



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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ARLINGTON, TEXAS 76011-8064**

January 24, 2002

Gregg R. Overbeck, Senior Vice
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Arizona Public Service Company
P.O. Box 52034
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**SUBJECT: PALO VERDE NUCLEAR GENERATING STATION - NRC INTEGRATED
INSPECTION REPORT 50-528/01-06, 50-529/01-06, 50-530/01-06**

Dear Mr. Overbeck:

On December 29, the NRC completed an inspection at your Palo Verde Nuclear Generating Station, Units 1, 2, and 3, facility. The enclosed report documents the results of this inspection. These results were discussed on January 8, 2002, with you and other members of your staff as described in Section 4OA6.

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 inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Immediately following the terrorist attacks on the World Trade Center and the Pentagon, the NRC issued an advisory recommending that nuclear power plant licensees go to the highest level of security, and all promptly did so. With continued uncertainty about the possibility of additional terrorist activities, the Nation's nuclear power plants remain at the highest level of security and the NRC continues to monitor the situation. This advisory was followed by additional advisories, and although the specific actions are not releasable to the public, they generally include increased patrols, augmented security forces and capabilities, additional security posts, heightened coordination with law enforcement and military authorities, and more limited access of personnel and vehicles to the sites. The NRC has conducted various audits of your responses to these advisories and your ability to respond to terrorist attacks with the capabilities of the current design-basis threat (DBT). From these audits, the NRC has concluded that your security program is adequate at this time.

Based on the results of this inspection, no findings of significance were identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be 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).

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

Sincerely,

/RA/

Linda Joy Smith, Chief
Project Branch D
Division of Reactor Projects

Docket Nos: 50-528
50-529
50-530

License Nos: NPF-41
NPF-51
NPF-74

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NRC Inspection Report 50-528/01-06;
50-529/0-06; 50-530/01-06

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01/23/02	01/23/02	01/23/02	01/18/02	01/24/02

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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: 50-528/01-06, 50-529/01-06, 50-530/01-06

Licensee: Arizona Public Service Company

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

Location: 5951 S. Wintersburg Road
Tonopah, Arizona

Dates: October 7 through December 29, 2001

Inspectors: J. H. Moorman, III, Senior Resident Inspector
N. L. Salgado, Resident Inspector
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Approved By: Linda Joy Smith, Chief, Project Branch D
Division of Reactor Projects

SUMMARY OF FINDINGS

Palo Verde Nuclear Generating Station
NRC Inspection Report 50-528/01-06, 50-529/01-06, 50-530/01-06

IR 05000528-01-06, IR 05000529-01-06, IR 05000530-01-06, on 10/07-12/29/01, Arizona Public Service Company, Palo Verde Nuclear Generating Station; Units 1, 2, and 3. Integrated resident and regional report. No findings identified.

The report covered a 12-week period of resident inspection, and announced inspections by regional health physicists and physical security specialists. The report also included in-office review by emergency preparedness inspectors. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using IMC 609 "Significance Determination Process" (SDP). Findings for which the SDP does not apply are indicated by "No color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at <http://www.nrc.gov/reading-rm/ADAMS.html>.

A. Inspector Identified Findings

No findings of significance were identified.

B. Licensee Identified Violations

Two violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee appear reasonable. These violations are listed in Section 4OA7 of this report.

Report Details

Summary of Plant Status

Unit 1 operated at full power until December 8, 2001, when power was reduced to 58 percent to allow for adjustment of steam generator water chemistry. The unit was returned to full power on December 10 and operated at that level for the duration of this inspection period.

Unit 2 operated at full power until October 10 when the unit was shutdown to allow for replacement of control element assemblies as the result of concerns raised during the Unit 3 outage. The unit was returned to full power on November 10 and operated at that level for the duration of this inspection period.

Unit 3 began this inspection period in Mode 6 in the ninth refueling outage. The outage was completed on November 4 and the unit was returned to full power on November 8. Power was reduced to 12 percent on December 1 to support maintenance on the main turbine. The unit was returned to full power on December 2 and operated at that level until December 13 when power was reduced to 85 percent when heater drain Pump B tripped. The unit was returned to full power on December 13 and operated at that level for the duration of this inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity [REACTOR - R]

1R04 Equipment Alignments - Routine Inspection (71111.04)

a. Inspection Scope

The inspectors completed a partial walkdown of the systems listed below to verify proper equipment alignment. This inspection included a review of the applicable plant procedures, plant drawings, outstanding modifications, work orders and condition report/disposition requests (CRDR). The inspectors verified the following: all valves were properly aligned, there was no leakage that could affect operability, electrical power was available as required, major system components were properly labeled, lubricated, and cooled, and hangers and supports were correctly installed and functional.

- October 8, 2001 - Fuel pool cooling system (Unit 3)
- October 30, 2001 - Shutdown cooling system Train A (Unit 2)
- November 28, 2001 - Low pressure safety injection system Train B (Unit 2)

b. Findings

No findings of significance were identified.

1R05 Fire Protection - Monthly Routine Inspection (71111.05)

a. Inspection Scope

The inspectors performed fire protection walkdowns to assess the materiel condition of

plant fire protection equipment and proper control of transient combustibles. The following risk-significant areas were inspected:

- October 11, 2001, Reactor Building - all accessible elevations (Unit 3)
- November 7, 2001, Reactor Building - all accessible elevations (Unit 2)
- November 20, 2001, Auxiliary Building 40-foot, 51-foot, 6-inch, 70-foot, and 88-foot elevations (Unit 1)
- November 23, 2001, Control Building 74-foot elevation (Unit 2)
- December 11, 2001, Auxiliary Building 40-foot and 51-foot, 6-inch elevations (Unit 3)
- December 13, 2001, Auxiliary Building 40-foot and 51-foot, 6-inch elevations (Unit 2)

b. Findings

No findings of significance were identified.

