

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1)
WOLF CREEK GENERATING STATION

DOCKET NUMBER (2)
05000482

PAGE (3)
1 OF 5

TITLE (4)
Technical Specification Surveillance Requirement Not Satisfied Prior to Entry into Mode 4

| EVENT DATE (5) | | | LER NUMBER (6) | | | REPORT DATE (7) | | | OTHER FACILITIES INVOLVED (8) | |
|----------------|-----|------|----------------|-------------------|-------------|-----------------|-----|------|-------------------------------|---------------|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REV. NUMBER | MONTH | DAY | YEAR | FACILITY NAME | DOCKET NUMBER |
| 10 | 24 | 1994 | 1994 | 015 | 00 | 10 | 15 | 1999 | FACILITY NAME | DOCKET NUMBER |

| OPERATING MODE (9) | MODE 4 | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11) | | | | | | | | |
|--------------------|--------|---|---|------------------|--|----------------------|--|----------|--|--|
| POWER LEVEL (10) | 0% | 20.402(b) | | 20.405(c) | | 50.73(a)(2)(iv) | | 73.71(b) | | |
| | | 20.405(a)(1)(i) | | 50.36(c)(1) | | 50.73(a)(2)(v) | | 73.71(c) | | |
| | | 20.405(a)(1)(ii) | | 50.36(c)(2) | | 50.73(a)(2)(vii) | | OTHER | | |
| | | 20.405(a)(1)(iii) | X | 50.73(a)(2)(i) | | 50.73(a)(2)(viii)(A) | | | | |
| | | 20.405(a)(1)(iv) | | 50.73(a)(2)(ii) | | 50.73(a)(2)(viii)(B) | | | | |
| | | 20.405(a)(1)(v) | | 50.73(a)(2)(iii) | | 50.73(a)(2)(x) | | | | |

LICENSEE CONTACT FOR THIS LER (12)

NAME
Michael J. Angus
Manager Licensing and Corrective Action

TELEPHONE NUMBER (Include Area Code)
(316) 364-4077

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO EPIX |
|-------|--------|-----------|--------------|--------------------|-------|--------|-----------|--------------|--------------------|
| | | | | | | | | | |
| | | | | | | | | | |

SUPPLEMENTAL REPORT EXPECTED (14)

| | | | | | | |
|-----|---|----|-------------------------------|-------|-----|------|
| YES | X | NO | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
|-----|---|----|-------------------------------|-------|-----|------|

ABSTRACT (16): On September 17, 1999, Wolf Creek Nuclear Operating Corporation (WCNOC) personnel determined that in October of 1994, Wolf Creek Generating Station (WCGS) entered Mode 4 following the seventh refueling outage without satisfying a surveillance requirement. Technical Specification Surveillance Requirement 4.5.3.1 requires that one Emergency Core Cooling System (ECCS) subsystem be demonstrated operable per the applicable requirements of Technical Specification Surveillance Requirement 4.5.2. The requirements of 4.5.2 include performing a flow balance test, during shutdown, following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics. The Reactor Coolant Pump Seal Injection throttle valves in this system had been replaced during the refueling outage. Mode 3 was also entered without satisfying the surveillance requirements. This is a historic event. The root cause of this event was a failure to verify the Technical Specification requirements of 3.5.2 and 3.5.3 with respect to plant conditions. Corrective actions for this event include: training operations crews and support staff concerning this event, revising procedures STS BG-004 and STS EM-003A and the surveillance tracking program to address the requirements of Technical Specifications 4.5.2 and 4.5.3, and validating surveillance requirements to ensure they are properly tied to the applicable surveillance procedures. This event constitutes a reportable event in accordance with 10 CFR 50.73(a)(2)(i)(B). The safety significance of this event was minimal, because seal injection flow limit is not crucial at Mode 3 and Mode 4 conditions based on the operator actions assumed in the bounding analysis.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | | | PAGE (3) |
|-------------------------------|-------------------|----------------|-------------------|-----------------|----------|
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | |
| Wolf Creek Generating Station | 05000482 | 1994 | 015 | 00 | 2 OF 5 |

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

Plant Conditions Prior to the Event:

