February 14, 2005

L-MT-05-007
10 CFR Part 50.73

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

Monticello Nuclear Generating Plant
Docket No. 50-263
License No. DPR-22

LER 2004-003, "High Pressure Coolant Injection System Declared Inoperable due to Loose Oil Plug"

A Licensee Event Report for this occurrence is attached.

This letter makes no new commitments or changes any existing commitments.

Thomas J. Palmisano
Site Vice President, Monticello Nuclear Generating Plant
Nuclear Management Company, LLC

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, Monticello, USNRC
Resident Inspector, Monticello, USNRC

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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

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TITLE (4) High Pressure Coolant Injection System Declared Inoperable due to Loose Oil Plug

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER 05000
12	15	2004	2004	– 003	– 00	02	14	2005	FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	N
POWER LEVEL (10)	100

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

	20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)
	20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)
	20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73.71(a)(4)
	20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)
	20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)		OTHER Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		
	20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)	X	50.73(a)(2)(v)(D)		
	20.2203(a)(2)(v)		50.73(a)(2)(i)(B)		50.73(a)(2)(vii)		
	20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)		
	20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Ron Baumer	763-295-1357

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO				

ABSTRACT

On 12/14/2004, the lube oil plug on the High Pressure Coolant Injection (HPCI) Turbine Booster Pump had been removed to take an oil sample and replaced. The turbine was then operated to perform vibration analysis. Later on 12/14/2004, a Monticello Nuclear Generating Plant operator found a small amount of oil under the oil plug on the High Pressure Coolant Injection (HPCI) Turbine Booster Pump and the oil plug was identified as being loose. The plug was immediately tightened and oil level verified. At 1300 on 12/15/2004, based on the evaluation by Operations that the HPCI plug could have backed further out during extended operation, and caused the HPCI system to be unable to fulfill its safety function, an Event Notification was made to the NRC for the event.

The root cause of the loose drain plug is the lack of programmatic controls to ensure the minimum required tightness is applied during reinstallation of the drain plugs after sampling or changing oil. The current practice was to allow oil drain plugs to be installed as a skill of the craft activity by Operations personnel. Operations personnel had not been sufficiently trained on this skill area. The small tool used, and the height of the plug (71 inches) also contributed to the event. NMC has initiated corrective actions to ensure that oil drain plugs are sufficiently tightened following oil-sampling activities.

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TEXT *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

Description

On 12/13/2004 at 0312, the High Pressure Coolant Injection (HPCI)[1] Comprehensive Pump and Valve Test was initiated. The procedure required that dynamic oil samples be obtained from the bearings of the HPCI booster pump. On 12/13/2004 at 0530, after the initial steps of the test were performed, the HPCI system was isolated for 4 work orders. On 12/14/2004 at 0228, the maintenance was completed, the isolations lifted, and the test was continued. The HPCI system was operated for approximately one hour and then shut down. The Reactor Building Operator was assigned to obtain samples of oil from the HPCI Booster Pump[2] bearings. The Reactor Building Operator obtained the samples via the oil drain plugs. The same method of sampling was used for both booster pump bearings. Testing was resumed at 0939 and the HPCI Turbine was operated a second time to obtain vibration readings. The testing was completed, and the HPCI system was declared operable at 1338. At approximately 2200 the night shift Reactor Building Operator found a small amount of oil under HPCI booster pump outer bearing. He checked the bearing plug and found it loose. He turned it approximately two turns by hand then tightened it with an 8-inch box end wrench. The oil level was checked and found to be sufficient. He reported the incident to the Control Room Supervisor. At 1300 on 12/15/2004, based on the evaluation by Operations that the HPCI plug could have backed further out during extended operation, and caused the HPCI system to be unable to fulfill its safety function, an Event Notification was made to the NRC for the event.

Event Analysis

The high pressure coolant injection (HPCI) system is provided to assure that the reactor core is adequately cooled to limit fuel clad temperature in the event of a small break in the reactor coolant system and loss of coolant which does not result in rapid depressurization of the reactor vessel. The HPCI system permits the reactor to be shut down while maintaining sufficient reactor vessel water level inventory until the vessel is depressurized. The HPCI system continues to operate until reactor vessel pressure is below the pressure at which Core Spray[3] system operation or Low Pressure Core Injection (LPCI)[4] mode of the RHR system operation maintains core cooling.

