ENCLOSURE 1

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.:	50-528/98-04 50-529/98-04 50-530/98-04
Licensee:	Arizona Public Service Company
Facility:	Palo Verde Nuclear Generating Station, Units 1, 2, and 3
Location:	5951 S. Wintersburg Road Tonopah, Arizona
Dates:	April 19 through May 30, 1998
Inspectors:	Jim Moorman, Senior Resident Inspector Nancy Salgado, Resident Inspector Dan Carter, Resident Inspector
Accompanied by:	Margaret Kotzalas, Accompanying Inspector
Approved By:	P. H. Harrell, Chief, Projects Branch D

ATTACHMENT: Supplemental Information

EXECUTIVE SUMMARY

Palo Verde Nuclear Generating Station, Units 1, 2, and 3
NRC Inspection Report 50-528/98-04; 50-529/98-04; 50-530/98-04

Operations

- Auxiliary Operators (AO) conducted thorough checks of plant equipment with a good questioning attitude and attention to detail, as demonstrated by identification of a small oil leak on an emergency diesel generator and a high spray pond pump discharge pressure that indicated line blockage (Section O4.1).

- During the Unit 1 startup, nonconservative decision making by the Control Room Supervisor (CRS) caused the administrative limit for the power ascension ramp rate to be exceeded. Other contributors to the event were weakness in communications between the licensed operators, failure to include the reactor engineer in the prejob brief for power ascension, and weak procedures (Section O4.2).

Maintenance

- Inadequate reinstallation of a vibration probe flange on Unit 1 Main Feedwater Pump A during the Unit 1 outage allowed oil to leak onto the pump high pressure journal bearing. The oil ignited and resulted in a small fire that was extinguished quickly. Subsequent corrective actions for the event were comprehensive, effective, and timely (Section M2.1).

- Inattention to detail by instrument and control (I&C) technicians resulted in a noncited violation of Technical Specification (TS) 6.8.1 for not conducting postmaintenance retests, in accordance with the applicable procedures, on three separate occasions (Section M4.1).

Engineering

- Engineering support for the Furmanite repair to a regenerative heat exchanger valve was good. The engineers performed comprehensive, detailed calculations and appropriately performed a safety evaluation in support of the required valve modification (Section E1.1).

Plant Support

- Radiological planning for the Furmanite repair of a regenerative heat exchanger vent valve was very good. The as-low-as-reasonably-achievable (ALARA) review reduced the area dose rate from 500 to 75 mRem/hr and the total exposure for the job did not exceed 592 mRem (Section R4.1).

- Corrective actions for improvement of the emergency plan exercise scenario development process in response to an exercise weakness were not fully effective in that

a scenario was created that did not provide sufficient information for operators to promptly recognize and declare the desired Emergency Action Level (EAL) (Section P1.2).

- Performance of the Technical Support Center (TSC) staff during the annual emergency preparedness exercise was very good. The staff demonstrated effective communications, with frequent and informative briefings provided by the emergency coordinator. Good access control and accountability were established and maintained (Section P1.3).

- Relocation of the Operations Support Center (OSC) to an alternate facility during the annual emergency preparedness exercise was disorganized, which extended the amount of time taken for the relocation. Because of this, an opportunity to demonstrate operations from the relocated OSC was missed (Section P1.4).

- The Emergency Response Organization (ERO) critique process was effective in identifying areas in need of corrective action. However, the severity of identified weaknesses was not accurately reflected in the drill report (Section P1.5).

- The training program for the ERO was effectively implemented, as demonstrated from the 50 records reviewed by the inspectors (Section P2.1).

Report Details

Summary of Plant Status

Unit 1 entered Mode 1 at the beginning of this inspection period, starting up after its seventh refueling outage, reached 100 percent power on April 24, 1998, and operated at essentially that power level for the duration of this inspection period.

