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

March 2, 2000

Gregg R. Overbeck, Senior Vice
President, Nuclear
Arizona Public Service Company
P.O. Box 52034
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SUBJECT: NRC RESIDENT INSPECTION REPORT NO. 50-528/00-03; 50-529/00-03; 50-530/00-03

Dear Mr. Overbeck:

This refers to the inspection conducted on January 9 through February 19, 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 four Severity Level IV violations of NRC requirements occurred. These violations are being treated as noncited violations (NCV), consistent with Section VII.B.1.a of the Enforcement Policy. The NCVs are described in the subject inspection report. If you contest a violation or severity level of an 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).

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.
50-528/00-03; 50-529/00-03; 50-530/00-03

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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.:	50-528/00-03 50-529/00-03 50-530/00-03
Licensee:	Arizona Public Service Company
Facility:	Palo Verde Nuclear Generating Station, Units 1, 2, and 3
Location:	5951 S. Wintersburg Road Tonopah, Arizona
Dates:	January 9 through February 19, 2000
Inspectors:	J. H. Moorman, III, Senior Resident Inspector D. E. Corporandy, Resident Inspector N. L. Salgado, Resident Inspector
Approved By:	P. H. Harrell, Chief, Project Branch D

ATTACHMENTS: Supplemental Information

EXECUTIVE SUMMARY

Palo Verde Nuclear Generating Station, Units 1, 2, and 3
NRC Inspection Report No. 50-528/00-03; 50-529/00-03; 50-530/00-03

Operations

- Supervisory oversight and direction of the operating crew and operator performance during the Unit 2 reactor startup were excellent (Section O1.1).

- A violation of Technical Specification Surveillance Requirement 4.5.2.h was identified for failing to perform an emergency core cooling system flow balance test following the implementation of a modification, in October 1996, that affected the flow characteristics in the high pressure safety injection system. This event was reported in Licensee Event Report 50-528/96-009-00. 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 990835 (Section O8.3).

Maintenance

- Knowledgeable technicians used approved procedures to perform routine maintenance activities in a safe manner. Good work control practices were observed (Section M1.1).

- Knowledgeable technicians used approved procedures to conduct surveillance activities in a safe manner (Section M1.2).

- Observable material condition of the three units was good (Section M2.1).

- An inadequate procedure for the installation of tie-back required scaffolding resulted in the installation of scaffolding in Unit 3 that would have had an interference with safety-related piping under seismic loading conditions. The failure of licensee procedures to include appropriate acceptance criteria for determining that scaffolding has sufficient clearance between its members and adjacent piping and components is a violation of 10 CFR Part 50, Appendix B, Criterion V. 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 116095 (Section M3.1).

- The licensee's, "Maintenance Rule Periodic Assessment," satisfied the requirements of 10 CFR 50.65(a)(3). Corrective actions for program issues identified in the assessment were being tracked by the licensee's corrective action program (Section M7.1).

- A violation of Technical Specification 3.0.3 occurred when it was discovered that an improperly wired power receptacle resulted in Unit 3 hydrogen recombiner Train B being inoperable since initial unit operation. This event was reported in Licensee Event Reports 50-530/98-002-00 and 50-530/98-002-01. 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 2-8-0236 (Section M8.1).

- A failure to perform procedure steps to reinstall seismic fasteners on the plant protection system Channel D cabinet rendered the equipment inoperable for 6 days and is a violation of Technical Specifications 3.3.1 and 3.3.5. This event was reported in Licensee Event Report 50-529/99-006-00. 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 2-9-0229 (Section M8.2).

Engineering

- The licensee's troubleshooting to find the cause of two valve failures in the Unit 2 turbine-driven auxiliary feedwater system was both timely and effective in returning the system to operable status within the Technical Specification allowed outage time. The licensee was pursuing resolution of the cause of the failed turbine-driven auxiliary feedwater surveillance tests in a comprehensive and timely manner (Section E1.1).

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 February 19, when power was reduced to 80 percent to facilitate repairs to the electrical generator stator cooling water system.

Unit 2 began this inspection period in Mode 3 with repairs ongoing in Condenser Hotwell 1B. On January 14, the unit was returned to 100 percent power. On January 14, power was again reduced to 40 percent to repair a tube leak in Condenser Hotwell 1A. The unit was returned to 100 percent power on January 16, and remained at that power level for the duration of this inspection period.

