

ENCLOSURE

**U.S. NUCLEAR REGULATORY COMMISSION
REGION IV**

Docket No.: 50-482
License No.: NPF-42
Report No.: 50-482/99-18
Licensee: Wolf Creek Nuclear Operating Corporation
Facility: Wolf Creek Generating Station
Location: 1550 Oxen Lane NE
Burlington, Kansas
Dates: October 17 through November 27, 1999
Inspector: F. L. Brush, Senior Resident Inspector
Approved By: W. D. Johnson, Chief, Project Branch B

ATTACHMENT: Supplemental Information

EXECUTIVE SUMMARY

Wolf Creek Generating Station
NRC Inspection Report No. 50-482/99-18

Operations

- The failure to move the correct fuel assembly in the spent fuel pool was a violation of Technical Specification 6.8.1.a. Licensee personnel picked up a fuel assembly from Location PP22 rather than P22 and placed it in spent fuel pool Location AA63. The safety significance was low since the fuel assembly was in a spent fuel pool location allowed by Technical Specifications. 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 Performance Improvement Request 99-3521 (Section O4.1).

Maintenance

- In October 1994, following replacement of the reactor coolant pump seal injection throttle valves during a refueling outage, the licensee failed to perform a flow balance test and set the throttle position of the valves prior to entering Mode 4. The event was of low safety significance since both pumps were functional (would not have reached runout following a loss of coolant accident). The licensee did not perform the required flow balance until after entry into Mode 3. This is a violation of Technical Specifications 3.5.2 and 3.5.3. 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 Performance Improvement Request 99-3094. This closes Licensee Event Report 50-482/94-015 (Section M8.1).

Engineering

- The licensee unnecessarily removed essential service water Train A from service for approximately 17 hours. This placed the plant in a significantly higher risk condition since Emergency Diesel Generator A and all emergency core cooling system Train A components were inoperable and unavailable. The piping downstream of the component cooling water heat exchanger had developed a pinhole leak. The licensee later determined that a noncode repair to the piping was acceptable and that the repair could be completed without removing Train A from service (Section E4.1).

Report Details

Summary of Plant Status

The plant operated at essentially 100 percent power during the entire report period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

The inspector conducted frequent reviews of ongoing plant operations. In general, the conduct of operations was professional and safety-conscious. Plant status, operating problems, and work plans were appropriately addressed during daily turnover and plan-of-the-day meetings. Plant testing and maintenance requiring control room coordination were properly controlled. The inspector observed several shift turnovers and noted no problems.

O2 Operational Status of Facilities and Equipment

O2.1 Review of Equipment Tagouts (71707)

The inspector walked down the following tagout:

Clearance Order 99-097-EJ Residual Heat Removal Pump A Motor, DPEJ01A

The inspector did not identify any discrepancies. The tagout was properly prepared and authorized. All tags were on the correct devices and the devices were in the position prescribed by the tags.

O2.2 Engineered Safety Feature System Walkdowns (71707)

The inspector walked down accessible portions of the following engineered safety features and vital systems:

- Emergency Diesel Generators A and B,
- Component Cooling Water Train A, and
- Auxiliary Feedwater Trains A, B, and T.

Equipment operability, material condition, and housekeeping were acceptable.

O4 Operator Knowledge and Performance

O4.1 Mispositioned Fuel Assembly in the Spent Fuel Pool

a. Inspection Scope (71707)

The inspector reviewed the licensee's response when a fuel assembly was moved to the incorrect location in the spent fuel pool.

b. Observations and Findings

On October 31, 1999, while moving spent fuel within the spent fuel pool, licensee personnel moved a fuel assembly from Location PP22 to Location AA63. The fuel assembly in Location P22 should have been moved instead. Later that day, when the step was reached to move the fuel assembly from Location PP22, personnel saw that the location was empty. The licensee halted fuel movement and investigated the problem.

When the licensee determined that the fuel assembly that was in Location PP22 had been moved earlier and that it was in Location AA63, the licensee moved the assembly to the correct location, RR13. Even though the fuel assembly was in the incorrect location, it was in the appropriate area of the spent fuel pool required by Technical Specifications. Therefore, the safety significance of the misplacement was low. The licensee then placed a hold on fuel moving operations until corrective actions were identified and implemented.

The licensee concluded that the following contributed to the fuel moving error:

- The operators did not verify the fuel location before accomplishing the move,
- Procedure AP 19C-002, "Special Nuclear Material Safeguards and Accountability," Revision 2, was not appropriate for moving fuel in the spent fuel pool,
- The corrective actions for the fuel movement errors from the last refueling outage were not fully implemented, and
- The checks required to successfully perform fuel moving within the spent fuel pool were not formalized.

The licensee's corrective actions included:

- Briefing each crew on the event and corrective actions,
- Stressing that fuel movement be accomplished in the sequence identified in the fuel transfer authorization,

- Implementing a fuel handling procedure for moves within the spent fuel pool,
- Establishing better communications between personnel involved in fuel moving,
- Assigning a reactor engineering person to the fuel moving crew to assist in verifying fuel assembly locations, and
- Proceduralizing fuel assembly identification and location checks for each move.