1RO7 Heat Sink Performance (71111.07)

.1 Unit 1 Train A Essential Cooling Water Heat Exchanger Inspection

a. Inspection Scope

During the Unit 1 outage in April 2001 licensee personnel conducted an inspection of the Train A essential cooling water heat exchanger. The inspectors viewed the interior of the heat exchanger tube side to assess materiel condition. The inspectors also reviewed test and analysis results for the Train A essential cooling water heat exchanger. Heat exchanger data was collected on April 2 as directed by Procedure 70TI-9EW01, "Thermal Performance Testing Of Essential Cooling Water Heat Exchangers," Revision 4. The data was analyzed using Procedure 73DP-9ZZ10, "Guidelines For Heat Exchanger Thermal Performance Analysis," Revision 3. Final review of the analysis was completed on October 23. The inspectors' review was conducted to determine if the test acceptance criteria and results appropriately considered the differences between testing and design conditions, and to determine if the results were appropriately measured against pre-established acceptance criteria and were acceptable.

b. Findings

No findings of significance were identified.

.2 Unit 3 Train B Essential Cooling Water Heat Exchanger Inspection

a. Inspection Scope

During the Unit 3 outage, licensee personnel conducted an inspection of the Train B essential cooling water heat exchanger. The inspectors reviewed test and analysis results for the Train B essential cooling water heat exchanger. The analysis and test were conducted in accordance with Procedure 73DP-9ZZ10, "Guidelines For Heat Exchanger Thermal Performance Analysis," Revision 3, and Procedure 70TI-9EW01, "Thermal Performance Testing Of Essential Cooling Water Heat Exchangers," Revision 4. This review was conducted to determine if the test acceptance criteria and results appropriately considered the differences between testing conditions and design conditions, and to determine if the results were appropriately measured against pre-established acceptance criteria and were acceptable.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

On November 27, 2001, the inspectors observed an evaluated simulator scenario for an on-shift crew conducted at the beginning of Cycle 5, Week 3. The inspectors evaluated the simulator scenario, the crew performance, and the evaluator critique sessions conducted following the completion of the simulator scenarios. The inspectors verified that the examinations were in conformance with NUREG 1021, "Operator Licensing Examiner Standards," ES-604, "Dynamic Simulator Requalification Examination," and management expectations.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope

The inspectors evaluated the following equipment failures to verify that licensee personnel properly implemented the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,":

- Failure to achieve rated voltage within allowed time requirement on emergency diesel generator Train A reported in CRDR 2432009, October 12, 2001 (Unit 3)

- Failure of Valve 3JSGAUV0138A caused the turbine driven auxiliary feedwater pump to trip on overspeed during performance of Procedure 73ST-9AF02 as reported in CRDR 2438432, November 2, 2001 (Unit 3)
- Failure of load center Circuit Breaker 3EPGBL32C3 which resulted in the loss of power to Motor Control Center 3EPHBM38 reported in CRDR 2436787, October 27, 2001 (Unit 3)
- Failure of Supply Isolation Dampers HFAM01/M02 and HFBM01/M02 caused the fuel building essential ventilation system to become inoperable as reported in CRDR 2444110, November 28, 2001 (Unit 2)
- Essential chilled water Train A was declared inoperable when an auxiliary operator attempted to drain the expansion tank and observed a gas-water mixture flowing from the drain valve as reported in CRDR 2441118, November 13, 2001 (Unit 1)

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessment and Emergent Work Evaluation (71111.13)

a. Inspection Scope

Throughout this inspection period the inspectors reviewed daily and weekly work schedules to determine when risk-significant activities were scheduled. The inspectors reviewed risk evaluations and overall plant configuration control for selected activities to verify compliance with Procedure 30DP-9MT03, "Assessment and Management of Risk When Performing Maintenance in Modes 1 - 4," Revision 3. The inspectors discussed emergent work issues with work control personnel and reviewed the potential risk impact of these activities to verify that the work was adequately planned, controlled, and executed. The inspectors verified that plant configurations allowed by the Plant Configuration Risk Indicator Matrix were consistent with actual plant conditions during maintenance. The specific activities reviewed were associated with planned and emergent maintenance on:

- October 30, 2001 - Rescheduled emergency diesel generator Train B outage (Unit 2)
- November 19, 2001 - Performance of Procedure 73ST-9AF02, "AFA-P01 - Inservice Test," Revision 21, and the failure of steam supply pilot Valve SGA-UV-138A (Unit 2)
- November 28, 2001 - Scheduled online outage for low pressure safety injection Train A (Unit 2)

- November 29, 2001 - Scheduled online outage for control building normal ventilation (Unit 3)
- December 4, 2001 - Scheduled online outage for auxiliary feedwater Train B (Unit 2)
- December 13, 2001 - Scheduled maintenance on high pressure safety injection pump Train B (Unit 1)
- December 19, 2001 - Scheduled emergency diesel generator/spray pond/essential chilled water/essential cooling water/containment spray Train A online outage (Unit 2)

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

.1 (Closed) Unresolved Item 50-530/01-005-01: Root Cause Investigation for Containment Operability with Quick Operating Closure Device Leakage

An unresolved item (URI) was identified during review of the Unit 3 shutdown that occurred when containment was declared inoperable due to an apparent failure of the containment barrier on August 17, 2001. The apparent containment failure was based on the identification of water leaking from the fuel transfer canal, through the containment barrier established by the fuel transfer tube quick operating closure device (QOCD), and into containment. The URI was opened to further evaluate the ability of the QOCD to properly isolate containment. In addition, the acceptability of the safety evaluation associated with the design modification that replaced the fuel transfer tube closure flange with the QOCD was questioned.

