



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
611 RYAN PLAZA DRIVE, SUITE 400  
ARLINGTON, TEXAS 76011-4005**

March 24, 2003

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

**SUBJECT: PALO VERDE NUCLEAR GENERATING STATION - NRC RADIATION SAFETY  
TEAM INSPECTION REPORT 50-528/03-08; 50-529/03-08; 50-530/03-08**

Dear Mr. Overbeck:

On March 6, 2003, the NRC completed an inspection at your Palo Verde Nuclear Generating Station, Units 1, 2, and 3, facility. The enclosed report documents the inspection findings which were discussed with you and members of your staff, as described in Section 40A6.

The inspection examined activities conducted under your licenses as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. The team reviewed selected procedures and records, observed activities, and interviewed personnel. Specifically, the team evaluated the inspectable areas within the Radiation Protection Strategic Performance Area that are scheduled for review every two years. These areas are:

- Radiation Monitoring Instrumentation
- Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems
- Radioactive Material Processing and Transportation
- Radiological Environmental Monitoring Program and Radioactive Material Control Program

This inspection report documents one NRC-identified finding of very low safety significance. The finding was determined to involve violations of NRC requirements. Additionally, licensee-identified violations are listed in Section 40A7. Because of their very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as noncited violations (NCVs) consistent with Section V1.A of the NRC Enforcement Policy.

If you contest the validity or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,  
**/RA/** MPS for

Troy W. Pruett, Chief  
Plant Support Branch  
Division of Reactor Safety

Dockets: 50-528  
50-529  
50-530  
Licenses: NPF-41  
NPF-51  
NPF-74

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 RITS Coordinator (**NBH**)

Only inspection reports to the following:  
 Scott Morris (**SAM1**)  
 PV Site Secretary (**vacant**)

Document: S:\DRS\Reports\PV200308RP-LTR.wpd

RIV:DRS/PSB	PSB	PSB	PSB	C:PSB
LTRicketson	JBNicholas	DRCarter	BDBaca	MPShannon
<b>/RA/</b>	<b>/RA/</b>	<b>/RA/</b>	<b>/RA/</b>	<b>/RA/</b>
3/07/03	3/13/03	3/17/03	3/17/03	3/18/03
C:DRP/D	C:PSB			
LJSmith	MPShannon			
<b>/RA/</b>	<b>/RA/</b>			
3/21/03	3/24/03			

**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Dockets: 50-528  
50-529  
50-530

Licenses: NPF-41  
NPF-51  
NPF-74

Report No: 50-528/03-08  
50-529/03-08  
50-530/03-08

Licensee: Arizona Public Service Company

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

Location: 5951 S. Wintersburg Road  
Tonopah, Arizona

Dates: February 24 through March 6, 2003

Inspectors: Larry Ricketson, P.E., Senior Health Physicist - Team Leader  
J. Blair Nicholas, PhD., Senior Health Physicist  
Bernadette D. Baca, Health Physicist  
Daniel R. Carter, Health Physicist

Approved By: Troy Pruett, Chief, Plant Support Branch  
Division of Reactor Safety

Attachment: Supplemental Information

## SUMMARY OF FINDINGS

Palo Verde Nuclear Generating Station, Units 1, 2, and 3  
NRC Inspection Report 50-528/03-08; 50-529/03-08; 50-530/03-08

IR 05000528-03-08, IR 05000529-03-08, IR 05000530-03-08, on 2/24/03 - 3/06/03, Arizona Public Service Company; Palo Verde Nuclear Generating Station, Units 1, 2, and 3; Radioactive material control; Radiation Safety Team Inspection

The inspection was conducted by a team of four region-based health physics inspectors. Based on the results of the inspection, the team identified one finding of very low safety significance (Green). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process," (SDP). Findings for which the SDP does not apply may be "Green" or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

