WOLF CREEK
NUCLEAR OPERATING CORPORATION

Rick L. Gardner
Plant Manager

June 24, 2010

WO 10-0040

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

Reference:
1) Letter WO 08-0010, dated April 10, 2008, from M. W. Sunseri, WCNOC, to USNRC
2) Letter WM 09-0065, dated December 9, 2009, from R. A. Muench, WCNOC, to USNRC
3) Letter WO 10-0003, dated January 11, 2010, from M. W. Sunseri, WCNOC, to USNRC
4) NRC letter dated March 4, 2010, from D. D. Chamberlain, USNRC, to M. W. Sunseri, WCNOC

Subject: Docket No. 50-482: Licensee Event Report 2008-002-02, Technical Specification Allowed Outage Time Exceeded due to Room Cooler Leak

Gentlemen,

Reference 1 submitted Licensee Event Report (LER) 2008-002-00 which described a condition in which Wolf Creek Nuclear Operating Corporation (WCNOC) requested and was granted a Notice of Enforcement Discretion to exceed the Technical Specification (TS) 3.8.1, Required Action B.2 Completion Time of 4 hours. Reference 1 submitted LER 2008-002-00 pursuant to 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plant's TSs.

Reference 3 submitted LER 2008-002-01 based on the November 10, 2009, Nuclear Regulatory Commission (NRC) Integrated Inspection Report 2009004. This inspection report identified a green severity level IV noncited violation of 10 CFR 50.73, with three examples for failure to submit LERs within 60 days following discovery of events or conditions meeting the reportability criteria. One of the examples in the inspection report was the failure to report LER 2008-002-00 under 10 CFR 50.73(a)(2)(v) as an event or condition that could have prevented the fulfillment of a safety function of structures or systems that are needed to shutdown the reactor and maintain it in a safe shutdown condition, remove residual heat, control the release of radioactive material, or mitigate the consequences of an accident.

IE22
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Reference 2 provided the results of an additional evaluation of the event and requested the NRC review the evaluation and provide WCNOC with an assessment of their review. Reference 3 indicated that WCNOC would supplement LER 2008-002-01 based on the NRC's assessment of the additional evaluation. Reference 4 provided the NRC assessment which concluded:

> The staff noted the calculations provided for the room cooler leak did not address the mechanical stresses generated in the room cooler and potential consequential failures following catastrophic failure of the end plug. The staff also noted that the calculations for centrifugal charging pump A utilized the conditions that existed at the time instead of design conditions. The staff concluded the computations provided in your response did not provide a reasonable basis to demonstrate the operability of the structures, systems and components described in the first example. Therefore, NRC staff determined that this example was applicable.

The enclosed LER has been revised to remove the results of the additional evaluation of the event based on the conclusions reached in Reference 4.

There are no regulatory commitments in this submittal. If you have any questions concerning this matter, please contact me at (620) 364-4008, or Mr. Richard D. Flannigan, Manager Regulatory Affairs at (620) 364-4117.

Sincerely,

Rick L. Gardner

RLG/rlt

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

NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION

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.

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
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4. TITLE

Technical Specification Allowed Outage Time Exceeded due to Room Cooler Leak

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
02	14	2008	2008	- 002 -	02	06	24	2010		05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

1

10. POWER LEVEL

100

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

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)*

At 1420 hours Central Standard Time on February 13, 2008, with the "B" train diesel generator out of service for planned maintenance activities, the "A" train Centrifugal Charging Pump (CCP) was declared inoperable due to an associated room cooler tube leak. Technical Specification (TS) Limiting Condition of Operation (LCO) 3.0.3 was entered at 1820 hours due to two trains of Emergency Core Cooling Systems being declared inoperable. A plant shutdown was commenced at 1850 hours.

At 1950 hours, the NRC granted a Notice of Enforcement Discretion to allow an additional 15 hours to restore the "A" train CCP and its associated room cooler to OPERABLE status. The power reduction was stopped and the plant was returned to 100% power. TS LCO 3.0.3 was exited.

On February 14, 2008, at 0141 hours, the "A" train CCP room cooler was returned to service. The condition causing the need for the enforcement discretion was corrected. The appropriate TS Conditions were exited.

NARRATIVE

PLANT CONDITIONS PRIOR TO EVENT:

MODE – 1
Power – 100

EVENT DESCRIPTION:

On February 11, 2008, at 0502 Central Standard Time (CST), the "B" diesel generator (DG) (EIIS Code: DG) was declared inoperable for voluntary planned maintenance activities in accordance with Technical Specification (TS) 3.8.1. Required Action B.4.2.2 of TS 3.8.1 specifies a Completion Time of 7 days to restore the DG to OPERABLE status.

