

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.: 50-482
License No.: NPF-42
Report No.: 50-482/98-17
Licensee: Wolf Creek Nuclear Operating Corporation
Facility: Wolf Creek Generating Station
Location: 1550 Oxen Lane, NE
Burlington, Kansas
Dates: August 23 through October 3, 1998
Inspectors: B. A. Smalldrige, Acting Senior Resident Inspector
R. V. Azua, Project Engineer, Project Branch B
D. Passehl, Senior Resident Inspector, Callaway
Approved By: W. D. Johnson, Chief, Project Branch B
ATTACHMENT: Supplemental Information

EXECUTIVE SUMMARY

Wolf Creek Generating Station
NRC Inspection Report 50-482/98-17

Operations

- The lack of a policy to verify the restoration of systems or components on which work or testing was not fully complete contributed to the failure of the reactor coolant system makeup control valve to operate as expected. Operators did not verify that the control valve was properly restored before it was returned to operation following the suspension of a calibration procedure by maintenance technicians (Section O1.1).
- The licensee identified and responded to an increase in component misposition events. The licensee's response provided techniques for use by site personnel to prevent component misposition events and raised the level of awareness and attention for this issue to site management and personnel (Section O1.2).
- The licensee failed to ensure that turbine trip instrumentation surveillance tests were performed during the required modes of operation as required by Technical Specifications. This nonrepetitive, licensee-identified and corrected violation is being treated as a noncited violation consistent with Section VII.B.1 of the Enforcement Policy. This issue was identified by the licensee in Licensee Event Report 50-482/9722-00 (Section O8.3).

Maintenance

- The licensee failed to properly test Pressurizer Pressure Permissive P-11, because of an inadequate design. This nonrepetitive, licensee-identified and corrected violation is being treated as a noncited violation consistent with Section VII.B.1 of the Enforcement Policy. This issue was identified by the licensee in Licensee Event Report 50-482/9710-00 (Section M8.2)

Engineering

Licensee management demonstrated a questioning attitude during an engineering presentation on the health of the residual heat removal system by asking challenging questions regarding long-term operability and bearing lube oil volume and demanding adequate responses (Section E7.1).

Plant Support

- The inspectors identified maintenance technicians working greater than 8 feet above the floor inside the radiologically controlled area without first contacting health physics. This supported the conclusion in NRC Inspection Report 50-482/98-15 that there was a

deficiency in radiation worker knowledge regarding the requirement to contact health physics before working in the overhead in the radiologically controlled area (Section M4.1).

- Observations by the inspectors of poor radiological work practices indicated a deficiency in the knowledge of some radiation workers regarding contaminated area boundary controls and methods of preventing the spread of contamination (Section R1.1).
- Weaknesses were identified in the licensee's stop-work criteria and in identifying the increased potential for airborne radioactivity, known to exist, to workers performing reactor coolant system filter shearing operations. The stop-work criteria was based solely on the dose from the high efficiency particulate air filtration unit and a known increased potential for airborne radioactivity was not communicated to the workers (Section R1.2).
- The inspectors noted a reduction in the number of storage containers and installed drip bags, and a generally improved appearance inside the radiologically controlled area because of licensee housekeeping improvement efforts directed at reducing the resources required to maintain tools and equipment, and improved surveying capabilities inside the radiologically controlled area (Section R2.1).
- Use of fire protection system pumps for purposes other than fire protection constituted a significant degradation of the fire protection system and was contrary to license conditions. This nonrepetitive, licensee-identified and corrected violation is being treated as a noncited violation consistent with Section VII.B.1 of the Enforcement Policy. This issue was identified by the licensee in Licensee Event Reports 50-482/9716-00, 01, and 02 (Section F8.1).

Report Details

Summary of Plant Status

The plant operated at essentially 100 percent power throughout the inspection period.