### A. Inspector Identified Findings

Cornerstone: Public Radiation Safety

- Green. The team identified three examples (one NRC identified and two self-revealing) of a noncited violation of Technical Specification 5.4.1.a because the licensee failed to follow procedural requirements. Specifically, the licensee failed to prevent detectable amounts of licensed radioactive material from being unconditionally released from the radiologically controlled area, as required by Procedure 75RP-9RP09, Revision 21, Section 3.2

Unconditionally releasing equipment from the radiologically controlled area with detectable radioactivity was a performance deficiency. The finding was more than minor because it was associated with the cornerstone attribute (material release) and it affected the associated cornerstone objective (to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain). The finding involved an occurrence in the radiological material control program that was contrary to licensee procedures. When processed through the Public Safety Significance Determination Process, the finding was found to have very low safety significance because the finding was a radioactive material control issue, was not a transportation issue, public exposure was not greater than 5 millirem, and there were less than 5 occurrences (Section 2PS3).

## Report Details

### 2. RADIATION SAFETY

#### Cornerstone: Occupational Radiation Safety [OS]

#### 2OS3 Radiation Monitoring Instrumentation (71121.03)

##### a. Inspection Scope

To determine the accuracy and operability of radiation monitoring instruments used for the protection of occupational workers and the adequacy of the program to provide self-contained breathing apparatus to personnel entering unknown atmospheres, the inspector interviewed cognizant licensee personnel and compared the following items with regulatory requirements:

- Calibration, operability, and alarm setpoint of selected area radiation monitors (Unit 2 RU-31) and emergency instrumentation (Unit 3 RU-29)
- Calibration and operability of portable radiation detection instrumentation used for job coverage of high radiation area work, whole body counters, and personnel contamination monitors
- Calibration expiration and source response check currency on portable radiation detection instruments staged for use
- The status of self-contained breathing apparatuses staged and ready for use in the plant and associated surveillance and maintenance records
- The licensee's capability for refilling and transporting self-contained breathing apparatus air bottles to and from the control room and operations support center during emergency conditions
- Training and qualifications of personnel who may use self-contained breathing apparatus during an emergency (control room operators and emergency response personnel), perform maintenance and repair of self-contained breathing apparatus, and refill air bottles
- Periodic air cylinder hydrostatic testing results
- Audits (Nuclear Assurance Division Audit 2002-008) and self-assessments
- Selected corrective action documents involving radiation monitoring instrument deficiencies and self-contained breathing apparatus problems

##### b. Findings

No findings of significance were identified.

## **Cornerstone: Public Radiation Safety [PS]**

### 2PS1 Radioactive Gaseous And Liquid Effluent Treatment And Monitoring Systems (71122.01)

#### a. Inspection Scope

To ensure that the gaseous and liquid effluent processing systems were maintained so that radiological releases were properly mitigated, monitored, and evaluated with respect to public exposure, the team interviewed cognizant personnel, walked down the major components of the gaseous and liquid release systems, observed equipment material condition, and compared the observed configuration to the description in the Updated Final Safety Analysis Report (UFSAR). Additionally, the following items were reviewed and compared with regulatory requirements:

- 2001 Radiological Effluent Release Report
- Changes to the Offsite Dose Calculation Manual and to the radioactive waste system design and operation.
- Anomalous results, if any, reported in the Radiological Effluent Release Report
- Effluent radiological occurrence performance indicator incidents
- Effluent radiation monitor alarm setpoint values and calculation methodology
- Sample collection and analysis of particulate, iodine, and gaseous effluents
- Selected radioactive gaseous waste release permits and associated projected doses to members of the public
- Compensatory sampling and radiological analyses conducted for unmonitored releases and when effluent monitors were declared out-of-service
- Monthly, quarterly, and annual dose calculations
- Air cleaning system surveillance test results
- Surveillance test results for the stack and vent flow rates
- Records of instrument calibrations performed since the last inspection for each point of discharge effluent radiation monitor and flow measurement device
- Calibration records of counting room instrumentation associated with effluent monitoring and release activities
- Licensee interlaboratory comparison program and the 2001 second and fourth quarter results



- Quality control records for the counting room instruments
- Nuclear Assurance Evaluation Reports
- Audits (Nuclear Assurance Division Audit 2002-008, Chemistry/Radiological Monitoring Program Audit Report 2002-002) and self assessments (Site Chemistry Self-assessment, "Laboratory Analytical Control," December 2001; Site Chemistry Focused Self-Assessment, "Countroom AFI and Operations," April 2002; and, Site Chemistry Self Assessment, "RMS Operations," May 2002)
- Selected corrective action documents related to the radioactive effluent treatment and monitoring program and repetitive or significant individual deficiencies

b. Findings

No findings of significance were identified.