Unit 3 operated at essentially 100 percent power for the duration of this inspection period.

I. Operations

O1 Conduct of Operations

O1.1 Reactor Startup (Unit 2)

a. Inspection Scope (71707)

The inspectors observed portions of the reactor startup performed in accordance with Procedure 40OP-9ZZ03, “Reactor Startup,” Revision 16.

b. Observations and Findings

On January 12, 2000, the licensee prepared to return the unit to power operation after the replacement of eleven extraction steam expansion joints in Condenser Hotwell 1B. The root cause of failure of the expansion joints will be documented in Condition Report/Disposition Request (CRDR) 114865.

The inspectors attended a sensitive issues briefing conducted for withdrawal of the regulating control element assemblies. The briefing was conducted by the control room supervisor (CRS) and shift manager. Also in attendance were the reactor operators, unit department leader, shift technical advisor (STA), reactor engineering personnel, and a nuclear assurance department representative. The briefing covered procedure use, individual duties, communications, nuclear safety, industry events, and contingencies.

The operators conducted the reactor startup in accordance with Procedure 40OP-9ZZ03. Reactor engineering personnel prepared 1/m plots, which were independently reviewed by the STA. The reactor engineer and the STA evaluated the anticipated position of the control element assemblies to achieve criticality and made recommendations to the CRS about the magnitude of control element assembly withdrawals throughout the startup. The inspectors observed good communications between the CRS, reactor engineering personnel, and STA throughout the startup evolution. The reactor was declared critical at 3:38 p.m.

The CRS displayed excellent oversight and direction during the startup. The shift manger provided excellent supervisory oversight of the control room staff. The startup was monitored by the unit department leader, operations director, as well as a representative from the nuclear assurance department. The reactor engineer provided excellent support throughout the startup. The control room operators exhibited excellent attentiveness and responsiveness to plant conditions. Proper three-way communications were implemented by the control room staff.

c. Conclusions

Supervisory oversight and direction of the operating crew and operator performance during the Unit 2 reactor startup were excellent.

O8 Miscellaneous Operations Issues (92901)

O8.1 (Closed) Violation 50-528/9811-01: Failure To Log Abnormal Occurrence (Acid Filled Trench) In Control Room Log

The inspectors verified the corrective actions described in NRC Inspection Report 50-528/98-11; 50-529/98-11; 50-530/98-11, dated March 25, 1998, to be reasonable and complete.

O8.2 (Closed) Licensee Event Report (LER) 50-528/99-007-00: Half-Leg Engineered Safety Features Actuation System (ESFAS) Actuation Due to Loose Power Supply Jumper

The inspectors reviewed this LER and CRDR 108122, which were initiated for the event. The inspectors found that the cause determination and corrective actions were commensurate with the safety significance. This event was considered to be minor because the unit was in Mode 6 and defueled at the time of the event.

O8.3 (Closed) LER 50-528/96-009-00: Missed Emergency Core Cooling System (ECCS) Surveillance Requirement Due to Procedure Noncompliance

On July 8, 1999, while reviewing closed CRDR 190103, engineering personnel identified that ECCS flow characteristics had been affected when limit switch setpoints for Valve 1JSIAUV647, high pressure safety injection cold leg injection valve, were incorrectly set during the installation of a modification in October 1996. The incorrect setpoints allowed the valve to only open 76 to 80 percent. The licensee analyzed this condition and concluded that the short stroke for Valve 1JSIAUV647 resulted in an estimated 12 gpm flow degradation. This degradation was bounded by the safety analysis. The inspectors agreed with the licensee conclusions.

The inspectors determined that the information provided in the LER did not clearly describe the potential impact of this condition on the ability of the high pressure safety injection system to meet the surveillance requirements contained in the Technical Requirements Manual. Technical Requirements Manual Table 3.5.202-1 required that the sum of the injection line flow rates, excluding the highest flow rate, be greater than

or equal to 816 gpm. The LER stated that the estimated flow degradation of 12 gpm would reduce the total injection flow to 808 gpm. The LER did not address the fact that the estimated flow rate would not satisfy the requirements of the Technical Requirements Manual. The licensee characterized the 12 gpm degradation in injection flow as a conservative estimate. The inspectors reviewed the licensee's assumptions and evaluation and concluded that the estimate of flow degradation did appear to be conservative and that the operability determination adequately addressed the conservative estimate of flow degradation.

