



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

January 25, 2001

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 INSPECTION
REPORT 50-528/00-11; 50-529/00-11; 50-530/00-11**

Dear Mr. Overbeck:

On January 6, 2001, the NRC completed an inspection at your Palo Verde Nuclear Generating Station, Units 1, 2, and 3, facility. The enclosed report presents the results of this inspection. The results of this inspection were discussed on January 10 with you and members of your staff.

This inspection was an examination of activities conducted under your licenses as they relate to safety and to 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.

Based on the results of this inspection, the inspectors identified one issue of very low safety significance (GREEN). This issue was determined to involve a violation of NRC requirements. However, because of its very low safety significance and because it has been entered into your corrective action program, the NRC is treating this issue as a noncited violation, in accordance with Section VI.A.1 of the NRC Enforcement Policy. If you deny this noncited violation, you should provide a response with the basis for your denial within 30 days of the date of this inspection report 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 facility.

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/NRC/ADAMS/index.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

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

Enclosures:
NRC Inspection Report
50-528/00-11, 50-529/00-11, 50-530/00-11

Attachments:
(1) Supplemental Information
(2) NRC's Revised Reactor Oversight Process

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Only inspection reports to the following:
 David Diec (**DTD**)
 NRR Event Tracking System (**IPAS**)
 PV Site Secretary (**TLB4**)
 Dale Thatcher (**DFT**)

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RIV:RI:DRP/D	RI:DRP/D	SRI:DRP/D	BC:DRP/D
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T-LJSmith	T-NLS/LJS	T-LJSmith	/RA/
01/23/01	01/23/01	01/25/01	01/25/01

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 50-528, 50-529, 50-530
License: NPF-41, NPF-51, NPF-74
Report: 50-528/00-11, 50-529/00-11, 50-530/00-11
Licensee: Arizona Public Service Company
Facility: Palo Verde Nuclear Generating Station, Units 1, 2, and 3
Location: 5951 S. Wintersburg Road
Tonopah, Arizona
Dates: November 26, 2000, through January 6, 2001
Inspectors: J. H. Moorman, III, Senior Resident Inspector
N. L. Salgado, Resident Inspector
G. G. Warnick, Resident Inspector
J. G. Kramer, Resident Inspector, San Onofre
Approved By: Linda Joy Smith, Chief, Project Branch D, Division of Reactor Projects

SUMMARY OF FINDINGS

Palo Verde Nuclear Generating Station
NRC Inspection Report 50-528/00-11; 50-529/00-11; 50-530/00-11

IR 05000-528-00-11, IR 05000-529-00-11, IR 05000-530-00-11, on 11/26-1/06/01; Arizona Public Service Company; Palo Verde Nuclear Generating Station; Units 1, 2, and 3; personnel performance during nonroutine plant evolutions and events.

This inspection was conducted by resident inspectors. The inspection identified one GREEN finding that was a noncited violation. The significance of the finding is indicated by its color and was determined using MC 0609, "Significance Determination Process" (SDP). See Attachment 2 for a description of the NRC's revised reactor oversight process.

A. Inspector Identified Findings

Cornerstone: Mitigating Systems

GREEN. The inspectors determined that Procedure 40OP-9PC05, "Augmentation of Fuel Pool Cooling with Shutdown Cooling," Revision 13, was inadequate. On December 8, 2000, in Unit 3, this procedure was in use and did not provide guidance to isolate the suction of the spent fuel pool cooling pumps from the refueling water storage tank during the alignment of containment spray Pump B for spent fuel pool cooling. This resulted in the transfer of 27,000 gallons of borated water from the refueling water tank to the spent fuel pool. Of this, 1200 gallons spilled into the fuel building. The inspectors also determined that control room operators did not perform Procedure 40OP-9PC05, step 7.3.14, which required an operator be posted to monitor spent fuel pool level during the evolution. This resulted in delayed detection of the incorrect lineup that caused the spent fuel pool overfill. The failure to maintain and implement Regulatory Guide 1.33, Appendix A, recommended procedure for operation of the spent fuel pool cooling system was a noncited violation of Technical Specification 5.4.