Mode -- 4
Power -- 0 percent
Temperature -- 200 degrees Fahrenheit
Pressure -- 350 pounds per square inch gauge

Basis for Reportability:

Technical Specification 3.5.3 requires that one Emergency Core Cooling System (ECCS) subsystem be OPERABLE comprised, among others, of one OPERABLE centrifugal charging pump. Operability is verified by performing applicable portions of Technical Specification Surveillance Requirement 4.5.2. Surveillance Requirement 4.5.2.h requires each ECCS subsystem be demonstrated OPERABLE by performing a flow balance test, during shutdown, following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics. On September 17, 1999, during the root cause investigation for LER 1999-011-00, Wolf Creek Nuclear Operating Corporation (WCNOC) personnel identified that, following the seventh refueling outage, this surveillance was not performed prior to entry into Mode 4. Surveillance Requirement 4.0.4, requires satisfying applicable Technical Specification surveillance requirements prior to entry into an operational mode. Therefore, since 4.5.2.h was not satisfied prior to entry into Mode 4, Technical Specification Surveillance Requirement 4.0.4 was not satisfied.

In addition, the valves were not throttled properly until approximately 48 hours after entry into Mode 3. Therefore, Mode 3 was entered without demonstrating both trains of ECCS operable in accordance with Technical Specification 4.5.2.

In accordance with NUREG-1022, Revision 1, missed surveillance tests are reportable when the surveillance interval plus allowed surveillance interval extension, e.g., Technical Specification section 4.0.2, plus the LCO action statement time is exceeded. To be reportable, a condition prohibited by Technical Specifications must have existed for a period of time longer than allowed by Technical Specifications. In addition, in accordance with NUREG-1022, an LER is required if the conditions of an LCO are not met.

The condition discussed above existed for longer than the allowed outage time of Technical Specification 3.5.3 and 3.5.2. In addition, Surveillance Requirement 4.0.4 was not satisfied prior to entry into mode 4. Therefore, this event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B).

Event Description:

As noted above, on September 17, 1999, during the root cause investigation for LER 1999-011-00, WCNOC personnel identified that Technical Specification Surveillance Requirement 4.5.3.1 was not satisfied with regard to verifying or setting the Reactor Coolant Pump (RCP) Seal Injection/Return valves to the throttled position, following the seventh refueling outage, prior to entry into Mode 4.

During the seventh refueling outage, the RCP seal injection and return throttle valves were replaced. The post installation test requirements were performed using procedure STS EM-001, "ECCS Throttle Valve Position," to verify the correct ECCS throttle valve positions. A test deficiency was recorded for the seal injection throttle valves. It was noted that

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | | | PAGE (3) |
|-------------------------------|-------------------|----------------|-------------------|-----------------|----------|
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | |
| Wolf Creek Generating Station | 05000482 | 1994 | 015 | 00 | 3 OF 5 |

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

they were not throttled. The valves were left in the full open position after installation. The decision was made to throttle the valves using STS BG-004, "CVCS Seal Injection and Return Flow Balance," when the plant was at Normal Operating Pressure/Normal Operating Temperature (NOP/NOT). Procedure STS BG-004 was performed in mode 3 at NOP/NOT and the valves were throttled to their correct position.

What failed to occur was throttling the valves prior to entering Mode 4 when one ECCS train is required to be operable per Technical Specification 3.5.3 nor prior to entry into Mode 3 when both ECCS trains are required in accordance with Technical Specification 3.5.2. Mode 4 was entered on October 25, 1994 at 0332, and the RCP seal injection throttle valves were not correctly positioned. The throttle valves were correctly positioned when procedure STS BG-004 was performed at NOP/NOT, approximately 48 hours after Mode 3 was entered.

Root Cause:

Performance Improvement Request (PIR) 99-0094 was issued to evaluate this event. The root cause of this event has been attributed to a failure by the Shift Supervisor to verify the requirements of Technical Specification 3.5.2 and 3.5.3 after STS EM-001 was performed. The technical specification requirements were not met for the duration of time from Mode 4 to NOP/NOT in Mode 3 when the valves were throttled. The Shift Supervisor also failed to identify that the test deficiency of STS EM-001 was a Technical Specification failure.

