UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

February 9, 2000

Gregg R. Overbeck, Senior Vice
President, Nuclear
Arizona Public Service Company
P.O. Box 52034
Phoenix, Arizona 85072-2034

SUBJECT: NRC INSPECTION REPORT NO. 50-528/00-01; 50-529/00-01; 50-530/00-01

Dear Mr. Overbeck:

This refers to the inspection conducted on January 10-14, 2000, at the Palo Verde Nuclear Generating Station, Units 1, 2, and 3 facilities. The purpose of the inspection was to review radiation protection activities. The enclosed report presents the results of this inspection.

We found that radiation protection practices were implemented effectively and personnel radiation doses were very low, compared with similar facilities.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room (PDR).

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/RA/

Gail M. Good, Chief
Plant Support Branch
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Docket Nos.: 50-528
50-529
50-530
License Nos.: NPF-41
NPF-51
NPF-74

Enclosure:
NRC Inspection Report No.
50-528/00-01; 50-529/00-01; 50-530/00-01

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E-Mail report to D. Lange (DJL)
E-Mail report to NRR Event Tracking System (IPAS)
E-Mail report to Document Control Desk (DOCDESK)

E-Mail notification of report issuance to the PV SRI and Site Secretary (JHM2, TLB4).

E-Mail notification of issuance of all documents to Nancy Holbrook (NBH).

bcc to DCD (IE06)

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Nos.:	50-528 50-529 50-530
License Nos.:	NPF-41 NPF-51 NPF-74
Report No.:	50-528/00-01 50-529/00-01 50-530/00-01
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 10-14, 2000
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. 50-528/00-01; 50-529/00-01; 50-530/00-01

A routine, announced inspection was conducted. The inspection reviewed radiation protection planning and preparation, radiation protection operational activities, results of the program to maintain radiation doses as low as is reasonably achievable (ALARA), and quality assurance for radiation protection activities.

Plant Support

- Radiation exposure permits provided the workers sufficient information to prevent an unnecessary radiation dose (Section R1.1).

- A pre-job briefing before the movement and storage of reactor coolant pump seal-assembly housings was not comprehensive, and the workers' comments made during the briefing indicated the need for better planning and better communications with the radiation protection organization. Supervisors postponed the work until additional planning was completed (Section R1.1).

- The licensee implemented effective radiological controlled area access controls. Radiological areas were correctly posted and controlled. Radiation protection personnel provided good oversight and support for work activities and implemented effective radioactive material controls. Radiation workers complied with radiation exposure permit guidance (Section R1.2).

- The licensee achieved excellent ALARA results. The 1999 three-year, per-unit, radiation dose total was much lower than recent national averages of pressurized water reactor doses (Section R1.3).

- The Nuclear Assurance audit was comprehensive and thorough. The audit team was well qualified, and the audit findings were appropriately placed into the licensee's corrective action program (Section R7).

- The radiation protection organization identified and resolved problems effectively (Section R7).

Report Details

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 Planning and Preparation

a. Inspection Scope (83750)

The inspector interviewed radiation protection personnel and reviewed the following items:

- Radiation exposure permits
- Pre-job briefings

b. Observations and Findings

Radiation exposure permits were formatted in a manner that made information easy to understand. The radiation exposure permits contained sufficient radiological information and worker instructions to comply with the requirements of 10 CFR 19.12.

The inspector attended five pre-job briefings. Some pre-job briefings were required by the associated radiation exposure permits; some were simply precautionary. In four of the five pre-job briefings, adequate information was provided to ensure that the workers understood their work assignments, the radiological conditions, and practices necessary to ensure minimal radiation doses. However, during the required pre-briefing before the movement and storage of reactor coolant pump seal-assembly housings, the inspector noted that the discussion of the job sequence was disorganized and was not comprehensive. A comprehensive discussion of the job sequence would have helped to ensure that all workers understood their assignments. This was also noted by a radiation protection department leader, who intervened and suggested that a detailed listing of the work steps be discussed.

After the job sequence was discussed, members of the Refueling and Mechanical Services Organization discussed the need for a personnel entry into a locked high radiation area to straighten tangled rigging. Radiation Exposure Permit 1-0240A stated that workers were to use long-handled tools to the extent practical, so it was not clear that personnel entry into locked high radiation areas was anticipated by the ALARA planners. Refueling and Mechanical Services personnel also expressed concerns about the viability of the shielding technique to be used. Both of these discussions indicated that there was either inadequate pre-job planning or inadequate communications between the Refueling and Mechanical Services Organization and the ALARA planners concerning this particular work activity. The work groups reached a similar conclusion and the job was postponed until additional planning was conducted. The job was not conducted during the inspection period.

c. Conclusions

Radiation exposure permits provided the workers sufficient information to prevent unnecessary radiation dose.

A pre-job briefing before the movement and storage of reactor coolant pump seal-assembly housings was not comprehensive, and the workers' comments made during the briefing indicated the need for better planning and better communications with the radiation protection organization. Supervisors postponed the work until additional planning was completed.