2PS2 Radioactive Material Processing and Transportation (71122.02)

a. Inspection Scope

The team interviewed licensee personnel involved in radioactive material and waste processing and transportation activities, walked down liquid and solid radioactive waste processing systems to verify that the current system configurations and operation agreed with the descriptions contained in the UFSAR and Process Control Program. The team observed the licensee prepare a shipment to a waste processor containing a sealand container, a Type A box, and an empty container (Shipment 03-RW-004). The team reviewed the status of radioactive waste processing equipment that was not operational and/or abandoned in place for material condition, potential unmonitored release pathways, and unnecessary personnel exposure. Additionally, the team reviewed the following items, to verify that the licensee's radioactive material/waste processing and transportation programs complied with the regulatory requirements of 10 CFR Parts 20, 61, and 71 and Department of Transportation (DOT) regulations contained in 49 CFR Parts 170-189.

- Radioactive material/waste processing and shipping procedures
- The adequacy of any changes made to the radioactive waste processing systems since the last inspection in November 2001
- Waste stream determination and sampling procedures, waste concentration averaging methodologies, and waste classification procedures
- Radio-chemical sample analysis results for each identified radioactive waste stream

- Changes in waste stream composition due to changing operational parameters and analysis updates
- Scaling factors and calculations used to account for difficult-to-measure radionuclides
- 10 CFR Part 20, Appendix G, Quality Assurance Program
- Transport cask Certificates of Compliance and cask loading and closure procedures for the following shipping casks: 14-210H, 8-120B, and 10-142B
- Documentation for 12 non-excepted package shipments that demonstrated shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and licensee verification of shipment readiness
- Transferee's licenses and state/DOT permits
- Conduct of radioactive waste processing and radioactive material shipment preparation activities
- Training of personnel responsible for the conduct of radioactive material/waste processing and shipment preparation activities
- Audits (Nuclear Assurance Audits 2001-007 and 2002-008) and self-assessments (2002 Radioactive Waste/Shipping Department Self-Assessment)
- Nuclear Assurance Division Evaluation Reports
- Selected corrective action documents involving the radioactive material/waste and shipping programs

b. Findings

No findings of significance were identified.

2PS3 Radiological Environmental Monitoring Program and Radioactive Material Control Program (71122.03)

a. Inspection Scope

The team interviewed members of the licensee's staff responsible for implementing the radiological environmental, meteorological monitoring, and radioactive material control programs. The team observed the following activities and equipment with respect to the UFSAR, Offsite Dose Calculation Manual (ODCM), and regulatory requirements:

- Collection and preparation for shipment of airborne particulate, charcoal, and milk samples for analysis at an off-site contract laboratory
- Meteorological instrumentation (redundant channels) at the meteorological tower and data displays in the control room
- The survey of materials for release from the radiologically controlled area

The following items were reviewed and compared with the UFSAR, ODCM, and regulatory requirements to determine whether the licensee had an adequate program to verify the impact of radioactive effluent releases to the environment and to ensure that the licensee's surveys and controls were adequate to prevent the inadvertent release of licensed radioactive materials into the public domain:

