

Indiana Michigan
Power Company
500 Circle Drive
Buchanan, MI 49107 1395



February 2, 2005

AEP:NRC:2573-23

Docket No. 50-316

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop O-P1-17
Washington, DC 20555-0001

Donald C. Cook Nuclear Plant Unit 2
SUPPLEMENTAL LER FOR UNIT 2 TECHNICAL SPECIFICATION 3.7.1.2
LIMITING CONDITION FOR OPERATION EXCEEDED
FOR AUXILIARY FEEDWATER SYSTEM

In accordance with the criteria established by 10 CFR 50.73, entitled "Licensee Event Report System," the following report is being submitted:

LER 316/2003-003-02: "Supplemental LER for Unit 2 Technical Specification 3.7.1.2 Limiting Condition for Operation Exceeded for Auxiliary Feedwater System"

This supplement corrects the previous submitted supplement to change the root cause for the event. The original root cause was amended to address comments provided to Indiana Michigan Power Company by an external stakeholder.

There are no new commitments identified in this submittal. Should you have any questions regarding this correspondence, please contact Mr. Toby K. Woods, Compliance Supervisor, at (269) 466-2798.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jensen', with a long horizontal line extending to the right.

Joseph N. Jensen
Site Vice President

RAM/jen

Attachment

JE22

c: J. L. Caldwell – NRC Region III
K. D. Curry – AEP Ft. Wayne
J. T. King - MPSC
C. F. Lyon – NRC Washington DC
MDEQ – WHMD/HWRPS
NRC Resident Inspector
Records Center - INPO

NRC Form 366 (6-2004)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB: NO. 3150-0104	EXPIRES 6/30/2007
<h2 style="margin: 0;">LICENSEE EVENT REPORT (LER)</h2> <p style="margin: 0;">(See reverse for required number of digits/characters for each block)</p>		Estimated burden per response to comply with this mandatory collection request: 50 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 Donald C. Cook Nuclear Plant Unit 2	2. DOCKET NUMBER 05000-316	3. PAGE 1 of 4
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4. TITLE
 Supplemental LER for Unit 2 Technical Specification 3.7.1.2 Limiting Condition for Operation Exceeded for Auxiliary Feedwater System

5. EVENT DATE			6. LER NUMBER		7. REPORT DATE			8. OTHER FACILITIES INVOLVED		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	08	2003	2003	-- 003	-- 02	02	02	2005	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) <table style="width:100%; font-size: x-small;"> <tr> <td><input type="checkbox"/> 20.2201(b)</td> <td><input type="checkbox"/> 20.2203(a)(3)(i)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(C)</td> <td><input type="checkbox"/> 50.73(a)(2)(vii)</td> </tr> <tr> <td><input type="checkbox"/> 20.2201(d)</td> <td><input type="checkbox"/> 20.2203(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(1)</td> <td><input type="checkbox"/> 20.2203(a)(4)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(B)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(i)</td> <td><input type="checkbox"/> 50.36(c)(1)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ix)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(ii)</td> <td><input type="checkbox"/> 50.36(c)(1)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iv)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(x)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iii)</td> <td><input type="checkbox"/> 50.36(c)(2)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(A)</td> <td><input type="checkbox"/> 73.71(a)(4)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iv)</td> <td><input type="checkbox"/> 50.46(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(B)</td> <td><input type="checkbox"/> 73.71(a)(5)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(v)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(C)</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(vi)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(D)</td> <td style="font-size: x-small;">Specify in Abstract below or in NRC Form 366A</td> </tr> </table>	<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	<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)	Specify in Abstract below or in NRC Form 366A
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12. LICENSEE CONTACT FOR THIS LER	
FACILITY NAME Toby Woods, Regulatory Affairs	TELEPHONE NUMBER (Include Area Code) (269) 466-2798

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPK	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPK

