

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

April 18, 2000

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

SUBJECT: NRC RESIDENT INSPECTION REPORT NO. 50-528/00-04; 50-529/00-04; 50-530/00-04

Dear Mr. Overbeck:

This refers to the inspection conducted on February 20 through April 1, 2000, at the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, facility. The enclosed report presents the results of this inspection.

During the 6-week period covered by this inspection, your conduct of activities at the Palo Verde facility was generally characterized by safety-conscious operations, sound engineering and maintenance practices, and careful radiological controls.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. The violation is being treated as a noncited violation (NCV), consistent with Section VII.B.1.a of the Enforcement Policy. The NCV is described in the subject inspection report. If you contest the violation or severity level of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, facility.

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

Arizona Public Service Company

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

Sincerely,

/RA/

P. Harrell, Chief Project Branch D Division of Reactor Projects

Docket Nos.: 50-528 50-529 50-530 License Nos.: NPF-41 NPF-51 NPF-74

Enclosure: NRC Inspection Report No. 50-528/00-04; 50-529/00-04; 50-530/00-04

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bcc to DCD (IE01)

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION REGION IV

Docket Nos.:	50-528 50-529 50-530
License Nos.:	NPF-41 NPF-51 NPF-74
Report No.:	50-528/00-04 50-529/00-04 50-530/00-04
Licensee:	Arizona Public Service Company
Facility:	Palo Verde Nuclear Generating Station, Units 1, 2, and 3
Location:	5951 S. Wintersburg Road Tonopah, Arizona
Dates:	February 20 through April 1, 2000
Inspectors:	J. H. Moorman, III, Senior Resident Inspector D. E. Corporandy, Resident Inspector N. L. Salgado, Resident Inspector
Approved By:	P. Harrell, Chief, Project Branch D

ATTACHMENT: Supplemental Information

EXECUTIVE SUMMARY

Palo Verde Nuclear Generating Station, Units 1, 2, and 3 NRC Inspection Report No. 50-528/00-04; 50-529/00-04; 50-530/00-04

Operations

- The conduct of operations was professional as demonstrated by comprehensive shift turnovers, clear three-way communications, and operator attentiveness to current plant conditions. However, some operators were not fully aware of the plant response that would have occurred during a reactor trip in Unit 1 or 3 with the fast bus transfer of Buses NAN-S02 or NAN-S01 blocked (Section O1.1).
- Evaluation of the consequences and development of compensatory actions by Reactor Engineering to a problem with the rodded radial peaking factors in Unit 1 were thorough and timely. The shift manager clearly communicated compensatory actions to the control room operators. He was also thorough in briefing auxiliary operators about taking extra precautions when performing activities that could potentially cause a reactor power cutback (Section O1.2).
- A violation of Technical Specifications 3.3.1, Action G.1, and 3.3.5, Action E.1, resulted when a Unit 1 operations crew failed to recognize an out-of-tolerance condition indicated by surveillance data and subsequently failed to bypass an inoperable steam generator level channel. This event was reported as Licensee Event Report 50-528/99-004-00. This Severity Level IV violation is being treated as a noncited violation consistent with Section VII.B.1.a of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Condition Report/Disposition Request 102002 (Section 08.1).

Maintenance

- Knowledgeable technicians used approved procedures to perform routine maintenance activities in a safety conscious manner. Good work and foreign material control practices were observed (Section M1.1).
- Knowledgeable technicians used approved procedures to conduct surveillance activities in a safety conscious manner (Section M1.2).
- Material condition of the three units was good (Section M2.1).

Plant Support

• The radiological protection program was effectively implemented in those areas reviewed (Section R1.1).

Report Details

Summary of Plant Status

Unit 1 operated at essentially 100 percent power for the duration of this inspection period until March 25, 2000, when power was reduced to 70 percent to facilitate repairs to the Main Feedwater Pump A overspeed trip lockout solenoid valve. Power was returned to 100 percent later on the same day.

Unit 2 operated at essentially 100 percent power for the duration of this inspection period.

Unit 3 operated at 100 percent power until March 30, 2000, at which time the unit began reducing power for the planned eighth refueling outage. The unit entered Mode 3 on April 1.