The licensee also performed a visual check of each assembly in the spent fuel pool to ensure there were no other fuel placement problems. All other fuel assemblies were in the correct location.

The failure to move fuel in accordance with Procedure AP 19C-002 was a violation of Technical Specification Section 6.8.1.a. This Severity Level IV violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Performance Improvement Request 99-3521 (50-482/9918-01).

c. Conclusions

The failure to move the correct fuel assembly in the spent fuel pool was a violation of Technical Specification 6.8.1.a. Licensee personnel picked up a fuel assembly from Location PP22 rather than P22 and placed it in spent fuel pool Location AA63. The safety significance was low since the fuel assembly was in a spent fuel pool location allowed by Technical Specifications. This Severity Level IV violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Performance Improvement Request 99-3521 (50-482/9918-01).

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments - Surveillance

a. Inspection Scope (61726)

The inspector observed or reviewed all or portions of the following test activities:

- Test Procedure STS AL-101, "Motor-Driven Auxiliary Feedwater Pump A Inservice Pump Test," and
- Test Procedure STS KJ-005B, "Manual/Auto Start, Synchronization & Loading of Emergency D/G NE02."

b. Observations and Findings

The surveillance testing was conducted satisfactorily in accordance with the licensee's approved programs and the Technical Specifications.

- M8.2 (Closed) Licensee Event Report 50-482/94-015-00: Technical Specification requirement not satisfied prior to entry into Mode 4. The licensee failed to ensure that at least one emergency core cooling system train was operable prior to entering Mode 4 and two were operable for entry into Mode 3. Technical Specification Section 3.5.3 requires that one emergency core cooling system subsystem be operable prior to entering Mode 4. Technical Specification Section 3.5.2 requires that both emergency core cooling system subsystems be operable prior to entering Mode 3. Each emergency core cooling system subsystem was comprised of, among other components, one centrifugal charging pump.

On September 17, 1999, licensee personnel determined that in October 1994, following replacement of the reactor coolant pump seal injection throttle valves, the licensee failed to perform a flow balance test as required by Technical Specification 4.5.2.h prior to entry into Mode 4. The licensee left the valves full open after replacement. The flow balance test is intended to ensure that centrifugal charging pump flow does not exceed the runout value during a loss of coolant accident. The licensee performed the flow balance within 48 hours of entering Mode 3.

The event was of low safety significance. The licensee determined that the pump flows would have exceeded the Technical Specification limit of 556 gallons per minute with the throttle valves open by approximately 2 gallons per minute. However, the flows would not have exceeded the pump runout flows of 560 gallons per minute. The pumps remained functional but not operable.

The licensee stated that the root cause was a failure by the shift supervisor to verify that the appropriate Technical Specification requirements were met prior to entering Mode 4. The licensee performed surveillance Procedure STS EM-001, "ECCS Throttle Valve Position," to verify the correct throttle valve positions. Licensee personnel recorded a test deficiency for the seal injection throttle valves in that they were not throttled. The shift supervisor failed to identify that the test deficiency was a failure to meet the Technical Specification requirements for entry into Mode 4.

A contributing root cause was that the premodification planning did not identify that the need to throttle the reactor coolant pump seal injection throttle valves was a mode restraint. Procedure STS BG-004, "CVCS Seal Injection and Return Flow Balance," was to be performed in Modes 1, 2, or 3 at normal operating pressure and temperature. The mode change checklist did not include that Procedure STS BG-004 was required to be performed in conjunction with Procedure STS EM-003A, "ECCS (CCP) Flow Balance."

The licensee's corrective actions included the following:

- Revising the appropriate procedures to ensure the mode restraints were clearly identified,
- Training operations personnel to understand the Technical Specification surveillance requirements when emergency core cooling system flow balances have been changed, and
- Ensuring, during the new surveillance tracking database development, that the requirements are in the database and the requirements are tied to the applicable procedures.

Technical Specification Section 3.5.2 required that both emergency core cooling system trains be operable for entry into Mode 3. Technical Specification Section 3.5.3 required that one emergency core cooling system train be operable for entry into Mode 4. In October 1994, following replacement of the reactor coolant pump seal injection throttle valves during a refueling outage, the licensee failed to set the throttle position of the valves. This rendered both trains of high-head injection inoperable, which caused both emergency core cooling system trains to be inoperable. The event was of low safety significance since both pumps were functional. The licensee did not perform the flow balance until after entry into Mode 3. This is a violation of Technical Specifications 3.5.2 and 3.5.3. This Severity Level IV violation is being treated as a noncited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Performance Improvement Request 99-3094 (50-482/9918-02).

