

WOLF CREEK

NUCLEAR OPERATING CORPORATION

Stephen E. Hedges
Site Vice President

March 29, 2010

WO 10-0018

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

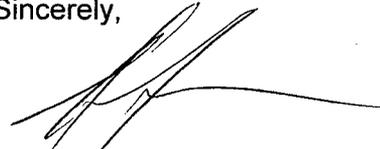
Subject: Docket No. 50-482: Licensee Event Report 2010-002-00, Turbine Trip Function of Reactor Trip, P-4 Interlock Defeated During Entry Into and in Mode 3

Gentlemen,

The enclosed Licensee Event Report (LER) is being submitted in accordance with 10 CFR 50.73, "Licensee event report system," paragraph (a)(2)(i)(B) as a condition prohibited by the plant's Technical Specifications (TS), 50.73(a)(2)(v)(D) as an event or condition that could have prevented the fulfillment of a safety function, and 50.73(a)(2)(vii) where a single cause or condition caused independent trains or channels to become inoperable. The LER involves the defeating of the turbine trip function of the Reactor Trip, P-4 interlock using procedure SYS AC-120, "Main Turbine Generator Startup." Defeating Function 8.a. of TS 3.3.2, "Engineered Safety Feature Actuations System (ESFAS) Instrumentation," TS Table 3.3.2-1 constitutes a failure to meet LCO 3.0.4 when the plant transitioned from Mode 4 to Mode 3. Additionally, defeating this function in Mode 3 on two occasions constituted a failure to take action to place the plant in Mode 4 as required by TSs.

This letter contains no regulatory commitments. If you have any questions concerning this matter, please contact me at (620) 364-4190, or Mr. Richard D. Flannigan, Manager Regulatory Affairs at (620) 364-4117.

Sincerely,



Stephen E. Hedges

SEH/rt

Enclosure

cc: E. E. Collins (NRC), w/e
G. B. Miller (NRC), w/e
B. K. Singal (NRC), w/e
Senior Resident Inspector (NRC), w/e

IE22
NRR

LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOF-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose 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.

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| 1. FACILITY NAME WOLF CREEK GENERATING STATION | 2. DOCKET NUMBER 05000 482 | 3. PAGE 1 OF 4 |
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4. TITLE
Turbine Trip Function of Reactor Trip, P-4 Interlock Defeated During Entry Into and in Mode 3

| 5. EVENT DATE | | | 6. LER NUMBER | | | 7. REPORT DATE | | | 8. OTHER FACILITIES INVOLVED | |
|---------------|-----|------|---------------|-------------------|---------|----------------|-----|------|------------------------------|---------------|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REV NO. | MONTH | DAY | YEAR | FACILITY NAME | DOCKET NUMBER |
| 01 | 26 | 2010 | 2010 | - 002 | - 00 | 03 | 29 | 2010 | FACILITY NAME | DOCKET NUMBER |
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| 9. OPERATING MODE 1 | 11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply) | | | | | | | | | |
| 10. POWER LEVEL 40 | <input type="checkbox"/> 20.2201(b) | <input type="checkbox"/> 20.2203(a)(3)(i) | <input type="checkbox"/> 50.73(a)(2)(i)(C) | <input checked="" type="checkbox"/> 50.73(a)(2)(vii) | | | | | | |
| | <input type="checkbox"/> 20.2201(d) | <input type="checkbox"/> 20.2203(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(viii)(A) | | | | | | |
| | <input type="checkbox"/> 20.2203(a)(1) | <input type="checkbox"/> 20.2203(a)(4) | <input type="checkbox"/> 50.73(a)(2)(ii)(B) | <input type="checkbox"/> 50.73(a)(2)(viii)(B) | | | | | | |
| | <input type="checkbox"/> 20.2203(a)(2)(i) | <input type="checkbox"/> 50.36(c)(1)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(iii) | <input type="checkbox"/> 50.73(a)(2)(ix)(A) | | | | | | |
| | <input type="checkbox"/> 20.2203(a)(2)(ii) | <input type="checkbox"/> 50.36(c)(1)(ii)(A) | <input type="checkbox"/> 50.73(a)(2)(iv)(A) | <input type="checkbox"/> 50.73(a)(2)(x) | | | | | | |
| | <input type="checkbox"/> 20.2203(a)(2)(iii) | <input type="checkbox"/> 50.36(c)(2) | <input type="checkbox"/> 50.73(a)(2)(v)(A) | <input type="checkbox"/> 73.71(a)(4) | | | | | | |
| | <input type="checkbox"/> 20.2203(a)(2)(iv) | <input type="checkbox"/> 50.46(a)(3)(ii) | <input type="checkbox"/> 50.73(a)(2)(v)(B) | <input type="checkbox"/> 73.71(a)(5) | | | | | | |
| <input type="checkbox"/> 20.2203(a)(2)(v) | <input type="checkbox"/> 50.73(a)(2)(i)(A) | <input type="checkbox"/> 50.73(a)(2)(v)(C) | <input type="checkbox"/> OTHER | | | | | | | |
| <input type="checkbox"/> 20.2203(a)(2)(vi) | <input checked="" type="checkbox"/> 50.73(a)(2)(i)(B) | <input checked="" type="checkbox"/> 50.73(a)(2)(v)(D) | Specify in Abstract below or in NRC Form 366A | | | | | | | |