In accordance with 10 CFR 50.72 (b)(3)(v)(D), “Event or Condition that could have Prevented Fulfillment of a Safety Function,” an eight-hour event notification was made to the USNRC, due to the loss of HPCI which is required to mitigate the consequences of an accident. Operators determined that there was a potential for the HPCI oil plug to have fallen out, resulting in the HPCI bearing becoming seized, and the HPCI system would have been unable to perform its safety function. Per 10 CFR 50.73 (a)(2)(v)(D), a Licensee Event report is required for this event.

The event is classified as a safety system functional failure.

[1] EIIS System Code – BJ
[2] EIIS Component Code - P
[3] EIIS System Code – BM
[4] EIIS System Code - BO

Safety Significance

Evaluation of this condition identified that low safety significance could be assigned to this discovery and that no noticeable increase in Core Damage Frequency (CDF) would occur due to HPCI being inoperable for a nine-hour period.

Although the HPCI turbine would have been able to inject for an unknown period of time, this safety significance is based on assuming that the HPCI booster pump would fail due to the plug coming loose and the bearing seizing due to loss of oil. In this event the operators would have several other systems available to mitigate the consequences of an accident with a loss of HPCI in the event that normal off-site power is available or during a Loss of Offsite Power (LOOP). Plant operators have established procedures, Emergency Operating Procedures (EOP) and EOP support procedures to ensure the ability to inject water without HPCI available.

With higher reactor pressures and normal offsite power available the operators would procedurally maintain level with the preferred or alternate injection systems. These are normal Condensate[5]/Feedwater[6] Pumps, Control Rod Drive[7] (CRD) Pumps, and Reactor Core Isolation Cooling[8] (RCIC). Alternate high-pressure injection would be available using the Standby Liquid Control[9] pumps if needed. With lower pressures the preferred method would be Condensate pumps, LPCI, Core Spray pumps, CRD pumps, and to an extent RCIC.

For a LOOP all of the above means of water make-up would be available for either high or low-pressure injection, except for the Condensate Pumps and Reactor Feed pumps. If the reactor vessel make-up needs exceeded the capacity of the high pressure pumps, or the high pressure pumps became unavailable and a predetermined EOP level could not be maintained, Automatic Depressurization System[10] would be utilized to depressurize the vessel to allow the use of low pressure systems to be used.

The Monticello Risk Analysis group evaluated the event with the following results: A review of plant operating logs determined that on 12/14/2004 the #12 RBCCW pump and the #12 off-gas compressor were out of service when the drain plug on the oil reservoir for the HPCI booster pump outboard bearing housing was found to be loose. Conservatively assuming that the booster pump would fail given that HPCI was called upon to operate, the HPCI system would not have been capable of completing its function. The CDF with #12 off-gas compressor and #12 RBCCW out of service is 4.39 E-05/yr. If HPCI is failed in addition to the #12 off-gas compressor and #12 RBCCW pump, CDF becomes 5.00 E-05/yr. From the time that HPCI was declared operable (1338 on 12/14/2004) to the time that the loose plug was discovered and corrected (2200 on 12/14/2004), approximately nine hours had elapsed. The additional risk incurred (conditional increase in probability of a core damage

[5] EIIS System Code - SD
[6] EIIS System Code - SJ
[7] EIIS System Code - AA
[8] EIIS System Code - BN
[9] EIIS System Code - BR
[10] EIIS System Code - VA

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accident) due to the HPCI system being unavailable for this nine hour period is estimated to be (5.00 E-05/yr - 4.39 E-05/yr) x 9 hrs x 1 yr/8760 hrs = 6.27 E-09. This is considered to be a negligible amount of additional risk.

Cause

The root cause of the loose drain plug is the lack of programmatic controls to ensure the minimum required tightness is applied during reinstallation of the drain plugs after sampling or changing oil. The current practice is to allow oil drain plugs to be installed as a skill of the craft activity by Operations personnel. Operations personnel have not been sufficiently trained in this skill area. The small tool used, and the height of the plug (71 inches) also contributed to the event.

Corrective Action

Upon discovery, the oil plug was immediately tightened and the oil level was verified to be correct.

An Operations Memorandum was issued to the operators to provide guidance for tightening oil plugs as an interim action.

Site procedures for obtaining an oil sample and changing oil will be revised, to incorporate the maintenance definition of mechanically tight, and require a second person to verify the tightness for safety related equipment.

Training will be provided to operators on appropriate standards for tightening drain plugs.

Failed Component Identification

N/A

Previous Similar Events

A review of the station corrective action program database did not find any similar events.