The licensee failed to perform an ECCS flow balance test following a modification that affected ECCS flow characteristics, as required by Technical Specification (TS) Surveillance Requirement 4.5.2.h. The failure to perform Surveillance Requirement 4.5.2.h is a violation of the TS. 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 CRDR 990835 (50-528/00-03-01).

Conclusions

A violation of Technical Specification Surveillance Requirement 4.5.2.h was identified for failing to perform an emergency core cooling system flow balance test following the implementation of a modification, in October 1996, that affected the flow characteristics in the high pressure safety injection system. This event was reported in LER 50-528/96-009-00. 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 CRDR 990835.

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:

898556 "Inspect Battery Charger and Electrical Components" (Unit 3)

905641 "Adjust the Turbine-Driven Auxiliary Feedwater PSV Discharge Pressure as Required to Approximately 15 - 15.5 PSIG, the Middle of the Specified Tolerance" (Unit 1)

890108 "Essential Spray Pond Inspect Sliding Screen and Intake Structure" (Unit 2)

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. Good work and foreign material exclusion practices were observed. Technicians were experienced and knowledgeable of their assigned tasks.

c. Conclusions

Knowledgeable technicians used approved procedures to perform routine maintenance activities in a safe manner. Good work control practices were observed.

M1.2 General Comments on Surveillance Activities (Units 1, 2, and 3)

a. Inspection Scope (61726)

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

73ST-9AF02 "AFA- P01 - Inservice Test," Revision 13 (Units 1 and 2)

73ST-9EC01 "Essential Chilled Water Pumps - Inservice Test," Revision 5 (Unit 3)

73ST-9SI11 "Low Pressure Safety Injection Pumps Miniflow - Inservice Test," Revision 10 (Unit 1)

b. Observations and Findings

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

c. Conclusions

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

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Review of Material Condition During Plant Tours (Units 1, 2, and 3)

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. Conclusions

Observable material condition of the three units was good.

M3 Maintenance Procedures and Documentation

M3.1 Scaffolding Erection Procedures (Units 1, 2, and 3)

a. Inspection Scope (62707)

The inspectors observed scaffolding that had been prestaged for the upcoming Unit 3 outage and reviewed the licensee's procedures for erecting scaffolding.

b. Observations and Findings

On January 27, 2000, during a routine walk down of Unit 3 Shutdown Cooling Heat Exchanger B, the inspectors observed a clearance of approximately 1/16-inch between the bottom of a flange adjacent to Valve EWB-HCV-66, nuclear cooling cross-tie valve, and the top of a horizontal cross member of recently erected scaffolding. The inspectors were concerned that the scaffolding might limit the movement of the essential cooling water piping in certain thermal modes of operation and during an earthquake.

In response to the inspectors' concerns, the licensee moved the horizontal cross-brace of the scaffolding to increase the vertical clearance from 1/16 inch to approximately 1 inch.

The licensee reviewed Procedure 30DP-9WP11 "Scaffolding Instructions," Revision 12, and Specification 13-CN-380, "Installation Specification for Seismic Category IX Scaffolding," Revision 4. The scaffolding observed by the inspectors was classified as tie-back required scaffolding, because it was tied to adjacent permanent structural members, which was intended to minimize scaffolding movement. Neither the scaffolding procedure nor the specification contained any clearance requirements, except for scaffolding near energized high voltage equipment. For the case observed by the inspectors, the original 1/16-inch gap between the scaffold bracing and adjacent piping did not violate any procedural or specification requirements.

The inspectors noted that in certain situations, if clearance requirements between piping or components and adjacent scaffolding were not established, interferences could occur that would put the system in an unanalyzed condition. Upon the inspectors' request, the licensee provided displacements from the piping stress calculation, which showed that at the location of concern, maximum vertical system movements would be 0.037-inch downward for thermal, and as much as 0.097-inch downward for seismic loading. Subsequent evaluation by the licensee concluded that had these movements occurred

at the time when a 1/16-inch vertical gap was present, an interference would have occurred. However, the system stresses and loading would not have exceeded design allowables. The inspectors agreed with the evaluation, but noted that the scaffolding procedures were deficient.