Contributing causes to the event include elements of procedural issues and pre-modification planning. Procedure STS BG-004, which is used to perform the flow balance and throttle the RCP seal injection valves, was written to be performed in Modes 1, 2, or 3 at NOP/NOT. The pre-modification planning did not clearly specify mode restraints. The surveillance cross-reference database did not reflect that STS BG-004 partially satisfied Technical Specification 4.5.2.h.1. Therefore, the mode change check list did not include procedure STS BG-004 as being required to be performed in conjunction with procedure STS EM-003A for the ECCS Flow balance to completely satisfy the Technical Specification requirements of Surveillance 4.5.2.h.1.

Corrective Action Taken:

Procedures STS EM-001, "ECCS Throttle Valve Position," STS BG-004, "CVCS Seal Injection and Return Flow Balance," AP 21F-001, "Equipment Out-OF-Service Control" and AP 29B-003, "Surveillance Testing," were reviewed to identify whether changes were necessary. Shortly after the seventh refueling outage, STS BG-004 was revised to allow the surveillance to be performed in all Modes. In addition, the modification pre-planning process was changed in 1996 to include a dedicated pre-implementation coordinator and a work control center to minimize the burden on the control room staff. It was determined that additional procedure changes are necessary.

Actions to Prevent Recurrence:

To ensure that licensed operators understand the Technical Specification surveillance requirements necessary when ECCS flow balance characteristics have been changed, training will be provided. This training will include a review of surveillance procedures STS BG-004 and STS EM-003A. Also, the changes to STS BG-004, as the result of the corrective actions associated to this LER, will be included in the training. Training will be completed by September 25, 2000.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | | | PAGE (3) |
|-------------------------------|-------------------|----------------|-------------------|-----------------|----------|
| Wolf Creek Generating Station | 05000482 | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | 4 OF 5 |
| | | 1994 | 015 | 00 | |

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

Since this event, WCNOG has implemented human error reduction techniques to prevent human errors similar to this from occurring. These techniques have become part of the operating culture. In addition, due to a more literal compliance culture and questioning attitude by the WCNOG staff, deficiencies to surveillance procedures and the tracking database will continue to be identified and corrected.

Procedure STS BG-004 will be revised to link it to Procedure STS EM-003A to satisfy the requirements of Technical Specification 4.5.2.h.1. Procedure STS EM-003A will be revised to clarify that it must be performed in conjunction with STS BG-004 to satisfy Technical Specification 4.5.2.h after maintenance or modifications that may affect flow characteristics. These procedure revisions will be completed by April 21, 2000, in preparation for the eleventh refueling outage.

An ongoing review of surveillance procedures and the surveillance tracking database is being performed. A new surveillance tracking database is being developed. In conjunction with the database replacement, the reviews will validate that surveillance requirements are captured in the database and that they are properly tied to the applicable surveillance procedure. This project is scheduled for completion to coincide with implementation of the Wolf Creek Generating Station (WCGS) Improved Technical Specifications on December 18, 1999.

Safety Significance:

There is minimal safety significance associated with the missed surveillance and the associated condition of the seal injection throttle valves not set properly until approximately 48 hours after entry into Mode 3.

Following the seventh refueling outage the RCP seal injection throttle valves were in the full open position during Mode 4 and approximately 48 hours into Mode 3. During this period both trains of ECCS were inoperable because, during high head injection, CCP flow may have exceeded the runout values.

The seal injection flow limit is not crucial in Mode 4 or in Mode 3 with Reactor Coolant System (RCS) pressure \leq 1000 psig. High seal injection flow is less critical due to the relatively low initial RCS pressure and decay heat removal requirements in these modes. In Mode 4 or in Mode 3 with RCS pressure \leq 1000 psig, operator actions are required to mitigate the consequences of a credible Loss of Coolant Accident (LOCA), because the availability of safety systems is reduced (e.g., automatic actuation of safety injection has been locked out and accumulators are blocked). The operator actions, assumed in the bounding analysis, are those required to establish the safety injection flow.