I. Operations

O1 Conduct of Operations

O1.1 Review of Operations Department Process for System Restoration

a. Inspection Scope (71707)

The inspectors reviewed the operations department process for verifying that components, systems, and system configuration is restored to a known or operable condition following the suspension or interruption of a surveillance or work procedure.

b. Observations and Findings

On August 21, 1998, reactor operators attempted to dilute the reactor coolant system for temperature control. However, reactor coolant system makeup Valve BG FCV-111A failed to open as expected. Upon investigation, a nuclear station operator found that a local instrument air valve to the makeup valve positioner was isolated. The instrument air valve was opened and system operability was restored. This was identified in licensee Performance Improvement Request 98-2484.

Further investigation by the operations and maintenance departments identified that work had been performed on Valve BG FCV-111A earlier in the day per Procedure STN IC-420A, "Calibration of Boric Acid Blend Flow Transmitters," Revision 4. The procedure was suspended before it was completed and the system restoration portion of the procedure was not accomplished. The maintenance technicians who conducted the procedure did not use a formal system restoration procedure to restore the system, which resulted in leaving the instrument air valve in the closed position instead of open. When the technicians returned the makeup valve to the operations department, the operators did not verify that system configuration was restored procedurally nor was a nuclear station operator sent to verify system configuration before the component was returned to service.

The inspectors determined during followup discussions with the licensee that the operations department had no formal expectation or policy to verify the restoration of components or systems on which work or testing is not fully complete with the expectation to use the component/system as fully functional. The inspectors noted that this contributed to the failure of the reactor coolant system makeup valve to open as expected. The licensee initiated an evaluation to determine if a policy for verifying

adequate restoration should be developed for components or systems on which work or testing is not complete when returned to service.

c. Conclusions

The lack of a policy to verify the restoration of systems or components on which work or testing was not fully complete contributed to the failure of the reactor coolant system makeup control valve to operate as expected. Operators did not verify that the control valve was properly restored before it was returned to operation following the suspension of a calibration procedure by maintenance technicians.

O1.2 Licensee Response to an Increase in Component Misposition Events

a. Inspection Scope (71707)

The inspectors reviewed the licensee's response to a self-identified increase in the number of sitewide component misposition events.

b. Observations and Findings

The inspectors noted an increase in the number of sitewide component misposition events beginning in mid-August 1998. The components found out of position included:

- Breaker NG03CHF3, for Valve EG HV-0015, component cooling water service loop return isolation valve. This was identified in Performance Improvement Request 98-2327.
- Valve EF V-0247, essential service water prelube storage tank cross-connect valve. This was identified in Performance Improvement Request 98-2840.
- An unlabeled instrument air isolation valve to Valve BG FCV-111A, reactor makeup water to boric acid blender tee valve. This was identified in Performance Improvement Request 98-2484.
- Damper GK HIS-0060, control room filter System A supply damper. This was identified in Performance Improvement Request 98-2868.

During subsequent discussions with site management, the inspectors noted that, while none of these component misposition events had an impact on safety or indicated a programmatic problem, when taken in aggregate there was cause for concern. The licensee responded that this trend of increasing component misposition events had been identified and steps were underway to correct the trend.

Actions taken by the licensee to correct the trend of increasing component misposition events raised the level of attention for this issue to include operations and maintenance department personnel stand down meetings, personnel required reading, and crew briefings. The techniques discussed for use to prevent component misposition events

included stop, think, act, and review (STAR), qualification validation and verification; attention to detail; and a questioning attitude.

c. Conclusions

The licensee identified and responded to an increase in component misposition events. The licensee's response provided techniques for use by site personnel to prevent component misposition events and raised the level of awareness and attention for this issue to site management and personnel.