This noncited violation was determined to have very low safety significance because the refueling water tank level did not drop below the Technical Specification required level during the event (Section 1R14).

B. Licensee Identified Violations

None

Report Details

Summary of Plant Status

Units 1, 2, and 3 operated at essentially 100 percent power for the duration of this inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignments - Routine Inspection (71111.04)

.1 Partial Walkdown Inspections

a. Inspection Scope

The inspectors performed an equipment alignment verification for Unit 3 Auxiliary Feedwater Train B.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown of the High Pressure Safety Injection System

a. Inspection Scope

The inspectors completed a detailed alignment verification of the High Pressure Safety Injection Systems. This verification included a review of Updated Final Safety Analysis Report, Procedure 40ST-9SI07, "High Pressure Safety Injection Alignment Verification," Revision 4, applicable plant drawings, outstanding modifications, work orders, operator workarounds, and condition report/disposition requests. 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.
- Hangers and supports were correctly installed and functional.

The inspector also verified that the licensee was identifying and documenting equipment alignment problems at an appropriate threshold in the corrective action program.

b. Findings

No findings of significance were identified.

1R05 Fire Protection - Routine Inspection (7111.05)

a. Inspection Scope

The inspectors performed fire protection walkdowns to assess the material condition of plant fire protection equipment and proper control of transient combustibles. The following risk significant areas were inspected:

- Control Building 100-foot elevation (Unit 1)
- Auxiliary Building 100-foot elevation (Unit 2)
- Main Steam Support Structure 80-foot elevation (Unit 3)

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

On December 12, the inspectors observed licensed operators perform job performance measures during the conduct of licensed operator requalification training. The inspectors evaluated the training and assessed the performance of the operators and the adequacy of the licensee evaluator critiques.

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope

The inspectors reviewed 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" :

- Shutdown Cooling Suction Valve 2JSIAUV655 Failure to Stroke Close (Unit 2)
- Reactor Head Vent Valve RCAHV0101 Failure to Stroke Open (Unit 2)
- Instrument Air Compressor A Tripped on Ground Fault (Unit 3)
- Intermittent Loss of Signal to the Channel "D" Plant Protection System Variable Overpower Trip Card (Unit 1)
- Condenser Tube Leaks Resulting in Power Reduction to 40 Percent (Unit 2)

- Fuel Building Isolation Damper 1MHFA(B)M01 Failure (Unit 1)
- Emergency Diesel Generator B Failed to Start (Unit 2)
- Auxiliary Feedwater Pump A Failure to Ramp Up to Speed (Unit 2)

The inspectors used the maintenance rule field flow chart to determine if the licensee properly dispositioned the failures.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed daily and weekly work schedules to determine when risk significant activities were scheduled. The inspectors reviewed selected activities regarding risk evaluations and overall plant configuration control. 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 inspection included the following maintenance activities:

- Diesel Generator, Spray Pond, Essential Cooling Water, and Essential Chilled Water Train A outages (Unit 3)
- Charging Pump Train B outage (Unit 2)
- Low Pressure Safety Injection Train B outage (Unit 1)

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Nonroutine Plant Evolutions and Events (71111.14)

1. Overfill of Unit 3 Spent Fuel Pool

a. Inspection Scope

On December 8, 2000, Unit 3 operators were aligning containment spray Pump B to recirculate to the spent fuel pool for the purpose of flushing a radiological hot spot in piping which cross-connects the safety injection and fuel pool cooling systems. While performing Section 7.3 of Procedure 40OP-9PC05, "Augmentation of Fuel Pool Cooling with Shutdown Cooling," Revision 13, a path was created between the spent fuel pool pump suction and the refueling water tank. With the spent fuel pool cooling pump as the motive force, approximately 27,000 gallons of borated water were transferred from

the refueling water tank to the spent fuel pool during the 11 minutes that the path existed. Most of the overfill water spilled into the fuel transfer canal and cask loading pit. However, approximately 1200 gallons of water spilled into the fuel building. The inspectors assessed plant conditions for compliance with Technical Specifications. The inspectors also conducted interviews with operators and reviewed control room logs, personnel statements, and applicable procedures.