The licensee initiated CRDR 2414777 for root cause investigation. The inspectors reviewed the licensee's root cause investigation, CRDR 2414777. Additionally, the inspectors completed a review of the safety evaluation for the QOCD design modification to confirm compliance with 10 CFR 50.59.

The inspectors determined that the QOCD provided an adequate containment barrier for the containment pressures expected during an accident. While the as-found QOCD did not provide a leak-tight seal from the fuel transfer canal into the containment, it would have provided a leak-tight seal from the containment into the fuel transfer canal. This was based on the licensee's root cause investigation that identified the failure mechanism as hydrostatic pressure behind the fuel building side of the QOCD cover, which unseated the sealing o-rings such that water from the transfer canal leaked into containment. The QOCD cover unseated because it did not have adequate torque applied to the closure latches to prevent flow from the fuel building. However, based on as-found leak test data the torque that had been applied to the closure latches was adequate to prevent flow from containment to the fuel building. The investigation

confirmed that increasing pressure in the fuel transfer tube would tend to unseat the QOCD cover o-rings, and conversely, increasing pressure in the containment building would tend to seat the o-rings tighter. Consequently, for the August 17, 2001, as-found conditions, the QOCD would have performed its safety function as a containment barrier, preserving containment operability.

The inspectors found that the safety evaluation for the design change that modified a blank flange to a QOCD satisfied the requirements of 10 CFR 50.59. When the modification was considered in combination with the required leakage tests, the inspectors concluded that the modification did not result in more than a minimal increase in the likelihood of occurrence of a malfunction of the containment barrier.

No findings of significance were identified. Based on the reviews completed by the inspectors, this URI is closed.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors observed and/or evaluated the results from the following postmaintenance tests to determine whether the test adequately confirmed equipment operability. The inspectors also verified that postmaintenance tests satisfied the requirements of Procedure 30DP-9WP04, "Postmaintenance Retest Development," Revision 12.

- Work Order 2429435 Installation of furmanite clamp on Valve RCE-V244 to stop reactor coolant system leakage (Unit 1)
- Work Order 2433396 Performance of Procedure 77ST-9RX01, "CEA Drop Time," Revision 2 (Unit 2)
- Work Order 2441468 Repair/replace faulted pressurizer pressure master controller, RCN-PIC-100 (Unit 3)

1R20 Refueling and Outage Activities (71111.20)

A. Unit 3 - Ninth Refueling Outage

On September 29, 2001, Unit 3 was shutdown for the ninth refueling outage. Due to the degradation of control element assemblies (CEAs) noted during the last Unit 1 outage, the Unit 3 work scope included inspection and replacement of CEAs. Results of the inspections indicated that the CEAs had reached their end-of-life. As a result, Unit 2 was also shutdown for CEA replacement. Degradation of the CEAs was reported to the NRC in Licensee Event Report (LER) 50-528; 529; 530/2001-03, "Technical Specification Required Shutdown Due to Degraded Control Element Assemblies."

.1 Review of the Unit 3 Outage Plan

a. Inspection Scope

The inspectors reviewed the licensee's outage risk assessment, Palo Verde Unit 3 Ninth Refueling Shutdown Risk Assessment, to verify that the licensee appropriately considered risk in planning and scheduling the outage activities.

The inspectors primarily focused on the following activities:

- Transition and midloop operation
- Fuel offload and reload

b. Findings

No findings of significance were identified.

.2 Monitoring of Shutdown Activities

a. Inspection Scope

The inspectors reviewed plant data records and control room and unit logs and conducted interviews with licensed operators to assess the licensee's compliance with Technical Specifications (TS) plant cooldown limits during the Unit 3 plant cooldown.

b. Findings

No findings of significance were identified.

.3 Control of Outage Activities

a. Inspection Scope

The inspectors reviewed plant conditions and observed selected refueling outage activities throughout the outage to verify that the licensee maintained the plant in a configuration consistent with the requirements of TS and with the assumptions of the outage risk assessment. The inspectors verified that emergent issues were properly assessed for their impact on plant risk.

Electrical power availability was periodically verified to meet TS requirements and outage risk-assessment recommendations. Control room operators were interviewed to determine if they were cognizant of plant conditions. The inspectors reviewed equipment clearance activities, controls for reactivity management, and reactor coolant system inventory.

b. Findings

No findings of significance were identified.

.4 Clearance Activities

a. Inspection Scope

The inspectors reviewed the following equipment clearances to confirm that the clearance boundary did not increase the risk associated with the remaining relied-upon equipment:

- ID# 53805, Half Pipe Permit
- ID# 49935, Core Reload Permit
- ID# 52765, Steam Generator 1 Water Side Permit
- ID# 60011, Reactor Coolant Pump Seal Replacement

b. Findings

No findings of significance were identified.

.5 Reduced Inventory and Midloop

a. Inspection Scope

On October 2 and 25, 2001, the inspectors observed, in part, Unit 3 midloop activities to verify that the licensee had appropriately considered the risk associated with this activity. The inspectors reviewed the licensee's response to Generic Letter 88-17 and verified that licensee commitments had been properly translated into procedures. The inspectors also verified that multiple sources of electrical power, multiple reactor vessel level indications, and multiple reactor coolant system temperature indications were available. The inspectors observed licensee compliance with the following procedures:

- 40OP-9ZZ16 "RCS Drain Operations," Revision 27
- 40OP-9ZZ20 "Reduced Inventory Operations," Revision 3

b. Findings

No findings of significance were identified.

.6 Refueling Activities

a. Inspection Scope

The inspectors observed portions of core off-load and core reload activities to determine if these activities were conducted in accordance with the TS and administrative procedures. Refueling was conducted using Procedure 72IC-9RX03, "Core Reloading," Revision 16.

b. Findings

No findings of significance were identified.