O8 Miscellaneous Operations Issues (92901)

- O8.1 (Closed) Violation 50-482/9804-01: Operators' failure to log entry into Technical Specification. The inspectors verified the corrective actions described in the licensee's response letter, dated April 28, 1998, to be reasonable and complete. No similar problems have been identified.
- O8.2 (Closed) Licensee Event Report 50-482/9802-00: Inadequate evaluation of a reactor coolant pump lube oil leak collection system nonconforming condition. This issue was addressed during the review and closure of the noncited violation (50-482/9812-11). No further actions were required.
- O8.3 (Closed) Licensee Event Report 50-482/9722-00: Turbine trip instrumentation surveillance testing not performed prior to startup. This item was identified when the licensee was informed by another utility that their surveillance testing frequency for turbine trip instrumentation did not meet the trip actuating device operational testing requirements as stated in Table 4.3-1 of Technical Specification 4.3.1.1. The root cause of this event was determined to be the mind set of personnel involved in the development and revision of the procedures in which plant conditions and operational knowledge were utilized in the application of Technical Specifications, without thorough consideration of the literal wording of the Technical Specifications. Corrective actions taken included creating Procedure STS AC-003, "Turbine Valve Testing While Shutdown," making changes to the surveillance tracking computer database, and reviewing the mode change checklist for other Technical Specification startup frequency requirements. The described corrective actions were found to be appropriate for addressing this issue. The failure by the licensee to ensure that surveillance tests were performed during the appropriate modes of operation as required by Technical Specification is a violation of NRC requirements. This licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (50-482/9817-01).
- O8.4 (Closed) Licensee Event Report 50-482/9724-00: Engineered safety features and reactor protection system actuations due to a spike on the excore neutron monitoring system Nuclear Instrument NI-35, intermediate range channel. This item was addressed in NRC Inspection Report 50-482/97-22.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments on Maintenance Activities

a. Inspection Scope (62707)

The inspectors observed all or portions of the following work activities.

WO 98-119607-005	Replace annunciator tri-auxiliary relay module on Emergency Diesel Generator B annunciator panel
WO 98-200680-000	Implement CP 07767, diode installation on Emergency Diesel Generator B
WO 98-124592-001	Remove, disassemble, and reassemble AB PV-0003, Atmospheric Relief Valve C
WO 98-101433-030	Remove existing breaker, install Westinghouse breaker
WO 97-123118-001	Clean, inspect, and rework seating surfaces of AL V0004, turbine-driven auxiliary feedwater pump suction from essential service water Train B isolation valve

b. Observation and Findings

Except as noted in Section M4.1, the inspectors identified no concerns with the maintenance observed.

c. Conclusions

Except as noted in Section M4.1, the inspectors concluded that the maintenance activities were performed as required.

M1.2 General Comments on Surveillance Activities

a. Inspection Scope (61726)

The inspectors observed all or portions of the following surveillance activities.

- STS IC-603A, Slave Relay Test K603, Train B safety injection
- STS EF-100A, Essential service water system inservice Pump A and essential service water cross-connect valve test

- STS EG-100A, Component cooling water Pumps A and C inservice pump test
- STS EM-205, Safety injection system inservice pump testing

b. Observations and Findings

The inspectors identified no concerns with the surveillances observed.

c. Conclusions

The inspectors concluded that the surveillance activities were performed as required.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Review of Material Condition During Plant Tours

a. Inspection Scope (61726)

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

b. Observations and Findings

In general, where equipment deficiencies existed, the deficiencies had been identified by the licensee for corrective action. The inspectors noted that several systems were unavailable during all or part of this inspection period.

Channel 8 of the loose parts monitoring system, which monitors Steam Generator B, was declared inoperable on August 7, 1998. Licensee troubleshooting efforts identified a preamp located inside containment outside of the bioshield as the source of the problem. The component was replaced during the first week of September and all checks indicated that the channel was functional. The licensee was unable to calibrate the circuit without entering the bioshield but expected to complete the calibration in 1999 during the next refueling outage when the monitoring instrument located at the steam generator was accessible. The licensee continued to monitor for loose parts in Steam Generator B, using redundant Channel 7, which ensured the steam generator was monitored per Regulatory Guide 1.133, "Loose-Part Detection Program for the Primary System of Light-Water-Cooled Reactors." The licensee identified this issue in Performance Improvement Request 98-2354.