R1.2 Radiation Protection Operations

a. Inspection Scope (83750)

The inspector interviewed radiation protection personnel and reviewed the following items:

- Access controls
- Control of high radiation areas
- Radiological posting
- Dosimetry use
- Radiation protection job coverage
- Radiation worker practices
- Air sampling techniques
- Radioactive material control
- Personnel contamination events
- Portable survey instrument calibration

b. Observations and Findings

Access to the radiological controlled area was properly controlled. Workers demonstrated a good knowledge of the use of the access control computer. Radiation exposure permits and radiological survey information were available for the workers to review prior to entry. The radiation protection station was adequately staffed to resolve worker questions without excessive delays in entry times.

During tours of the radiological controlled area, the inspector verified that areas accessible to personnel, with radiation dose rates such that an individual could receive in 1 hour a dose greater than 1000 millirems, were locked to prevent unauthorized entry. The inspector performed independent radiation measurements and confirmed that areas were controlled with the correct radiological postings. The inspector also noted that all workers wore dosimetry as required.

Radiological work activities observed by the inspector included repair of the spent fuel pool lighting in Unit 3. The work was conducted by electrical maintenance personnel and supported by radiation protection operations personnel. The work was conducted in a contaminated area that potentially contained hot particles. Workers conformed to the

protective clothing requirements of the radiation exposure permit and used good health physics practices during the task. Radiation protection technicians performed frequent surveys of equipment removed from the spent fuel pool and periodic surveys of worker clothing to prevent the workers from unknowingly being contaminated and receiving unnecessary dose from hot particles. The work area was properly posted, and radiation protection personnel conducted proper radiological surveys to ensure that radioactive contamination was not spread to clean areas.

Another work activity observed by the inspector involved the capping and movement of a high integrity container filled with radioactive resin. The work was performed by radioactive material control personnel and supported by radiation protection operations personnel. Movement of the container temporarily created an area with dose rates greater than 1 rem per hour. This was anticipated by the licensee, and radiation protection technicians implemented proper radiological controls. The work was completed with minimal personnel dose, because, in part, of dose saving measures such as the use television cameras for remote viewing.

During observations of work activities, the inspector confirmed that radiation protection personnel used only radiation measuring instruments that were within the required calibration intervals and that had been properly response tested.

Workers exiting the radiological controlled area correctly used the tool contamination monitors and the personnel contamination monitors. Radiation protection personnel responded quickly to alarms from either type of monitor and provided guidance and assistance to the radiation workers.

c. Conclusions

The licensee implemented effective radiological controlled area access controls. Radiological areas were correctly posted and controlled. Radiation protection personnel provided good oversight and support for work activities and implemented effective radioactive material controls. Radiation workers complied with radiation exposure permit guidance.

R1.3 ALARA

a. Inspection Scope

The inspector interviewed radiation protection personnel and reviewed the licensee's collective dose results.

b. Observations and Findings

The licensee recorded the following person-rem results, as measured by thermoluminescent dosimeters:

	1997	1998	1999
Site Total	246	192	146
Three-year Average	302	246	195
Three-year Average/Unit	101	82	65
National PWR Average*	132	92	Not available

*As reported in NUREG-0713

The inspector noted that the licensee recorded very low dose totals despite conducting two refueling outages in 1998 and 1999.

c. Conclusions

The licensee achieved excellent ALARA results. The 1999 three-year, per-unit, radiation dose total was much lower than recent national averages of pressurized water reactor doses.

R7 Quality Assurance in Radiological Protection and Chemistry Activities

a. Inspection Scope

The inspector reviewed the following items:

- Nuclear Assurance Audit Report 99-008
- Condition Reports/Disposition Requests

b. Observations and Findings

Nuclear Assurance Audit Report 99-008 was conducted June 8-18, 1999. The audit team included four technical specialists from outside the licensee's organization. The scope of the audit was comprehensive. The audit team identified areas for program improvement, but concluded that programs reviewed were in compliance with regulatory requirements and effectively maintained personnel radiation exposure ALARA. The audit findings were appropriately placed into the site's corrective action program.

The inspector reviewed selected condition reports/disposition requests and determined that corrective actions appropriately addressed the identified problems. The inspector also reviewed radiation protection logs, but did not identify conditions that radiation protection personnel failed to identify through conditions reports.

c. Conclusions

The Nuclear Assurance audit was comprehensive and thorough. The audit team was well qualified, and the audit findings were appropriately placed into the licensee's corrective action program.

The radiation protection organization identified and resolved problems effectively.

V. Management Meeting

X1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at an exit meeting on January 14, 2000. The licensee acknowledged the findings presented. No proprietary information was identified.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

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M. Wagner, Section Leader, Radiation Protection

NRC

Jim Moorman, Senior Resident Inspector

INSPECTION PROCEDURES USED

83750	Occupational Radiation Exposure

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

LIST OF DOCUMENTS REVIEWED

Nuclear Assurance Audit Report 99-008

List of Condition Reports/Disposition Requests for 1/01/99 to 1/10/00

Radiation Protection Procedure 75RP-9RP02, “Radiation Exposure Permits,” Revision 14

Radiation Exposure Permits
9-0006C, “Change Out Process Filters and Transport to Storage Area”
9-0226A, “Prepare Containers for Shipment”
1-0240A, “RCP Seal Assembly Housing Movement and Storage”
9-8504C, “SNOW Outage Minor Maintenance”