



An Exelon Company

Clinton Power Station  
R. R. 3, Box 228  
Clinton, IL 61727

10 CFR 50.73

U-603793  
November 10, 2006

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D. C. 20555-0001

Clinton Power Station, Unit 1  
Facility Operating License No. NPF-62  
NRC Docket No. 50-461

Subject: Licensee Event Report 2006-002-01

Enclosed is Licensee Event Report (LER) No. 2006-002-01: Turbine Bypass Function Lost Due to Circuit Card Maintenance Frequency. This report is being submitted in accordance with the requirements of 10 CFR 50.73. The report has been revised to include the cause of event, corrective action, safety analysis and previous similar event information.

Should you have any questions concerning this report, please contact Mr. Ronald Frantz, Sr. Regulatory Specialist, at (217)-937-2813.

Respectfully,

Bryan Hanson  
Site Vice President  
Clinton Power Station

RSF/blf

Enclosures: Licensee Event Report 2006-002-01  
Summary of Commitments

cc: Regional Administrator – NRC Region III  
NRC Senior Resident Inspector – Clinton Power Station  
Office of Nuclear Facility Safety – IEMA Division of Nuclear Safety

IE22

# 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> Clinton Power Station	<b>2. DOCKET NUMBER</b> <b>05000 461</b>	<b>3. PAGE</b> 1 OF 3
--	---	--------------------------

**4. TITLE**  
Turbine Bypass Function Lost Due to Circuit Card Maintenance Frequency

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
08	17	2006	2006	- 002 -	01	11	10	2006	None	05000
									FACILITY NAME	DOCKET NUMBER
									None	05000

<b>9. OPERATING MODE</b>  1	<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§:</b> (Check all that apply)									
<b>10. POWER LEVEL</b>  096	<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 type="checkbox"/> 50.73(a)(2)(i)(B)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

**12. LICENSEE CONTACT FOR THIS LER**

NAME T. R. Husted, System Manager	TELEPHONE NUMBER (Include Area Code) (217) 937-3834
--------------------------------------	--

**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	J1	RLY	M422	N					

<b>14. SUPPLEMENTAL REPORT EXPECTED</b>				<b>15. EXPECTED SUBMISSION DATE</b>		
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO				MONTH	DAY	YEAR

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

On August 17, 2006, with the station operating in Mode 1 at 96 percent power, operators received a Main Condenser low vacuum alarm. Operators verified condenser vacuum was normal. Initial troubleshooting identified a false low condenser vacuum signal was present, inhibiting the Main Turbine bypass valves from being able to perform their safety function if called upon. Since no other system performs the Main Turbine Bypass System safety function, the safety function was not available. The actions of Technical Specifications (TS) 3.7.6, Main Turbine Bypass System, were entered for the inoperable Main Turbine Bypass System, requiring the system to be restored to operable status within 2 hours. A lead was lifted to remove the low vacuum inhibit logic input which restored the Main Turbine Bypass valve function before the TS 2-hour action completion time expired. The cause of this event was failure of Main Condenser Pressure Trip Unit (electronic circuit card) components due to not having an appropriate replacement interval for the card. Corrective action includes replacing the circuit card that failed and revising the maintenance template for this type of circuit card to include an appropriate replacement frequency.

**LICENSEE EVENT REPORT (LER)**

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Clinton Power Station, Unit 1	05000461	2006	- 002	- 01	2	OF 3

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

**PLANT OPERATING CONDITIONS PRIOR TO THE EVENT**

Unit: 1      Event Date: 8/17/06      Event Time: 10:44 AM Central Daylight Time  
 Mode: 1 (Power Operation)      Reactor Power: 96 percent

**DESCRIPTION OF EVENT**

On August 17, 2006, Clinton Power Station was operating in Mode 1 at about 96 percent power. At 1044 hours, operators in the Main Control Room received a Main Condenser [SG] low vacuum alarm [ALM]. Operators responded by verifying condenser vacuum was normal. Initial troubleshooting in response to the alarm identified that a false low condenser vacuum signal was present, inhibiting the Main Turbine bypass [JI] [SB] valves [V] from being able to open upon receipt of a demand.

At 1110 hours, operators entered the actions of Technical Specifications (TS) 3.7.6, Main Turbine Bypass System, Condition 'A'. TS 3.7.6 requires the Main Turbine bypass valves to be operable when Reactor Thermal Power is greater than or equal to 21.6 percent. When the Main Turbine Bypass System is not operable per Condition 'A', Required Action A.1 is to restore the system to operable status within 2 hours.