On August 14, 1998, the reactor vessel level indication system Train B was declared inoperable when the output from a compensation resistance temperature detector circuit was found outside of the acceptable range. The licensee's initial evaluation indicated that the problem was located in a segment of the circuit located inside containment and inside of the bioshield. The licensee was unable to determine the cause of the compensation resistance temperature detector circuit failure but expected to repair the system in 1999 during the next refueling outage when the resistance temperature

detector is accessible. The licensee was unable to return the reactor vessel level indication train to operable status within the 30 days required by Technical Specification 3.3.3.6 and had submitted Special Report 98-003, dated September 3, 1998, to the NRC as required by Technical Specification 6.9.2.

On August 26, 1998, multiple lightning strikes on site caused the free-field acceleration sensor in the seismic monitoring system to fail. The licensee did not have a spare sensor in stock, having just replaced the free-field sensor in June 1998, following a severe thunderstorm. The free-field sensor detects the acceleration in the earth in the vicinity of the plant should a seismic event occur, but it is susceptible to failure during severe thunderstorms with multiple lightning strikes. The free-field seismic monitor was unavailable for 15 days.

In June 1998, the reactor operators noted that the dilute function of the reactor coolant makeup system controlled by the control board handswitch failed intermittently. Initial troubleshooting efforts identified no specific hardware failure, equipment alignment, or operator action as the cause of the intermittent failure. Subsequent troubleshooting revealed that the problem was heat related. It was identified that opening the door to the cabinet where the circuit cards for the reactor coolant makeup system dilute function were located resulted in the system operating properly after several minutes. Maintenance technicians were unable to identify the specific degraded card(s) because of the system self-correction once the cabinet doors were opened. Operators worked around the reactor coolant makeup system malfunction for several months and had developed contingency plans for use in the event that the system degraded further during use. Operators also made a procedure change to address the manual dilution of the reactor coolant system. The licensee ruled out a complete replacement of all the circuit cards in the cabinet that affect the reactor coolant makeup system at power because some of the same cards were used in the pressurizer heater controls circuitry. However, the licensee ordered replacement parts for several cards and expected to have the cards replaced by the end of November 1998. The licensee identified this as an operator work around on September 29, 1998.

During the calibration of a plant nitrogen system pressure switch, a vendor supplied 1/4-inch stainless steel braided hose failed suddenly at 2500 psi. This resulted in a 6-foot length of stainless steel braided hose whipping around violently driven by a 2500 psi regulated source. Three of the four persons in the immediate area were outside of the reach of the hose. The fourth person, a maintenance technician, was adjusting the pressure regulator at the time of the hose failure. The technician, who isolated the pressure source within 5 seconds of the hose separation, was struck by the hose before the pressure was isolated. The licensee determined that the hose had a working pressure rating of 3000 psi and a burst pressure rating of 12,000 psi and contacted the vendor for more information. The licensee identified this in Performance Improvement Request 98-2585 and had taken steps to incorporate other means of preventing hose whip in the event that a high pressure hose separates in the future.

c. Conclusions

The material condition of those plant systems and components evaluated during this inspection period were good with few equipment deficiencies, including those discussed in this section.

M4 Maintenance Staff Knowledge and Performance

M4.1 Knowledge Deficiency Regarding Radiation Worker Guidelines Criteria for Working Greater than 8 Feet Above the Floor

a. Inspection Scope (62707)

The inspectors questioned maintenance workers about their use of ladders inside the radiologically controlled area.

b. Observations and Findings

On September 14, 1998, maintenance technicians removed Atmospheric Relief Valve C in accordance with Work Order 98-124592-001. While observing this work inside the radiologically controlled area, the inspectors noted that the maintenance technicians used a ladder to access the overhead in order to move a permanently installed chain fall over a structural support beam approximately 12 feet above the floor.

When asked if they had contacted the health physics department before climbing the ladder, the technicians responded that they had not. The technicians stated that health physics personnel knew they were working on the atmospheric relief valve which included climbing up on a temporary scaffold which was installed specifically for the task. However, health physics personnel were not made aware that maintenance technicians were going to use a ladder at a location away from the scaffolding. The inspectors also noted that the work order did not contain caution statements reflecting that work planners recognized there was a need for the technicians to climb a ladder inside the radiologically controlled area to move the chain fall. The inspectors informed the maintenance technicians that radiation worker guidelines for working in the overhead require that health physics be contacted before working greater than 8 feet above the floor inside the radiologically controlled area. This was identified in licensee Performance Improvement Request 98-2789.