III. Engineering

E4 Engineering Staff Knowledge and Performance

E4.1 Essential Service Water Train A Unnecessary Outage

a. Inspection Scope (37551)

The inspector reviewed the licensee's response to a pinhole leak in essential service water Train A.

b. Observations and Findings

An operator discovered a pinhole leak in the essential service water Train A piping downstream of component cooling water Heat Exchanger A. The licensee then performed nondestructive testing of the piping in the area of the pinhole leak. The testing revealed a small area of erosion around the leak.

Licensee personnel initially stated that the essential service water piping did not meet ASME Section XI structural integrity requirements and would have to be repaired. The licensee made preparations to repair the leak. Operations personnel tagged out and drained essential service water Train A. This rendered Emergency Diesel Generator A and all emergency core cooling system Train A components inoperable. The instantaneous core damage frequency increased from 3.49E-5 to 7.42E-4, which was in the licensee's Risk Condition 3.

Maintenance personnel determined that a temporary weld repair could not be completed in the Technical Specification allowed outage time. Following further review, using NRC Generic Letters 90-05, "Guidance for Performing Temporary Noncode Repair of ASME Code Class 1, 2, and 3 Piping," and 91-18, Revision 1, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions," the licensee determined that the leak could be stopped with a noncode repair. After performing a detailed calculation, engineering personnel determined that the essential service water pipe's structural integrity was intact.

Essential service water system Train A was unavailable for approximately 17 hours. The licensee initiated Performance Improvement Request 99-3397, since removing the train from service was unnecessary. The licensee preliminary determination was that the following contributed to the unnecessary outage:

- Miscommunications between shift, engineering, and duty management personnel,
- Overall command and control was never established,
- Engineering personnel involved in the evolution were not knowledgeable on the requirements of NRC Generic Letters 90-05 and 91-18, Revision 1,
- Administrative Procedure AP 28-001, "Evaluation of Nonconforming Conditions of Installed Plant Equipment," did not provide a clear link to NRC Generic Letters 90-05 and 91-18, and
- Inadequate knowledge by other than operations personnel of plant risk levels and its contributions to core damage frequency.

The licensee's planned corrective actions included:

- Improving the command and control structure for on-call maintenance and engineering personnel managers,
- Generating a new procedure that integrates regulatory information specific to ASME code pipe leaks,
- Revising Procedure AP 28-001 to provide a clearer link to NRC Generic Letter 91-18, and

- Providing clear guidance on communication standards and holding supervisors and managers responsible for reinforcing and providing feedback and coaching on the standards.

The licensee continued to review the causes and corrective actions for the outage.

c. Conclusions

The licensee unnecessarily removed essential service water Train A from service for approximately 17 hours. This placed the plant in a significantly higher risk condition since Emergency Diesel Generator A and all emergency core cooling system Train A components were inoperable and unavailable. The instantaneous core damage frequency increased from the baseline value of 3.49E-05 to 7.42E-04. The piping downstream of the component cooling water heat exchanger had developed a pinhole leak. Licensee personnel initially determined that the piping did not have the required structural integrity. The licensee later determined that a noncode repair to the piping was acceptable and that the repair could be completed without removing Train A from service

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R1.1 General Comments (71750)

The inspector observed health physics personnel, including supervisors, routinely touring the radiologically controlled areas. Licensee personnel working in radiologically controlled areas exhibited good radiation worker practices.

Contaminated areas and high radiation areas were properly posted. Area surveys posted outside rooms in the auxiliary building were current. However, a survey map was not posted outside the boron injection tank room because of a health physics technician's oversight. The map was available at access control. The inspector checked a sample of doors, required to be locked for the purpose of radiation protection, and found no problems.

V. Management Meetings

X1 Exit Meeting Summary

The exit meeting was conducted on November 30, 1999. The licensee did not express a position on any of the findings in the report.

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

ATTACHMENT
SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

M. J. Angus, Manager, Licensing and Corrective Action
G. D. Boyer, Chief Administrative Officer
J. W. Johnson, Manager, Resource Protection
O. L. Maynard, President and Chief Executive Officer
B. T. McKinney, Plant Manager
R. Muench, Vice President Engineering
S. R. Koenig, Manager, Performance Improvement and Assessment
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
IP 92903	Followup - Engineering
IP 92904	Followup - Plant Support

ITEMS OPENED AND CLOSED

Opened

50-482/9918-01	NCV	Mispositioned Fuel Assembly in the Spent Fuel Pool (Section 04.1)
50-482/9918-02	NCV	Technical Specification requirement not satisfied prior to entry into Mode 4 (Section M8.1)

Closed

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| 50-482/94-015-00 | LER | Technical Specification procedure requirement not satisfied prior to entry into Mode 4 (Section M8.1) |
| 50-482/9918-01 | NCV | Mispositioned Fuel Assembly in the Spent Fuel Pool (Section 04.1) |
| 50-482/9918-02 | NCV | Technical Specification requirement not satisfied prior to entry into Mode 4 (Section M8.1) |