



June 14, 2005

L-PI-05-050
10 CFR 50.73

U S Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Prairie Island Nuclear Generating Plant Unit 2
Docket 50-306
License No. DPR-60

LER 2-05-02, Unit 2 Shutdown Required by Technical Specifications Due to Inoperable
Emergency Diesel Generator

The Licensee Event Report for this occurrence is attached. Notification of this event as required by 10 CFR 50.72(b)(2)(i) was made on April 15, 2005. Please contact us if you require additional information related to this event.

Summary of Commitments

This letter contains one new commitment and no revisions to existing commitments. Specifically, NMC commits that, following completion of additional cause investigation, NMC will submit a supplement to this Licensee Event Report.

Joseph M. Solymossy
Site Vice President, Prairie Island Nuclear Generating Plant
Nuclear Management Company, LLC

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, Prairie Island, USNRC
Resident Inspector, Prairie Island, USNRC
Glenn Wilson, State of Minnesota

ENCLOSURE

LICENSEE EVENT REPORT 2-05-02

4 pages follow

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION (6-2004)	APPROVED BY OMB NO. 3150-0104	EXPIRES 6-30-2007
<h2 style="margin: 0;">LICENSEE EVENT REPORT (LER)</h2> <p style="margin: 5px 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, (3150-0066), 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.		

FACILITY NAME (1) Prairie Island Nuclear Generating Plant Unit 2	DOCKET NUMBER (2) 05000 306	PAGE (3) 1 of 4
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TITLE (4)
Unit 2 Shutdown Required by Technical Specifications Due to Inoperable Emergency Diesel Generator

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	
4	15	05	05	-- 02 --	0	6	14	05	FACILITY NAME	DOCKET NUMBER	
OPERATING MODE (9)		1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)								
POWER LEVEL (10)		100	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)		X	50.73(a)(2)(i)(A)			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 Jeff Kivi	TELEPHONE NUMBER (include Area Code) 651.388.1121
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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
<input checked="" type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE).	<input type="checkbox"/> NO				9	15	05

ABSTRACT

On April 11, 2005, the Train A Unit 2 Emergency Diesel Generator (D5) was removed from service for a monthly slow start test. At approximately 0830 CDT the test was halted on indications of high crankcase pressure on Engine 2 (D5 is a tandem engine generator). The test procedure specifies shutting down the diesel generator (DG) if crankcase pressure exceeds 30mm for more than a few minutes (the setpoint for the crankcase pressure trip is 52 mm). During the test crankcase pressure increased to 48 mm and D5 was unloaded early per the procedure.

With D5 inoperable, Technical Specification 3.8.1 (AC Sources – Operating), Required Action B.4, requires returning the inoperable diesel generator to operable status within seven days. A troubleshooting plan was initiated and actions were taken to diagnose and return D5 to operable status. An assessment of the scope of work to return D5 to operable status and the schedule for completing the work indicated that repairs could not be completed within the 7 days allowed outage time. Based on this assessment an orderly shutdown of Unit 2 was initiated on April 15, 2005. Unit 2 entered Mode 5 (Cold Shutdown) on April 17, 2005.

D5 engines were rebuilt and D5 was declared operable and returned to service on April 25, 2005.

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

EVENT DESCRIPTION

On April 11, 2005, the Train A Unit 2 Emergency Diesel Generator¹ (D5) was removed from service for a monthly slow start test. At approximately 0830 CDT the test was halted on indications of high crankcase pressure on Engine² 2 (D5 is a tandem engine generator). The test procedure specifies shutting down the DG if crankcase pressure exceeds 30mm for more than a few minutes (the setpoint for the crankcase pressure trip is 52 mm). During the test crankcase pressure increased to 48 mm and D5 was unloaded early per the procedure.

With D5 inoperable, Technical Specification (TS) 3.8.1 (AC Sources – Operating), Required Action B.4, requires returning the inoperable diesel generator to operable status within seven days. A troubleshooting plan was initiated and actions were taken to diagnose and return D5 to operable status. An assessment of the scope of work to return D5 to operable status and the schedule for completing the work indicated that repairs could not be completed within the 7 days allowed outage time. Based on this assessment an orderly shutdown of Unit 2 was initiated on April 15, 2005. Unit 2 entered Mode 5 (Cold Shutdown) on April 17, 2005.