12. LICENSEE CONTACT FOR THIS LER

| | |
|---|--|
| FACILITY NAME Richard D. Flannigan, Manager Regulatory Affairs | TELEPHONE NUMBER (Include Area Code) (620) 364-4117 |
|---|--|

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

| CAUSE | SYSTEM | COMPONENT | MANU-FACTURER | REPORTABLE TO EPIX | CAUSE | SYSTEM | COMPONENT | MANU-FACTURER | REPORTABLE TO EPIX |
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| 14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO | 15. EXPECTED SUBMISSION DATE MONTH: DAY: YEAR: |
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On January 26, 2010, a review of a revision to procedure SYS AC-120, "Main Turbine Generator Startup," identified that Step 5.6 allows leads to be lifted that defeat Reactor Trip, P-4 interlock for the turbine trip function when the plant is in Mode 3. Further review identified that Step 5.6 of procedure SYS AC-120 was performed on November 17, 2009 at approximately 1600 hours CST. Wolf Creek Nuclear Operating Corporation (WCNOC) defeated the turbine trip on reactor trip function in Mode 4 and the plant transitioned to Mode 3 on November 18, 2009, at 0014 hours with the function defeated. The leads were relanded on November 20, 2009, at 1559.

Technical Specification (TS) 3.3.2, Table 3.3.2-1 specifies the applicable Mode for Function 8.a. (Reactor Trip, P-4) as Modes 1, 2, 3. Defeating the turbine trip on reactor trip function of the Reactor Trip, P-4 interlock using procedure SYS AC-120 results in both channels being defeated. The Mode change was not in conformance with Limiting Condition for Operation (LCO) 3.0.4 which precludes entry into a Mode or other specified condition in the Applicability statement when an LCO is not met and there is no Condition/Required Action for two channels or trains inoperable. Additionally, it was identified that the turbine trip on reactor trip function had been defeated on two occasions while in Mode 3. LCO 3.0.3 specifies that when an associated Action is not provided, action shall be initiated within 1 hour to place the plant in Mode 4 in 13 hours. Action had not previously been taken as required by TSs.

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NARRATIVE

PLANT CONDITIONS PRIOR TO EVENT:

MODE - 1
Power - 40

EVENT DESCRIPTION:

On January 26, 2010, a review of a revision to procedure SYS AC-120, "Main Turbine Generator Startup," identified that Step 5.6 allows leads to be lifted that defeat Reactor Trip, P-4 interlock [EIIS: JC] for the turbine trip function when the plant is in Mode 3. Further review identified that Step 5.6 of procedure SYS AC-120 was performed on November 17, 2009, at approximately 1600 hours CST. Wolf Creek Nuclear Operating Corporation (WCNOC) defeated the turbine trip on reactor trip function in Mode 4 and the plant transitioned to Mode 3 on November 18, 2009, at 0014 hours with the function defeated. The leads were relanded on November 20, 2009, at 1559.