In paragraph R4.1 of NRC Inspection Report 50-482/98-15, the inspectors concluded that there was indication of a potential deficiency in the knowledge of some radiation workers regarding the radiation worker guidance requirement to contact health physics before performing work in the overhead of the radiologically controlled area. The occurrence of radiation workers using a ladder to access and work greater than 8 feet above the floor inside the radiologically controlled area during this inspection period indicates that there was a definite deficiency in the knowledge of some radiation workers.

The licensee's review and evaluation of the deficiency in radiation worker knowledge regarding the requirement to contact health physics before using a ladder or climbing on plant equipment to work greater than 8 feet above the floor in the radiologically controlled area commenced following the inspectors' assessment in NRC Inspection Report 50-482/98-15. These efforts were still underway when the inspectors identified this additional example of a deficiency in radiation worker knowledge regarding the requirement to contact health physics before working in the overhead in the radiologically controlled area.

c. Conclusions

The inspectors identified maintenance technicians working greater than 8 feet above the floor inside the radiologically controlled area without first contacting health physics. This supported the conclusion in NRC Inspection Report 50-482/98-15 that there was a deficiency in radiation worker knowledge regarding the requirement to contact health physics before working in the overhead in the radiologically controlled area.

M8 Miscellaneous Maintenance Issues (92902)

M8.1 (Closed) Violation 50-482/9814-01: Improper storage of temporary equipment in the control room equipment cabinet room. The inspectors verified the corrective actions described in the licensee's response letter, dated April 21, 1998, to be reasonable and complete. The inspectors also noted that the licensee committed in Attachment III of the letter to assess and evaluate the definitions for stable versus unstable equipment and the approval process for storage areas of temporary equipment.

M8.2 (Closed) Licensee Event Report 50-482/9710-00: Inadequate surveillance of pressurizer pressure interlock. On June 4, 1997, the licensee determined that engineering safety feature actuation system pressurizer pressure Permissive P-11 was not adequately tested. Technical Specification 4.3.2.1, Table 4.3-2, Item 11.a, required a quarterly analog channel operability test of Permissive P-11.

Permissive P-11 permitted a normal cooldown of the reactor coolant system and depressurization without actuation of safety injection or main steam line isolation. The licensee's surveillance and calibration procedures for Permissive P-11 did not adequately verify proper overlap. The licensee determined the cause to be inadequate system design.

The licensee revised the following test procedures:

- Procedure STN IC-201A, "Analog Channel Operational Test of TAVG, dT, and Pressurizer Pressure Protection Set 1";
- Procedure STN IC-202A, "Analog Channel Operational Test of TAVG, dT, and Pressurizer Pressure Protection Set 2"; and

- Procedure STN IC-203A, "Analog Channel Operational Test of TAVG, dT, and Pressurizer Pressure Protection Set 3."

The procedure revisions ensured the proper testability of Permissive P-11. As part of the long-term corrective actions, the licensee evaluated installing a test jumper in the Permissive P-11 circuitry. The licensee determined that the procedure revisions were adequate to satisfy the Technical Specification surveillance requirement and the jumper was not necessary. The inspectors identified no concerns.

The inspectors concluded that the failure to properly test pressurizer pressure Permissive P-11, as a result of inadequate design, was a violation. This nonrepetitive, licensee-identified and corrected violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (50-482/9817-02).

- M8.3 (Closed) Inspection Followup Item 50-482/9710-04: Inadequate surveillance of pressurizer pressure interlock. This inspection followup item was identified as a result of the issue discussed in Licensee Event Report 50-482/9710-00. This item was closed based on the corrective actions described in Section M8.2.

