed by designated maintenance personnel. The inspector confirmed through a review of training records that three individuals had received specialized training to qualify them to perform the in-place filter tests.

On January 28, 1999, the inspector observed a portion of the in-place filter testing in Unit 3. During the observation, licensee representatives tested the charcoal adsorbers in one of the auxiliary/fuel building air treatment units. The inspector interviewed the

lead individual conducting the in-place filter testing, and the individual demonstrated a good knowledge of in-place filter testing techniques and requirements.

c. Conclusions

Individuals performing in-place filter testing had received related training and were knowledgeable of testing requirements and acceptance criteria.

III. Engineering

E4 Engineering Staff Knowledge and Performance

During interviews, heating, ventilation, and air conditioning system engineers demonstrated a good knowledge of industry events related to air cleaning systems. The engineers participated in user group activities and maintained familiarity with NRC Information Notices specific to air cleaning systems.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 Implementation of the Liquid, Gaseous, and Particulate Radioactive Waste Program

a. Inspection Scope (84750)

The inspector interviewed licensee personnel and reviewed the following:

- 1995, 1996, and 1997 Annual Effluent Release Reports
- Radioactive effluent release permits
- Quarterly and monthly radioactive effluent sampling results and calculated doses

b. Observations and Findings

From the annual reports, the inspector determined that releases of radioactive effluents were within regulatory requirements and did not exceed the commitments within the Final Safety Analysis Report. The licensee did not release liquid effluents to the environment. There were no abnormal releases. The only notable trend was the increase in tritium released through gaseous effluents during the 1995 through 1997 period. Licensee representatives stated that a change in the type of fuel, an increase in operating times, and higher boron concentrations caused the increase. The 1998 Annual Effluent Release Report had not been completed, but licensee representatives stated that preliminary data indicated that the amount of tritium released in 1998 was near or below the amount released in 1997.

The inspector reviewed selected gaseous release permits and confirmed that sampling was performed in accordance with Table 3-1 of the Offsite Dose Calculation Manual. Pre-release and post-release calculations followed the methodology of Section 4 of the

Offsite Dose Calculation Manual. Cumulative dose contributions from gaseous effluents were determined at least once per 31 days in accordance with the surveillance requirements in Section 4 of the Offsite Dose Calculation Manual.

c. Conclusions

The licensee implemented a good radioactive effluent management program. The licensee's radioactive effluent sampling, analysis, and dose projection program met the requirements of the Offsite Dose Calculation Manual. Releases of radioactive effluents were within regulatory requirements and did not exceed the commitments within the Final Safety Analysis report.

R2 Status of Radiation Protection and Chemistry Facilities and Equipment

R2.1 Radiation Monitoring System

a. Inspection Scope (84750)

The inspector interviewed licensee personnel and reviewed the following:

- Effluent monitor physical condition
- Effluent monitor calibrations
- Effluent monitor availability

b. Observations and Findings

The licensee used gaseous effluent monitors manufactured by Kaman Instrumentation. In 1988, the Kaman radiation monitoring instrumentation product line was purchased by Amalgamated Services Incorporated. Licensee representatives stated that Amalgamated Services Incorporated stopped supplying replacement parts and support for the radiation instruments at the end of December 1998. In a telephone conversation on February 16, 1999, the chief executive officer of Amalgamated Services Incorporated confirmed that the company planned to terminate its support of all Kaman radiation monitoring systems, when current contractual commitments were met.

The licensee dedicated a group of individuals within the operations computer systems maintenance organization to the calibration and maintenance of radiation monitors. Licensee representatives stated that they had been able to rebuild or repair some radiation monitor components, such as circuit boards, and find new suppliers for other components, such as power supplies. The licensee provided operability data demonstrating that radiation monitors required by the Technical Specifications and the Offsite Dose Calculation Manual were available 99 percent of the time.

The inspector reviewed calibration records for selected effluent monitors and determined that the monitors were calibrated properly, within the required calibration intervals.

c. Conclusions

The licensee calibrated the effluent monitors correctly and maintained them well, particularly in view of the lack of manufacturer's support.

R5 Staff Training and Qualification

The inspector reviewed training and qualification records and confirmed that chemistry technicians who prepared radioactive effluent release permits were qualified in accordance to procedural requirements and regulatory guidance.