.7 Monitoring of Heatup and Startup Activities

a. Inspection Scope

The inspectors reviewed control room and unit logs to verify that the Unit 3 startup was conducted in compliance with TS and administrative requirements. The inspectors accompanied licensee personnel during the performance of Procedure 40ST-9ZZ09, "Containment Cleanliness Inspection," Revision 4, to assess containment cleanliness and materiel condition of components. The inspectors reviewed Procedure 72PY-9RX04, "Low Power Physics Testing using RMAS," Revision 0, to verify that core operating limit parameters were consistent with the design.

b. Findings

No findings of significance were identified.

.8 Identification and Resolution of Problems

a. Inspection Scope

The inspectors screened CRDRs that documented problems identified during the Unit 3 outage to verify that problems were identified at an appropriate threshold.

b. Findings

No findings of significance were identified.

B. Unit 2 Midcycle Outage

On October 10, 2001, inspections of the Unit 3 CEAs confirmed that they had reached their end-of-life. Since the Unit 2 CEAs had seen similar duty to those in Unit 3, they were declared inoperable. Operators appropriately entered TS 3.1.5, which requires CEAs to be operable. The operators subsequently entered TS 3.0.3. and conducted an orderly shutdown of the unit to allow for CEA replacement.

.1 Review of the Unit 2 Outage Plan

a. Inspection Scope

The inspectors reviewed the licensee's outage risk assessment U2M10 Midcycle outage Shutdown Risk Assessment, to verify that the licensee appropriately considered risk in planning and scheduling the outage activities.

The inspectors primarily focused on the following activities:

- Maintenance of decay heat removal capability
- Maintenance of containment closure capability
- Movement of heavy loads inside containment

b. Findings

No findings of significance were identified.

.2 Monitoring of Shutdown Activities

a. Inspection Scope

The inspectors reviewed plant data records and control room and unit logs and conducted interviews with licensed operators to assess the licensee's compliance with TS plant cooldown limits during the Unit 2 plant cooldown.

b. Findings

No findings of significance were identified.

.3 Control of Outage Activities

a. Inspection Scope

The inspectors reviewed plant conditions and observed selected outage activities throughout the outage to verify that the licensee maintained the plant in a configuration consistent with the requirements of TS and with the assumptions of the outage risk assessment. The inspectors verified that emergent issues were properly assessed for their impact on plant risk.

Electrical power availability was periodically verified to meet TS requirements and outage risk-assessment recommendations. Control room operators were interviewed to determine if they were cognizant of plant conditions. The inspectors reviewed equipment clearance activities, controls for reactivity management, and reactor coolant system inventory.

b. Findings

No findings of significance were identified.

.4 Clearance Activities

a. Inspection Scope

The inspectors reviewed Equipment Clearance ID# 58749, "1877 SIT 2B Outage Permit," to confirm that the clearance boundary did not increase the risk associated with

the remaining relied-upon equipment.

b. Findings

No findings of significance were identified.

.5 Monitoring of Heatup and Startup

a. Inspection Scope

The inspectors observed and verified that the Unit 2 startup was conducted in compliance with TS and administrative requirements. The inspectors accompanied licensee personnel during the performance of Procedure 40ST-9ZZ09, "Containment Cleanliness Inspection," Revision 4, to assess containment cleanliness and materiel condition of components.

b. Findings

No findings of significance were identified.

.8 Identification and Resolution of Problems

a. Inspection Scope

The inspectors screened CRDRs that documented problems identified during the Unit 2 outage to verify that problems were identified at an appropriate threshold.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed the performance of and/or reviewed documentation for the following surveillance tests. Applicable test data was reviewed to verify whether they met TS, Updated Final Safety Analysis Report, and licensee procedure requirements. Also, the inspectors verified that the testing effectively demonstrated that the systems were operationally ready, capable of performing their intended safety functions, and that identified problems were entered into the corrective action program for resolution.

- October 23, 2001 Procedure 73ST-9XI33, "HPSI Pump and Check Valve Full Flow Test," Revision 21 (Unit 3)
- October 24, 2001 Procedure 73ST-9DG02, "Class 1E Diesel Generator and Integrated Safeguards Test," Revision 3, Section 8.7 (Unit 3)

- October 26, 2001 Procedure 73ST-9CL01, "Containment Leakage Type "B" and "C" Testing," Revision 14, Section 8.21 (Unit 3)

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors evaluated the following temporary modifications (T-Mod) and associated 10 CFR 50.59 screening. The inspectors reviewed these against the system design-basis documentation and verified that the modification did not adversely affect system operability or availability. Additionally, the inspectors verified that the installation was consistent with applicable modification documents and conducted with adequate configuration control. The inspectors observed the installation of and/or reviewed documentation for the following T-Mods:

- T-Mod 2438428 implemented to raise alarm and trip setpoints for reactor coolant Pump 1A upper journal bearing due to elevated temperatures (Unit 3)
- Procedure 31MT-9PW02, "Installation & Removal Of Temporary Cooling Tower To NC Heat Exchanger For PW System Outage," Revision 3 (Unit 3)
- T-Mod 2441542 implemented to replace the signal from RTD 112HC to CPC Channel C with the signal from RTD 111X (Unit 3)

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness [EP]

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspectors conducted an in-office review of changes made to emergency action levels contained in the following procedures:

- EPIP-01, Satellite Technical Support Center Actions, Revision 9
- EPIP-02, Operations Support Center Actions, Revision 22
- EPIP-03, Technical Support Center Actions, Revision 28
- EPIP-04, Emergency Operations Facility Actions, Revision 28

These changes were compared to the requirements of 10 CFR 50.54(q) and of

Appendix E, IV. B to Part 50 to determine if these changes decreased the effectiveness of the plan.

