



Stephen L. Smith  
Plant Manager

July 1, 2015

WO 15-0037

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

Subject: Docket No. 50-482: Licensee Event Report 2015-003-00, "Manual Reactor Trip due to High Steam Generator Level Transient at Low Power"

Gentlemen:

The enclosed Licensee Event Report (LER) 2015-003-00 is being submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A) regarding an Engineered Safety Features Actuation and subsequent manual reactor trip at Wolf Creek Generating Station.

This letter contains no regulatory commitments. If you have any questions concerning this matter, please contact me at (620) 364-4093, or Mr. Steven R. Koenig at (620) 364-4041.

Sincerely,

A handwritten signature in black ink, appearing to read "S. L. Smith".

Stephen L. Smith

SLS/rlt

Enclosure

cc: M. L. Dapas (NRC), w/e  
C. F. Lyon (NRC), w/e  
A. A. Rosebrook (NRC), w/e  
Senior Resident Inspector (NRC), w/e

Handwritten initials "IE22" above "NRR" in black ink.



## LICENSEE EVENT REPORT (LER)

(See Page 2 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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollections.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-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.

## 1. FACILITY NAME

WOLF CREEK GENERATING STATION

## 2. DOCKET NUMBER

05000 482

## 3. PAGE

1 OF 3

## 4. TITLE Manual Reactor Trip due to High Steam Generator Level Transient at Low Power

| 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 |
| 05            | 03  | 2015 | 2015          | 003               | 00      | 07             | 01  | 2015 | FACILITY NAME                | DOCKET NUMBER |
|               |     |      |               |                   |         |                |     |      |                              | 05000         |
|               |     |      |               |                   |         |                |     |      |                              | 05000         |

  

| 9. OPERATING MODE         | 11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) |   |  |   |
|---------------------------|---|---|--|---|
| 1                         | <input type="checkbox"/> 20.2201(b)   | <input type="checkbox"/> 20.2203(a)(3)(i)   | <input type="checkbox"/> 50.73(a)(2)(i)(C)             | <input 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)   |
| 10. POWER LEVEL<br><br>25 | <input type="checkbox"/> 20.2203(a)(2)(ii)  | <input type="checkbox"/> 50.36(c)(1)(ii)(A) | <input checked="" 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 type="checkbox"/> 50.73(a)(2)(i)(B)  | <input 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

Steven R. Koenig, Manager Regulatory Affairs

## TELEPHONE NUMBER (Include Area Code)

620-364-4041

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

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

## 14. SUPPLEMENTAL REPORT EXPECTED

☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO

## 15. EXPECTED SUBMISSION DATE

| MONTH | DAY | YEAR |
|-------|-----|------|
|       |     |      |

## ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On May 3, 2015 at 1021 Central Daylight Time (CDT), Wolf Creek Generating Station (WCGS) was at approximately 25% power during startup from Refueling Outage 20. The 'C' steam generator received a Hi-Hi level signal while the Reactor Operator was manually transferring feedwater control from the Main Feedwater Regulating Valve (MFRV) bypass valves to the MFRVs. This resulted in a main turbine trip, feedwater isolation, and auxiliary feedwater actuation. A manual reactor trip was initiated at 1022 CDT. The root cause was the lack of a reliable and consistent standardization between the operating crews to control the transfer of the steam generator feedwater flow between the MFRV bypass valves and MFRVs and a sense of urgency by the control room operators.

The event is bounded by analyses as reported in the Wolf Creek Generating Station (WCGS) Updated Safety Analysis Report (USAR) Section 15.2.7, "Loss of Normal Feedwater Flow."

**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

APPROVED BY OMB: NO.3150-0104

EXPIRES: 01/31/2017

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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-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.

|                               |           |               |                      |            |
|-------------------------------|-----------|---------------|----------------------|------------|
| 1. FACILITY NAME              | 2. DOCKET | 6. LER NUMBER |                      | 3. PAGE    |
| WOLF CREEK GENERATING STATION | 05000 482 | YEAR          | SEQUENTIAL<br>NUMBER | REV<br>NO. |
|                               |           | 2015          | - 003                | - 00       |
|                               |           |               |                      | 2 OF 3     |

**NARRATIVE****PLANT CONDITIONS PRIOR TO THE EVENT**

Mode - 1

Power - 25%

There were no systems, structures or components (SSC) that were inoperable at the start of the event and contributed to the event.