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

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

This supplemental LER is being issued to update the causal and corrective action statements. At 0400 hours on March 5, 2003, Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.1.2, Action "a" was entered to perform routine maintenance on the Unit 2 West Motor Driven Auxiliary Feedwater (MDAFW) pump. During post-maintenance testing, a loud "buzzing" noise was heard emanating from the vicinity of the pump motor. A supporting/refuting evaluation was performed, which eliminated the pump, breaker, or system alignment as the possible source of the noise. At this point, the decision was made to replace the suspect motor. Initially, Indiana Michigan Power (I&M) had expected to complete the replacement of the West MDAFW pump motor within the allowed outage times specified in TS 3.7.1.2. However, unanticipated delays prevented the completion of this activity within the allowed outage time. Therefore, I&M requested, and was granted, enforcement discretion on March 8, 2003.

The apparent cause of the Unit 2 West MDAFW pump motor noise was loose air baffles due to mounting hole deformation as determined by the vendor's as found condition analysis. The cause for the failure to complete the motor replacement within the allowed outage time was inconsistent maintenance work practices and inadequate interface requirements that resulted in a lack of command and control process for short term LCO activities. Corrective actions to prevent recurrence included the establishment of administrative guidance to ensure the appropriate techniques and tools are used when performing work on critical components, and the development and satisfactory completion of coupling installation training. Also, going forward, I&M established a team to respond to equipment issues that challenge short duration allowed outage time.

I&M determined that no net increase in risk was associated with extending the TS 72-hour allowed outage time by an additional 36 hours to restore the West MDAFW pump to an operable status. Although the proposed action deviated from a requirement in TS 3.7.1.2, it did not affect any safety limits, setpoints in the TS, or other operational parameters, nor did it affect any margins assumed in the accident analyses. In addition, the redundant Unit 2 East MDAFW pump and TDAFW pump continued to be operable to perform their required design function. The Unit 2 West MDAFW pump motor was replaced with a spare motor and the pump was declared operable at 0246 hours on March 9, 2003.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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

Conditions Prior to Event

Unit 1 – Mode 1, 100 percent power
Unit 2 – Mode 1, 100 percent power

Description of Event

This supplemental LER is being issued to update the causal statement and corrective action statements.

At 0400 hours on March 5, 2003, Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.1.2, Action "a", was entered to perform routine maintenance on the Unit 2 West Motor Driven Auxiliary Feedwater (MDAFW) pump. During post-maintenance surveillance testing of the pump, a loud "buzzing" noise (lasting approximately one second) was heard emanating from the vicinity of the pump motor during the start sequence. Due to the presence of the noise, infrared thermography of the motor was performed during the surveillance. No abnormalities were indicated.

The motor was instrumented for another run to collect data to assist in determining the source and cause of the noise. The motor was started and the following data was collected during the five-minute run:

- Electromagnetic Interference (EMI) testing utilizing the hand-held EMI unit. The data did not indicate the presence of a degraded condition.
- Vibration monitoring of the motor. The data did not indicate the presence of a degraded condition or a degrading trend.
- Oil samples were collected from the motor and pump bearings. Visual examination indicated no problems in the oil, nor any evidence of bearing degradation.

Following the five-minute run, the circuit breaker was checked and preventive maintenance was performed, which ruled out the circuit breaker as the cause for the noise.

In addition, a motor characterization test was performed. This test checks the condition of the insulation in the motor and power cables from the circuit breaker. It also checks the electrical connections and the inductance of the motor stator windings. The test results indicated no abnormalities or evidence of degradation.

The condition monitoring tests that were performed prior to and following the manifestation of the noise did not indicate any degraded condition. However, based on the prior experience of the personnel involved, the noise was believed to indicate a potentially degraded condition in the motor. As such, the following actions were performed:

- The pump and motor were rotated by hand and both were found to rotate freely.
- The pump was uncoupled from the motor and each component was rotated by hand. Both were found to rotate freely.
- The motor was run uncoupled and a similar noise was heard.