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

I. Operations

O4 Operator Knowledge and Performance

O4.1 AOs Area Monitoring (Units 2 and 3)

a. Inspection Scope (71707)

The inspectors observed AOs perform Procedure 40DP-9OPA4, "Area 4 Operator Logs, Modes 1 through 4," Revision 26, and Procedure 40DP-9OPA3, "Area 3 Operator Logs, Modes 1 through 4," Revision 16. In addition, the inspectors observed the Area 3 AO perform a system alignment associated with a clearance order and the Area 4 AO perform portions of a surveillance test on Unit 3 Diesel Generator B per Procedure 40ST-9DG02, "Diesel Generator B Test," Revision 2.

b. Observations and Findings

The AOs were knowledgeable about the performance of structures, systems, and components in their assigned areas of the plant and followed logkeeping procedures. A Unit 3, Area 4 AO exhibited a questioning attitude when noticing control air supply lines out of the expected location. He investigated the situation and determined it to be acceptable.

The Unit 2, Area 4 AO displayed good attention to detail during chemical addition of corrosion inhibitor to the essential spray ponds. The AO noticed that the discharge pressures for Pumps A and B were different. Chemistry confirmed a discrepancy in concentration of corrosion inhibitor between Spray Ponds A and B. A work request was issued to investigate a possible blockage in the pump discharge line. The licensee took the necessary steps to fix the problem.

Inspectors observed a Unit 3, Area 3 AO perform a system alignment associated with a clearance order after completion of work on the hydrogen recombiner system. Appropriate attention to detail was displayed by the AO and independent verification for the removal of the clearance tags was requested.

Inspectors observed portions of the Unit 3 Diesel Generator B surveillance test. Procedural adherence was good, including obtaining the required independent

verifications. During the course of the surveillance, a minor oil leak was detected. Mechanics promptly responded, evaluated the leak, and issued a work request to have the leak repaired.

c. Conclusion

AOs conducted thorough checks of plant equipment with a good questioning attitude and attention to detail, as demonstrated by identification of a small oil leak on an emergency diesel generator and a high spray pond pump discharge pressure that indicated line blockage.

O4.2 Operator Performance During Startup (Unit 1)

a. Inspection Scope (71707)

The inspectors reviewed documentation and discussed with operations personnel an event involving poor implementation of reactivity management practices during the Unit 1 startup after the seventh refueling outage.

b. Observations and Findings

On April 20, 1998, the core reload power ascension testing at the 20 percent power level was completed for Unit 1. The operators were in the process of increasing power to the next testing plateau. The shift crew had conducted a briefing to discuss the power increase. The brief included discussion of the limitation of 3.5 percent per hour power ascension rate when greater than 20 percent power as required by Procedure 72PA-9ZZ07, "Reload Power Ascension Test," Revision 11. They also discussed that, to prevent exceeding the limit of 3.5 percent per hour, Procedure 40OP-9ZZ05, "Power Operations," Revision 20, directed the power ascension rate be kept at 1.0 percent per hour less than the maximum allowed rate.

The crew concluded that power would be monitored using the indication required by Procedure 40DP-9ZZ05. This indication (JSCALOR) displayed instantaneous power; however, minor changes in power at low power levels caused oscillations in indicated power level and made the instrument difficult to read. The onshift reactor engineer was not notified of the briefing and was not present when power ascension began. The primary operator calculated a dilution rate that would allow the crew to raise power 0.6 percent every 15 minutes using a 3-minute dilution at 20 gallons per minute followed by a 12-minute wait.

At 8:15 p.m., with reactor power at 19.15 percent, the first dilution was conducted. At 8:30 p.m., power level increased to 19.33 percent and the second dilution was conducted. Concurrent with the dilutions, the secondary operator raised power with the turbine in an attempt to increase power at 0.6 percent every 15 minutes. The secondary operator was leading the power increase with the turbine, which caused the average temperature to be low in the band. At approximately 8:37 p.m., the CRS observed that

the average temperature was low in the band and directed the primary operator to begin a continuous dilution. The primary operator reminded the CRS of the original plan for power ascension, but complied with the direction to begin the dilution.

At approximately 8:40 p.m., the reactor engineer returned to the control room to discuss the power ascension and found the ascension already in progress. The reactor engineer had intended to discuss with the crew which power indicator would provide the most reliable indication at low power levels. After a review of plant status, the reactor engineer did not observe anything out of the ordinary.