The inspectors also reviewed Revision 24 to the Palo Verde Nuclear Generating Station Emergency Plan, submitted September 11, 2001, against 10 CFR 50.54(q) to determine if the revision decreased the effectiveness he plan.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluations (71114.06)

a. Inspection Scope

On December 5, 2001, the licensee conducted an emergency preparedness drill. Prior to the drill, the inspectors reviewed the scenario to determine whether it was of appropriate scope to be included in the performance indicator statistics as intended by the licensee. During the drill the inspectors observed performance of the operations crew in the simulator, as well as licensee performance in the Technical Support Center. The inspectors observed activities involving event classification, notification, and protective action recommendations. The inspectors' observations were compared with licensee identified findings to determine the adequacy of the licensee's exercise evaluation process.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety [OS]

2OS2 As-Low-As-Is-Reasonable-Achievable (ALARA) Planning and Controls (71121.02)

a. Inspection Scope

The inspector interviewed and observed radiation workers and radiation protection personnel throughout the radiologically controlled area to determine if:

- low dose waiting areas were utilized
- personnel were maintaining doses ALARA
- radiation workers were receiving appropriate job supervision and radiation protection coverage

- worker performance was commensurate with the radiological hazards and work involved
- there were any procedural compliance issues

One high dose job, REP 3-3306D, "Unit-3 Primary Steam Generator No. 1 Nozzle Dam Removal," was observed to determine if personnel ALARA practices were within regulatory and procedural compliance.

The inspector attended two high dose prejob briefings, REP 3-3306D, "Primary Steam Generator No. 1 Nozzle Dam Removal," and REP 3-1283A, "Regenerative Heat Exchanger In Service Inspections and Associated Work - Scaffolding Removal." The inspector also conducted independent radiation surveys of various work areas within Unit 2 and 3 containment.

The inspector reviewed a summary of ALARA and radiological worker performance condition reports/disposition requests written since February 2001. The following CRDRs were reviewed in detail.

- 2311114, 2378897, 2398349, 2405005, 2405009, and 2405644
- CRDRs Action Items CRAI 2368229 and CRAI 2369641

The following items were reviewed and compared with regulatory requirements to determine whether the licensee had an adequate program to maintain occupational exposures ALARA:

- ALARA program procedures
- Plant collective exposure history for the past 3 years, current exposure trends, and 3-year rolling average dose information
- Six radiation exposure permit packages for work activities which could result in the highest personnel collective exposures during Outages 2M10 (2-3000A, and 2-3002D) and 3R9 (3-3502C, 3-3306D, 3-3000A, 3-3002D, and 3-3507E)
- Three postjob reviews of work activities from Refueling Outage U2R9 (REP 2-3412, "Pressurizer Heater Removal and Replacement," REP 2-3002, "Reactor De-Stack & Re-Stack," and REP 2-3508, "In Service Inspections")
- Use of engineering and administrative controls to achieve dose reductions, to include temporary shielding and scheduling of work activities
- Individual exposures of work groups radiation protection operations, refueling and mechanical, and maintenance services
- Refueling Outage U2R9 ALARA Report and 2000 Annual ALARA Report
- Hot spot tracking and reduction program

- Radiological work planning and interfaces between various departments
- Declared pregnant worker dose monitoring controls and exposures
- ALARA Committee Meeting minutes since February 2001

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 gaseous effluent processing systems were maintained so that radiological releases were properly mitigated, monitored, and evaluated with respect to public exposure, the inspector interviewed cognizant personnel, walked down major gaseous release system components, and observed ongoing activities, equipment material condition, and system configuration, as compared to the description in the Updated Final Safety Analysis Report. The licensee does not release liquid effluent into the public domain.

In addition, the inspector reviewed and compared the following items with regulatory and licensee requirements:

- Unit 2 control room essential air cleaning system surveillance testing for Train A and carbon analysis results for Units 1, 2, and 3 control room essential air and auxiliary/fuel building exhaust Trains A and B
- Surveillance test results for the stack and vent flow rates
- Changes to the Offsite Dose Calculation Manual and to the radioactive waste system design and operation
- Monthly, quarterly, and annual dose calculations
- Plant ventilation and auxiliary/fuel building exhaust stack radiation monitor and flow measurement device calibrations since the last inspection
- Effluent radiation monitor alarm setpoint values and setpoint calculation methodology
- September 2000 Site Chemistry Department Self-Assessment Surveillance Testing and two Nuclear Assurance audits (Audit 2000-02 and Audit 2001-07) related to the radioactive effluent treatment and monitoring program

To ensure that abnormal releases and conditions when effluent radiation monitors were out of service were controlled in accordance with requirements and that releases of radioactive materials were adequately quantified and evaluated, the inspector reviewed and compared the following items with regulatory requirements:

- 1999 and 2000 Radiological Effluent Release Reports
- Anomalous results reported in the 2000 Radiological Effluent Release Report and one special report (2-SR-2000-002) involving a venting of Unit 2 containment without treatment
- Effluent radiological occurrence performance indicator incidents, if applicable
- Selected radioactive release permits (waste gas decay tanks, fuel building ventilation exhaust stack, plant ventilation stack, and nonstandard containment purges) and the associated projected doses to members of the public since January 1999
- Compensatory sampling and radiological analyses conducted when effluent monitors were declared out of service
- Calibration records of selected counting room instrumentation associated with effluent monitoring and release activities
- Quality control records for selected counting room instruments
- 2000 Site Chemistry Laboratory Analytical Control Self-Assessment
- Selected quarterly interlaboratory site radiochemistry cross-check results (4th Quarter 2000 and 2nd Quarter 2001)

The inspector reviewed a summary of effluent related CRDRs written since January 1999. Thirty-one CRDRs were reviewed in detail (110722, 114569, 115781, 115967, 116309, 116716, 116999, 117121, 117170, 118364, 2304812, 2319298, 2319713, 2321265, 2328018, 2329349, 2334997, 2335540, 2338176, 2341996, 2351173, 2356338, 2358013, 2372272, 2384598, 2408525, 2408735, 2408895, 2419627, 2412326, and 2426047)

The inspector observed the sample collection and analysis of gaseous effluents from Unit 2 fuel building ventilation Exhaust RU-145 and the surveillance testing of Unit 2 control room essential air system Train A 2MHJAF04 for procedure and regulatory compliance.

b. Findings

No findings of significance were identified.

