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.:	50-528/97-26; 50-529/97-26; 50-530/97-26
Licensee:	Arizona Public Service Company
Facility:	Palo Verde Nuclear Generating Station, Units 1, 2, and 3
Location:	5951 S. Wintersburg Road Tonopah, Arizona
Dates:	December 8-12, 1997
Inspector:	Gilbert L. Guerra, Jr., Radiation Specialist Plant Support Branch
Approved By:	Blaine Murray, 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 50-528/97-26; 50-529/97-26; 50-530/97-26

This announced, routine inspection reviewed the implementation of the solid, radioactive waste management and the radioactive materials transportation programs. Training, quality assurance oversight, and procedural guidance were also reviewed.

Plant Support

- A very good solid radioactive waste management program was implemented. The generation of dry active wastes had been reduced (Section R1.1).
- A very good transportation program for radioactive materials and radioactive waste was maintained. The licensee satisfactorily implemented the revisions of 49 CFR and 10 CFR Part 71. Shipments of radioactive materials were made consistent with the latest revisions to the Department of Transportation and NRC regulations (Section R1.2).
- Excellent facilities were maintained for the storage and management of solid radioactive wastes and transportation activities (Section R2).
- Proper procedures for handling, processing, and shipping of radioactive waste/materials were maintained (Section R3).
- Training provided to workers adequately addressed the revisions in the transportation regulations. Personnel involved in the transfer, packaging, and transport of radioactive materials and wastes were properly trained and qualified (Section R5).
- A proper organization and staff were maintained which effectively implemented the radioactive waste management and transportation of radioactive materials programs (Section R6).
- An effective audit/self-assessment program was maintained. Strong management oversight was maintained for the solid radioactive waste management and transportation programs (Section R7).

Report Details

Summary of Plant Status

Palo Verde Units 1, 2, and 3, operated at full power during this inspection. No events occurred during this inspection that adversely affected the inspection results.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Solid Radioactive Waste Management

a. Inspection Scope (TI 2515/133 and 86750)

The inspector interviewed members of the radioactive materials control group and observed or reviewed the following solid radioactive waste management program activities:

- Waste stream sampling results and waste characterization documentation
- Scaling factors for required isotopes not measured directly
- Solid radioactive waste classification
- Quantities of radioactive waste shipped for disposal
- Waste minimization program
- Solid radioactive waste reports

b. Observations and Findings

The inspector verified that waste stream samples were taken as required and analyzed to meet 10 CFR Part 61 requirements for waste classification and characterization. Five waste streams were identified for each unit that consisted of dry active waste, resin, filters, concentrates, and other. Some of the waste streams were further broken down into sub-waste streams. The waste stream samples were analyzed by a contractor laboratory.

Classification of waste was performed with a computer code commonly used in the nuclear industry. Scaling factors determined from waste stream sample analyses were entered into the computer code data base. The computer code data base was routinely updated with the latest waste stream sampling results. No problems related to waste stream sampling or waste classification were identified. The inspector noted that the radwaste computer code was updated with the most current revisions of the vendor software, after acceptance by the licensee.

The inspector noted that Palo Verde had reduced the amount of solid radwaste generated; especially, dry active wastes. This was done, in part, by enhancing radworker awareness in minimizing radioactive waste when performing their assigned tasks and maintaining the amount of contaminated area to a minimum.

Radwaste generation, tracked by the licensee as pounds generated with no segregation, processing, or volume reduction, has steadily been reduced each year. Good performance was noted in the licensee's dry active waste minimization program. The following table of licensee data shows a very good decline in dry active waste generated.

Solid Waste Reduction Results (Pounds of DAW)	
1992	286,886
1993	228,139
1994	165,304
1995	162,154
1996	89,377
1997	68,000 (estimated)

Annual Radioactive Effluent Release Reports contained the required solid radioactive waste data. Dry active waste was shipped to an off-site vendor for volume reduction and subsequent burial. A summary of the volume and activity of solid radioactive waste including resins, irradiated components, and dry active waste shipped for disposal during the last six years is tabulated below.