At 8:45 p.m., reactor power was at 19.79 percent. The crew was experiencing minor difficulties shifting charging pumps and the reactor engineer was asked to leave the at-the-controls area of the control room. The reactor engineer complied and went to the computer room to monitor the startup. At approximately 8:55 p.m., the primary operator noted that the average temperature was high in the band and stopped the dilution. The total amount of the dilution was approximately 360 gallons. At 8:58 p.m., the secondary operator noted that power was 21.36 percent and seemed to be rising fast. At this time, the secondary operator lowered turbine load and informed the primary operator and CRS that an automatic rod withdrawal prohibit alarm had come in and that a steam bypass valve had opened. At 9 p.m., the alarm cleared and the bypass valve shut. At 9:03 p.m., another withdrawal prohibit alarm was received and the bypass valve reopened. The crew allowed conditions to stabilize and at 9:15 p.m. reactor power was 22.65 percent.

The reactor engineer returned to the control room at 9:30 p.m. and heard the crew discussing the event. He then determined that the crew was using JSCALOR as the indication for reactor power, rather than the indication that was recommended by reactor engineering. The recommended power indication (JSCALORC) provided a 10-minute average power indication and was a better indication at low power levels. At 9:49 p.m., the alarm cleared and the bypass valve shut for the second time.

The inspectors discussed the event with reactor engineering and determined that fuel preconditioning limits had not been exceeded. Details of the event and corrective actions were documented in Condition Report/Disposition Request (CRDR) 1-8-0283. The licensee initiated several corrective actions as a result of this event. The corrective actions included a change to Procedure 40OP-9ZZ05 to monitor power using the 10-minute average indication and to make the prejob brief for Procedure 72PA-9ZZ07 more thoroughly cover expected plant response. Simulator training and coaching for the crew, changes to just-in-time training, and the issuance of a newsletter were also part of corrective actions.

c. Conclusions

During the Unit 1 startup, nonconservative decision making by the CRS caused the administrative limit for the power ascension ramp rate to be exceeded. Other

contributors to the event were weakness in communications between the licensed operators, failure to include the reactor engineer in the prejob brief for power ascension, and weak procedures.

O8 Miscellaneous Operations Issues

O8.1 Review of World Association of Nuclear Operators Report

The inspectors reviewed the November 19, 1997, World Association of Nuclear Operators evaluation report which covered a site evaluation performed during the weeks of September 29 and October 6, 1997. The inspectors found the evaluation was consistent with recent NRC perception of the licensee's performance.

II. Maintenance

M1 Conduct of Maintenance

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

a. Inspection Scope (62707)

The inspectors observed all or portions of the following work activities performed per the following work orders (WO):

WO 841153: Perform Procedure 31MT-9ZZ17, "Disassembly and Reassembly of Borg-Warner Check Valves," Revision 4

WO 832644: Replace Relay for Containment Isolation Valve CHB-UV-924

b. Observations and Findings

The inspectors found the work performed under these activities to be in accordance with procedures and was thorough. All work observed was performed with the work package present and in active use. Generally, good work practices were observed. Foreign material exclusion practices were good. Technicians were experienced and knowledgeable of their assigned tasks.

c. Conclusions

Routine maintenance activities were generally conducted in a safety conscious manner by knowledgeable technicians using approved procedures. Good work and foreign material 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 surveillance activities:

73ST-9AF02: "AFA-P01 - Inservice Test," Revision 8

73ST-9XI35: "High Pressure Safety Injection Pump Discharge Check Valve Closed Exercise Test," Revision 0

43OP-3NC01: "Nuclear Cooling Water," Revision 8

73ST-9SI11: "Low Pressure Safety Injection Pumps Mini-flow - Inservice Test," Revision 6

36ST-9SB44: "Reactor Protection System Matrix Relays To Reactor Trip Response Time Testing," Revision 9

b. Observations and Findings

The inspectors found these surveillances were performed acceptably and as specified by applicable procedures.

c. Conclusions

Surveillance activities were generally conducted in a safety conscious manner by knowledgeable technicians using approved procedures.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Fire in Main Feedwater Pump A (Unit 1)

a. Inspection Scope (62707)

The inspectors reviewed the circumstances surrounding the May 2, 1998, fire in Main Feedwater Pump A.

b. Observations and Findings

On May 2, 1998, after detecting smoke in the Unit 1 turbine building, an AO determined that a small oil fire had started on the Main Feedwater Pump A high pressure journal bearing. The fire, which caused minor damage to lagging and to the conduit leading to a vibration probe, was extinguished with a CO_2 extinguisher approximately 7 minutes after

discovery. The Palo Verde onsite fire department responded, but was not needed. Proper precautions were taken to prevent recurrence of the fire. The spilled oil was cleaned from the affected area, monitored for further leakage, and subsequently cleaned, as necessary, until the leak was corrected.

