



**INDIANA
MICHIGAN
POWER®**

A unit of American Electric Power

Indiana Michigan Power
Cook Nuclear Plant
One Cook Place
Bridgman, MI 49106
IndianaMichiganPower.com

August 31, 2016

AEP-NRC-2016-68
10 CFR 50.73

Docket No.: 50-316

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

Donald C. Cook Nuclear Plant Unit 2
LICENSEE EVENT REPORT 316/2016-001-00
Manual Reactor Trip Due to Moisture Separator Heater Expansion Joint Failure

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 2, is submitting as an enclosure to this letter the following report:

LER 316/2016-001-00: Manual Reactor Trip Due to Moisture Separator Heater Expansion Joint Failure

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,

Q. Shane Lies
Site Vice President

MPH/ml

Enclosure: LER 316/2016-001-00: Manual Reactor Trip Due to Moisture Separator Heater Expansion Joint Failure

IEZZ
NRR

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

Enclosure to AEP-NRC-2016-68

LER 316/2016-001-00

Manual Reactor Trip Due to Moisture Separator Heater Expansion Joint Failure



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 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.

1. FACILITY NAME Donald C. Cook Nuclear Plant Unit 2	2. DOCKET NUMBER 05000316	3. PAGE 1 OF 3
--	-------------------------------------	--------------------------

4. TITLE
Manual Reactor Trip Due To Moisture Separator Heater Expansion Joint Failure

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
07	06	2016	2016	001	00	08	31	2016		05000
									FACILITY NAME	DOCKET NUMBER
										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)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(B)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
100	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<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)(D)	<input type="checkbox"/> 73.77(a)(2)(i)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)
	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> OTHER	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	SB	BLL	Senior Flexonics Pathway	Y					

14. SUPPLEMENTAL REPORT EXPECTED **15. EXPECTED SUBMISSION DATE**

YES (If yes, complete 15. EXPECTED SUBMISSION DATE) NO

MONTH	DAY	YEAR
09	30	2016

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

On July 6, 2016, with the Donald C. Cook Nuclear Plant Unit 2 Reactor operating in Mode 1 at 100 percent power, the control room received a report of a steam leak on the Unit 2 B Right Moisture Separator Reheater (MSR) crossover piping and damage to the turbine building structure. This information resulted in a decision by the crew to manually trip the Unit 2 Reactor at 0038. The cause of the steam leak was the sudden failure of the balance bellows on the Unit 2 B Right MSR crossover expansion joint, which also resulted in damage to the west wall of the turbine building. A Root Cause Evaluation of the bellows failure is in progress. A supplement to this Licensee Event Report with additional information will be submitted upon completion

This event is being reported in accordance with 10CFR 50.73(a)(2)(iv)(A) as a Manual Actuation of the Reactor Protection System and an automatic actuation of the Auxiliary Feedwater system.

NRC FORM 366A
(11-2015)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104

EXPIRES: 10/31/2018



**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.

1. FACILITY NAME	2. DOCKET	3. LER NUMBER		
Donald C. Cook Nuclear Plant Unit 2	05000316	YEAR 2016	SEQUENTIAL NUMBER 001	REV NO. 00

NARRATIVE

INTRODUCTION

On July 6, 2016, Donald C. Cook Nuclear Plant Unit 2 Reactor [RCT] was operating at 100 percent power. At 0038, the Unit 2 Reactor was manually tripped due to the sudden failure of the balance bellows on the Unit 2 B Right Moisture Steam Reheater (MSR) [RHTR] crossover expansion joint [EXJ], which also resulted in damage to the west wall of the turbine building. As a result of damage to the MSR, main condenser [COND] vacuum slowly degraded and heat removal was accomplished through the Steam Generator Power Operated Relief Valves (PORVs) [SB][RV].

EVENT DESCRIPTION

On July 6, 2016, at 0038, Donald C. Cook Nuclear Plant Unit 2 Reactor was manually tripped from 100 percent power, after operators heard a loud noise and observed a large steam leak in the vicinity of the B Right MSR crossover line. This information resulted in the operators' decision to manually trip the Unit 2 Reactor. The Auxiliary Feedwater System [BA] automatically initiated to maintain Steam Generator levels within acceptable control limitations, and the steam release immediately dissipated upon trip of the main turbine [TRB]. Due to the B Right MSR crossover expansion joint damage, main condenser vacuum slowly degraded and heat removal was accomplished through the steam generator PORVs. However, main feedwater flow could have been established, if needed, and therefore this trip is considered to be "uncomplicated". Plant response was within acceptable control limitations and all system parameters stabilized at normal post-trip levels. The Emergency Plan was entered at 0050 due to declaration of an Unusual Event based on EAL N-7, Explosion (Report by plant personnel of an unanticipated EXPLOSION within the protected area boundary resulting in visible damage to permanent structures or equipment). The Unusual Event was terminated at 0207. A Root Cause Evaluation (RCE) of the bellows failure is in progress. A supplement to this Licensee Event Report (LER) with additional information will be submitted upon completion of the RCE.

COMPONENT

2-XJ-113-6: B Right MSR Reheat Steam to Low Pressure Turbine B Outlet Elbow Expansion Joint Bellows.

ASSESSMENT OF SAFETY CONSEQUENCES

NUCLEAR SAFETY

This event was not significant with respect to the health and safety of the general public since all safety systems functioned per design during this event.

INDUSTRIAL SAFETY

No personnel injuries occurred as a result of this event. However, this event was significant with respect to the safety of plant personnel due to the potential for personnel injury resulting from the bellows failure.

RADIOLOGICAL SAFETY

There was no actual or potential radiological safety hazard resulting from the bellows failure.

NRC FORM 366A
(11-2015)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104

EXPIRES: 10/31/2018



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.

1. FACILITY NAME	2. DOCKET	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Donald C. Cook Nuclear Plant Unit 2	05000316	2016	001	00

NARRATIVE

PROBABILISTIC RISK ASSESSMENT (PRA)

This event was low risk significant from a PRA perspective because the MSR is not a risk significant component in the PRA. Reactor trips with a loss of main feedwater or condenser heat sink have a Conditional Core Damage Probability of approximately $7E-7$ and a Conditional Large Early Release Probability of $9.5E-8$, which is considered low in comparison to other risk significant events.

ROOT CAUSE

The Root Cause Evaluation is currently in progress. A supplement to this LER will be submitted upon completion.

CONTRIBUTING CAUSES

Contributing causes will be provided in the supplement.

CORRECTIVE ACTIONS

Immediate Corrective Action Taken

The Unit 2 Reactor was manually tripped and the steam release immediately dissipated upon trip of the main turbine. Repairs to the expansion joint bellows were completed on July 11, 2016.

Corrective Action Planned

Corrective Actions will be included in the supplement.

PREVIOUS SIMILAR EVENTS

LERs for both units for the past three years were reviewed for similar events related to 10 CFR 50.73(a)(2)(iv)(A) reporting criteria for system actuation. The following event was identified:

LER-316-2013-001-00 "Unit 2 Manual Reactor Trip due to Lowering Steam Generator Level"

LER-315-2014-001-00 "Manual Reactor Trip Due to Lake Debris Intrusion Causing Degraded Forebay Conditions"

LER-316-2015-001-00 "Manual Reactor Trip Due to a Secondary Plant Transient"

Although these three events were similar with respect to Manual Reactor Trips, the Corrective Actions resulting from these LERs are not expected to have prevented this occurrence.