The results of the bounding analysis confirm that the limits of 10 CFR 50.46 will not be exceeded if the operator establishes flow from both a high head Centrifugal Charging Pump (CCP) or Safety Injection Pump (SIP) and a low head Residual Heat Removing (RHR) pump, within 10 minutes after the LOCA symptoms have been exhibited. Assuming CCP failure, due to pump runout because of high seal injection flow, the operator can establish SIP flow in a timely manner. This will establish sufficient flow to overcome coolant losses and maintain the RCS inventory. Therefore, the safety analysis assumption for minimum ECCS flow would not have been invalidated assuming the operator establishes flow from one safety injection pump and one RHR pump within 10 minutes after the appropriate symptoms are reached.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | | | PAGE (3) |
|-------------------------------|-------------------|----------------|-------------------|-----------------|----------|
| Wolf Creek Generating Station | 05000482 | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | 5 OF 5 |
| | | 1994 | 015 | 00 | |

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

Should the seal injection flow potentially exceed the design limit, due to improper setting of the throttle valves, while in Mode 3 with RCS pressure > 1000 psig, the consequences from a postulated LOCA event are judged to be bounded by the limiting full power case. This is because the decay heat level is relatively low. A lower decay heat translates into lower ECCS flow requirements in meeting the applicable acceptance criteria as set forth in 10 CFR 50.46. In addition, the accumulators are available for safety injection in this situation should a postulated LOCA occur.

Other Previous Occurrences:

Licensee Event Reports (LERs) submitted to the NRC since January 1, 1997, were reviewed. This review identified 17 LERs associated with missed surveillances (LER 1999-001-01, LER 1999-002-00, LER 1999-003-00, LER 1999-010-00, LER 1999-011-00, LER 98-006-00, LER 97-022-00, LER 97-019-00, LER 97-017-00, LER 97-010-02, LER 97-010-01, LER 97-010-00, LER 97-001-03, LER 97-001-02, LER 97-001-00, LER 96-020-00, and LER 96-009-01). Of those, several were due to inadequate procedures containing errors introduced in the initial procedure; a procedure revision in 1986, and an indeterminate cause based on the time elapsed between when the error was made and when it was discovered. Of the remaining LERs, personnel error and misalignment between organizational culture and the regulatory environment were identified as the cause. Safety significance associated with the LERs in each case was identified as minimal or none.

WCNOC determined there was a need for additional actions. Therefore, WCNOC performed a common cause methodology to evaluate missed surveillances reported to the NRC since January 1, 1996. This action has been completed. As with the event discussed in this report, the assessment determined that the current culture would continue to discover similar historical circumstances. Based on the safety significance of all of the findings, both alone and compounded, no additional broad surveillance review project will be initiated.

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LIST OF COMMITMENTS

The following table identifies those actions committed to by Wolf Creek Nuclear Operating Corporation (WCNOC) in this document. Any other statements in this submittal are provided for information purposes and are not considered to be commitments. Please direct questions regarding these commitments to Mr. Michael J. Angus, Manager Licensing and Corrective Action at Wolf Creek Generating Station, (316) 364-4077.

| COMMITMENT | Due Date/Event |
|---|--------------------|
| To ensure that licensed operators are aware of the Technical Specification surveillance requirements necessary when ECCS flow balance characteristics have been changed, training will be provided. This training will include review of surveillance procedures STS BG-004 and STS EM-003A. Also, the changes to STS BG-004 as the result of the corrective actions associated to this LER will be included in the training. | September 25, 2000 |
| Procedure STS BG-004 will be revised to link it to Procedure STS EM-003A to satisfy the requirements of Technical Specification 4.5.2.h.1. | April 21, 2000 |
| Procedure STS EM-003A will be revised to clarify that it does not completely satisfy Technical Specification 4.5.2.h after modification to the Reactor Coolant Pump seal injection throttle valves. | April 21, 2000 |
| An ongoing review of surveillance procedures and the surveillance tracking database is being performed. A new surveillance tracking database is being developed. In conjunction with this development, the reviews will validate that surveillance requirements are captured in the database and that they are properly tied to the applicable surveillance procedures. | December 18, 1999 |