The fire was caused by ignition of oil that leaked from a vibration probe mounting flange. Although the ignition temperature of the oil is above the metal temperature of the pump, extended exposure of the oil to high temperature conditions allows the oil to break down into a substance with a lower ignition point. The licensee determined that the probe had not been properly reinstalled after the Unit 1 outage. The flange was successfully tightened to stop the oil leak. All feed pumps at Palo Verde were assessed for oil leaks and no new leaks were identified.

c. Conclusions

Inadequate reinstallation of a vibration probe flange on Unit 1 Main Feedwater Pump A during the Unit 1 outage allowed oil to leak onto the pump high pressure journal bearing. The oil ignited and resulted in a small fire that was extinguished quickly. Subsequent corrective actions for the event were comprehensive, effective, and timely.

M4 Maintenance Staff Knowledge and Performance

M4.1 Failure To Conduct Retests

a. Inspection Scope (62707)

CRDRs 1-8-0290, 2-8-0141, and 2-8-0142 documented I&C Department technician failures to complete all postmaintenance retest requirements for replacement of: (1) Unit 1 Logarithmic Power Channel C preamplifier, (2) Unit 2 steam generator (SG) 2 pressure indicator, and (3) Unit 2 SG wide-range level indicator for both SGs. The inspectors reviewed the circumstances of the missed retests to determine compliance with licensee procedures and regulatory requirements.

b. Observations and Findings

WO 806191, "Troubleshoot/Rework/Replace Components As Necessary For Unit 1 Safety Excore Channel(s)," was issued on July 17,1997, to address erratic indication on Unit 1 Logarithmic Power Channel C. At that time, Logarithmic Power Channel C was declared inoperable and remained inoperable until returned to service just prior to the unit startup from the outage, which ended April 19, 1998.

A portion of the work performed under this WO included replacement of a preamplifier. The retest for the preamplifier replacement required the performance of Section 8.3 of Procedure 36ST-9SB42, "Plant Protection Bistable and Bistable Relay Response Time Test." Although handwritten into the work package, the retest was clearly specified. The licensee's review of this WO conducted prior to closure did not identify that the retest had

been missed. A later nonrequired review of the work package identified the missed signoff for the retest. The licensee searched and found that no documentation to support the conduct of the required retest existed. The licensee initiated CRDR 1-8-0290, on April 28, 1998, to document the missed retest and determine corrective actions. Immediate corrective actions included placing the affected parameters in bypass and performing the retest. After interviews with the personnel involved and review of documentation, the inspectors concluded that personnel error was the cause.

WO 837832, "Troubleshoot/Rework/Replace As Necessary To Return JSGAR1113A To Service," was issued on March 24, 1998, to replace a broken trend pen control wire. This indicator displayed wide-range levels for both Unit 2 SGs and was part of the postaccident monitoring instrumentation. Instructions in WO 837832 provided guidance for both maintenance and retest of the indicator. Steps in the WO specified the restest, which included the determination of the as-left loop values. On a request from the CRS, the retest requirements were reevaluated in the field by the technician performing the work and an incorrect decision was made not to obtain the as-left loop values. This omission was identified during a postmaintenance review of the WO by a planner. When the omission was discovered, CRDR 2-8-0142 was initiated. Based on an interviews with plant personnel, the inspectors concluded that the root cause of this omission was personnel error.

WO 834672, "Troubleshoot and Rework/Replace Components To Correct Faulty Indications on Control Room Indicator SGA-PI-1023A," was issued on March 27, 1998, and the indicator was replaced the same day. The WO specified that retest of the replaced indicator be conducted in accordance with Procedure 36ST-9SB27, "PPS Input Loop Calibration For Parameter 12, Lo SG-2 Press." After the technician replaced the indicator, the indicator itself was calibrated. However, Procedure 36ST-9SB27 also requires that as-left loop readings be taken and the technician did not perform the necessary steps to accomplish this. This was documented in CRDR 2-8-0141, dated April 29, 1998. From interviews with plant personnel, the inspectors concluded that the root cause of this omission was personnel error.