Technical Specification (TS) 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," Table 3.3.2-1 specifies the applicable Mode for Function 8.a. (Reactor Trip, P-4) as Modes 1, 2, 3. Defeating the turbine trip on reactor trip function of the Reactor Trip, P-4 interlock using procedure SYS AC-120 results in both trip channels to the main turbine [EIIS: TA] being defeated. The other Reactor Trip, P-4 interlock functions are not affected by the lifting of these leads at the turbine control panel. The Mode change was not in conformance with Limiting Condition for Operation (LCO) 3.0.4, which precludes entry into a Mode or other specified condition in the Applicability statement when an LCO is not met and there is no Condition/Required Action for two channels or trains inoperable. Additionally, it was identified that the turbine trip on reactor trip function had been defeated on two occasions while in Mode 3. LCO 3.0.3 specifies that when an associated Action is not provided, action shall be initiated within 1 hour to place the plant in Mode 4 in 13 hours. Action had not previously been taken as required by TSs.

A review of the completed SYS AC-120 procedures for the previous 3 years was performed. The review identified that the turbine trip on reactor trip function had been defeated in the following time periods:

| Date | Event |
|----------------------|--|
| November 6 - 8, 2006 | Startup from Refueling Outage 15. Function defeated when transitioning from Mode 4 to Mode 3. |
| May 10, 2008 | Startup from Refueling Outage 16. Function defeated while in Mode 3. Action not initiated in 1 hour to place the plant in Mode 4 within 13 hours per LCO 3.0.3. |
| April 30, 2009 | Startup from forced outage for inadvertent closure of main feedwater regulating valve and subsequent reactor trip. Function defeated while in Mode 3. Action not initiated in 1 hour to place the plant in Mode 4 within 13 hours per LCO 3.0.3. |

BASIS FOR REPORTABILITY:

TS 3.3.2, Table 3.3.2-1 specifies the applicable Mode for Function 8.a. (Reactor Trip, P-4) as Modes 1, 2, 3. The TS Bases indicates that the turbine trip on reactor trip is a function of the P-4 interlock. Defeating the turbine trip on reactor trip function of the Reactor Trip, P-4 interlock using procedure SYS AC-120 results in both channels being defeated. This event is being reported pursuant to 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plant's

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TSs in that LCO 3.0.4 which precludes entry into a Mode or other specified condition in the Applicability statement when an LCO is not met and there is no Condition/Required Action for two channels or trains inoperable. Additionally, on two occasions action was not taken in accordance with LCO 3.0.3 when the turbine trip on reactor trip was defeated while in Mode 3.

This event is also being reported pursuant to 50.73(a)(2)(vii) as an event where a single cause or condition caused at least two independent trains or channels to become inoperable in a single system designed to mitigate the consequences of an accident. Lifting the turbine trip on reactor trip leads at the turbine control panel results in two independent trip channels being inoperable.

This event is also being reported pursuant to 50.73(a)(2)(v)(D) as an event or condition that could have prevented the fulfillment of a safety function. Updated Safety Analysis Report (USAR) Section 15.2.3 indicates that the turbine trip is classified as an ANS Condition II event. For a turbine trip event, the reactor would be tripped (when above P-9) directly from a signal derived from the turbine stop emergency trip fluid pressure and turbine stop valves. The accident analyses in USAR Section 15.2.3 assumes that the turbine trip occurs prior to the reactor trip and not the turbine trip on reactor trip provided by the P-4 interlock. USAR Section 7.2.1.1.1 indicates that the reactor trip system initiates a turbine trip signal whenever a reactor trip is initiated to prevent the reactivity insertion that would otherwise result from excessive reactor system cooldown. This eliminates unnecessary ESFAS actuations. Therefore, based on industry precedent and corrective actions from a severity level IV noncited violation from NRC Integrated Inspection Report 2009005, this event is being reported pursuant to 50.73(a)(2)(v)(D).

CAUSE:

The apparent cause of this event is attributed to a historical misunderstanding of TSs that allowed procedure SYS AC-120 to be revised to allow the leads for the turbine trip function to be lifted in Mode 3. As such, defeating the Reactor Trip, P-4 interlock for the turbine trip function was not considered to be required for P-4 interlock operability per TS Table 3.3.2-1.

