WOLF CREEK
NUCLEAR OPERATING CORPORATION

Stephen E. Hedges
Site Vice President

May 5, 2010

WO 10-0036

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

Subject: Docket No. 50-482: License Event Report 2010-006-00, Manual Reactor Trip due to Trip of Main Feedwater Pump

Gentlemen:

The enclosed Licensee Event Report (LER) 2010-006-00 is being submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A) regarding an Engineered Safety Features Actuation and subsequent reactor trip at Wolf Creek Generating Station.

Commitments made by Wolf Creek Nuclear Operating Corporation in the enclosed LER are identified in the Attachment to this letter.

If you have any questions concerning this matter, please contact me at (620) 364-4190, or Mr. Richard D. Flannigan at (620) 364-4117.

Sincerely,

Stephen E. Hedges

SEH/rlt

Attachment
Enclosure

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

JE22
NRR

LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by WCNOC in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments. Please direct questions regarding these commitments to Mr. Richard Flannigan at (620) 364-4117.

REGULATORY COMMITMENT	DUE DATE/EVENT
The evaluation of the results from the Hardware Failure Analysis will be completed.	06/30/2010

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION

(9-2007)

LICENSEE EVENT REPORT (LER)

(See reverse for required number of

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2010

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, 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 NUMBER	3. PAGE
WOLF CREEK GENERATING STATION	05000 482	1 OF 3

4. TITLE

Manual Reactor Trip due to Trip of Main Feedwater Pump

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
										05000
03	08	2010	2010	- 006 -	00	05	05	2010	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

1

10. POWER LEVEL

42

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☒ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Richard D. Flannigan, Manager Regulatory Affairs	(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
B	SJ	FCV	G080	Y					

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 3/8/2010, Wolf Creek Generating Station (WCGS) was at 42 percent power during a reactor startup when the "A" main feedwater (MFW) pump tripped at 0332 CST. The control room operators manually tripped the reactor due to the decreasing steam generator levels. All control rods fully inserted and the Reactor Trip System and the Engineered Safety Feature Systems performed as expected. The cause of the MFW pump trip was a failed servo in the MFW control circuitry.

Emergency boration was actuated when reactor coolant system (RCS) temperature dropped below 550 degrees Fahrenheit. Emergency boration was secured at 0404 CST on 3/8/2010 when RCS temperature was raised to greater than 550 degrees Fahrenheit.

The safety significance of this event is low. This event is bounded by analyses as reported in the WCGS Updated Safety Analysis Report (USAR) Section 15.2.7, "Loss of Normal Feedwater Flow." There were no adverse effects on the health and safety of the public.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
WOLF CREEK GENERATING STATION	05000 482	2010	-- 006 --	00	2 OF 3

PLANT CONDITIONS PRIOR TO EVENT

MODE 1
Power Level – 42 percent

EVENT DESCRIPTION

On 3/8/2010 the Wolf Creek Generating Station (WCGS) was in the process of power ascension at approximately 42 percent power. The "B" main feedwater (MFW) pump [EIIS Code: SJ-P] was being warmed in the process of being placed in service, but was not providing flow to the steam generators (SG). At 0332 CST the "A" MFW pump automatically tripped. With no feedwater supply to the steam generators (SG) [EIIS Code: SG], water level in the steam generators began decreasing and the Control Room staff manually tripped the reactor at 0333 CST.

The MFW pump tripped due to a failed servo valve [EIIS Code: JK-FCV] in the main feedwater speed control system. The servo failed when it was in the open position, causing the low pressure and high pressure control valves to become full open. This resulted in more steam being admitted to the feedwater turbine when there was no demand for it. The speed of the feedwater turbine increased beyond its overspeed set point, resulting in a trip of the MFW pump.

The reactor was manually tripped due to the decreasing SG level, prior to the automatic trip set point being reached. All control rods fully inserted and all safety equipment performed as designed. The Reactor Trip System (RTS) and the Engineered Safety Feature Actuation System (ESFAS) [EIIS Code: JE] performed as required. The motor-driven auxiliary feedwater (AFW) pumps [EIIS Code: BA] started due to the loss of the MFW pump and the turbine-driven AFW pump started due to the loss of the resultant Low SG level.

Emergency boration was initiated at 0341 CST per procedure EMG ES-02, "Reactor Trip Response," when the reactor coolant system (RCS) temperature decreased below 550 degrees Fahrenheit. This was a result of the actuation of auxiliary feedwater (AFW) and the lack of decay heat with the reactor power at 42 percent. Emergency boration was secured at 0404 CST when RCS temperature was raised to greater than 550 degrees Fahrenheit, by throttling AFW flow. The lowest RCS temperature reached following the reactor trip was 544 degrees Fahrenheit.

BASIS FOR REPORTABILITY

The reactor trip and subsequent actuation of ESFAS instrumentation 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."

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
WOLF CREEK GENERATING STATION	05000 482	2010	-- 006 --	00	3 OF 3

ROOT CAUSE

The cause of the MFW pump tripping is a failed servo valve in the main feedwater speed control system. A Hardware Failure Analysis is investigating the exact cause for the servo failure. The servo valve is a device that takes an electrical signal and converts it to mechanical signal. The servo ports hydraulic oil to the bottom side of the pilot valve that controls the position of the secondary operating cylinder, which then controls the position of the low pressure (LP) and high pressure (HP) control valves for the feedwater turbine. The servo failed when it was in the open position, causing the pilot valve to travel full open, and the LP and HP control valves to become full open. This resulted in more steam being admitted to the feedwater turbine when there was no demand for it. The speed of the feedwater turbine increased beyond its overspeed set point, resulting in the trip of the MFW pump.

CORRECTIVE ACTIONS

A Hardware Failure Analysis is in process to determine the the most probable cause of the servo failure. The evaluation of the results of the analysis will be completed by 6/30/2010. This evaluation will determine if additional actions are needed to prevent recurrence.

The servo valve was replaced and retested satisfactorily on 3/9/2010.

Action has been taken to replace the servo valve on a 3-year frequency.

SAFETY SIGNIFICANCE

The safety significance of this event is low. 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.

There were no adverse effects on the health and safety of the public.

OPERATING EXPERIENCE/PREVIOUS EVENTS

LER 2010-005-00 described a reactor trip due to a trip of a main feedwater pump caused by the failed transfer of an invertor to its alternate power supply.

LER 2009-001-00 described a reactor trip due to a Main Feedwater Regulating Valve (MFRV) closure in response to failures of the primary and secondary fuses for the Westinghouse 7300 control card frame that contained the associated control cards for the MFRV.

LER 2004-002-00 described a reactor trip due to a MFRV closure caused by the valve plug in the MFRV separating from the valve stem.