Upon discovery of each of the above items, the affected control room was notified and the appropriate instruments were declared inoperable and placed in bypass. The necessary retests were performed and completed satisfactorily and each of the instruments passed all channel checks.

Retests for the above were required to be performed by Procedure 30DP-9MP01, "Conduct of Maintenance." Changes in retests were controlled by Procedure 30DP-9WP02, "Work Document Development and Control." Failure to adhere to the requirements of these procedures is a violation of TS 6.8.1. However, this licensee-identified and corrected violation is being treated as a noncited violation consistent with Section VII.B.1 of the NRC Enforcement Policy. Specifically, the violation was identified by the licensee, it was not willful, actions taken as a result of a previous violation should not have corrected this problem, and appropriate corrective actions were completed by the licensee (50-528, 529/9804-01).

c. Conclusions

Inattention to detail by I&C technicians resulted in a noncited violation of TS 6.8.1 for not conducting postmaintenance retests, in accordance with the applicable procedures, on three separate occasions.

III. Engineering

E1 Conduct of Engineering

E1.1 Furmanite Repair of Regenerative Heat Exchanger Shell Side Vent Valve (Unit 3)

a. Inspection Scope (37551)

On May 6, 1998, the licensee conducted a Furmanite repair of Regenerative Heat Exchanger Shell Side Vent Valve 3PCHEV393. The inspectors reviewed the engineering evaluations associated with the repair and discussed the repair with the engineers assigned to the task.

b. Observations and Findings

On April 28, 1998, licensee personnel entered the Unit 3 containment to locate the source of leakage identified by the regular leak rate surveillance and increased level in the containment normal sump. A leak of approximately 0.3 gpm was identified as coming from the packing gland on Valve 3PCHEV393. Inspection of the valve revealed that both of the carbon steel packing gland retainer eye bolts had completely deteriorated. The absence of the packing gland retainer eye bolts allowed the packing gland retainer and the packing gland to move up the stem of the valve until movement was stopped by the valve yoke.

Licensee engineers evaluated the valve and determined that the most appropriate repair was Furmanite injection into the valve body at a point above the backseat and below the packing gland. Engineers determined the appropriate point for drilling by using valve drawings and using a spare valve of the same type as a mockup. Prior to the Furmanite injection, the licensee installed a wedge device around the stem of the valve to force the packing gland retainer and the packing gland back down into the stuffing box. Returning the packing gland to its approximate original position in the stuffing box provided a restraint for the Furmanite compound. One hole was drilled into the valve body to accomplish the leak repair.

Engineering Calculation 03-MA-CH-982 was performed to address the changes in seismic loading, stresses, natural frequency, and blowdown caused by addition of the wedge and the addition of the Furmanite injection hole in the valve body. The calculation was comprehensive and detailed. The inspectors also reviewed the 10 CFR 50.59 screening and evaluation for the Furmanite injection and noted that it was thorough.

Seismic scaffolding was installed to support placement of radiological shielding and provide access to the valve. The inspectors reviewed the engineering analysis for installation of the scaffolding and found it to be thorough and comprehensive. As allowed by the licensee's analysis, the scaffolding was left installed after completion of the job. Material transportable to the containment sump was removed from the scaffolding and will be reattached in the future to support permanent repair of the valve in the Fall 1998 Unit 3 outage.

c. Conclusions

Engineering support for the Furmanite repair to a regenerative heat exchanger valve was good. The engineers performed comprehensive, detailed calculations and appropriately performed a safety evaluation in support of the required valve modification.

IV. Plant Support

R4 Staff Knowledge and Performance

R4.1 Radiological Controls and ALARA Planning for Furmanite Repair of a Regenerative Heat Exchanger Valve (Unit 3)

a. Inspection Scope (71750)

On May 6, 1998, the licensee conducted a Furmanite repair of Regenerative Heat Exchanger Shell Side Vent Valve 3PCHEV393. The inspectors reviewed the licensee's as-low-as-reasonably-achievable planning, attended the prejob briefing, and reviewed the dose report for the job.

b. Observations and Findings

Valve 3PCHEV393 is located inside the containment building in the same room with, and just above, the regenerative heat exchanger. General area dose rates in the room were 500 mr/hr, with a 3000 mr/hr hot spot located on the regenerative heat exchanger. Shielding was installed to reduce the dose rates in the work area. After the shielding was installed, the general area dose rates were reduced from 500 to 75 mr/hr.