D5 engines were rebuilt and D5 was declared operable and returned to service on April 25, 2005. Six pistons and cylinder liners replaced within the previous year were examined by borescope, found to be acceptable and were not replaced.

EVENT ANALYSIS

Since Unit 2 was brought to Mode 3 as required by TS 3.8.1, Condition F, this shutdown is reportable per 10 CFR 50.73(a)(2)(i)(A).

Impact on Safety System Functional Failure Performance Indicator

On April 12, 2005, D6 was successfully tested to demonstrate its operability. While D6 had to be removed from service to conduct the test, this test was done in accordance with an approved procedure and TS. Therefore, the as-found condition of D5 did not result in loss of any safety function. Thus, this event is not reportable per 10 CFR 50.73(a)(2)(v)(C) as a Unit 2 Safety System Functional Failure (SSFF).

¹ (EIS Component Identifier: DG)

² (EIS Component Identifier: ENG)

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

SAFETY SIGNIFICANCE

As power was being reduced (after the test had been halted), operators noted that, after D5 load was reduced to 4000 kW, crankcase pressure decreased rapidly to 0 mm. Both D5 and D6 have been noted to have crankcase pressure issues in the past and one consistent attribute is that the crankcase pressure excursions occur at high load. The acceptance criteria of the surveillance test is that the diesel generator be loaded to between 5100 kW and 5300 kW for one hour. However, the highest predicted load for any event is under 3700 kW. Thus, it is reasonable to assume that, had D5 been called upon in response to any event, it would have performed its specified safety function. Therefore, the as-found condition of D5 did not affect the health and safety of the public.

CAUSE

Nuclear Management Company, LLC, (NMC) is conducting a root cause evaluation of this condition. As part of this root cause evaluation, a selected portion of the D5 parts that were removed as part of rebuilding D5 have been sent to the manufacturer for analysis. Since the manufacturer analysis will take some time, the final root cause evaluation will not be completed until later this year. When the final root cause analysis is complete, NMC will submit a supplement to this LER.

Based on past root cause analysis conducted for D6 when it was affected by crankcase pressure excursions (refer to LER 2-01-03), the likeliest cause is deposits left over from the time when D5 and D6 were running with lube oil that was not compatible with the low sulfur fuel oil being used. The suspected mechanism leading to high crankcase pressure was that the deposits (caused by unreacted detergent salts in the lube oil) were breaking free and disturbing the pressure balance of the top piston ring. The top ring was being pinched because tolerance between the ring and ring groove are reduced as load (and piston temperature) increase and stray hard deposit(s) between the ring and groove prevent the ring from sealing to the cylinder wall (thus, leading to blow-by and high crankcase pressure).

At the time of LER 2-01-03, D5 cylinders and liners were not replaced as D5 was considered to be less susceptible to blow-by because it: (1) had substantially less run time since its last major overhaul, (2) had been operating on higher sulfur content fuel oil, and (3) had cylinder liners that were found to be in better condition. In addition, the blow-by phenomenon only manifested itself at high test loads (not at the loads expected for event response) and D5 had been successfully tested. In June of 2004, D5 exhibited its first indication of blow-by. A number of pistons and cylinders were replaced, D5 was successfully tested, and NMC began planning for replacement of the remaining pistons and cylinders.

CORRECTIVE ACTION

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Immediate:

1. Unit 2 was shutdown per Technical Specification 3.8.1, Condition F.

Subsequent:

2. The D5 pistons and cylinder liners (that had not been replaced since June 2004) were replaced.

Planned:

3. The Root Cause Evaluation may recommend additional corrective actions when it is complete. The recommended corrective actions will be described in the supplement to this LER.

PREVIOUS SIMILAR EVENTS

Licensee Event Report 2-01-03 was submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) for a Technical Specification required shutdown that was a result of Unit 2 emergency diesel generator inoperability.