Year	Number Of Shipments	Total Volume (m^3)	Total Activity (Ci)
1992	154	425	1170
1993	145	229	644
1994	144	218	416
1995	21	421	0.965
1996	61	606	16.6
1997	27	132	583

c. Conclusions

A very good solid radioactive waste management program was implemented. The generation of dry active wastes had been reduced. Waste stream sampling met regulatory requirements. Solid radioactive waste was properly classified and characterized for shipment and disposal.

R1.2 Transportation of Radioactive Materials and Radioactive Waste

a. Inspection Scope (TI 2515/133 and 86750)

The inspector interviewed radioactive materials control personnel and reviewed the following:

- Implementation of revised 49 CFR Parts 100-179 and 10 CFR Part 71
- Shipping documentation from selected shipments
- Certificates of compliance for NRC certified shipping casks
- Copies of current Department of Transportation and NRC regulations
- Copies of current licenses for recipients of radioactive wastes/materials
- Use of a vendor supplied computer program to generate shipping papers
- Packaging and shipping papers
- Marking and labeling of packages for shipment
- Vehicle placarding and driver instructions
- Emergency response information
- Radiation surveys of packages and vehicles
- Use of system international (SI) units
- Use of the current A_1/A_2 values for isotopes

b. Observations and Findings

The inspector observed the final preparations for a contaminated oil shipment. This included final radiation surveys of packages and the vehicle and shipping documentation preparation. The inspector noted that the vehicle was properly placarded and that the driver was given proper instructions, the required shipping documentation, and emergency response information. The shipment preparation activities were conducted well.

An effective file system was maintained. Selected shipping records showed that the licensee had made shipments of both radioactive materials and radioactive waste. The inspector noted that shipments using the new category for surface contaminated objects had been performed. Instructions for surface contaminated object packaging and shipping were included in licensee procedures. The inspector noted no problems in the records reviewed.

Certificates of Compliance for routinely used shipping casks were verified. State shipping permits were reviewed. The inspector reviewed selected shipment consignees and verified the licensee maintained current copies of the consignees radioactive material licenses on file.

A vendor supplied computer code was used to determine proper radioactive material transportation categories, shipping packages, labeling, and shipping paper information. The inspector reviewed the table of A_1 and A_2 values used by the program and compared selected radionuclide values to those provided in the regulations. The values compared

were determined to be correct. The licensee did not utilize the "95 percent rule" to delist radionuclides on shipping papers, preferring to list all radionuclides.

Shipping papers for radioactive materials shipments contained the information required by 49 CFR 172, Subpart C. In addition to this information, radioactive waste shipment documentation included manifests that conformed to the requirements of 10 CFR Part 20, Appendix F and 49 CFR 173.433. Shipping documents included radioactive activity measurements recorded in international system units as well as customary units. The licensee satisfactorily implemented the revisions of 49 CFR and 10 CFR Part 71. Emergency telephone numbers were included with the shipping papers. The licensee utilized an offsite facility to provide emergency response information. The licensee's practice was to fax information on shipment contents to this facility whenever shipments were performed.

Radiation survey records indicated that radiation and contamination levels of shipments were within regulatory limits.

c. Conclusions

A very good transportation program for radioactive materials and radioactive waste was maintained. The licensee satisfactorily implemented the revisions of 49 CFR and 10 CFR Part 71. Packages were properly prepared for shipment. Proper A_1 and A_2 values were used to characterize shipments in accordance with transportation regulations. Shipments of radioactive materials were in agreement with the latest revisions to the Department of Transportation and NRC regulations.

R2 Status of Facilities and Equipment

a. Inspection Scope

The inspector toured the radwaste buildings, the dry active waste processing and storage facility, and the low-level radioactive material storage facility and observed the following solid radioactive waste management program activities:

- Container storage and labeling
- Container accountability
- Pre-job briefing

b. Findings and Observations

An excellent low level radioactive material storage facility was utilized. The design and ALARA dose saving initiatives, such as cameras, remote radiation survey instrumentation, and remotely operated cranes and grapples of the facility were excellent. The licensee was able to move high dose rate waste containers with minimal personnel exposure.