**DESCRIPTION**

On May 3, 2015 at 1021 Central Daylight Time (CDT), Wolf Creek Generating Station (WCGS) was at approximately 25% power during startup from Refueling Outage 20. Feedwater control [EIS: JB] was in the process of being transferred, from the Main Feedwater Regulating Valve (MFRV) bypass valves [EIS: SJ-V] to the MFRVs. During transfer to the MFRV for the 'C' steam generator (SG) [EIS: SB-SG], the indicated feedwater flow to the SG increased to a rate higher than expected. Actions were taken to lower the MFRV open demand signal, but it was not adequate to turn the rising SG level trend. A feedwater isolation occurred due to the 'C' SG level >78% and the main turbine tripped. An auxiliary feedwater actuation occurred which started the motor-driven auxiliary feedwater pumps [EIS: BA-P]. The reactor was manually tripped at 1022 CDT and all safety systems responded as expected.

During the transfer between the MFRV bypass valves and MFRVs, both the 'A' and 'C' SG MFRVs were operated simultaneously by two Reactor Operators. Both MFRVs were operated with approximately 10-30% valve position movements. The 'A' MFRV transfer occurred in approximately 40 seconds while the 'C' MFRV transfer occurred at a similar rate before the plant trip. The 'B' MFRV transfer was being performed at the time of the plant trip.

It was noted that the operation of the pushbutton for AEFK0530, 'C' MFRV Controller, had a distinct difference from the other three MFRV controllers. The 'C' controller was replaced as a precaution. No tuning adjustments were performed on the control loop.

The plant returned to Mode 1 on May 4, 2015 at 0424 CDT. Feedwater control was successfully transferred from the MFRV bypass valves to the MFRVs on May 4, 2015 at 1342 CDT.

**REPORTABILITY**

The manual reactor trip and actuation of Engineered Safety Feature Actuation System (ESFAS) instrumentation actuation described in this event is reportable per 10 CFR 50.73(a)(2)(iv)(A), which requires reporting of "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section." Paragraph (B)(1) of 10 CFR 50.73(a)(2)(iv) includes "Reactor Protection System (RPS) including: reactor scram or reactor trip." Paragraph (B)(6) of 10 CFR 50.73(a)(2)(iv) includes "PWR auxiliary or emergency feedwater."

CONTINUATION SHEET

| 1.FACILITY NAME               | 2.DOCKET  | 6. LER NUMBER |                      |            | 3.PAGE |
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|                               |           |               |                      |            |        |

NARRATIVE

CAUSE

The root cause was the lack of a reliable and consistent standardization between the operating crews to control the transfer of the SG feedwater flow between the MFRV bypass valves and MFRVs.

This cause is supported by the sense of urgency by the operators to perform the MFRV transfer evolution, which has been reinforced through prior experience, briefings, and training focus. This led to more than minor adjustments in MFRV controller output, and these tasks being performed simultaneously on more than one SG. In addition, the procedure allows operators to develop their own methods for MFRV transfer which varied among the operators making adjustments on SG level simultaneously.

CORRECTIVE ACTIONS

The 'C' MFRV Controller, was replaced.

Operators were provided training in the current training cycle on what occurred on May 3, 2015 to cause the main turbine trip and subsequent manual reactor trip. A similar malfunction was incorporated into a MFRV controller on the WCGS simulator.

During the May 4, 2015 startup, additional actions were implemented to standardize the transfer of the MFRV bypass valves to the MFRVs. An optimized process of SG level control transfer between the MFRV bypass valves and MFRVs was incorporated into procedures.

SAFETY SIGNIFICANCE

The safety significance of this event is low. There were no adverse effects on the health and safety of the public. This event is analyzed as reported in WCGS Updated Safety Analysis Report (USAR) Section 15.2.7, "Loss of Normal Feedwater Flow." Results of the analysis show that a loss of normal feedwater does not adversely affect the core, the reactor coolant system, or the steam system, since the auxiliary feedwater capacity is such that reactor coolant water is not relieved from the pressurizer relief or safety valves.

OPERATING EXPERIENCE/PREVIOUS EVENTS

LER 2010-012-00 described a reactor trip at 15% power due to low SG levels. The cause was operation of the plant during power ascension outside the MFRV bypass valves optimum operating region and the feedwater preheating limitations. Procedures were revised to correct this condition.

LER 2011-006-00 described a reactor trip in Mode 4 due to low SG levels. The cause was failure to adequately maintain SG levels using the MFRV bypass valves.