I. Operations

O1 Conduct of Operations

- O1.1 Control Room Operations (Unit 1, 2, and 3)
 - a. Inspection Scope (71707)

The inspectors observed various aspects of plant operations, including compliance with Technical Specifications (TS), conformance with plant procedures, shift manning, communications, management oversight, proper system configuration and configuration control, operator performance during routine plant evolutions, and operator awareness of plant conditions.

b. Observations and Findings

The conduct of operations was characterized by compliance with procedures, three-way communications, attentiveness to plant conditions, and a safety-conscious work ethic. Shift turnover briefings were comprehensive and attended by the necessary personnel.

The inspectors discussed plant conditions with operators and shift technical advisors to determine their awareness of plant conditions and the risk associated with the plant configurations. On March 2, Startup Transformer NAN-X02 was taken out of service for replacement. This resulted in Units 1 and 3 blocking fast bus transfer on Buses NAN-S02 and NAN-S01, respectively. These two buses carry major, nonsafety-related plant loads that are normally supplied from the unit auxiliary transformer during normal plant operation. On a reactor trip in Units 1 and 3, Buses NAN-S02 or NAN-S01 would normally fast-transfer to a bus powered by Transformer NAN-X02. However, with fast bus transfer blocked, Buses NAN-S02 or NAN-S01 would deenergize. The loss of Buses NAN-S02 or NAN-S01 would cause, depending on the unit, the loss of one or two condensate pumps, one or two instrument air compressors, two circulating water pumps, two reactor coolant pumps, one nuclear cooling water pump, and other minor loads.

The inspectors discussed this plant configuration with control room operators to determine their awareness of posttrip plant response and the increase in risk that resulted from this plant alignment. The inspectors determined that the operators were aware of the type of major loads that would be lost but, in some cases, did not know specifically which loads would be affected. The inspectors determined that a premaintenance briefing had been conducted prior to taking Transformer NAN-X02 out of service, which covered the loss of 13.8-kV loads and not 4160-Vac loads.

Operators were also not aware of the minor increase in risk that resulted from the potential loss of power to the condensate pumps. In reviewing the equipment alignment in Unit 3, the inspectors determined that some equipment was not powered from buses which would still be powered after a reactor trip. This would cause the standby equipment to start automatically. After discussions with licensee management, the control room operators were briefed on the specifics of what to expect after a reactor trip, and equipment was aligned to minimize the impact of a reactor trip on inservice equipment.

c. <u>Conclusions</u>

The conduct of operations was professional as demonstrated by comprehensive shift turnovers, clear three-way communications, and operator attentiveness to current plant conditions. However, some operators were not fully aware of the plant response that would have occurred during a reactor trip in Units 1 or 3 with the fast bus transfer of Buses NAN-S02 or NAN-S01 blocked.

O1.2 Compensatory Actions for Nonconservative Radial Peaking Factor (Unit 1)

a. Inspection Scope (71707)

The inspectors observed the briefings of the operations crew, and compensatory actions that were implemented, because a nonconservative radial peaking factor had been entered into the core protection calculator system (CPC) and core operating limit supervisory system (COLSS).

b. Observations and Findings

At approximately 5 p.m. on March 17, Reactor Engineering discovered that the rodded radial peaking factors between the Group 5 and Partial Group (Group P) control element assemblies (CEA) had been swapped. This resulted in the Group 5 factor being nonconservative. The rodded radial peaking factors would be nonconservative if only Group 5 CEAs were inserted. It was noted that none of the safety functions of the CEAs were affected by the error.

The operating crews were instructed that, in order to stay within the design basis, the following protocol would be necessary when moving the CEAs. Group P could be inserted by itself. Situations involving insertion of both the Group 5 and Group P CEAs were allowed, provided that the Group P CEAs were inserted first. Until the rodded radial peaking factors were corrected in the CPC and COLSS, Group 5 CEAs were not

allowed to be inserted alone. Reactor Engineering also determined that, for one situation, a reactor power cutback, Group 5 CEAs could be automatically inserted into the core. The operators were instructed to manually trip the reactor, if a reactor power cutback were to occur.