The inspector attended a pre-job briefing for the transfer of a high integrity container loaded with filters to a storage cell in the low-level radioactive material storage facility. The briefing was conducted well. Activities and assignments of personnel involved in the job were appropriately discussed, including radiation surveys, communication, and equipment operation including stop work authority.

Storage areas were properly posted and controlled. Containers were properly labeled and marked. Housekeeping in the radwaste buildings, the dry active waste processing and storage facility, and low level radioactive material storage facility was very good.

The licensee utilized a bar coding system for radwaste container accountability. The bar code system was effective in managing the radwaste inventory. The inventory conducted monthly was efficiently performed with this tool with minimal exposure to personnel involved. The inspector concluded that the licensee could account for all of the radwaste inventory.

c. Conclusions

Excellent facilities were maintained for the storage and management of solid radioactive wastes and transportation activities. An effective inventory system was utilized.

R3 Radiological Protection and Chemistry Procedures and Documentation

R3.1 Transportation Procedures

a. Inspection Scope (TI 2515/133 and 86750)

The inspector reviewed various procedures used to implement the waste stream sampling and analyses and transportation programs; and to verify compliance with the revised Department of Transportation regulations. The inspector also reviewed the following:

- Changes made to procedures for the processing, packaging, and shipment of low specific activity material and surface contaminated objects
- Use of system international units

b. Observations and Findings

The inspector noted that procedures were revised to incorporate changes made to regulations in April 1996. The inspector verified that procedures incorporated the recent transportation regulation changes including; new requirements for the transportation of low specific activity materials and surface contaminated objects, and the use of the international system of units on radioactive materials shipping documentation. Changes to the regulations were appropriately addressed in the radwaste program implementing procedures and current regulations were referenced.

Guidance was provided in the procedures for radioactive waste stream sampling, vendor laboratory analysis, updating the computer code data with new waste stream sample analysis results, and scaling factor generation used to correlate nuclides that were difficult to measure with nuclides that were easy to measure. Checklists were utilized to provided guidance for the preparation of shipments. The licensee incorporated the use of the international system of units into the radioactive material shipping documents.

c. Conclusions

Proper procedures for handling, processing, and shipping of radioactive waste/materials were maintained. The procedure for shipping low specific activity materials and surface contaminated objects was consistent with regulatory requirements.

R4 Staff Knowledge and Performance

The inspector interviewed members of the radioactive material control group of the radiation protection department involved in radioactive waste and transportation activities. Personnel responsible for conducting the transportation program for radioactive waste and radioactive materials were knowledgeable of currently revised transportation regulations that were effective April 1, 1996, and April 1, 1997. Radwaste staff had an excellent knowledge of the transportation regulations. Technical specialists were also knowledgeable of the transportation software utilization constraints.

The inspector determined that the radiation protection department was adequately staffed with knowledgeable and experienced personnel.

R5 Staff Training and Qualification in Radiological Protection and Chemistry

R5.1 Training and Qualification of Radwaste Personnel

a. Inspection Scope (86750 and TI 2515/133)

The inspector reviewed the training of personnel who were responsible for the preparation and packaging of radioactive waste and radioactive materials for shipment. The inspector reviewed the following:

- Training materials related to 49 CFR Parts 171-179 and 10 CFR Part 71
- Training and qualification records
- Retraining requirements

b. Observations and Findings

The inspector verified that radioactive material control personnel were trained on the revised regulations prior to the implementation date of April 1, 1996, and that the materials for the required training classes for qualification have been updated.

Training records and qualification cards revealed that all radwaste personnel were trained and qualified in accordance with regulatory requirements and station procedures.

A periodic retraining program was conducted in accordance with commitments made in response to NRC Bulletin 79-19, "Packaging of Low-Level Radioactive Waste for Transport and Burial." No changes were made to this commitment.

c. Conclusions

Training provided to workers adequately addressed the revisions in the transportation regulations. Personnel involved in the transfer, packaging, and transport of radioactive materials and wastes were properly trained and qualified.