III. Engineering

E7 Quality Assurance in Engineering Activities

E7.1 Engineering System Health Reports

a. Inspection Scope (37551)

The inspectors evaluated a presentation by system engineering to licensee management on the health of the residual heat removal system and the component cooling water system.

b. Observations and Findings

On August 31, 1998, the inspectors attended the normally scheduled system health presentation by system engineers to site management. System engineers presented their findings on the health of the residual heat removal system and the component cooling water system. The inspectors noted that during the system health presentations, site management demonstrated a questioning attitude by asking challenging questions and demanding adequate responses. In one case with less than thorough responses to the questions asked by site management, the system engineer was asked to further evaluate the system and to present the report at the next scheduled presentation.

c. Conclusions

Licensee management demonstrated a questioning attitude during an engineering

presentation on the health of the residual heat removal system by asking challenging questions regarding long-term operability and bearing lube oil volume and demanding adequate responses.

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 Poor Contaminated Area Work Practices

a. Inspection Scope (71750)

The inspectors evaluated radiological work practices associated with work in a contaminated area.

b. Observations and Findings

On September 14, 1998, the inspectors observed licensee efforts to determine the cause of packing leakage from Valve EM HV-8801A, the boron injection tank Train A inlet isolation valve, during the performance of Procedure STS EM-205, "Safety Injection System Inservice Pump Testing," Revision 5. Valve EM HV-8801A, which was in a posted contaminated area, was cycled several times during the test. A member of the operations department management team also observed this activity.

Before Valve EM HV-8801A was cycled, a maintenance technician accompanied by a health physics technician attached a magnetically mounted dial indicator to the valve bonnet and positioned the device to measure lateral valve stem deflection. While attempting to set up and properly attach the mounting device, the maintenance technician moved his gloved hands in and out of the valve stem area in a manner that could have resulted in cross contamination. The inspectors noted that, while this was occurring, the health physics technician did not move to prevent the maintenance technicians poor radiological work practice. At one point, the maintenance technician requested that the health physics technician hold one piece of the mounting device while an adjustment was made to another. The health physics technician responded in a manner that could also have resulted in cross contamination.

The health physics technician immediately recognized this error and took the appropriate corrective action. The poor radiological work practices on the part of both technicians did not result in personnel contaminations or in the spread of contamination outside of the contaminated area. The inspectors also noted that personnel in the area, while discussing and observing the valve stem and packing on Valve EM HV-8801A, extended their hands, arms, and heads across the vertical plane of the contaminated area boundary without touching any part of the valve.

The work practices observed by the inspectors are not consistent with the guidance provided in licensee Training Manual GT1245200, "Radiation Worker Training," Revision 28. The licensee informed the inspectors that radiological work practices

observed by the inspectors did not meet site management expectations. The licensee identified this issue in Performance Improvement Requests 98-2797 and 98-2846.

Based on the poor radiological work practices observed by the inspectors during work in a small contaminated area posted around Valve EM HV-8801A, the inspectors noted that there was indication of a deficiency in the knowledge of some radiation workers regarding contaminated area boundary controls and methods of preventing the spread of contamination.

c. Conclusions

Observations by the inspectors of poor radiological work practices indicated a deficiency in the knowledge of some radiation workers regarding contaminated area boundary controls and methods of preventing the spread of contamination.

R1.2 Licensee Response to Airborne Radioactivity in the Radioactive Waste Building

a. Inspection Scope (71750)

The inspectors reviewed the licensee's response to airborne radioactivity in the radioactive waste building as a result of reactor coolant system filter shearing operations.

b. Observations and Findings

On September 20, 1998, during shearing operations on filters used to remove radioactive particulate from the reactor coolant system, health physics technicians discovered loose surface radioactive contamination on the grappling device used to move filter cartridges from the shielded storage drums to the shearing device. The health physics technicians providing job coverage immediately suspended all work in the truck bay of the radiological waste building because of the potential to generate airborne radioactivity. The technicians collected and analyzed the air filters and loose surface contamination smears collected from the area for radioactivity.