During the shift briefing, the inspectors observed that compensatory measures were clearly communicated to the operators. In addition, the shift manager took the time to explain to the auxiliary operators the importance of minimizing any activities that could potentially cause perturbations in the plant secondary system and possibly lead to a reactor power cutback. By 10:55 p.m. that evening, the rodded radial peaking factors for CEA Group 5 and Group P had been checked, approved, and entered into CPC and COLSS.

c. <u>Conclusions</u>

Evaluation of the consequences and development of compensatory actions by Reactor Engineering to a problem with the rodded radial peaking factors in Unit 1 were thorough and timely. The shift manager clearly communicated compensatory actions to the control room operators. He was also thorough in briefing auxiliary operators about taking extra precautions when performing activities that could potentially cause a reactor power cutback.

O8 Miscellaneous Operations Issues (92901)

O8.1 (Closed) Licensee Event Report (LER) 50-528/99-004-00: Missed Required Actions for Inoperable Instrument Channel Caused by Human Performance Error

This LER describes a condition where a TS-required shiftly channel check indicated that the difference between two of the four wide-range level channels for Unit 1 Steam Generator 2 exceeded the acceptance criteria. The maximum difference was recorded as 4 percent for Channel B; however, the surveillance test acceptance criteria for this parameter was 3.73 percent. According to the LER, the reactor operator who performed the surveillance, the reactor operator who second checked the surveillance, the control room supervisor, and shift technical advisor who reviewed the surveillance failed to identify the out-of-tolerance condition.

On the following shift, the operators performing the test found the four wide-range level channels to be within the acceptance criteria. However, in reviewing the test data from the prior shift, the operators recognized that the operators on the previous shift had not identified the out-of-tolerance condition. Maintenance personnel assessed the condition and found the Channel B Wide-Range Level Indicator to be operating properly. The licensee's failure to place the unit in Mode 3 within 6 hours if the out-of-tolerance channel is not placed into bypass or trip within 1 hour is a violation of TS 3.3.1, Action G.1, and 3.3.5, Action E.1. This Severity Level IV violation is being treated as a noncited violation consistent with Section VII.B.1.a of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Condition Report/Disposition Request 102002 (50-528/0004-01).

Conclusion

A violation of Technical Specifications 3.3.1, Action G.1, and 3.3.5, Action E.1, resulted when a Unit 1 operations crew failed to recognize an out-of-tolerance condition indicated by surveillance data and subsequently failed to bypass an inoperable steam generator level channel. This event was reported as LER 50-528/99-004-00. This Severity Level IV violation is being treated as a noncited violation consistent with Section VII.B.1.a of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Condition Report/Disposition Request 102002.

II. Maintenance

M1 Conduct of Maintenance

- M1.1 General Comments on Maintenance Activities (Units 1, 2, and 3)
 - a. Inspection Scope (62707)

The inspectors observed all or portions of the following activities performed per the listed work document:

- 906928 "Calibrate Diesel Generator B Fuel Oil Strainer Differential Pressure Indicating Switch" (Unit 1)
 919316 "Troubleshoot and Rework Problem With Loss of Open Indication for Valve 2JSGA-UV-134A" (Unit 2)
 916149 "Replace solenoid coil of 3JSGAUV0138A" (Unit 3)
- b. Observations and Findings

The inspectors found the work performed under these activities to be properly performed. All work observed was performed with the work package present and in active use. Work and foreign material exclusion practices observed were good. Technicians were experienced and knowledgeable of their assigned tasks.

c. <u>Conclusions</u>

Knowledgeable technicians used approved procedures to perform routine maintenance activities in a safety conscious manner. Good work and foreign material control practices were observed.

M1.2 General Comments on Surveillance Activities (Units 2 and 3)

a. Inspection Scope (61726)

The inspectors observed all or portions of the following activities performed per the listed surveillance procedures:

40ST-9SF01 "CEA Operability Checks," Revision 3 (Unit 3)

40OP-9ZZ22 "Steam Plant Acoustic Valve Leakage Detection Program," Revision 1 (Unit 3)

73ST-9CT01 "Condensate Transfer System Inservice Test," Revision 5 (Unit 2)

b. Observations and Findings

The inspectors found that knowledgeable personnel performed these surveillances satisfactorily, as specified by applicable procedures.

c. <u>Conclusions</u>

Knowledgeable technicians used approved procedures to conduct surveillance activities in a safety conscious manner.