In addition to the high dose rates, the room was wet from the leak and the ambient temperature was high. The inspectors attended the prejob briefing conducted just prior to commencement of the Furmanite job. Personnel safety, radiological conditions, and the job of each person participating in the repair were discussed in detail. Total exposure for the job was 592 mrem, which included 23 mrem exposure to the technician who injected the valve with Furmanite.

c. Conclusions

Radiological planning for the Furmanite repair of a regenerative heat exchanger valve was very good. The ALARA review reduced the area dose rate from 500 to 75 mRem/hr and the total exposure for the job did not exceed 592 mRem.

P1 Staff Knowledge and Performance in Emergency Preparedness

P1.1 Exercise Conduct and Scenario Description (71750)

The licensee conducted an annual emergency preparedness exercise on May 27, 1998. The exercise was conducted to test the licensee, state, and county personnel's capability to respond to an emergency.

The scenario for the exercise was simulated using one of the licensee's control room simulators. The initial scenario conditions included Unit 1 operating at 100 percent power for the last 116 days. Subsequent simulated events were as follows:

- A crane operator moving a load near the condensate storage tank (CST) accidentally swung the load into some piping, breaking the weld at the point where the pipe connects to the CST.
- Loose parts in the reactor coolant system impacted the fuel cladding and a fuel rod rupture occurred.
- SG tube leakage developed in SG 2 and escalated at a rate of approximately 10 gpm every minute.
- The reactor was manually tripped based on the inability to maintain pressurizer level. Coincidental with the trip, the effected SG safety valve lifted and stuck open at approximately 20 percent. A radioactive release to the environment began.

The remainder of the scenario consisted of efforts to initiate plant cooldown with a goal to reduce the pressure difference between the affected SG and the primary system. However, the fuel cladding continued to be affected by loose parts and reactor coolant activity continued to rise. The radiological concentrations associated with the offsite release reached general emergency threshold levels at the site boundary. Due to meteorological conditions, radiological concentrations in the area where the OSC is located rose to an uninhabitable level. Relocation of the Unit 1 OSC to the Unit 2 OSC occurred.

P1.2 Control Room

a. Inspection Scope (71750)

Inspectors observed the postexercise debrief on May 28, 1998, during which operator performance was discussed. In addition, Procedure 16DP-0EP13, "Emergency Classification," Revision 1, Palo Verde Nuclear Generating Station EAL Technical Bases, and the controllers' guide for the 1998 Emergency Preparedness Exercise were reviewed.

b. Observations and Findings

According to the debrief, at 8:10 a.m. information was given to the control room that a crane operator moving a load near the CST accidentally swung the load into some attached piping, bending the pipe where it enters the CST. The crane operator informed the control room that the weld seam at the tank appeared to be broken because a small amount of water was running down the side of the tank. The scenario was designed for an Alert to be declared based on EAL V-118 of Procedure 16DP-0EP13, "Emergency Classification." However, based on the information as understood by the control room staff, a Notification of Unusual Event was declared using EAL V-107, based on a vehicle crash or missile impact into plant structures or systems within the protected area. To keep the exercise on schedule, the controller provided a contingency message for the shift manager to reconsider EAL V-118. At 8:39 a.m., an Alert was declared.

Both operations and emergency preparedness personnel were involved in the development of the scenario. They agreed that the wording of the crane operator's message was critical for the control room staff to understand that structural damage had been done to the CST. It was determined that the words "weld seam at the tank" were sufficient for operators to understand the severity of the damage and declare an Alert. The training department validated the scenario and operations approved it.

Interviews with the controller playing the part of crane operator and members of the operations crew indicated there was miscommunication concerning the description of damage to the CST. The operations crew had sent an AO to the tank to assess the damage. The AO questioned the controller about visible damage to the concrete exterior of the tank, believing that damage to the weld at the tank would necessarily break the concrete. The controller answered that there was no other visible damage and repeated the original message of a break to the weld at the tank. The design of the scenario did not anticipate requests for additional information and the controller had no additional information to provide.