A troubleshooting team investigating the condition determined that a lead could be lifted to remove the low vacuum inhibit logic input and restore the Main Turbine Bypass valve function. At 1212 hours, the lead was lifted and the low vacuum light [IL] went out as expected. At 1215 hours, the low vacuum inhibit was reset, restoring the bypass valves to operable status before the TS 2-hour action completion time expired.

The Main Turbine Bypass System is designed to control steam pressure when reactor steam generation exceeds turbine requirements during unit startup, sudden load reduction, and cooldown, and allows excess steam flow from the reactor to go to the condenser without going through the turbine.

Two alarm/trip units (electronic circuit cards) [RLY] are arranged in a 1-out-of-2 logic to inhibit the Main Turbine bypass valve opening function when Main Condenser vacuum is too low for steam to be admitted. The alarm/trip units are part of two independent instrument loops beginning with pressure sensing transmitters [PT] and ending in computer points, and alarm/trip units. Troubleshooting isolated the cause of this event to one circuit card failure, the Main Condenser Pressure Trip Unit (electronic circuit card).

The circuit card that failed was removed from the system and was sent to the card manufacturer for failure analysis to identify the cause for the circuit card failure. The remaining redundant circuit card is providing the necessary function to inhibit the steam bypass function upon a loss of condenser vacuum.

Issue Report 520922 was initiated to perform a cause evaluation of this event and to identify corrective action.

**LICENSEE EVENT REPORT (LER)**

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Clinton Power Station, Unit 1	05000461	2006	- 002	- 01	3	OF 3

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

No automatic or manually initiated safety system responses were necessary to place the plant in a safe and stable condition. No other inoperable equipment or components directly affected this event.

**CAUSE OF EVENT**

The circuit card that failed was returned to the manufacturer for failure analysis. The manufacturer determined the most likely cause for the failure was a leaky electrolytic capacitor. At the time of the event, the card power supply apparently shutdown or stalled, reducing voltage until the output relay de-energized. When the relay de-energized the relay contacts closed and the Main Turbine Bypass System was inhibited.

The cause of this event is the failure the electrolytic capacitor on the Main Condenser Pressure Trip Unit (electronic circuit card) due to the Performance Centered Maintenance (PCM) template not specifying the appropriate replacement interval for Moore Industries model Direct Current Alarm (DCA) cards. The circuit card replacement frequency in the PCM template for Moore model DCA cards is 30 years, and is in direct contrast to a PCM template created for power supplies, which addresses electrolytic capacitor aging and has a replacement frequency of 7.5 years.

**SAFETY ANALYSIS**

This event is reportable under the provisions of 10 CFR 50.73 (a)(2)(v)(D) as an event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to mitigate the consequences of an accident. Events that are reportable under 10 CFR 50.73 (a)(2)(v)(D) are considered to be safety system functional failures.

A failure of the turbine bypass system function is within the design basis of the plant as analyzed in Chapter 15 of the Clinton Updated Safety Analysis Report.

**CORRECTIVE ACTION**

Immediate corrective action for this event was lifting a lead to restore the Main Turbine Bypass System function to an operable condition. The circuit card that failed will be replaced in the future at a time when plant conditions support the replacement.

The PCM Template for Moore Industries Cards Model DCA will be revised to an appropriate replacement frequency and preventive maintenance tasks will be created for affected critical/vital Moore DCA cards.

**PREVIOUS OCCURRENCES**

None

**COMPONENT FAILURE DATA**

Manufacturer: Moore Industries

Nomenclature: Main Condenser Pressure Trip Unit (electronic circuit card)

Manufacturer Model Number: DCA/4-20MA/DX1X4/45VDC/-AD-DPST

**SUMMARY OF COMMITMENTS**  
**Clinton Power Station**  
**U-603793**

The following table identifies commitments made in this document. (Any other actions discussed in the submittal represent intended or planned actions. They are described to the NRC for the NRC's information and are not regulatory commitments.)

<b>COMMITMENT</b>	<b>COMMITMENT TYPE</b>	
	<b>ONE-TIME ACTION (Yes/No)</b>	<b>Programmatic (Yes/No)</b>
This document has no regulatory commitments		