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

September 27, 2006

AEP:NRC:2573-34  
10 CFR 50.73  
10 CFR 50.4

Docket No. 50-315

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

Donald C. Cook Nuclear Plant Unit 1  
LICENSEE EVENT REPORT 315/2006-001-00  
PLANT SHUTDOWN REQUIRED BY TECHNICAL SPECIFICATION ACTION 3.6.5.B.1

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

LER 315/2006-001-00: "Plant Shutdown Required by Technical Specification Action 3.6.5.B.1"

There are no commitments contained in this submittal.

Should you have any questions, please contact Ms. Susan D. Simpson, Regulatory Affairs Manager, at (269) 466-2428.

Sincerely,

Lawrence J. Weber  
Plant Manager

HLE/jen

Attachment

IE22

c: J. L. Caldwell, NRC Region III  
K. D. Curry – AEP Ft. Wayne, w/o attachment  
INPO Records Center  
J. T. King, MPSC – w/o attachment  
MDEQ – WHMD/RPMWS – w/o attachment  
NRC Resident Inspector  
P. S. Tam, NRC Washington DC

**LICENSEE EVENT REPORT (LER)**

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

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.

<b>1. FACILITY NAME</b> Donald C. Cook Nuclear Plant Unit 1	<b>2. DOCKET NUMBER</b> 05000-315	<b>3. PAGE</b> 1 of 3
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**4. TITLE**  
**Plant Shutdown Required by Technical Specification Action 3.6.5.B.1**

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
07	30	2006	2006	-- 001	-- 00	09	27	2006	FACILITY NAME	DOCKET NUMBER

<b>9. OPERATING MODE</b>  1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:</b> (Check all that apply)									
	<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)						
<b>10. POWER LEVEL</b>  100%	<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 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**

<b>FACILITY NAME</b> Susan D. Simpson, Regulatory Affairs Manager	<b>TELEPHONE NUMBER (Include Area Code)</b> (269) 466-2428
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

<b>14. SUPPLEMENTAL REPORT EXPECTED</b>				<b>15. EXPECTED SUBMISSION DATE</b>		
YES (If Yes, complete EXPECTED SUBMISSION DATE).	X	NO				

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

On July 30, 2006, at 0730 hours, a unit shutdown was initiated in accordance with Technical Specification (TS) 3.6.5, Containment Air Temperature, Action 3.6.5.B.1. This action requires that the unit be placed in Mode 3 within six hours if containment air temperature is not restored to within limits during the previous eight hours.

On July 29, 2006, at 2026 hours, TS Condition 3.6.5.A was entered due to containment lower compartment average air temperature exceeding the TS Limiting Condition for Operation 3.6.5.b limit of 120 degrees Fahrenheit. Efforts to reduce the containment temperature during the eight-hour completion time of TS Action 3.6.5.A.1 were unsuccessful. In accordance with normal plant operating procedures and TS Action 3.6.5, Condition B, Required Action B.1, Unit 1 entered Mode 3 on July 30, 2006, at 1014 hours. All safety systems and plant equipment used in the shutdown functioned as designed.

The causes of the Unit 1 shutdown were: 1) the containment cooling water system design did not support continued plant operation with sustained high cooling water (Lake Michigan) temperatures and potential for cooler fouling; and 2) a failure by Engineering personnel to recognize and communicate that an evaluation supporting past operability would not permit unit operation under some possible operating conditions during the summer (a loss of operating margin), resulting in a delay in communicating the impact of the lost margin to station management so compensatory actions could be developed at an earlier time. Corrective actions include: 1) changes to engineering procedures for identifying and managing margin changes; 2) requirement to install a temporary modification for supplemental containment cooling prior to the summer season until a design change can be implemented; and 3) development of an analysis to support removal of containment ventilation cooling units for cleaning while at power.

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

**Conditions Prior to Event**

Unit 1 in Mode 1 at 100% power.

**Description of Event**

As a result of an NRC inspection finding, Indiana Michigan Power Company (I&M) had approved a revised methodology for calculating lower containment average air temperature on July 28, 2006. The new methodology calculated an average lower containment temperature that was higher than the previous method.