b. Findings

Borated water was inadvertently transferred from the refueling water tank to the spent fuel pool and was spilled into the fuel building because of an inadequate procedure and a failure to follow a procedure. Procedure 40OP-9PC05 was found to be inadequate in that it did not contain a step to close low pressure safety injection pump suction isolation Valve SIB-HV-692. With this valve open, a path existed between the spent fuel pool cooling pump suction header and the refueling water tank through the safety injection Train B suction header. This allowed the operating spent fuel pool cooling pump to take a suction from the refueling water tank and discharge to the spent fuel pool. In addition, during performance of Procedure 40OP-9PC05, the control room operators did not post an operator at the spent fuel pool to monitor level as required by Procedure 40OP-9PC05, step 7.3.14. The control room operators discussed this step during a prejob briefing and determined that, in lieu of stationing an operator at the spent fuel pool to monitor level, the auxiliary operators performing the evolution would periodically monitor spent fuel pool level during the valve lineup and would be stationed at the spent fuel pool prior to starting containment spray Pump B. This resulted in delayed detection of the incorrect lineup that caused the spent fuel pool overfill.

The refueling water tank level stabilized at approximately 95 percent, which was within the Technical Specification limit. There were no personnel contaminations as a result of the spill and no safety-related equipment was affected. The licensee reviewed the spent fuel pool structural calculation and determined that the overfill did not affect structural integrity. The spent fuel pool high-level alarm did not function.

This finding, if left uncorrected, would become a more significant safety concern and would affect operability because, without operator intervention, the refueling water tank level would have dropped below the Technical Specification limit. Since the refueling water tank is used as a source of coolant for the emergency core cooling systems, this finding affected the Mitigating Systems cornerstone. The actual event was evaluated using MC 0609, "Significance Determination Process," (SDP) and found to be of very low safety consequence because the refueling water tank level did not drop below the Technical Specification required level.

Technical Specification 5.4, "Procedures," requires that written procedures be implemented and maintained covering the applicable procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Section 4.k. of this Regulatory Guide includes the Fuel Storage Pool Purification and Cooling System. Procedure 40OP-9PC05, "Augmentation of Fuel Pool Cooling with Shutdown Cooling," Revision 13, step 7.3.14, stated "Post an operator at the SFP to communicate any local level changes to the Control Room." Contrary to the above, on December 8, 2000, an

operator was not stationed as directed by Procedure 40OP-9PC05. Additionally, Procedure 40OP-9PC05 was inadequate in that it did not provide guidance to close Valve SIB-HV-692 to properly align containment spray Pump B for spent fuel pool cooling. This violation is associated with an inspection finding that is characterized by the significance determination process as having very low risk significance (GREEN) and is in the licensee's corrective action program as Condition Report/Disposition Request 2342925. As a result, this violation is being treated as a noncited violation, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 50-530/00-11-01).

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors evaluated the following operability determinations and evaluations for technical adequacy and assessed the impact of the condition on continued plant operation:

- Operability Determination 2345111 evaluated whether continued operation of Units 1 and 3 was justified with radioactive contamination in the nuclear cooling water system.
- Operability Determination 2341025 evaluated the operability of safety injection Tank 2A with the degraded condition of vent Valve 3JSIBHV0613.
- Entry into Unit 1 Technical Specification 3.3.3, Condition A, for inoperable Control Element Assembly Calculator 1

b. Findings

No findings of significance were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors observed or evaluated the following postmaintenance test to determine whether the test adequately confirmed equipment operability:

- Work Order 2313903 retest of low pressure safety injection Train B following pump/motor maintenance (Unit 1)

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed and/or reviewed the following surveillance tests:

- 73ST-9SI11 "Low Pressure Safety Injection Pumps Miniflow - Inservice Test," Revision 11 (Unit 3)
- 14FT-9FP08 "CO2 Fire Suppression System Functional Test," Revision 7 (Unit 1)
- 73ST-9AF03 "AFB-P01 - Inservice Test," Revision 10 (Unit 3)

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 Initiating Events Cornerstone

a. Inspection Scope

The inspectors reviewed the licensee's reactor coolant system leakage database and licensee event reports from January through December 2000, to verify the accuracy and completeness of data used to calculate and report the following performance indicators:

- Reactor coolant system leakage
- Safety system functional failures

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) Licensee Event Report (LER) 50-528/1999-006-00: Reactor Coolant System Pressure Boundary Leakage Due to Degraded Alloy 600 Instrument Nozzle. The inspectors reviewed the LER and no findings of significance were identified. This event has been addressed and corrected through the licensee's corrective action program and documented on Condition Report/Disposition Request 105382. This event did not constitute a violation of NRC requirements.