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

Indiana Michigan Power (I&M) decided to replace the suspect West MDAFW pump motor with a spare motor. This decision was based on the results of a supporting/refuting evaluation performed by I&M, which eliminated the pump, breaker, or system alignment as the possible source of the noise. The spare pump motor, which was functionally the same, had a different frame size. However, the spare motor was identical to the frame size used on the Unit 1 and Unit 2 East MDAFW pumps. Because the spare was of a different frame size, changes to the motor mounting configuration were necessary. A different coupling hub was required for the spare motor, which also had a larger shaft size than the suspect motor it was replacing. In addition, the spare motor weighed more than the suspect motor (4,800 pounds versus 2,800 pounds).

An equivalency evaluation was performed to evaluate the differences between the suspect motor and the spare motor. All critical characteristics were compared to the current motor design. I&M concluded that the differences had no adverse effect on the function or qualification of the West MDAFW pump. However, not all of the physical differences were taken into consideration and this error adversely affected installation.

Initially, I&M had expected to complete the replacement of the West MDAFW pump motor within the allowed outage times specified in TS 3.7.1.2. However, unanticipated delays prevented the completion of this activity within the allowed outage time. Therefore, on March 8, 2003, at 0127 hours, I&M received enforcement discretion from the NRC to extend the 72-hour allowed outage time by an additional 36 hours to restore the West MDAFW pump to an operable status. At the time that enforcement discretion was requested, the spare motor had been installed and an uncoupled run was successfully performed. Remaining work was to fabricate the motor coupling, align the spare motor to the West MDAFW pump, couple, and successfully perform post-maintenance testing before restoring the pump to an operable status. At 0246 hours on March 9, 2003, the Unit 2 West MDAFW pump was declared operable and the LCO for TS 3.7.1.2, Action "a" was exited.

Because the 72-hour allowed outage time for TS 3.7.1.2 was exceeded, this licensee event report (LER) is being submitted in accordance with the requirements of 10 CFR 50.73 (a)(2)(i)(B) for operation or a condition prohibited by the plant's TS.

Cause of Event

The apparent cause of the Unit 2 West MDAFW pump motor noise was loose air baffles due to mounting bolt hole deformation.

The cause for the failure to complete the motor replacement within the allowed outage time was due to inconsistent maintenance work practices and inadequate interface requirements that resulted in a lack of command and control process for short term LCO activities

Analysis of Event

The AFW system is a safety-related system that provides feedwater to the steam generators (SGs) when the main feedwater pumps are unavailable. Each unit's AFW system consists of three feedwater supply trains with diverse power sources. One train includes a turbine-driven auxiliary feedwater (TDAFW) pump supplying all four SGs. The other two trains consist of MDAFW pumps, each supplying two SGs. The MDAFW pumps are capable of supplying the corresponding sets of SGs in the opposite unit through manual cross-tie supply valves in the event of an Appendix R fire in the opposite unit.

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

I&M determined that no net increase in risk was associated with extending the TS 72-hour allowed outage time by an additional 36 hours to restore the West MDAFW pump to an operable status when compared with the risk associated with shutting the plant down. This conclusion supported I&M's request for enforcement discretion, which was verbally granted by the NRC on March 8, 2003, at 0127 hours. Although the proposed action deviated from a requirement in TS 3.7.1.2, it did not affect any safety limits, setpoints in the TS, or other operational parameters, nor did it affect any margins assumed in the accident analyses. In addition, the redundant Unit 2 East MDAFW pump and TDAFW pump continued to be operable to perform their required design function.

Corrective Actions

The suspect Unit 2 West MDAFW pump motor was replaced with a spare motor. The pump was satisfactorily tested and declared operable at 0246 hours on March 9, 2003.

Following are the corrective actions which were implemented to prevent recurrence:

I&M evaluated current precision measurement techniques and instrument identification used on critical equipment; and implemented changes to ensure appropriate techniques and tools are being used on critical plant equipment. (CR 03067008-07)

I&M developed and presented enhanced coupling installation training. (CR 03067008-05, -11, and -12)

Incorporated a response team into the forced outage work control process to facilitate its response to equipment issues that challenge short duration allowed outage time. (CRE 03067008 and CR 03067008-21)

Previous Similar Events

None