The results of the air filter analysis revealed that the air sample in the immediate vicinity was 7.0 derived air concentrations (DAC) and the general area air sample was 0.15 DAC. The loose surface contamination smears collected from the general area of the truck bay were less than or equal to 2000 dpm/100cm². Followup air samples indicated that no airborne radioactivity remained in the area. The health physics technicians appropriately controlled access to the area and posted the entire truck bay as a contaminated area. On September 24, 1998, the licensee had decontaminated the area and restored normal access to the affected area of the radiological waste building.

The four technicians who were involved in the filter shearing operations exited the radiologically controlled area without alarming the personnel contamination monitors. However, the technicians were whole body counted as a precaution to determine if there

was an intake of radioactive material. The inspectors were informed that three of the four technicians had detectable internal activity; however, the highest internal dose was determined to be less than one millirem.

During a tour of the affected area, health physics technicians discussed the filter shearing process with the inspectors, describing the work process and the layout of the equipment used to support the filter shearing evolution. The technicians explained that the exhaust from the high efficiency particulate air (HEPA) filtration unit used to provide negative ventilation was directed back toward the filter shear and shielded drum placement area. In subsequent discussions with the licensee, it was determined that the exhaust from the 1000 cfm HEPA filtration unit may have contributed to the entrainment and distribution of airborne radioactive particulate in the work area.

During followup evaluation and further discussion with the licensee, the inspectors identified several weaknesses associated with the prejob brief and the radiological work procedure for this filter shearing evolution:

- The stop-work criteria emphasized, was based only on external dose to the workers from the HEPA filter and did not consider airborne radioactivity or cumulative dose from all sources.
- No description of the increased potential for airborne radioactivity or the increased risk from the finer particulate with higher specific activity than was normally encountered was provided to the workers. This condition was known to exist as a result of filtering reactor coolant while experiencing axial offset anomaly in 1997.

The inspectors found the licensee's evaluation of the filter shearing process to be adequate under the circumstances to evaluate the potential hazard that could be present. However, the inspectors noted that the practice of allowing workers to enter an area between a source of high levels of loose surface contamination and the single negative ventilation suction line inlet opening, without real time airborne radioactivity level information or other added controls, added unwarranted risk to the workers.

On September 22, 1998, the licensee started an investigation of the filter shearing process. This event was documented in significant Performance Improvement Request 98-2875.

c. Conclusions

Health physics technicians responded appropriately to the discovery of unexpected contamination and elevated levels of airborne radioactivity during reactor coolant system filter shearing operations.

Weaknesses were identified in the licensee's stop-work criteria and in identifying the increased potential for airborne radioactivity, known to exist, to workers performing reactor coolant system filter shearing operations. The stop-work criteria was based solely on the dose from the HEPA filtration unit and a known increased potential for

airborne radioactivity was not communicated to the workers.

R2 Status of Radiological Protection and Chemistry Facilities and Equipment

R2.1 Radiologically Controlled Area Improved Housekeeping

a. Inspection Scope (71750)

The inspectors reviewed the licensee's efforts to improve housekeeping of the radiologically controlled area.

b. Observations and Findings

The licensee recently completed a major effort to improve housekeeping in the radiologically controlled area. The inspectors observed a reduction in the number of containers used to store potentially radioactive tools and equipment in the radiologically controlled area, a reduction in the number of drip bags installed to control potentially contaminated liquid and boron residue, and a generally improved appearance inside the radiologically controlled area both inside and outside of the buildings. The licensee also stated that the overall percentage of contaminated square footage was reduced by 50 percent during this effort.

During discussions with the licensee, the inspectors learned that the housekeeping improvements in the radiologically controlled area were motivated by the desire to reduce the potential for personnel contaminations, improve the ability to monitor and survey for contamination, clearly identify and limit the number of contaminated tools maintained inside the radiologically controlled area, and reduce the overall resources required to maintain the tools, equipment, and access inside the radiologically controlled area.

c. Conclusions

The inspectors noted a reduction in the number of storage containers and installed drip bags, and a generally improved appearance inside the radiologically controlled area because of licensee housekeeping improvement efforts directed at reducing the resources required to maintain tools and equipment, and improve surveying capabilities inside the radiologically controlled area.