M2 Maintenance and Material Condition of Facilities and Equipment

- M2.1 <u>Review of Material Condition During Plant Tours (Units 1, 2, and 3)</u>
 - a. Inspection Scope (62707)

During this inspection period, routine tours of all units were conducted to evaluate plant material condition.

b. Observations and Findings

Observation of plant material condition during this inspection period identified no major observable material condition deficiencies. Minor deficiencies brought to the attention of the licensee were documented with work requests.

c. <u>Conclusions</u>

Material condition of the three units was good.

III. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

- R1.1 General Comments on Radiological Protection Controls
 - a. Inspection Scope (71750)

The inspectors monitored radiological protection activities during routine site tours.

b. Observations and Findings

The inspectors observed radiation protection personnel, including supervisors, routinely touring the radiologically controlled areas. Licensee personnel working in radiologically controlled areas exhibited good radiation work practices.

Contaminated areas and high radiation areas were properly posted. Area surveys posted outside the room were current. The inspectors checked a sample of doors, required to be locked for the purpose of radiation protection, and found that they were all properly controlled.

c. <u>Conclusions</u>

The radiological protection program was effectively implemented in those areas reviewed.

F8 Miscellaneous Fire Protection Issues (92904)

F8.1 Administrative Closure of Inspection Followup Item (IFI) (Units 1, 2, and 3)

Inspectors reviewed the following IFI and determined that no further action is required. This item is closed.

• IFI 50-528;-529;-530/9921-02: Corrective actions addressing fire protection system corrosion issues.

IV. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee's staff at the conclusion of the inspection on March 31, 2000. The licensee acknowledged the findings presented.

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

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Buzzard, Senior Consultant, Nuclear Regulatory Affairs

- P. Crawley, Director, Nuclear Fuel Management
- R. Fullmer, Director, Nuclear Assurance
- R. Henry, Site Representative, Salt River Project
- J. Hesser, Director, Outage and Scheduling
- W. Ide, Vice President, Nuclear Production
- P. Kirker, Unit 3 Department Leader, Operations
- A. Krainik, Director, Nuclear Regulatory Affairs
- J. Levine, Executive Vice President, Generation
- D. Marks, Section Leader, Nuclear Regulatory Affairs
- D. Mauldin, Vice President, Engineering and Support
- G. Overbeck, Senior Vice President, Nuclear
- T. Radke, Director, Maintenance
- D. Smith, Director, Operations
- M. Sontag, Department Leader, Nuclear Assurance
- P. Wiley, Unit 2 Department Leader, Operations
- M. Winsor, Director, Nuclear Engineering

INSPECTION PROCEDURES USED

- 37551 Onsite Engineering
- 61726 Surveillance Observations
- 62707 Maintenance Observations
- 71707 Plant Operations
- 71750 Plant Support Activities
- 92901 Operations Follow-up

ITEMS OPENED AND CLOSED

<u>Opened</u>		
50-528/0004-01	NCV	Failure to bypass an inoperable steam generator level channel (Section O8.1)

<u>Closed</u>

50-528/99-004-00	LER	Missed Required Actions for Inoperable Instrument Channel Caused by Human Performance Error (Section O8.1)
50-528/0004-01	NCV	Failure to bypass an inoperable steam generator level channel (Section 08.1)
50-528;-529; -530/9921-02	IFI	NRC Review Of The Fire Protection System Corrosion Issues (Section F8.1)

LIST OF ACRONYMS USED

- CEA Control Element Assembly
- CFR Code of Federal Regulations
- COLSS Core Operating Limit Supervisory System
- CPC Core Protection Calculator System
- IFI Inspection Followup Item
- LER Licensee Event Report
- NCV Noncited Violation
- NRC Nuclear Regulatory Commission
- PDR Public Document Room
- TS Technical Specifications