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Indiana Michigan Power
Cook Nuclear Plant
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Bridgman, MI 49106
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July 29, 2015

AEP-NRC-2015-55
10 CFR 50.73

Docket No.: 50-315

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
11555 Rockville Pike,
Rockville, MD 20852

Donald C. Cook Nuclear Plant Unit 1
LICENSEE EVENT REPORT 315/2015-001-00
Completed Shutdown Required By Technical Specification

In accordance with 10 CFR 50.73, Licensee Event Report (LER) System, Indiana Michigan Power Company, the licensee for Donald C. Cook Nuclear Plant Unit 1, is submitting, as an enclosure to this letter, the following report:

LER 315/2015-001-00: "Plant Shutdown Required By Technical Specifications"

There are no commitments contained in this submittal.

Should you have any questions, please contact Mr. Michael K. Scarpello, Regulatory Affairs Manager, at (269) 466-2649.

Sincerely,

Joel P. Gebbie
Site Vice President

JEN/ams

Enclosure

c: A. W. Dietrich – NRC Washington, DC
J. T. King - MPSC
MDEQ – RMD/RPS
NRC Resident Inspector
C. D. Pederson – NRC Region III
A. J. Williamson - AEP Ft. Wayne

IE22
NRC

Enclosure to AEP-NRC-2015-55
Licensee Event Report 315/2015-001-00

**LICENSEE EVENT REPORT (LER)**(See Page 2 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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollections.Resource@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 1

2. DOCKET NUMBER

05000315

3. PAGE

1 of 4

4. TITLE

Plant Shutdown Required by Technical Specifications

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
06	01	2015	2015	001	00	07	29	2015	FACILITY NAME	DOCKET NUMBER
										05000
										05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
1	<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)
10. POWER LEVEL	<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 checked="" 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 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

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT

Michael K. Scarpello, Regulatory Affairs Manager

TELEPHONE NUMBER (Include Area Code)

(269) 466-2649

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
X	EK	DG	W315	Y					

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)

On June 1, 2015, at 0231 hours, a Unit 1 shutdown was completed in accordance with Technical Specification (TS) 3.8.1, AC Sources – Operating, due to the inability to restore 1 AB Emergency Diesel Generator (EDG) to operable status within the required TS completion time. The plant entered normal operating procedures for a planned Unit 1 shutdown and all systems responded as expected with no complications.

The Unit 1 AB EDG was declared inoperable on May 18, 2015, for scheduled maintenance. During a post maintenance test run, the Unit 1 AB EDG tripped after approximately 16 minutes on HI-HI bearing temperature due to a crankshaft bearing No. 4 failure.

The Root Cause has been determined to be that the station accepted leaving air within the lube oil system which left the EDG main bearing No. 4 susceptible to electrical pitting and eventual wiping of the babbitt material.

Corrective actions to preclude repetition include installing high point vent valves and implementing procedure enhancements to ensure the lube oil system is filled with oil and properly vented prior to returning to service, if drained for any reason.

The Unit 1 planned shutdown was reported via Event Notification 51106 in accordance with 10 CFR 50.72(b)(2)(i). The completion of the plant shutdown required by TS is reportable as a Licensee Event Report in accordance with 10 CFR 50.73(a)(2)(i)(A).

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@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.

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NARRATIVE**INTRODUCTION**

On June 1, 2015, at 0231 hours, Donald C. Cook Nuclear Plant Unit 1 Reactor [RCT] was manually tripped from Mode 1 at approximately 17 percent rated thermal power. Unit 1 was removed from service due to the inability to restore an inoperable emergency diesel generator (EDG) [EK] [DG] to operable status within 14 days in accordance with Technical Specification (TS) 3.8.1, AC Sources – Operating.

The Unit 1 AB EDG was declared inoperable on May 18, 2015, for scheduled maintenance. During a post maintenance test run, the Unit 1 AB EDG tripped after approximately 16 minutes on HI-HI bearing temperature due to crankshaft bearing No. 4 failure.

Both Unit 1 and Unit 2 reactors were operating at 100 percent power prior to the event.