An exercise weakness, documented in NRC Inspection Report 50-528;-529;-530/97-10 was identified during the full-scale biennial emergency preparedness exercise conducted on May 21, 1997, for failure to promptly recognize and declare a Notification of Unusual

Event. The licensee's July 18, 1997, response stated the cause of the failure to be the artificiality of the exercise scenario. Corrective actions included a revision to the Emergency Plan exercise scenario development process.

Although control room classification of an event was not a problem, the inspectors concluded that corrections made to the scenario development process were not fully effective in preventing problems from occurring in the 1998 emergency preparedness exercise.

c. Conclusions

Corrective actions for improvement of the emergency plan exercise scenario development process in response to an exercise weakness were not fully effective in that a scenario was created that did not provide sufficient information for operators to promptly recognize and declare the desired EAL.

P1.3 TSC

a. Inspection Scope (71750)

The inspectors observed and evaluated the TSC staff as they performed tasks necessary to respond to the exercise scenario conditions. These tasks included staffing and activation, accident assessment, personnel accountability and access control, facility management and control, onsite protective action decisions and implementation, and assistance and support to the control room. The inspectors reviewed applicable emergency plan sections and Procedure 16DP-0EP15, "TSC Actions," Revision 7.

b. Observations and Findings

Communications within the TSC were good. The emergency coordinator conducted informative and frequent briefings. Three-way communications were used consistently. Throughout the exercise the emergency coordinator exhibited good management and communication skills.

Access control of the TSC was good. Radiation protection (RP) personnel were aggressive in controlling the access points to the TSC. Contamination boundaries were established and a sign was posted indicating the need to contact RP prior to entry or exit. The inspectors observed two security guards frisking themselves, under RP guidance, at the access control point. When the guards exited, the RP technician provided them with information regarding preferred routes and additional measures needed due to the release.

Initial and continuing accountability was also adequately performed during the exercise. Several reminders were provided to the players of the need to use the card reader and to

contact security prior to exiting the TSC. Maintaining continuous accountability was an area of concern that was identified during the May 6, 1998, ERO Team Drill. Actions taken to correct the problem appeared to be effective.

c. Conclusions

Performance of the TSC staff was very good. The staff demonstrated effective communications with frequent and informative briefings provided by the emergency coordinator. Good access control and accountability were established and maintained.

P1.4 Operations Support Center

a. Inspection Scope (71750)

The inspectors observed and evaluated the OSC staff as they performed tasks in response to the scenario conditions. These tasks included functional staffing and in-plant emergency response team dispatch and coordination in support of control room and TSC requests. In addition, due to radiological habitability concerns in the Unit 1 OSC, the scenario required personnel in the OSC to evacuate from Unit 1 and reestablish operations from Unit 2.

b. Observations and Findings

One of the objectives of the exercise was to demonstrate the capability to relocate and function from an alternate emergency facility. At 11:48 a.m., the OSC coordinator received word that the airborne radioactive concentration was high and that the OSC needed to evacuate and relocate to the Unit 2 OSC facility. At 12:03 p.m., the staff in the OSC was briefed on the evacuation plans and, by 12:05 p.m., the evacuation had begun. Upon entering the 140-foot elevation of the Unit 2 auxiliary building, where the Unit 2 OSC is located, the staff was to put on protective clothing to contain the contamination received from the Unit 1 OSC. By 12:30 p.m. the last few members were donning protective clothing. After entering the 140-foot elevation, the exercise participants were to decontaminate themselves and report to the relocated OSC. The exercise was terminated at 12:55 p.m., prior to the exercise participants having fully re-established the function of the Unit 2 OSC.

Communication problems existed between the OSC coordinator and the dispatched field teams. Radios were available for the exercise participants' use; however, they were unaware of this. Because there was no radio contact, the OSC coordinator could not inform the field teams about changing plant conditions and/or priorities. The only means of communications being used were plant phones located at the dispatched locations. When the decision was made to evacuate and relocate the Unit 1 OSC, the OSC coordinator was unable to inform the dispatched field teams. There was also no system for accountability of OSC personnel during the evacuation and relocation process. The OSC evacuation was disorganized, which extended the amount of time taken to complete the evacuation.

c. Conclusions

Relocation of the OSC to an alternate facility was disorganized because of poor communications between the OSC coordinator and the dispatched field teams. This extended the amount of time taken to attempt the relocation. Because of this, an opportunity to demonstrate operations from the relocated OSC was missed.