2PS2 Radioactive Material Processing and Transportation (71122.02)

a. Inspection Scope

The inspector interviewed radiation workers and radiation protection personnel involved in material processing and transportation activities and walked down the liquid and solid radioactive waste processing systems to verify that the current system configuration and operation agreed with the descriptions contained in the Final Safety Analysis Report and in the Process Control Program. No shipments of radioactive materials were conducted during the inspection, but the following items were reviewed and compared with regulatory requirements:

- The adequacy of any changes made to the radioactive waste processing systems since the last inspection
- Waste stream sampling procedures and radio-chemical sample analysis results for selected radioactive waste streams
- Scaling factors and calculations used to account for difficult-to-measure radionuclides
- Documentation for five non-excepted package shipments (00-RW-010, 01-RW-012, 01-RW-017, 01-RW-019, 01-SH-076) which 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
- Applicable transport cask Certificates of Compliance
- Transferee licenses
- Procedures for cask loading and closure
- Training of selected personnel responsible for the conduct of radioactive waste processing and radioactive material shipment preparation activities
- Nuclear Assurance Division Audit 2001-007 and self assessments (8/08/00, 6/08/01) related to the radioactive material and transportation programs performed since the last inspection
- Selected corrective action reports (113525, 115381, 2341338, 2422019, and 2423603), written against the radioactive material and shipping programs since the previous inspection

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspector interviewed members of the chemistry staff responsible for implementing the radiological environmental and meteorological monitoring programs and inspected 23 environmental monitoring stations. These stations included ten environmental air sampler stations (4, 6A, 7A, 14A, 15, 17A, 21, 29, 35, and 40), four drinking water wells (46, 48, 49, and 55), two broadleaf vegetation sampling stations (47 and 52), and seven thermoluminescent dosimeter locations (4, 7, 15, 21, 29, 35, and 40). The inspector observed the analysis in the environmental central laboratory of the air particulate and charcoal cartridge samples from three air sampler locations. The inspector also observed the collection and preparation for analysis of the four drinking water samples. The inspector visited and inspected the primary meteorological tower and verified the meteorological instrument data displays in the Unit 1 control room and technical support center. The inspector also observed the licensee survey materials for release from the radiologically controlled area in Unit 2.

The inspector reviewed and compared the following items with regulatory requirements to verify the impact of radioactive effluent releases to the environment and to ensure that the licensee performed surveys and established controls to prevent the inadvertent release of licensed materials into the public domain:

- Implementing procedures for the radiological environmental monitoring program, as described in the Offsite Dose Calculation Manual
- Number and location descriptions of the environmental sampling stations to determine that the environmental sampling program was representative of the effluent release pathways and the resulting public ingestion pathways
- Environmental sampling schedules for 2000 and 2001
- Sample collection and analysis data records to determine any missed samples, inoperable samplers, and lost thermoluminescent dosimeters
- Environmental sample analytical results to determine proper analysis detection sensitivities and any positive sample analysis results
- 1999 and 2000 annual land use census reports to determine any resulting changes to the radiological environmental monitoring program
- Calibration records for two Sierra mass air flowmeter instruments used to measure and verify the flow rate of the air through the environmental air samplers at the time of each sample collection

- Interlaboratory comparison program analytical results for 1999, 2000, and first half of 2001 to determine the quality of the environmental central laboratory's performance
- Calibration and quality control procedures and records for the liquid scintillation counting system, gas flow proportional counter, and multichannel analyzer system used in the environmental central laboratory to analyze environmental media samples
- Meteorological monitoring instrumentation calibration procedures and records of completed instrument semiannual calibrations for 2000 and the first half of 2001
- Meteorological instrument operability and reliability to determine the 1999 and 2000 annual meteorological data recovery
- 1999 and 2000 Annual Radiological Environmental Operating Reports
- 1999 and 2000 Annual Radioactive Effluent Release Reports
- Offsite Dose Calculation Manual, Revision 16, issued August 3, 2001
- Procedures, methods, criteria, and instruments used to survey, control, and release materials from the radiologically controlled area
- Calibration procedures and records for instruments used to perform material release radiological surveys
- Detection sensitivities of radiation survey instruments used for contamination measurements prior to release of materials from the radiologically controlled areas, including screening levels for commonly found site-specific surface contamination radionuclides
- Nuclear Assurance Audit Report 00-002, "Chemistry/REMP/Effluents/ODCM," performed January 24 through February 11, 2000
- Nuclear Assurance Evaluation Reports ER 01-283, "2000 Annual Radiological Environmental Operating Report," performed July 27-31, 2001; ER 01-305, "Radiological Environmental Monitoring Program," performed August 1-14, 2001; and ER 01-325, "Offsite Dose Calculation Manual," performed August 23, 2001
- Summary of CRDRs related to the radiological environmental monitoring program, meteorological monitoring program, and release of licensed radioactive material written since the previous inspection conducted in May 1999 (22 of these CRDRs were reviewed in detail: 36024, 96671, 96714, 96856, 98602, 115664, 116653, 118283, 118284, 119246, 2323185, 2351579, 2371571, 2373538, 2378807, 2382475, 2386820, 2394109, 2403228, 2409699, 2413790, and 2421601)

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Reactor Coolant System Activity

a. Inspection Scope

The inspectors reviewed a random sample of the reactor coolant system activity data logs from September 2000 through November 2001 to verify the accuracy and completeness of the reactor coolant system specific activity reported for all three units.

b. Findings

No findings of significance were identified. The performance indicators all remained in the licensee response band (Green).