The failure of Procedure 30DP-9WP11 and Specification 13-CN-380 to include appropriate acceptance criteria for determining that tie-back required scaffolding has sufficient clearance between its members and adjacent piping and components is a violation of 10CFR Part 50, Appendix B, Criterion V. 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 CRDR 116095 (50-528;-529;-530/00-03-02).

c. Conclusions

An inadequate procedure for the installation of tie-back required scaffolding resulted in the installation of scaffolding in Unit 3 that would have had an interference with safety-related piping under seismic loading conditions. The failure of licensee procedures to include appropriate acceptance criteria for determining that scaffolding has sufficient clearance between its members and adjacent piping and components is a violation of 10 CFR Part 50, Appendix B, Criterion V. 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 CRDR 116095.

M7 Quality Assurance in Maintenance Activities

M7.1 Review of Maintenance Rule Integrated Assessment (Units 1, 2, and 3)

a. Inspection Scope (62707)

The inspectors reviewed the “Periodic Assessment of Maintenance Rule Program” conducted for the period of March 1998 to August 1999. This periodic assessment report was conducted pursuant to 10 CFR Part 50.65(a)(3). The inspectors also reviewed the associated CRDR initiated to track findings that required corrective actions.

b. Observations and Findings

The licensee’s assessment concluded, in part, that established corrective actions and goals were promoting improved performance of those structures, systems, and components (SSCs) in paragraph (a)(1) of the Maintenance Rule. Corrective actions appeared to be appropriately addressing the cause of the SSC performance which resulted in placement into (a)(1) monitoring, and the existing performance criteria appeared appropriate for continued monitoring of SSC performance after their return to (a)(2). Also, the (a)(2) SSC monitored by specific performance criteria were demonstrating adequate to good performance and were being effectively maintained by

the preventive maintenance program. Existing performance criteria were effectively monitoring the performance of (a)(2) SSCs. The licensee initiated CRDR 115358 to resolve assessment recommendations and establish due dates for their completion.

The licensee incorporated the periodic assessment report and a “Maintenance Rule Self Assessment” performed November 30 to December 10, 1999, into the “Maintenance Rule Integrated Assessment.” The assessments discussed, in part, the status and resolution of issues identified from Audit 98-014. The assessments concluded that overall the corrective actions adequately addressed the identified condition and were appropriately implemented to prevent recurrence.

c. Conclusions

The licensee’s "Maintenance Rule Periodic Assessment" satisfied the requirements of 10 CFR 50.65(a)(3). Corrective actions for program issues identified in the assessment were being tracked by the licensee’s corrective action program.

M8 Miscellaneous Maintenance Issues (92902)

M8.1 (Closed) LER 50-530/98-002-00 and -01: Train B Hydrogen Recombiner Inoperable Due to Cross-Wired Power Receptacle

All three units share two portable independent and redundant containment hydrogen recombiner systems. Both recombiners are normally kept in Unit 1 and available to be transported to either of the other units, if needed. The periodic testing of the recombiners had been accomplished while they were in Unit 1. A concern was raised that the hydrogen recombiners would not operate properly when transported to the other units due to differences in electrical phasing between units. A check of both Train A and B power receptacles for Units 2 and 3 was conducted.

On August 14, 1998, licensee personnel identified that the 480 volt, three-phase, alternating current power supply receptacle for Unit 3 hydrogen recombiner Train B was cross-wired (incorrectly phased). According to the LER, "the power supply receptacle was configured such that had it been utilized, the blower motor of the supplied Hydrogen Recombiner would have rotated in the reverse direction." Once discovered, the licensee took prompt corrective action to properly rewire the Unit 3 hydrogen recombiner Train B receptacle. Unit 3 hydrogen recombiner Train B was returned to operable status on the day of discovery.