On February 13, 2008, at 0749, the performance of procedure STS IC-805B, "Channel Calibration of NB02 Grid Degraded Voltage, Time Delay Trip," was initiated for testing of the train B degraded voltage relays. This resulted in the planned entry into TS 3.8.1, Condition A (one offsite circuit inoperable), Condition E (one offsite circuit inoperable and one DG inoperable) and Condition G (one load shedder and emergency load sequencer inoperable).

At 1420 hours on February 13, 2008, water was identified coming from the drip pan for the "A" Centrifugal Charging Pump (CCP) (EIIS Code: P) room cooler. At 1550 hours, after the removal of the outer cover panel of the room cooler, a leak was identified on a room cooler H-bend assembly. The "A" CCP room cooler and "A" CCP were declared inoperable. TS 3.5.2, Condition A / Required Action A.1 was entered with a 72 hour Completion Time to restore the inoperable train ("A" CCP) to OPERABLE status. Additionally, Condition B / Required Action B.2 of TS 3.8.1 was entered with a Completion Time of 4 hours to declare the required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable (i.e., 4 hours to declare the "B" CCP inoperable). When the "A" CCP was declared inoperable, entry into Condition B / Required Action B.2 of TS 3.8.1 was required as discussed in the TS Bases.

With the through-wall leak identified on the "A" CCP room cooler H-bend assembly, "A" Essential Service Water (ESW) train [EIIS Code: BI] was declared inoperable as required by Technical Requirement (TR) 3.4.17, "Structural Integrity," since structural integrity of the system could not be verified. TS 3.7.8, Condition A (one ESW train inoperable) was entered with a 72 hour Completion Time to restore the ESW train to OPERABLE status. Note 1 of Required Action A.1 (TS 3.7.8) indicates that the applicable Conditions and Required Actions of LCO 3.8.1 should be entered if an inoperable ESW train results in an inoperable DG. Plant operators entered TS 3.8.1, Condition F (two DGs inoperable) and Condition I (three or more required AC sources inoperable). Condition I of TS 3.8.1 required entry into LCO 3.0.3. Note that the entry into LCO 3.0.3 was backdated in the Control Room logs to time 1420 hours (time when it was identified that water was coming from the drip pan for the "A" CCP) and action was not taken within 1 hour to place the unit in MODE 3.

At 1613 hours on February 13, 2008, the "A" CCP room cooler was isolated from the ESW System. With the room cooler isolated, "A" ESW and "A" DG were declared operable and LCO 3.0.3 exited.

Enforcement discretion was sought to permit non-compliance with the Completion Time of Required Action B.2 of TS 3.8.1, i.e., to permit additional time to complete repairs and restoration of the "A" CCP room cooler and restoration of the "A" CCP before a plant shutdown was required.

At 1820 hours on February 13, 2008, Control Room operators declared the "B" CCP inoperable and entered LCO 3.0.3 (no TS 3.5.2 Condition for two trains inoperable).

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At 1950 hours on February 13, 2008, the request for a Notice of Enforcement Discretion (NOED) was approved. The approval was effective and would begin at 1420 hours on February 13, 2008 for a total of 19 hours.

At the time of the approval of the request for NOED, the plant had reduced rated thermal power to approximately 90%. The plant was returned to 100% rated thermal power.

At 0141 hours on February 14, 2008, the "A" CCP room cooler was returned to operable status. The condition causing the need for the enforcement discretion was corrected and Required Action B.2 of TS 3.8.1 was exited.

BASIS FOR REPORTABILITY:

Wolf Creek Nuclear Operating Corporation (WCNOC) requested and received a NOED from the NRC to obtain enforcement discretion to allow an additional 15 hours for restoring the "A" CCP room cooler and "A" CCP to OPERABLE status. The "A" CCP room cooler and "A" CCP were out of service for longer than allowed by the allowed outage time (AOT) of the Wolf Creek Generating Station (WCGS) TS 3.8.1, Required Action B.2. The event is reportable pursuant to 10 CFR 50.73(a)(2)(i)(B) for any operation or condition which was prohibited by the plant's TS.

This event is also being reported per 10 CFR 50.73(a)(2)(v)(A-D) as an event or condition that could have prevented the fulfillment of a safety function because mechanical stresses generated in the room cooler could result in potential consequential failures following a catastrophic failure of the end plug. Table 1 below provides a detailed timeline of the event. A review of the detailed timeline determined that in addition to both CCPs being declared inoperable, both DGs were declared inoperable during this event for a period of 1 hour and 53 minutes.