An inaccurate mental picture of TS application was formed on the basis of individual functions rather than overall constraint. Although it is possible to differentiate between those individual P-4 functions that ensure safe operation of the plant and those P-4 functions that are desirable control functions, all functions comprise the P-4 interlock. Technical Specification 3.3.2 specifies the Reactor Trip, P-4 ESFAS interlock as being applicable in Modes 1, 2, and 3. The basis for defeating the Reactor Trip, P-4 interlock for the turbine trip function was based on a validation of function, not on the legitimacy of permission per the plant TSs.

TS 3.3.2, Table 3.3.2-1 specifies the applicable Mode for Function 8.a. (ESFAS Interlocks, Reactor Trip, P-4) as Modes 1, 2, 3. The TS Bases identifies the functions of the P-4 as:

- Trips the main turbine;
- Isolates main feedwater with coincident low Tavg;
- Allows manual block of the automatic reactivation of safety injection after a manual reset of safety injection; and
- Allows arming of the steam dump valves and transfers the steam dump from the load rejection Tavg controller to the plant trip controller; and
- Prevents opening of the main feedwater isolation valves (MFIVs) if they were closed on safety injection or steam generator water level - high high.

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In November 2002, procedure SYS AC-120 was revised and included changes that allowed leads to be lifted at the turbine control panel that defeated the Reactor Trip, P-4 interlock for the turbine trip function when the plant is in Mode 3. The change was made based on an evaluation of an outage critique item to allow warming of the main turbine during various plant activities that involve opening of the reactor trip breakers. The procedure change also required that the trip function be reinstated prior to entry into Mode 2.

ACTIONS TAKEN:

Procedure SYS AC-120 has been revised to delete the steps that would allow defeating the turbine trip on reactor trip function.

Evaluation of this event identified that performance of procedure STS IC-215, "TADOT of Manual Reactor Trip, Trip and Bypass Breaker UV/Shunt Trip, Turbine Trip on Reactor Trip and P4," could result in defeating the turbine trip on reactor trip function in Mode 3. Further review identified that this procedure is normally scheduled to be performed in Mode 5 or Mode 6 and has not been performed in Mode 3 during the previous 3 years. Procedure STS IC-215 has been revised to remove the allowance for performing the procedure in Mode 3.

SAFETY SIGNIFICANCE:

As described in USAR Section 7.2.1.1.1, the reactor trip system initiates a turbine trip signal whenever reactor trip is initiated to prevent the reactivity insertion that would otherwise result from excessive reactor system cooldown. This eliminates unnecessary ESFAS actuations.

The turbine trip on reactor trip function provided by the P-4 interlock serves to limit the potential for an excessive cooldown of the reactor coolant system. Following the reactor trip signal, the turbine is tripped off the line by promptly stopping steam flow to the turbine. Should the turbine fail to trip after a reactor trip, continuous steam flow from the steam generators removes additional energy from the reactor coolant system. This results in a reduction of primary coolant temperature and pressure. In the presence of a negative moderator temperature coefficient, the continuous cooldown results in an insertion of positive reactivity. If the most reactive rod control cluster assembly is assumed stuck in its fully withdrawn position after a reactor trip, there is possibility that the core will become critical and return to power.

However, the core would be ultimately shut down by the boric acid solution delivered by the emergency core cooling system when a safety injection signal associated with ESFAS is actuated upon receipt of a low pressurizer pressure signal. In view of the redundant core protection, the safety significance of a loss of turbine trip on reactor trip function provided by the P-4 interlock is low.

OPERATING EXPERIENCE/PREVIOUS EVENTS:

As indicated above, WCNOG procedures have allowed defeating the turbine trip on reactor trip function of the P-4 interlock in Mode 3 since 2002.

LER 2009-009-01 involves a similar event that defeated the feedwater isolation on low Tavg coincident with P-4 Function using procedure SYS SB-122, "Enabling/Disabling P-4/Lo Tavg FWIS." The extent of the evaluation for this LER was bounded to the development and allowance of procedure SYS SB-122 to defeat the feedwater isolation signal on low Tavg coincident with P-4 in Mode 3. As such, the actions taken in response to LER 2009-009-00 were not effective identifying all of the procedures to prevent a similar event.