R6 Radiological Protection and Chemistry Organization and Administration

a. Inspection Scope (84750)

The organization and staffing for the implementation of the solid radioactive waste management and the transportation programs were reviewed.

b. Observations and Findings

The organization and staffing related to radioactive waste management and transportation of radioactive materials was appropriate. Changes were made with the addition of another section leader. With the addition of a new section leader, duties within the radioactive materials control group were divided. The technical staff experienced little change and no reduction.

c. Conclusions

A proper organization and staff were maintained which effectively implemented the radioactive waste management and transportation of radioactive materials programs.

R7 Quality Assurance in Radiological Protection and Chemistry Activities

R7.1 Solid Radwaste and Transportation Program Assessments

a. Inspection Scope (86750)

The inspector reviewed audits, evaluations, and self-assessments to evaluate the licensee's effectiveness at identifying and correcting problems. The review also included the following:

- Qualifications and resumes of auditors and technical specialists
- Radiological condition reports

b. Observations and Findings

Nuclear assurance plant support Audit 97-016 of radwaste activities was conducted August 7-22, 1997. An audit of this area is conducted every 24 months in accordance with Technical Specification requirements. The audit team included off-site technical specialists. The inspector determined that the audit was comprehensive in its review of solid radioactive waste management and transportation activities.

Seven nuclear assurance evaluation reports pertaining to the area of inspection were conducted in 1997. The reports were based on observations of activities in progress or existing plant conditions. Frequent evaluations were conducted that covered diverse areas. The evaluation reports were effective in providing feedback to radwaste management on program effectiveness.

Also, radiation protection department self assessments were performed on monthly, quarterly, and annual frequencies. The self-assessments were performed over a wide range of areas within the program. The inspector determined that this program was a good enhancement to ensure that the required shipping documentation was prepared for all shipments of radioactive material or waste.

The effort expended on quality assurance by the licensee was considered a program strength.

Audit findings were tracked as part of the condition reporting system. The inspector noted that the radiation protection organization responded properly to the findings. Other selected condition reports involving radioactive waste activities were reviewed. No adverse trends were noted. Appropriate corrective actions were taken and timely closure was noted.

Auditor qualifications were reviewed, including resumes of technical specialists. The qualifications and experience of auditors were appropriate. The inspector determined that the experience of the lead auditor for radwaste activities was very good. However, the inspector noted that the auditor had not received formal training on the revised transportation regulations. There is no regulatory requirement to provide this specific training to auditors.

c. Conclusions

An excellent quality assurance program was maintained. Through the use of a thorough audit, good evaluation reports, and periodic self-assessments, the licensee implemented a strong management oversight program for the solid radioactive waste management and transportation programs. Technical specialists knowledgeable in radioactive waste management and transportation requirements were members of the audit teams. Condition reports related to radioactive waste activities were closed in a timely manner.

R8 Miscellaneous Radiological Protection and Chemistry Issues

R8.1 (Closed) LER 96-001: Inaccurate Gas Calculations for the Post Accident Sampling System

On May 29, 1996, the licensee identified that between August 30, 1995, and December 22, 1995, the post-accident sampling system was inoperable for 75 days exceeding the 7-day limit for inoperability. This was identified as a violation of Technical Specification 3.3.3.1.

During the monthly performance of surveillance tests, miscalculations of the amount of dissolved hydrogen within the reactor coolant system indicated that the criteria had been met for test acceptance. However, had the calculations been performed correctly the surveillance test would have failed. Hence, the licensee declared the post-accident sampling system inoperable.

Monthly surveillance tests were performed on August 30, and September 27, 1995. An 18-month surveillance was performed on November 25, 1995. In each of the three surveillance tests the hydrogen gas calculations were performed erroneously. The December 22, 1995, surveillance test was performed satisfactorily. The calculations were in error because the wrong pressure reading was used in the calculations. The licensee's investigation cited causal factors for this error as the result of inattention to detail and poor procedural communication (surveillance test calculational worksheet).