Table 1
Timeline for "A" CCP Room Cooler Leak (LER 2008-002-00) [1]

TRAIN A			TRAIN B		
			2/11	0502	B DG declared inoperable per TS 3.8.1, Required Action (RA) B.4.2 (7-day planned Completion Time)
			2/13	0749	Offsite circuit inoperable for STS IC-805B (planned). Entered TS 3.8.1, Condition A, E, G (12 hours to restore)
2/13	1420	A CCP room cooler leak. A CCP declared inoperable – Condition A of TS 3.5.2 (72 hours)	2/13	1420	Re-entered RA B.2 to declare inoperable the required features supported by the inoperable DG (4hrs to restore either B DG or A CCP)
	1420	A ESW declared inoperable due to ESW leak in room cooler			
	1420	A DG declared inoperable with ESW inoperable. Entered TS 3.8.1 Condition F (2 hours to restore 1 DG) and Condition I (enter LCO 3.0.3 immediately)			
	1420	Entered LCO 3.0.3 (TS 3.8.1, Condition I – 3 AC source inoperable)			
	1445	Breaker opened for A CCP room cooler			
	1550	Determined leak on A CCP room cooler was through wall. Structural integrity cannot be verified. Backdated entry into LCO 3.0.3 to time when leak in drip pan identified.			
	1613	A CCP room cooler isolated from ESW. Exited LCO 3.0.3.			
	1613	A ESW operable, A DG operable. Exited TS 3.7.8 Condition A, Exited TS 3.8.1 Condition F.			
				1820	B CCP declared inoperable (due to TS RA B.2 – declare required redundant features inoperable)
	1820	Enter LCO 3.0.3 due to both CCPs inoperable (no TS 3.5.2 Condition for two trains inoperable)			
				1826	STS IC-805B completed. Exited TS 3.8.1, Conditions A, E, G
	1950	Enforcement Discretion granted by NRC. A CCP and room cooler required to be restored by 0920 on 2/14. Exited LCO 3.0.3, Entered TS 3.8.1 RA B.2			
2/14	0141	A CCP room cooler restored. A CCP operable. Exited TS 3.8.1, RA B.2, and TS 3.5.2, Condition A			

[1] The timeline is based on log entries from the control room log. Note that the 1445 timeframe was not in the control room log. The time for opening the breaker for the A CCP room cooler was taken from CR 00008574 (2008-000469).

CAUSE:

The "A" CCP room cooler is original installed plant equipment. The apparent degradation mechanism is flow-induced erosion in the H-Bend area. This failure mechanism has been seen on other room coolers that utilize H-Bends for connecting the circuits.

Flow erosion is a slow wear mechanism that degrades the H-Bends over a long period of time. This component has been in service for about 23 years and, other than maintenance outages, this component maintains continuous flow through the tubes. The continuous flow plus the length of service suggests that this is normal aging and not an accelerated degradation event.

CORRECTIVE ACTIONS:

The "A" CCP Room Cooler was isolated to repair the H-Bend leak. The repair activities replaced the defective H-Bend and returned the CCP Room Cooler to operable status.

The original room coolers included the use of H-Bend returns soldered to CuNi alloy tubes. The long-term plan to replace all CuNi coils with up-graded stainless steel components by the end of the first quarter of 2009 has been completed. The replacement room coolers have been re-designed which eliminated the H-bends and improved the tube material. The first of the new coils were installed in 1999.

SAFETY SIGNIFICANCE:

The final quantitative risk analysis indicated that the incremental conditional core damage probability (ICCDP) for the extension was 1.53E-08, and the incremental conditional large early release probability (ICLERP) for the extension is essentially zero. While the extension was for an additional 15 hours (approximately 1.71 E-03 years), the ICCDP and ICLERP were calculated using a bounding 24 hours (approximately 2.74E-03 years). The value for ICLERP is less than the guidance threshold in Inspection Manual Part 9900 Technical Guidance.

The calculated value for ICCDP meets the Regulatory Issue Summary 2005-01 threshold of less than or equal to 5.0E-07. The calculated ICCDP did not consider the implied risk of shutting down the plant with only one available diesel generator, the "A" CCP being in a functional status, and that the CCP room volume communicates with the Safety Injection and Containment Spray pump rooms which have their own functional room coolers.

To further mitigate the risk impact, WCNOC implemented a series of compensatory actions to minimize challenges to the dominant core damage frequency (CDF) contributor of Loss of Offsite Power. These measures included avoidance of testing and maintenance impacting availability of the "A" train safety bus, ensure no switchyard work was allowed, continual monitoring by the grid operator regarding grid conditions, and availability of the Sharpe Station to mitigate a Station Blackout (SBO).

OPERATING EXPERIENCE/PREVIOUS EVENTS:

None.