R6 Radiation Protection and Chemistry Organization and Administration

The radiation monitoring operations section, a group within the chemistry department, was responsible for sampling radioactive effluents, calculating doses, and generating radioactive effluent release permits.

R7 Quality Assurance in Radiation Protection and Chemistry Activities

a. Inspection Scope (84750)

The inspector interviewed quality assurance personnel and reviewed the following:

- 1998 nuclear assurance division audit of the radioactive effluent monitoring program
- Nuclear assurance evaluations
- Auditor qualifications

b. Observations and Findings

Audit Report 98-002 included the results of audits of the chemistry, the radiological monitoring, and the non-radiological environmental programs. With respect to the radiological monitoring program, the 1998 audit scope included reviews of the effluent program requirements and releases, secondary liquid releases to on-site collection ponds, radiation monitor sampling, monitor surveillance tests and maintenance, monitor setpoint control, Offsite Dose Calculation Manual changes, and reports.

The audit team included a visiting technical specialist who reviewed aspects of the radiation monitoring program in depth.

Audit findings were documented through the condition reporting system. The chemistry department responded appropriately to the findings. The audit team concluded that an excellent radiation monitoring program was implemented.

The nuclear assurance division conducted few surveillances or evaluations of daily radiation monitoring section activities. Nuclear assurance division representatives stated that this was not always the case, but previous reviews of this area confirmed good performance. Therefore, resources devoted to the oversight of the radiation monitoring section activities were reduced.

In addition to the audit and surveillances, the licensee conducted a self-assessment to review the effectiveness of the radiation monitoring section at determining, controlling, and evaluating radiation monitor alarm setpoints. The assessment was thorough, covering setpoints evaluated from January through December 1998 in all three units. The assessment team identified strengths and areas for improvement but concluded that an effective program was implemented in this area. Appropriate actions were taken to address the findings of the self-assessment.

c. Conclusions

The licensee provided good oversight of the radioactive effluent monitoring program. Nuclear assurance division audits were comprehensive, and the audit team had the proper technical expertise to provide insightful observations. The self-assessment of radiation monitoring activities demonstrated the licensee's ability to be self-critical and to identify areas in need of improvement.

V. Management Meetings

X1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at an exit meeting on January 29, 1999. The licensee acknowledged the findings presented. No proprietary information was identified.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Bouquot, Section Leader, Nuclear Assurance
R. Busto, HVAC Engineer, System Engineering
R. Buzard, Senior Consultant, Regulatory Affairs
L. Drinovsky, Advisor, Chemistry Support
R. Hazelwood, Engineer, Regulatory Affairs
T. Murphy, Section Leader, Site Chemistry
M. Pest, HVAC Engineer, System Engineering
R. Routolo, Radiation Monitoring System Advisor, Site Chemistry
J. Scott, Director, Site Chemistry

NRC

J. Moorman, Senior Resident Inspector

INSPECTION PROCEDURES USED

84750	Radioactive Waste Systems

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

LIST OF DOCUMENTS REVIEWED

Nuclear Assurance Audit Report 98-002, "Chemistry, Radiological Monitoring, Non-Radiological Environmental"

Nuclear Assurance Evaluation Report 98-0362

Integrated Self-Assessment - Primary-to-Secondary Leak Monitoring, May 1998

1997 Annual Radioactive Effluent Release Report

Procedures

30DP-9MP01	Conduct of Maintenance, Revision 25
33DP-0AP01	Nuclear Air Treatment System Testing Program, Revision 0
33DP-0AP03	Ventilation Filter Testing Program, Revision 0
33DP-0TR01	Qualification and Certification of NATS Testing Personnel, Revision 2
33ST-9HF01	Surveillance Testing for the Aux/Fuel Building Nuclear Air Treatment System, Revision 4
33ST-9HF03	Carbon Analysis for the Aux/Fuel Building Nuclear Air Treatment System, Revision 2
33ST-9HJ02	Surveillance Testing of the Control Room Air Treatment System, Revision 3
70DP-0EE11	Control of Welding, Painting, and the Use of Solvents, Revision 0
74DP-9CY08	Radiological Monitoring Program, Revision 4
74RM-9EF20	Gaseous Radioactive Release Permits and Offsite Dose Assessment, Revision 7
74RM-9EF42	Radiation Monitor Alarm Setpoint Determination, Revision 14