Subsequent investigation by the licensee revealed that the Unit 3 Train B power receptacle had been cross-wired during construction in October 1986. Prior to implementation of the Improved TS on August 13, 1998, there was no Limiting Condition for Operation by which Unit 3 could operate without at least one hydrogen recombiner operable. Therefore, during the periods of time when hydrogen recombiner Train A was inoperable, or those times when the hydrogen purge system was inoperable, Unit 3 was in TS 3.0.3, which specified that the condition be corrected within 1 hour or be in Mode 3 within the next 6 hours. The hydrogen recombiner being inoperable in excess of the

Technical Specification action completion time is a violation of TS 3.0.3. This Severity Level IV violation is being treated as a non-cited violation consistent with Section VII.B.1.a of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as CRDR 2-8-0236 (50-530/00-03-03).

Conclusions

A violation of Technical Specification 3.0.3 occurred when it was discovered that an improperly wired power receptacle resulted in Unit 3 hydrogen recombiner Train B being inoperable since initial unit operation. This event was reported in LER 50-530/98-002-00 and 50-530/98-002-01. 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 CRDR 2-8-0236.

M8.2 (Closed) LER 50-529/99-006-00: Reactor Protection System (RPS) and ESFAS Instrumentation Not Bypassed Within One Hour As Required By TS

This LER describes a condition where the plant protection system Channel D parameters had been inoperable due to a personnel error. The licensee's investigation of the event revealed that instrumentation and control technicians did not reinstall the seismic fasteners that were removed to perform a periodic response time surveillance test. This is because the technicians failed to perform all of the restoration steps of the surveillance test. The condition was immediately corrected when it was identified.

Actions required by associated TS 3.3.1 and 3.3.5 to restore the equipment to an operable status or place the channel in bypass or trip were not performed within the TS required action times. This Severity Level IV violation for not complying with the requirements of TS LCOs 3.3.1 and 3.3.5 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 CRDR 2-9-0229 (50-529/00-03-04).

Conclusion

A failure to perform procedure steps to reinstall seismic fasteners on the plant protection system Channel D cabinet rendered the equipment inoperable for 6 days and is a violation of TSs 3.3.1 and 3.3.5. This event was reported in LER 50-529/99-006-00. 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 CRDR 2-9-0229.

III. Engineering

E1 Conduct of Engineering

E1.1 Failed Surveillance Tests for the Turbine-Driven Auxiliary Feedwater (TDAFW) Pumps (Units 1 and 2)

a. Inspection Scope (37551)

The inspectors observed the licensee's investigation into the failure of the Unit 2 TDAFW pump surveillance test on January 21, 2000, and a similar failure of the Unit 1 TDAFW pump surveillance test on February 15. The inspectors reviewed pertinent documents and interviewed key licensee personnel in the course of their observation and evaluation of licensee performance.

b. Observations and Findings

On January 21, during testing of the Unit 2 TDAFW pump, Valve SGA-UV-134A, the auxiliary steam admission bypass valve from Steam Generator No. 1, failed in the closed position. Additionally a Safety Equipment Inoperable Status (SEIS) alarm was received in the control room, and when the operators attempted to close Valve SGA-UV-134, the steam admission valve from Steam Generator No. 1, it did not respond. Valve SGA-UV-134 was closed manually by the operators, thus isolating one of the two steam supplies to the TDAFW pump.

Trouble shooting by the licensee revealed that a coil in the solenoid operator of Valve SGA-UV-134A had an internal short. In addition, Fuse 3FU in the circuit was found to be open. Upon reviewing the circuitry, the licensee determined that the internally shorted coil of Valve SGA-UV-134A caused circuit resistance to decrease with a corresponding increase in circuit amperage resulting in the opening of Fuse 3FU. The open circuit at Fuse 3FU removed control power for Valve SGA-UV-134, rendering it unable to be closed remotely from the control room and alarming the SEIS annunciator, as designed.

On January 22, the failed solenoid and Fuse 3FU were replaced, and the TDAFW pump was successfully retested. CRDR 115571 was initiated to determine if the observed condition constituted a maintenance rule functional failure. The licensee determined that the event constituted a maintenance rule functional failure, because the failure would have prevented the operators from remotely isolating Steam Generator No. 1 and mitigating an indirect radioactive release, if a steam generator tube rupture would have occurred. The CRDR also intended that the cause of the solenoid coil failure be evaluated. The licensee noted that the coil was required to be replaced at a 112 month interval. The failed coil had been in service for only 53 months. CRDR 115571 also intended that the design of the circuit be re-evaluated, since it was noted that the failure of Valve SGA-UV-134A led to the opening of Fuse 3FU and the disabling of Valve SGA-UV-134, which the fuse was intended to protect.