- Implementing procedures for the radiological environmental monitoring program
- Environmental sample analytical results to include missed samples, inoperable samplers, lost thermoluminescent dosimeters, and anomalous environmental sample events
- Number and location descriptions of the environmental sampling stations as specified in the ODCM
- Calibration and maintenance records for environmental air sampling equipment, composite water sampling equipment, and radiation measurement instrumentation
- Calibration, maintenance, and quality control records for environmental sample measurement instrumentation
- 2001 land use census results and resulting changes to the radiological environmental monitoring program
- 2001 Annual Radiological Environmental Operating Report
- The licensee's environmental laboratory's performance in the intralaboratory comparison program for 2001
- Implementing procedures for the meteorological monitoring program
- Meteorological instrument operability, reliability, and annual meteorological data recovery
- Procedures, methods, and instruments used to survey, control, and release materials from the radiologically controlled area
- Calibration procedures and records for instruments used to perform radiological surveys prior to material release

- Detection sensitivities and counting parameters of radiation survey instruments used for the release of potentially contaminated materials from the radiologically controlled area
- Criteria used for the unrestricted release of potentially contaminated material from the radiologically controlled area
- Audits (ER-1-0305, "Radiological Environmental Monitoring Program") licensee event reports, and self-assessments
- Selected corrective action documents involving the radiological environmental monitoring, meteorological monitoring, and release of radioactive material programs

b. Findings

Introduction. The team identified three examples (one NRC identified and two self-revealing) of a Green noncited violation because the licensee failed to follow radiation protection procedures and released detectable radioactive material from the radiological controlled area (RCA).

Description. On November 25, 2002, Maine Yankee identified that one of 250 pocket ion chambers received from Palo Verde was radioactively contaminated. The pocket ion chambers were unconditionally released from Palo Verde's RCA before the implementation of automated tool monitors in 1995 and were stored in the Palo Verde dosimetry office until sent to Maine Yankee. When Maine Yankee performed a receipt survey of the pocket ion chambers using an automated tool monitor, it discovered a contamination level of 4,000 disintegrations per minute. Because the contaminated pocket ion chamber was unconditionally released using an acceptable survey method at the time (hand-held frisking device) but later found to be contaminated after the implementation of a survey technique involving more advanced radiation detection equipment, it is considered a "legacy item." Another legacy item was identified by the licensee and is discussed in Section 40A7. All legacy items are considered together, as one event.

On September 14, 2001, NWS Technology identified that a main steam safety valve shipped to them by Palo Verde contained low levels of radioactive contamination (2000 disintegrations per minute). The valve was unconditionally released from the RCA on April 11, 1999, and documented on Survey No. 2-99-01674. The valve was stored in a warehouse as a non-contaminated item until shipped to NWS Technology. This was a second example of radioactive material that was incorrectly released from the RCA.

On January 16, 2003, the licensee discovered four purple painted tools in the back of a tool box that had been in storage in several locations outside the RCA since 1995. Prior to 1995 radioactive contaminated tools had been painted purple for identification purposes. The licensee surveyed the tools using an automated tool monitor and identified that one razor knife was radioactively contaminated. The licensee stated that

the razor knife had fixed contamination uniformly distributed over the surface and was not detectable using a hand-held frisking device. Therefore, the licensee considered this a legacy item. However, during the inspection, a member of the team performed an independent survey of the razor knife and identified approximately 180 counts per minute above background (1800 disintegration per minute if assuming a 10 percent efficiency) using a hand-held frisking device. Since the radioactive contamination was identifiable using a hand-held frisking device, the team concluded that the contaminated razor knife did not meet the definition of a legacy item, as discussed above. This constituted a third example of radioactive material that was incorrectly released from the RCA.

Analysis. Unconditionally releasing equipment from the RCA with detectable radioactivity was a performance deficiency. The finding was more than minor because it was associated with the cornerstone attribute (material release) and it affected the associated cornerstone objective (to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain). The finding involved an occurrence in the radiological material control program that was contrary to licensee procedures. When processed through the Public Safety Significance Determination Process, the finding was found to have very low safety significance because the finding was a radioactive material control issue, was not a transportation issue, public exposure was not greater than 5 millirem, and there were less than 5 occurrences.