Corrective actions have been implemented to revise the appropriate portions of the surveillance test calculational worksheet and provide department training on performing post accident sampling system calculations.

This nonrepetitive, licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy. (50-530/9726-01)

V. Management Meetings

X1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee's management at an exit meeting on December 12, 1997. The licensee acknowledged the findings presented. No proprietary information was identified.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Bouquot, Section Leader, Nuclear Assurance
T. Dickinson, Senior Technician, RMC
D. Elkinton, Nuclear Assurance - Plant Support
M. Fladager, Radiation Protection Section Leader, RMC
P. Guay, Department Leader, Chemistry Operations
R. Henry, Site Representative, Salt River Project
V. Huntsman, Department Leader, Radiation Protection
D. Kanitz, Senior Engineer, Nuclear Regulatory Affairs
A. Krainik, Department Leader, Nuclear Regulatory Affairs
D. Larkin, Senior Engineer, Nuclear Regulatory Affairs
D. Leith, Senior Technical Advisor, Radiation Protection
D. Marks, Section Leader, Nuclear Regulatory Affairs
S. Sawtschenko, RMC Section Leader, Radiation Protection
J. Scott, Director, Site Chemistry
J. Steward, Department Leader, Radiation Protection

NRC

None

INSPECTION PROCEDURES USED

TI 2515/133	Implementation of Revised 49 CFR Parts 100-179 and 10 CFR Part 71
86750	Solid Waste Management and Transportation of Radioactive Waste

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

530/9726-01	NCV	Inoperable Post-Accident Sampling System

Closed

96-001	LER	Inaccurate Gas Calculations for the Post Accident Sampling System
530/9726-01	NCV	Inoperable Post-Accident Sampling System

Discussed

None

LIST OF DOCUMENTS REVIEWED

Procedures

76DP-0RP01 Radioactive Material Control Program Overview, Revision 0

76DP-0RP02 Radioactive Waste Minimization Program Overview, Revision 0

76DP-0RP03 Radwaste Process Control Program, Revision 0

76DP-0RP04 Receipt, Storage, and Shipment of Radioactive Material, Revision 1

76DP-0RP05 Radwaste Management and Volume Reduction Activities, Revision 0

76DP-0RW06 Packaging, Marking and Labeling of Radioactive Material, Revision 5, 4/1/96

76DP-0RW07 Shipping of Radioactive Material, Revision 10, 4/5/96

76DP-0RW09 Shipping of Radioactive Waste, Revision 5, 4/3/96

76RP-0RW01 Operation of RMC Equipment and Facilities, Revision 1

76RP-0RW03 Waste Stream Sampling and Database Maintenance, Revision 0

76RP-0RW04 Receipt of Radioactive Material, Revision 0

76RP-0RW05 Packaging and Classification of Radioactive Waste, Revision 0, 12/5/97

76RP-0RW06 Packaging of Radioactive Material, Revision 0, 12/5/97

76RP-0RW07 Shipping of Radioactive Material, Revision 0, 12/5/97

76RP-0RW09 Transfer and Storage of Radioactive Filters, Revision 0

76DP-0RW06 Packaging, Marking and Labeling of Radioactive Material, Revision 5

15DP-0TR45 Radiation protection Training Program Description, Revision 12

Audits, Evaluation Reports, and Self Assessments

Audit 97-016 - Radwaste 9/25/97

Evaluation Reports:
97-0201, 97-0202, 97-0289, 97-0341, 97-0356, 97-0446, 97-0527

Self Assessments:
Quarterly:
Radioactive Shipping Review 9/26/97
Radioactive Shipping Review 6/26/97
Processing, Packaging, Storage, and Transportation of Radioactive Material 11/8/96
Radwaste Quarterly 5/31/96
Radioactive Shipment Review 3/29/96

Monthly:
10/30/97, 9/26/97, 8/12/97, 7/18/97, 6/20/97, 5/15/97, 4/18/97, 3/6/97, 2/28/97, 1/28/97

Annual Radioactive Material Control Self Assessment 11/96

Other

Condition Reports: 1-7-0336, 9-7-1082

Training and Qualification Records