.2 Reactor Coolant System Leakage

a. Inspection Scope

The inspectors reviewed the licensee's reactor coolant system leakage database from January through October 2001 to verify the accuracy and completeness of data used to calculate and report Reactor Coolant System Leakage performance indicator.

b. Findings

No findings of significance were identified. The performance indicators all remained in the licensee response band (Green).

4OA3 Event Followup (71153)

.1 (Closed) LER 50-529/2000-009-00: Main Steam Safety Valve Lift Pressure Outside of TS Limits. The inspectors reviewed the LER and the associated safety consequences analysis and no findings of significance were identified. This event was placed in the licensee's corrective action program and documented on CRDR 2322128. This event did not constitute a violation of NRC requirements.

.2 (Closed) LER 50-529/2000-008-00: Pressurizer Safety Valve As-Found Lift Pressures Outside of TS Limits. The inspectors reviewed the LER and the associated safety consequences analysis and no findings of significance were identified. This TS violation was placed in the licensee's corrective action program and documented on CRDR 2345083. This event constituted a violation of minor significance that is not subject to

enforcement action in accordance with Section IV of the Enforcement Policy.

- .3 (Closed) LER 50-529/2001-001-00: Main Steam Safety Valve As-found Lift Pressure Outside of Technical Specification Limits. The inspectors reviewed the LER and the associated safety consequences analysis and no findings of significance were identified. This event was placed in the licensee's corrective action program and documented on CRDR 2372744. This event did not constitute a violation of NRC requirements.
- .4 (Closed) LER 50-530/2001-002-00: Unit 3 Mode 3 Entry With An Auxiliary Feed Water Pump Inoperable.

On October 29, 2001 and again on November 2, Unit 3 control room operators entered Mode 3 with the steam driven auxiliary feed water pump inoperable. Unit 3 was being returned to service following a refueling outage. Maintenance had been performed on the steam driven auxiliary feedwater pump and the associated steam supply valves during the outage. The pump was inoperable because steam supply valves were tagged closed and deenergized to comply with TS 3.6.3 to support inservice valve testing. Control room operators misinterpreted a provisional note in TS 3.7.5 to allow entry into Mode 3 following a refueling outage with the pump inoperable. The operators proceeded with the transition to Mode 3 on two separate occasions in violation of TS 3.0.4. Planned corrective actions include procedure changes and training. This finding is more than minor because it had a credible impact on safety because a more restrictive mode of operation was entered without the required equipment. This finding affects the mitigating systems cornerstone and was considered to have a very low safety significance (Green) using the Significance Determination Process because two other trains of auxiliary feedwater were available. This licensee identified violation is discussed in Section 4AO7. This finding was documented in the licensee's corrective action program as CRDR 2438386. This LER is closed.

4OA6 Management Meetings

Exit Meeting Summary

The results of the ALARA Planning and Controls inspection were presented to Mr. G. Overbeck, Senior Vice President - Nuclear, and other members of licensee management at the conclusion of the inspection on October 19, 2001.

During a telephone conference on October 23, 2001, the ALARA Planning and Controls inspector discussed with Mr. D. Hautala and other members of the licensee staff that the failure of an auxiliary operator to follow radiation exposure permit instructions as documented in CRDR 2405644 was a noncited violation of Technical Specification 5.4.1. This violation is discussed in Section 4OA7.

The inspector presented the inspection results to Mr. D. Crozier, Program Leader, Emergency Planning, and other members of licensee management during a telephonic exit meeting on October 19, 2001. The licensee acknowledged the findings presented.

The results of the radiological environmental monitoring program inspection were presented to Mr. W. Ide, Vice President, Nuclear Production, and other members of licensee management at the conclusion of the inspection on November 9, 2001. The licensee acknowledged the findings presented.

The results of the radiological effluent treatment and monitoring systems program inspection were presented to Mr. W. Ide, Vice President, Nuclear Production, and other members of licensee management at the conclusion of the inspection on November 30, 2001. The licensee acknowledged the findings presented.

The results of the radioactive material processing and transportation inspection were presented to Mr. W. Ide, Vice President, Nuclear Production, and other members of licensee management at the conclusion of the inspection on November 9, 2001. The licensee acknowledged the findings presented.

The resident inspectors presented inspection results to Mr. G. Overbeck, Senior Vice President - Nuclear, and other members of licensee management on January 8, 2002. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. The licensee acknowledged the findings presented.

No proprietary information was identified during any of the inspections.

40A7 Licensee Identified Violations.

The following findings of very low safety significance were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as noncited violations.

If the Palo Verde Nuclear Generating Station contests these noncited violations, 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 Region IV; 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.

NCV Tracking Number

NCV 50-528/01-006-01	Technical Specifications 5.4.1 requires the implementation of procedures listed in Regulatory Guide 1.33, Appendix A. Procedure 75DP-0RP01, "RP Program Overview," Revision 3, requires individuals to follow special instructions listed in the radiation exposure permit. On July 13, 2001, an auxiliary operator failed to follow radiation exposure permit instructions to obtain a prejob briefing before entering a high radiation area. This occurrence was documented in the licensee's corrective
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action program as CRDR 2405644.

The safety significance of this violation was determined to be very low by use of the occupational radiation safety significance determination process because there was no actual over-exposure, substantial potential for over-exposure, and the ability to assess dose was not compromised.