Enforcement. Technical Specification 5.4.1.a requires written procedures be established and implemented covering applicable procedures recommended in Regulatory Guide 1.33, Appendix A. Regulatory Guide 1.33, Appendix A, Section 7, requires procedures for the control of radioactivity and limiting personnel exposure. Procedure 75RP-9RP09, "Release of Vehicles, Equipment, and Materials from the RCA," Revision 21, Section 3.2, requires the evaluation of items to be unconditionally released by survey to be evaluated against criteria in Appendix B. The criteria in Appendix B of the procedure for unconditional release is, "No detectable activity." However, the licensee failed to evaluate items that were unconditionally released against its procedural criteria on three occasions and released radioactive material from the RCA. Because the release of radioactive material was of very low safety significance and has been entered into the corrective action program as CRDR 2423603, 2569888, and 2579110, this violation is being treated as a noncited violation, consistent with Section VI.A of the NRC Enforcement Policy (NCV 50-528/0308-01; 50-529/0308-01; 50-530/0308-01).

#### 4. OTHER ACTIVITIES

##### 4OA6 Meetings

###### Exit Meeting Summary

The team conducted an interim management briefing on February 28, 2003, with Mr. J. Gaffney, Director, Radiation Protection, and other members of the staff. The team presented the final inspection results to Mr. G. Overbeck, Senior Vice President, Nuclear, and other members of licensee management during an exit meeting conducted by telephone on March 6, 2003. The licensee acknowledged the findings presented.

The team asked the licensee whether or not any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

##### 4OA7 Licensee Identified Violations

The following finding of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which met the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a noncited violation.

Technical Specification 5.4.1.a requires written procedures for the control of radioactivity. Procedure 75RP-9RP09, Revision 21, Section 3.2, requires that items unconditionally released from the RCA have "No detectable activity." However, on March 14, 2003, the licensee identified, through a self assessment, that 102 of 1,576 respirators, that had been in storage since 1994 in the respirator facility located outside the protected area, were slightly contaminated with radioactive material. The total radioactivity of the 102 respirators was approximately 0.45 microcuries. The contaminated respirators are considered a legacy item. See Section 2PS3 for additional information. This event is documented in the licensee's corrective action program as CRDR 2529117. This finding is only of very low safety significance because the finding was a radioactive material control issue, was not a transportation issue, public exposure was not greater than 5 millirem, and there were less than 5 occurrences.

**ATTACHMENT**

**SUPPLEMENTAL INFORMATION**

**PARTIAL LIST OF PERSONS CONTACTED**

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C. Podgurski, Section Leader, Radiation Protection  
M. Wagner, Section Leader, Radiation Protection Operations

NRC

N. Salgado, Senior Resident Inspector

**ITEMS OPENED, CLOSED, AND DISCUSSED**

Opened

None.

Opened and Closed During this Inspection

50-528; 529; 530/0308-01    NCV    Failure to prevent the release of detectable amounts of licensed radioactive material (Section 2PS3).

Previous Items Closed

None

**LIST OF DOCUMENTS REVIEWED**

IP 71121.03

Condition Report/Deposition Requests: 2450676, 2460054, 2460148, 2501559, and 2589018

IP 71122.01

Condition Report/Deposition Requests: 2445883, 2507738, 2526781, 2530053, 2534517, 2537814, 2538175, 2551554, 2557542, 2559223, 2574203, and 2579521

Nuclear Assurance Evaluation Reports: ER-01-0278, 01-0283, 01-0305, 01-0401, 01-0415, 01-0434, 01-0435, 02-0010, and 02-0133

IP 71122.02

Condition Report/Disposition Requests: 2440198, 2441491, 2441495, 2445012, 2458926, 2468972, 2477236, 2519273, 2538768, 2541330, 2549039, 2558225, 2560589, 2566538, 2570366, 2570711, 2577334, and 2587683

Nuclear Assurance Division Evaluation Reports: ER-01-0423, 01-0434, 01-0438, 01-0439, and 02-0002)

IP 71122.03

Condition Report/Disposition Requests: 2467880, 2531442, 2546251, 2546305, 2557393, and 2554246