While unrelated to the revised methodology for calculating lower containment average temperature, in July 2006, Unit 1 lower containment high temperature alarms were being evaluated by Engineering personnel and troubleshooting efforts were not able to increase Non-Essential Service Water (NESW) cooling flow through the Containment Lower Ventilation Units (CLVs). A temporary modification (T-Mod) to add supplemental cooled water to the NESW header as it entered containment was developed; however, delays in completing the design and implementation prevented it from being fully functional prior to the TS required shutdown.

The average temperature in the Unit 1 lower containment volume was determined to exceed 120 degrees Fahrenheit using the revised methodology and Unit 1 was declared to have exceeded the Limiting Condition for Operation of Technical Specification (TS) 3.6.5.b and Condition A was entered as of 2026 hours on July 29, 2006. Required Action A.1 for Condition A was to restore containment average air temperature to within limits with an 8-hour completion time. At 0426 hours on July 30, 2006, TS 3.6.5 Condition B was entered when the 8-hour completion time of Required Action A.1 for Condition A was not met. In accordance with normal plant operating procedures and TS 3.6.5, Condition B, Required Action B.1, Unit 1 was shut down and entered Mode 3 at 1014 hours on July 30, 2006.

**Cause of Event**

The causes of the Unit 1 shutdown were:

1. The containment cooling water system design did not support continued plant operation with sustained high cooling water (Lake Michigan) temperatures and potential for cooler fouling.
2. A failure by I&M Engineering personnel to recognize and communicate that an evaluation supporting past operability would not permit unit operation under some possible operating conditions during the summer (loss of operating margin). The failure to recognize this loss of operating margin resulted in a delay in communicating the impact of the lost margin to station management so compensatory actions could be developed at an earlier time.

Contributing causes were that actions that were initiated to reduce the average temperature were hindered because the CLVs were partially plugged with sediment and the supplemental cooling T-Mod installation had numerous delays that were not resolved in a timely manner.

**Analysis of Event**

During an NRC inspection in May 2006, the NRC inspectors identified a finding that the methodology for calculating lower containment average air temperature was non-conservative. A past operability calculation was completed in June 2006 using an appropriately conservative volume weighted methodology. This calculation showed that under recent worst case conditions, average temperature in lower containment did not exceed 119.7

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degrees Fahrenheit with sustained lake temperatures of 79 degrees Fahrenheit in 2005, and thus a past operability concern was not present. The fact that containment temperatures may not remain below 120 degrees Fahrenheit when lake temperature exceeded 79 degrees Fahrenheit (permissible temperature was 85.8 degrees Fahrenheit) was not addressed.

In addition to the new average air temperature calculation methodology of lower containment, two of the four CLVs in Unit 1 had significant blockage that was identified prior to the 2006 summer season. Performance of on-line maintenance to clear the blockage in the CLVs prior to the 2006 summer season would have improved CLV performance.

A T-Mod to provide supplemental containment cooling was initiated two weeks prior to the TS required shutdown. The effort to implement this T-Mod was significantly larger than originally understood. Numerous equipment problems were identified during the installation and testing of the T-Mod, and these problems either delayed its implementation or resulted in reduced performance of the T-Mod below what was expected.

This event had minimal nuclear safety impact on the plant. A Probabilistic Risk Assessment (PRA) was performed and determined there was no nuclear safety significance to this event. Unit 1 was shut down in a controlled fashion and manually tripped as part of the normal shutdown procedure at approximately 16.5 percent reactor power. All safety systems and plant equipment used in the shutdown functioned as designed. In that the shutdown was orderly, there was no significant probabilistic risk associated with this event.

**Corrective Actions**

Two of the four Unit 1 CLVs cooling coils were cleaned to remove sediment and debris.

The T-Mod for supplemental cooling was installed and used to reduce Unit 1 lower containment average air temperature to less than 120 degrees Fahrenheit.

Engineering procedures for calculations and modifications will be revised to provide explicit considerations related to identifying and managing operating and design margin.

The procedure for summer readiness will be revised to require installation of the supplemental containment cooling T-Mod during the summer months until such time that a design change is made that precludes the need for installation of the supplemental containment cooling T-Mod.

Analysis will be completed to determine when a CLV can be removed from service for cleaning, and maintenance activities to clean the CLVs will be generated when required.

**Previous Similar Events**

A review was conducted of station Condition Reports and LERs for the previous 3 years. No similar events were identified.