P1.5 Licensee Self-Critique

a. Inspection Scope (71750)

The inspectors observed and evaluated the licensee's postexercise facility (OSC) critique and the postexercise debrief on May 28, 1998, to determine whether the process would identify and characterize weak or deficient areas in need of corrective action. Inspectors also attended the postdrill debrief of the May 6, 1998, ERO Team Drill and reviewed the associated the report.

b. Observation and Findings

The postexercise critique in the OSC was effective in identifying areas for improvement. The lead controller started the critique by reviewing the scenario. He then encouraged other controllers, evaluators, and drill participants to provide their comments. The discussion was generally critical and indicated areas of weakness.

During the postexercise debrief on May 28, 1998, the performance and deficiencies of the OSC, control room, and TSC were discussed at length. However, there was no discussion of whether the evacuation and relocation of the OSC met the objective's criteria.

Discussion during the postdrill debrief for the May 6, 1998, ERO Team Drill was generally critical. Several areas of weaknesses were identified, such as inconsistent use of three-way communication and lack of procedural familiarity. Although issues were identified, they tended to be excused for a variety of reasons. In the drill report, these weaknesses were not reflected in the description of how facility objectives were met. The drill report contained mainly positive descriptions of performance that were sometimes contrary to what was said during the debrief.

c. Conclusions

The ERO critique process was effective in identifying areas in need of corrective action. However, the severity of identified weaknesses was not accurately reflected in the drill report.

P2 Staff Training and Qualification in Emergency Preparedness

P2.1 Review of ERO Training Records

a. Inspection Scope (71750)

The inspectors reviewed Procedure 16DP-0EP10, "E-Plan Training Program Description," Revision 0, the "Engineering Support Personnel Training Program Description," Revision 10, and the training records for 50 members of the ERO.

b. Observations and Findings

As described in the E-Plan Training Program Description, assignments to discipline-specific ERO positions are given to personnel after fully qualifying in their normal discipline job position per the appropriate discipline training program description. All personnel in the ERO are also required to pass the Emergency Plan Overview course every calender year.

The inspectors reviewed training records for 50 people in the ERO to ensure they had received training required by the "E-Plan Training Program Description." Training records for people assigned to the positions of design engineer, electrical engineer, mechanical engineer, probabilistic risk assessment group, reactor analyst, and safety analyst were reviewed. All of the records showed that discipline specific and emergency plan training were current.

c. Conclusions

The training program for the ERO was effectively implemented, as demonstrated from the 50 records reviewed by the inspectors.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on June 3 and 16, 1998. 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

M. Banks, Owner Services
H. Bieling, Department Leader, Emergency Planning
P. Brandjes, Department Leader, Electrical Maintenance Engineering
D. Carnes, Unit 2 Department Leader, Operations
D. Crozier, Director, Emergency Services Division
M. Halzclaw, Administrative Assistant, Regulatory Affairs
W. Ide, Vice President, Nuclear Engineering
D. Kanitz, Engineer, Nuclear Regulatory Affairs
A. Krainik, Department Leader, Nuclear Regulatory Affairs
T. Radke, Director, Outages
C. Seaman, Director, Emergency Services
J. Scott, Manager, Regulatory Affairs
E. Sterling, Department Leader, Nuclear Assurance
S. Terrigrino, Manager, Strategic Communications
S. Zerkel, Site Manager, Operations

INSPECTION PROCEDURES USED

37551	Onsite Engineering
61726	Surveillance Observations
62707	Maintenance Observations
71707	Plant Operations
71750	Plant Support Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-528, 529/9804-01	NCV	Failure to conduct postmaintenance retests

Closed

50-528, 529/9804-01	NCV	Failure to conduct postmaintenance retests

ALARA

LIST OF ACRONYMS USED

AO	auxiliary operator
CFR	Code of Federal Regulations
CRDR	condition report/disposition request
CRS	control room supervisor
CST	condensate storage tank
EAL	emergency action level
ERO	Emergency Response Organization
gpm	gallons per minute
I&C	instrumentation and control
JSCALOR	a power indication
JSCALORC	a power indication
mr/hr	millirem per hour
mrem	millirem
NRC	Nuclear Regulatory Commission
OSC	operations support center
PDR	Public Document Room
RP	radiation protection
SG	steam generator
TS	Technical Specifications
TSC	technical support center
WO	work order