NCV 50-530/01-006-02

Technical Specification 3.0.4 requires, in part, that when a limiting condition for operation is not met, entry into a Mode or other specified condition in the Applicability shall not be made except when the associated actions to be entered permit continued operation in the Mode or other specified condition in the Applicability for an unlimited period of time. Technical Specification 3.7.5 requires that three auxiliary feedwater trains be operable in Modes 1, 2, and 3. Contrary to these requirements, on October 29 and November 2, 2001, control room operators entered Mode 3 with the steam driven auxiliary feedwater pump inoperable. At the time, steam supply Valves 3JSGAUV134 and 3JSGAUV0138 were deenergized and closed under permit 59885 to be in compliance with TS 3.6.3 Action C.1. pending inservice valve testing. This issue is identified in the licensee's corrective action program as CRDR 2438386. This finding is of very low safety significance because it only affects the mitigating systems cornerstone and two other operable auxiliary feedwater trains were available.

ATTACHMENT 1

Supplemental Information

KEY POINTS OF CONTACTS

Licensee

S. Bauer, Section Leader, Regulatory Affairs
K. Bell, Team Leader, OCS/I&C Maintenance
J. Bungard, Section Leader, Dosimetry
R. Busto, Engineer, System Engineering
R. Buzard, Senior Consultant, Nuclear Regulatory Affairs
K. Coon, Technical Management Assistant, Radiation Protection
D. Crozier, Program Leader, Emergency Planning
T. Dickinson, Senior Shipping Technician, Radiation Protection
E. Dutton, Section Leader Operating Experience/Trending, Nuclear Assurance
M. Fladager, Department Leader, Radiation Protection
J. Gaffney, Director, Radiation Protection
F. Garrett, Technical Management Assistant, Design Engineering
T. Gray, Department Leader, Radiation Protection
D. Hautala, Senior Engineer, Regulatory Affairs
R. Henry, Site Representative, Salt River Project
V. Huntsman, Technical Management Assistant, Radiation Protection
W. Ide, Vice President, Nuclear Production
L. Johnson, Department Leader, Chemistry
P. Kirker, Department Leader, Operations
A. Krainik, Director, Regulatory Affairs
D. Leith, Senior Technical Assistant, Radiation Protection
D. Marks, Section Leader, Nuclear Regulatory Affairs
G. Overbeck, Senior Vice President - Nuclear
S. Peace, Consultant, Communications
M. Pest, Engineer, HVAC Maintenance Engineering
T. Phillips, Senior Engineer, OCS/I&C Maintenance
T. Radtke, Director, Maintenance
M. Renfro, Section Leader, Design Engineering
C. Seaman, Director, Regulatory Affairs and Quality Assurance
J. Scott, Director, Chemistry
D. Smith, Director, Operations
R. Stroud, Senior Consultant, Regulatory Affairs
D. Wheeler, Engineering Section Leader, Nuclear Assurance
M. Winsor, Director, Nuclear Engineering

LIST OF ITEMS OPENED AND CLOSED

Opened

50-528/01-06-01	NCV	Failure to follow radiation exposure permit instructions (Section 4OA7)
50-530/01-06-02	NCV	Mode 3 Entry with an auxiliary feedwater pump inoperable (Section 4OA7)

Closed

50-530/01-005-01	URI	Root Cause Investigation for Containment Operability with Quick Operating Closure Device Leakage (Section 1R15.1)
50-529/2000-009-00	LER	Main Steam Safety Valve Lift Pressures Outside of Technical Specification Limits (Section 4OA3.1)
50-529/2000-008-00	LER	Pressurizer Safety Valve As-Found Lift Pressures Outside of Technical Specification Limits (Section 4OA3.2)
50-529/2001-001-00	LER	Main Steam Safety Valve As-found Lift Pressure Outside of Technical Specification Limits (Section 4OA3.3)
50-530/2001-002-00	LER	Unit 3 Mode 3 Entry With An Auxiliary Feed Water Pump Inoperable (Section 4OA3.4)
50-528/01-06-01	NCV	Failure to follow radiation exposure permit instructions (Section 4OA7)
50-530/01-06-02	NCV	Mode 3 Entry With An Auxiliary Feedwater Pump Inoperable (Section 4OA7)

LIST OF DOCUMENTS REVIEWED

The inspectors reviewed the following documents to accomplish the objectives and scope of the inspection and to support any findings:

PROCEDURES

PROCEDURE	TITLE	REVISION
40OP-9PC01	Fuel Pool Cooling	2
40OP-9SI01	Shutdown Cooling Initiation	24
90DP-0IP10	Condition Reporting	9

40ST-9SI13	Low Pressure Safety Injection System Alignment Verification	3
74DP-0LC01	RCS Activity Performance Indicator	0
74ST-9RC02	Reactor Coolant System Specific Activity Surveillance Test	8
20DP-OSK43	Control of Safeguards Information	4

Drawings

03-M-PCP-001, "Fuel Pool Cooling and Cleanup System," Revision 21
02-M-SIP-001/002, "Safety Injection and Shutdown Cooling System," Revision 21

Condition Report/Disposition Requests

2442711
2444013
113728
2333810

Miscellaneous

NUMBER	DESCRIPTION	REVISION
TA-02-C09-2001-003	Unit 2 Cycle 9 Main Steam and Pressurizer Safety Valve Lift Pressure Setting Out-of-Tolerance Analysis	0
162-09649-JJV	Unit 2 Cycle 10 "As-Found" Main Steam Safety Valve Setpoint Safety Assessment	0

LIST OF ACRONYMS

ALARA	as-low-as-is-reasonably-achievable
CEA	control element assembly
CFR	Code of Federal Regulations
CRAI	Condition Report Action Item
CRDR	condition report/disposition request
IMC	Inspection Manual Chapter
LER	licensee event report
NCV	noncited violation
NDE	nondestructive examination
QOCD	quick operating closure device
REP	radiation exposure permit
T-Mod	temporary modification
TS	Technical Specifications
URI	unresolved item