



Russell A. Smith  
Plant Manager

July 3, 2012

WO 12-0057

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

Reference: Letter WO 12-0047, dated May 31, 2012, from S. E. Hedges, WCNOC, to USNRC

Subject: Docket No. 50-482: Licensee Event Report 2012-004-00, "Two Charging Pumps Capable of Injecting into the RCS Due to Inadequate Definition of Centrifugal Charging Pump in LCO 3.4.12"

Gentlemen:

The enclosed Licensee Event Report (LER) is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) regarding two charging pumps (a centrifugal charging pump (CCP) and the normal charging pump (NCP)) being capable of injecting into the Reactor Coolant System (RCS) during the specified mode of applicability for the limiting condition of operation (LCO) for Technical Specification (TS) 3.4.12, "Low Temperature Overpressure Protection (LTOP) System." This event is being conservatively reported under 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TSs as the Required Actions of TS 3.4.12 would not have been met during certain periods of time if the NCP were to be considered a CCP.

The Reference submitted a request for interpretation of TS 3.4.12. The Reference requested concurrence with the following position:

LCO 3.4.12 requires, in part, an LTOP System shall be OPERABLE with a maximum of zero safety injection pumps and one centrifugal charging pump capable of injecting into the Reactor Coolant System (RCS). The LCO is applicable in MODE 3 with any RCS cold leg temperature  $\leq 368$  °F, MODE 4, MODE 5, and MODE 6 when the reactor vessel head is on. At the Wolf Creek Generating Station (WCGS), the LCO is met when both safety injection pumps and one centrifugal charging pump are not capable of injecting into the RCS with the second centrifugal charging pump and the normal charging pump capable of injecting into the RCS.

JE22  
NRK

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4156, or Mr. Gautam Sen at (620) 364-4175.

Sincerely,

A handwritten signature in black ink, appearing to read 'RAS', followed by a long horizontal line extending to the right.

Russell A. Smith

RAS/rlt

Enclosure

cc: E. E. Collins (NRC), w/e  
J. R. Hall (NRC), w/e  
N. F. O'Keefe (NRC), w/e  
Senior Resident Inspector (NRC), w/e

NRC FORM 366 (10-2010)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB: NO. 3150-0104		EXPIRES: 10/31/2013												
<b>LICENSEE EVENT REPORT (LER)</b>  (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, 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 4											
4. TITLE Two Charging Pumps Capable of Injecting into the RCS Due to Inadequate Definition of Centrifugal Charging Pump in LCO 3.4.12																			
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	09	2012	2012	004	00	07	03	2012	FACILITY NAME		DOCKET NUMBER								
											05000								
											05000								
9. OPERATING MODE  Mode 1			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)																
10. POWER LEVEL  100			<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)							
			<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			Specify in Abstract below or in NRC Form 366A							
<input type="checkbox"/> 20.2203(a)(2)(vi)			<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)			<input type="checkbox"/> 50.73(a)(2)(v)(D)													
12. LICENSEE CONTACT FOR THIS LER																			
FACILITY NAME Gautam Sen, Manager Regulatory Affairs								TELEPHONE NUMBER (Include Area Code) (620) 364-4175											
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										
14. SUPPLEMENTAL REPORT EXPECTED								15. EXPECTED SUBMISSION DATE		MONTH	DAY	YEAR							
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO																			
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)																			
<p>On May 9, 2012, a Nuclear Regulatory Commission (NRC) regional inspector identified that a potential violation of Technical Specification (TS) 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," occurred during the recent forced outage and in prior refueling outages. Limiting Condition for Operation (LCO) 3.4.12 requires an LTOP System shall be operable with a maximum of zero safety injection pumps and one centrifugal charging pump capable of injecting into the Reactor Coolant System (RCS). During the recent forced outage and during refueling outages, one safety related centrifugal charging pump and the non-safety related normal charging pump were capable of injecting into the RCS.</p> <p>The apparent cause for this potential violation is the failure to specifically define in the TS LCO that the centrifugal charging pump is an Emergency Core Cooling System (ECCS) centrifugal charging pump. A request for interpretation of TS 3.4.12 was submitted to the NRC on May 31, 2012.</p>																			

## LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
WOLF CREEK GENERATING STATION	05000 482	YEAR	SEQUENTIAL NUMBER	REV NO.	2 OF 4
		2012	-- 004 --	00	

## PLANT CONDITIONS AT THE TIME OF THE EVENT

Mode 1  
100 % power

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

## DESCRIPTION OF THE EVENT:

On May 9, 2012, a Nuclear Regulatory Commission (NRC) regional inspector identified that a potential violation of Technical Specification (TS) 3.4.12, "Low Temperature Overpressure Protection (LTOP) System," occurred during the recent forced outage and in prior refueling outages. Limiting Condition for Operation (LCO) 3.4.12 requires an LTOP System shall be operable with a maximum of zero safety injection pumps [EIS: BQ,P] and one centrifugal charging pump (CCP) [EIS: BQ,P] capable of injecting into the Reactor Coolant System (RCS) [EIS: AB]. During the recent forced outage and during refueling outages, one safety related centrifugal charging pump and the non-safety related normal charging pump (NCP) [EIS: CB,P] were capable of injecting into the RCS.

A review of the Wolf Creek Generating Station (WCGS) licensing basis and the NRC safety evaluations related to License Amendment Nos. 123 and 130 establishes the following position:

LCO 3.4.12 requires, in part, an LTOP System shall be operable with a maximum of zero safety injection pumps and one CCP capable of injecting into the RCS. The LCO is applicable in Mode 3 with any RCS cold leg temperature  $\leq$  368 degrees F, Mode 4, Mode 5, and Mode 6 when the reactor vessel head is on. The LCO is considered to be met when both safety injection pumps and one CCP are not capable of injecting into the RCS with the second CCP and the NCP capable of injecting into the RCS.

The mass input transient analysis assumes simultaneous injection of both a CCP and the NCP into the water-solid RCS while the Residual Heat Removal (RHR) System and the letdown line are isolated. This assumption is consistent with the TS LCO, which requires all safety injection pumps and one of the two Emergency Core Cooling System (ECCS) CCPs be made incapable of injecting into the RCS and therefore, allows a CCP to be operable and the NCP to be functional under these modes of operation. The safety evaluation in Amendment No. 123 for the conversion from current TSs to the improved TSs indicates that the requirements associated with LCO 3.4.12 is specific to ECCS pump capability to inject into the RCS. The NCP is not an ECCS pump. The safety evaluation for Amendment No. 130 specified that the operability of two power operated relief valves (PORVs) [EIS: AB,RV] or two RHR suction relief valves [EIS: BP,RV] or an RCS vent [EIS: AB,VTV] opening of at least 2 square inches ensures adequate flow capacity to protect the RCS from overpressurization from the start of a CCP and/or the NCP injecting into the RCS.

The full basis for this position was submitted to the NRC in Wolf Creek Nuclear Operating Corporation (WCNOC) letter WO 12-0047, "Request for Interpretation of Technical Specification 3.4.12, "Low Temperature Overpressure Protection (LTOP) System"," dated May 31, 2012.

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1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
WOLF CREEK GENERATING STATION	05000 482	YEAR	SEQUENTIAL NUMBER	REV NO.	3 OF 4
		2012	-- 004 --	00	

The NCP is a non-safety related single speed, horizontal, centrifugal type pump and is powered from a non-Class 1E source. The NCP is not an ECCS pump.

## BASIS FOR REPORTABILITY:

LCO 3.4.12 requires an LTOP System be operable with a maximum of zero safety injection pumps and one centrifugal charging pump capable of injecting into the RCS in Mode 3 with any RCS cold leg temperature  $\leq 368$  degrees F, Mode 4, Mode 5, and Mode 6 when the reactor vessel head is on. With two centrifugal charging pumps capable of injecting into the RCS, Required Action B.1 requires the immediate initiation of action to verify a maximum of one centrifugal charging pump is capable of injecting into the RCS. If the Completion Time of Required Action B.1 is not met, Required Action G.1 requires depressurizing the RCS and establishing an RCS vent of  $\geq 2.0$  square inches.