EVENT DESCRIPTION

On May 18, 2015, at 0010 hours, the Unit 1 AB EDG was removed from service for scheduled maintenance which included draining of the lube oil system [LA] to replace a strainer transfer valve and cooler thermostatic bypass valve. On May 21, 2015, at 1049 hours, the EDG was started for post maintenance testing. At approximately 16 minutes following the start, the EDG automatically tripped on HI-HI bearing temperature. A failure investigation team found, through identification of melted babbitt material within the crankcase, that the No. 4 main bearing had been damaged.

Further evaluation of the damage confirmed that the time required for repairs would exceed the TS completion time. This required a planned Unit 1 shutdown which took place on June 1, 2015, at 0231 hours, in accordance with TS 3.8.1, AC Sources – Operating.

EVENT ANALYSIS

On June 1, 2015, at 0231 hours, Unit 1 operators entered normal operating procedures for a planned Unit 1 shutdown. All systems responded as expected with no complications.

COMPONENT

Worthington, Emergency Diesel Generator

ASSESSMENT OF SAFETY CONSEQUENCES**NUCLEAR SAFETY**

Failure of the Unit 1 AB EDG during its post maintenance test run resulted in no actual nuclear safety impacts. The failure of this EDG occurred at a time when the EDG had already been declared inoperable in support of routine maintenance. All normal and reserve offsite power sources, the opposite Train Unit 1 CD EDG, and the Supplemental Diesel Generators were Operable and administratively guarded.

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NARRATIVE

The risk assessment determined this event created a low risk significant event assuming the No. 4 main bearing resulted in a total loss of the Unit 1 AB EDG to perform its safety function.

INDUSTRIAL SAFETY

There was no actual or potential industrial safety hazard resulting from the Unit 1 AB EDG No. 4 main bearing failure.

RADIOLOGICAL SAFETY

There was no actual or potential radiological safety hazard resulting from the Unit 1 AB EDG No. 4 main bearing failure. The EDGs are located outside the radiological controlled area and were not being relied on to supply emergency power to safety related or any radiological equipment at the time of the event. This condition did not result in any unplanned radiological exposure, release, or contamination.

PROBABILISTIC RISK ASSESSMENT (PRA)

The risk significance of the Unit 1 AB EDG No. 4 main bearing failure and the extended outage was calculated at 5E-6 Incremental Conditional Core Damage Probability and 4E-7 Incremental Conditional Large Early Release Probability. The risk assessment was performed assuming the Unit 1 AB EDG was non-functional, and the full power Probabilistic Risk Assessment models which are bounding for shutdown modes. This is considered to be low risk significance per Regulatory Guide 1.174, An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Bases, acceptance guidelines, but above the threshold requiring risk management actions per NUMARC-93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants.

ROOT CAUSE

The station accepted leaving air within the lube oil system which degraded the hydrodynamic film wedge and resistive capacity of the No. 4 main bearing leaving it susceptible to electrical pitting and eventual wiping of the bearing babbitt material.

CONTRIBUTING CAUSES

The station developed a culture to accept air in the EDG lube oil system due to prior experience that did not result in damage to the equipment.

The station failed to consider the exciter [EXC] air gap measurement indications and take the necessary actions to investigate or correct the condition.

CORRECTIVE ACTIONS

Immediate Corrective Actions Taken

Completed repair and replacement activities for the 1 AB EDG, including but not limited to replacement of the connecting rod bearing and air gap correction for the generator and exciter.

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NARRATIVE

Corrective Actions to Preclude Repetition

Completed installation of high point vent valves in the 1 AB EDG lube oil system.

Revised applicable procedures to include venting of the lube oil system and removed a note that allowed air to remain in some portions of the lube oil system.

Planned Corrective Actions

Revise the EDG system monitoring plan to include trending of the EDG shaft voltage.

Revise applicable procedure to require that generator and exciter air gap measurements be corrected if found to be out of tolerance, and add measurement of shaft voltage as a preventive maintenance task.

PREVIOUS SIMILAR EVENTS

A review of the past three years Licensee Event Reports identified no similar events.