On February 15, during a surveillance test of the Unit 1 TDAFW pump, a similar failure occurred. The closing of Valve SGA-UV-134A, the loss of control power to Valve SGA-UV-134, and the SEIS alarm were found to have been caused by the same component failures, internal shorting of the solenoid coil of Valve SGA-UV-134A and subsequent opening of Fuse 3FU.

Noting that the task of CRDR 115571, to evaluate the cause of the solenoid coil failure was ongoing, the inspectors questioned if some earlier action might have prevented the

failure of the Unit 1 valve solenoid coil. A failed solenoid could be detected by measuring its electrical resistance. However, the solenoid coil failures in both Units 1 and 2 were not experienced until the TDAFW pumps were well into their respective surveillance runs. The inspectors also noted that the Unit 1 Valve SGA-UV-134A solenoid coil had only been in service for 36 months at the time of its failure. The licensee's root cause evaluation and design review was ongoing at the close of this inspection period.

c. Conclusions

The licensee's troubleshooting to find the cause of two valve failures in the Unit 2 turbine-driven auxiliary feedwater system was both timely and effective in returning the system to operable status within the Technical Specification allowed outage time. The licensee was pursuing resolution of the cause of the failed turbine-driven auxiliary feedwater surveillance tests in a comprehensive and timely manner.

IV. Plant Support

R1 Radiological Protection and Chemistry 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. Conclusions

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

V. 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 1, 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

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A. Krainik, Director, Nuclear Regulatory Affairs
D. Larkin, Senior Consultant, Nuclear Regulatory Affairs
J. Levine, Executive Vice President, Generation
D. Mauldin, Vice President, Engineering and Support
D. Marks, Section Leader, Nuclear Regulatory Affairs
G. Overbeck, Senior Vice President, Nuclear
T. Radke, Director, Maintenance
B. Ruggles, Communications Representative, Strategic Communications
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	Plant Operations Follow-up
92902	Maintenance Follow-up

ITEMS OPENED AND CLOSED

Opened

50-528/00-03-01	NCV	Failure To Perform TS Required Full Flow ECCS Test (Section O8.3)
50-528;-529; -530/00-03-02	NCV	Inadequate Scaffolding Procedure (Section M3.1)
50-530/00-03-03	NCV	Inoperable Hydrogen Recombiner System (Section M8.1)
50-529/00-03-04	NCV	RPS and ESFAS Instrumentation Not Bypassed Within One Hour As Required By TS (Section M8.2)

Closed

50-528/9811-01	VIO	Failure To Log Abnormal Occurrence (Acid Filled Trench) In Control Room Log (Section O8.1)
50-528/99-007-00	LER	Half-Leg ESFAS Actuation Due to Loose Power Supply Jumper (Section O8.2)
50-528/96-009-00	LER	Missed ECCS Surveillance Requirement Due to Procedure Noncompliance (Section O8.3)
50-528/00-03-01	NCV	Failure To Perform TS Required Full Flow ECCS Test (Section O8.3)
50-528;-529; -530/00-03-02	NCV	Inadequate Scaffolding Procedure (Section M3.1)
50-530/98-002-00 and -01	LER	Train B Hydrogen Recombiner Inoperable Due to Cross-Wired Power Receptacle (Section M8.1)
50-530/00-03-03	NCV	Inoperable Hydrogen Recombiner System (Section M8.1)
50-529/99-006-00	LER	RPS and ESFAS Instrumentation Not Bypassed Within One Hour As Required By Technical Specification (Section M8.2)
50-529/00-03-04	NCV	RPS and ESFAS Instrumentation Not Bypassed Within One Hour As Required By TS (Section M8.2)

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
CRDR	condition report/disposition request
CRS	control room supervisor
ECCS	emergency core cooling system
ESFAS	engineered safety features actuation system
gpm	gallons per minute
LER	licensee event report
NCV	noncited violation
NRC	Nuclear Regulatory Commission
PDR	Public Document Room

RPS	reactor protection system
SEIS	Safety Equipment Inoperable Status
SSC	structures, system, and components
STA	shift technical advisor
TDAFW	turbine-driven auxiliary feedwater
TS	Technical Specifications