F8 Miscellaneous Fire Protection Issues

F8.1 (Closed) Licensee Event Report 50-482/9716-00, 01, and 02: Use of fire protection pumps for purposes other than fire protection constituted a significant degradation of fire protection system. This item was identified during a licensee review of uses of the fire protection system. The fire protection engineer found that the use of these pumps for nonfire protection services was contrary to the requirements of License Condition 2.C(5)(a), and determined that the diversion of significant quantities of water could impair the fire suppression system capability. The root cause of this event was

attributed to the inadequacy of the fire protection program management with respect to training of personnel and ensuring compliance with licensing requirements. Corrective actions taken included revising Procedures AP 26A-003, "Screening and Evaluating Changes, Tests, and Experiments"; SYS FP-293, "Fire Pumps Manual Operations"; and a number of other procedures; revising Updated Safety Analysis Report, Section 9.5.1.2.3, to list all allowed uses (training, maintenance/testing, off-normal and emergency) of the fire protection system; and performing a self-assessment of the fire protection program. The described corrective actions were found to be appropriate for addressing this issue. The failure by the licensee to ensure that the requirements of their license conditions were met is a violation of NRC requirements. This nonrepetitive, licensee-identified and corrected violation is being treated as a noncited violation consistent with Section VII.B.1 of the NRC Enforcement Policy (50-482/9817-03).

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 October 3, 1998. The licensee acknowledged the findings presented.

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

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

M. J. Angus, Manager, Licensing and Corrective Action
G. D. Boyer, Chief Administrative Officer
S. R. Koenig, Manager, Performance Improvement and Assessment
J. W. Johnson, Manager, Resource Protection
O. L. Maynard, President and Chief Executive Officer
B. T. McKinney, Plant Manager
R. Muench, Vice President Engineering
C. C. Warren, Chief Operating Officer

INSPECTION PROCEDURES USED

IP 37551	Onsite Engineering
IP 61726	Surveillance Observations
IP 62707	Maintenance Observations
IP 71707	Plant Operations
IP 71750	Plant Support Activities
IP 92901	Followup - Operations
IP 92902	Followup - Maintenance

ITEMS OPENED AND CLOSED

Opened

50-482/9817-01	NCV	Turbine trip instrumentation surveillance testing not performed prior to startup (Section O8.3)
50-482/9817-02	NCV	Inadequate surveillance of pressurizer pressure interlock (Section M8.2).
50-482/9817-03	NCV	Use of fire protection pumps for nonfire protection purposes constituted a significant degradation of fire protection system (Section F8.1).

Closed

50-482/9710-00	LER	Inadequate surveillance of pressurizer pressure interlock (Section M8.2)
50-482/9710-04	IFI	Inadequate surveillance of pressurizer pressure interlock (Section M8.3)

50-482/9716-00, 01, 02	LER	Use of fire protection pumps for nonfire protection purposes constituted a significant degradation of fire protection system (Section F8.1)
50-482/9722-00	LER	Turbine trip instrumentation surveillance testing not performed prior to startup (Section O8.3)
50-482/9724-00	LER	Engineered safety features and reactor protection system actuations due to a spike on the excore neutron monitoring system Nuclear Instrument Ni-35 intermediate range channel (Section O8.4)
50-482/9802-00	LER	Inadequate evaluation of an reactor coolant pump lube oil leak collection system nonconforming condition (Section O8.2)
50/482-9804-01	VIO	Operators failure to log entry into Technical Specification (Section O8.1).
50-482/9814-01	VIO	Improper storage of temporary equipment in the control room equipment cabinet room (Section M8.1).
50-482/9817-01	NCV	Turbine trip instrumentation surveillance testing not performed prior to startup (Section O8.3)
50-482/9817-02	NCV	Inadequate surveillance of pressurizer pressure interlock (Section M8.2).
50-482/9817-03	NCV	Use of fire protection pumps for nonfire protection purposes constituted a significant degradation of fire protection system (Section F8.1).