- .2 (Closed) LER 50-528/2000-002-00: Degraded Solder Joint Causes Inoperability of Channel D Plant Protection System. The inspectors determined that the issue is minor and warrants no additional inspection. Although this issue should be corrected, it constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the Enforcement Policy.
- .3 (Closed) LER 50-528;-529;-530/2000-003-00: Inappropriate Procedure Setting in Variable Over Power Trip Channels Result in Condition Prohibited by Technical Specification. The inspectors reviewed the LER and no findings of significance were identified. The setpoint problem was placed in the licensee's corrective action program and documented on Condition Report/Disposition Request 118492. This event constituted a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the Enforcement Policy.

40A6 Exit Meeting Summary

The resident inspectors presented the inspection results to Mr. G. Overbeck, Senior Vice President - Nuclear, and other members of licensee management on January 10, 2001.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT 1

PARTIAL LIST OF PERSONS CONTACTED

LICENSEE

R. Buzard, Senior Consultant, Nuclear Regulatory Affairs
D. Carnes, Unit 1 Department Leader
P. Crawley, Director, Nuclear Fuels Management
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T. Radtke, Director, Maintenance
M. Sontag, Section Leader, Nuclear Assurance
P. Wiley, Unit 2 Department Leader
M. Winsor, Director, Nuclear Engineering

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

01DP-0AP01, "Procedure Process," Revision 10
73ST-9SI11, "Low Pressure Safety Injection Pumps Miniflow - InService Test," Revision 11
40ST-9SI07, "High Pressure Safety Injection Alignment Verification," Revision 4
40OP-9SI02, "Recovery from Shutdown Cooling to Normal Operating Lineup," Revision 36

CONDITION REPORT/DISPOSITION REQUESTS

116508
239353
2326554
2333810
115788
116508
116388
2333696
2335119
2326407

MISCELLANEOUS

Licensed Operator Continuing Training Simulator Evaluation Scenario, SES004A01, Steam Generator Tube Rupture

Licensee Design Change Request 00-R005

Pre-Fire Strategies Manual, Revision 12

ITEMS OPENED AND CLOSED

OPENED

50-530/00-11-01	NCV	Inadequate Procedure and Operator Failure To Follow Procedure Results in Spent Fuel Pool Overfill (Section 1R14)
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CLOSED

50-530/00-11-01	NCV	Inadequate Procedure and Operator Failure To Follow Procedure Results in Spent Fuel Pool Overfill (Section 1R14)
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50-528/1999-006-00	LER	Reactor Coolant System Pressure Boundary Leakage Due to Degraded Alloy 600 Instrument Nozzle (Section 4OA3.1)
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50-528/2000-002-00	LER	Degraded Solder Joint Causes Inoperability of Channel D Plant Protection System (Section 4OA3.2)
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50-528;-529;-530/2000-003-00	LER	Inappropriate Procedure Setting in Variable Over Power Trip Channels Result in Condition Prohibited by Technical Specification (Section 4OA3.3)
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LIST OF ACRONYMS AND INITIALISMS USED

CFR	Code of Federal Regulations
LER	licensee event report
NCV	noncited violation
NRC	Nuclear Regulatory Commission

ATTACHMENT 2

NRC'S REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
<ul style="list-style-type: none">•Initiating Events•Mitigating Systems•Barrier Integrity•Emergency Preparedness	<ul style="list-style-type: none">•Occupational•Public	<ul style="list-style-type: none">•Physical Protection

To monitor these seven cornerstones of safety, the NRC used two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW, or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, or RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.