This event is being conservatively reported under 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TSs as the Required Actions of TS 3.4.12 would not have been met during certain periods of time if the NCP were to be considered a CCP. The following table identifies the dates in the prior 3 years in which a CCP and the NCP may have been capable of injecting into the RCS when in the mode of applicability of TS 3.4.12.

Dates – one CCP and the NCP capable of Injecting into RCS
3/23/12 to 3/25/12
1/14/12 to 3/19/12
6/2/11 to 6/20/11
5/6/11 to 5/30/11
3/19/11 to 3/25/11
10/5/10 to 10/15/10
3/4/10 to 3/5/10
10/10/09 to 10/15/09
11/9/09 to 11/18/09

A request for interpretation of TS 3.4.12 was submitted to the NRC as WCNOG considers the LCO to be met when both safety injection pumps and one CCP are not capable of injecting into the RCS with the second CCP and the NCP capable of injecting into the RCS.

## ROOT CAUSE:

The apparent cause for this potential violation is the failure to specifically define in the TS LCO that the centrifugal charging pump is an Emergency Core Cooling System (ECCS) centrifugal charging pump. The TS 3.4.12 Bases specifies that the term CCP refers to the safety related ECCS pumps only.

## CORRECTIVE ACTIONS:

A request for interpretation of TS 3.4.12 was submitted to the NRC on May 31, 2012.

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1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
WOLF CREEK GENERATING STATION	05000 482	YEAR	SEQUENTIAL NUMBER	REV NO.	4 OF 4
		2012	-- 004 --	00	

The affected Operations procedures will be revised to apply a conservative understanding of LCO 3.4.12 by specifying that the NCP is rendered incapable of injecting into the RCS in the mode or other specified condition in the Applicability of TS 3.4.12 since a CCP is required for a functional boration injection flow path.

The TS 3.4.12 Bases will be revised to apply a conservative understanding of LCO 3.4.12 by specifying that the NCP is rendered incapable of injecting into the RCS in the mode or other specified condition in the Applicability of TS 3.4.12.

## SAFETY SIGNIFICANCE:

The safety significance of this event is low. The LTOP PORV setpoint limit curve (Pressure and Temperature Limits Report Figure 2.2-1) is determined based on the updated heatup and cooldown limit curves, and the analysis results of limiting LTOP transients. The methodology for this determination is given in WCAP-14040-A, "Methodology Used to Develop Cold Overpressure Mitigation System Setpoints and RCS Heatup and Cooldown Limit Curves," Revision 4. The limiting LTOP mechanisms analyzed for WCGS under water solid conditions were:

## a. FOR LIMITING MASS ADDITION LTOP MECHANISM

Operation of one CCP and the NCP with instrument air failure resulting in the flow control valve in the letdown line failing closed (letdown isolation) and the flow control valve in the charging line failing open (maximum charging flow), and

## b. FOR LIMITING HEAT ADDITION LTOP MECHANISM

Inadvertent start-up of a reactor coolant pump with a maximum 50 degrees F temperature mismatch between the RCS and the hotter steam generators.

These analyses, using the LOFTRAN computer code, take into consideration pressure overshoot and undershoot beyond the PORV open and close setpoints, which can occur as a result of time delays in signal processing and valve stroke times. The maximum expected pressure overshoot and undershoot calculated from the limiting mass input and heat input transients, in conjunction with the 10 CFR 50, Appendix G, pressure limits and reactor coolant pump No. 1 seal pressure limit, are utilized in the selection of the pressure setpoints for the PORV. The mass injection rate assumed in the design basis mass input transient is based on 100% flow capacity of the NCP and one CCP. The maximum combined pump flow has been assumed in order to envelop the maximum flow possible by the operational configuration that uses the NCP for charging with one CCP remaining operable, or the use of one CCP for charging with the NCP remaining operable, during shutdown modes.

## OPERATING EXPERIENCE/PREVIOUS SIMILAR OCCURRENCES:

None