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Nuclear

March 3, 2008

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File: 2.01.0700

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

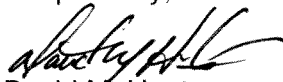
Byron Station, Unit 1
Facility Operating License No. NPF-37
NRC Docket No. STN 50-454

Subject: Licensee Event Report (LER) 454-2007-003-00, "Technical Specifications Non-Compliance on a Single Reactor Trip Instrument Channels Due to an Instrument Maintenance Procedure Revision Error"

Enclosed is an LER involving the January 4, 2008 discovery of a single reactor trip instrument channel found in an inoperable condition. This condition is reportable to the NRC in accordance with 10 CFR 50.73 (a)(2)(i)(B).

Should you have any questions concerning this matter, please contact Mr. William Grundmann, Regulatory Assurance Manager, at (815) 234-5441, extension 2800.

Respectfully,



David M. Hoots
Site Vice President
Byron Nuclear Generating Station

Attachment LER 454-2007-003-00

cc: Regional Administrator, Region III, NRC
NRC Senior Resident Inspector– Byron Station

NRC FORM 366 (9-2007)		U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB: NO. 3150-0104 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 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.		EXPIRES: 08/31/2010																																						
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)																																												
1. FACILITY NAME Byron Station Unit 1				2. DOCKET NUMBER 05000454		3. PAGE 1 OF 4																																						
4. TITLE Technical Specifications Non-Compliance on a Single Reactor Trip Instrument Channel Due to an Instrument Maintenance Procedure Revision Error																																												
5. EVENT DATE			6. LER NUMBER			7. REPORT DATE																																						
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8. OTHER FACILITIES INVOLVED			<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:80%;">FACILITY NAME</td> <td style="width:20%;">DOCKET NUMBER</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td>FACILITY NAME</td> <td>DOCKET NUMBER</td> </tr> <tr> <td> </td> <td> </td> </tr> </table>						FACILITY NAME	DOCKET NUMBER			FACILITY NAME	DOCKET NUMBER																														
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10. POWER LEVEL <div style="text-align: center; font-size: 24pt;">100</div>			<table style="width:100%;"> <tr> <td><input type="checkbox"/> 20.2201(b)</td> <td><input type="checkbox"/> 20.2203(a)(3)(i)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(C)</td> <td><input type="checkbox"/> 50.73(a)(2)(vii)</td> </tr> <tr> <td><input type="checkbox"/> 20.2201(d)</td> <td><input type="checkbox"/> 20.2203(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(1)</td> <td><input type="checkbox"/> 20.2203(a)(4)</td> <td><input type="checkbox"/> 50.73(a)(2)(ii)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(viii)(B)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(i)</td> <td><input type="checkbox"/> 50.36(c)(1)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iii)</td> <td><input type="checkbox"/> 50.73(a)(2)(ix)(A)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(ii)</td> <td><input type="checkbox"/> 50.36(c)(1)(ii)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(iv)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(x)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iii)</td> <td><input type="checkbox"/> 50.36(c)(2)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(A)</td> <td><input type="checkbox"/> 73.71(a)(4)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(iv)</td> <td><input type="checkbox"/> 50.46(a)(3)(ii)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(B)</td> <td><input type="checkbox"/> 73.71(a)(5)</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(v)</td> <td><input type="checkbox"/> 50.73(a)(2)(i)(A)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(C)</td> <td><input type="checkbox"/> OTHER</td> </tr> <tr> <td><input type="checkbox"/> 20.2203(a)(2)(vi)</td> <td><input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)</td> <td><input type="checkbox"/> 50.73(a)(2)(v)(D)</td> <td>Specify in Abstract below or in NRC Form 366A</td> </tr> </table>						<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 checked="" 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
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12. LICENSEE CONTACT FOR THIS LER																																												
FACILITY NAME Byron Station, William Grundmann, Regulatory Assurance Manager						TELEPHONE NUMBER <i>(Include Area Code)</i> (815) 406-2800																																						
13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT																																												
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ABSTRACT <i>(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)</i> On January 4, 2008, during the performance of the Channel Operational Test (COT) for the 1B Reactor Coolant (RC) Delta T/T-Average protection channel, an Instrument Maintenance Department technician (non-licensed) questioned and subsequently validated that the COT procedure contained an incorrect jumper configuration on a lead/lag circuit card that provides dynamic compensation to the Delta T signal. An ensuing investigation revealed this incorrect configuration was installed on the lead/lag circuit card using this incorrect procedure during the previous execution of the 1B Delta T/T-Average channel COT on October 5, 2007. Consequently, the Technical Specification Reactor Trip functions of Overtemperature Delta Temperature and Overpower Delta Temperature for the 1B RC Delta T channel were unknowingly inoperable for approximately 80 days. During the revision development process for the 1B Delta T/T-Average channel COT procedure, the jumper positions for the lead/lag card were inadvertently transposed from another card. The subsequent procedure review and approval process did not identify this transposition error. The correct jumper configuration was determined and the 1B Delta T/T-Average procedure revised to restore the circuit card to the proper configuration. An extent of condition review was conducted with other procedure revisions involving the personnel involved in preparation and review. No similar discrepancies were discovered, such that the error was limited to the 1B Delta T/T-Average channel.																																												

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NARRATIVE

A. Plant Condition Prior to Event:

Event Date: October 5, 2007

Discovery Date: January 4, 2008

Unit 1 experienced a forced outage and was in Mode 5, "Cold Shutdown" from October 19, 2007 until October 31, 2007. Otherwise Unit 1 was Mode 1, "Power Operations" with Reactor Power nominally at 100%.

Reactor Coolant System (RC) [AB]: Normal operating temperature and pressure.

No structures, systems, or components were inoperable at the start of this event that contributed to the initiation or mitigation of this event.

Background:

Two of the functions of Technical Specification (TS) 3.3.1, "Reactor Trip System (RTS) Instrumentation" are the RC Overtemperature Delta Temperature (OTDT) (JC) and the Overpower Delta Temperature (OPDT) (JC) functions. The OTDT reactor trip function is designed to prevent departure from nucleate boiling in the reactor core and the OPDT function is designed to ensure integrity of the fuel cladding.

The Limiting Condition for Operation (LCO) for these two functions requires four Delta T/T-Average channels to be operable (i.e., 1A, 1B, 1C, and 1D). Two of four channel logic coincidence is needed to generate a reactor trip signal. Condition E of TS 3.3.1 allows for one channel to be inoperable indefinitely provided it is placed in the tripped condition within six hours. This reduces the logic coincidence to one of three channels.

The RC Delta T/T-Average channel processes the instrument signals that perform the OTDT and OPDT functions stated on TS Table 3.3.1-1, Note 1 and Note 2, respectively. The subject 1B Delta T signal is dynamically compensated (via a lead/lag circuit card) to account for the response time delay of the RC temperature detectors versus actual RC temperature during transient conditions.

B. Description of Event

On January 4, 2008, during the performance of the Channel Operational Test (COT) for the 1B Reactor Coolant (RC) Delta T/T-Average protection channel, an Instrument Maintenance Department technician (non-licensed) questioned and subsequently validated that the COT procedure contained an incorrect jumper configuration on a lead/lag circuit card that provides dynamic compensation to the Delta T signal. An ensuing investigation revealed this incorrect configuration was installed on the

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lead/lag circuit card using this incorrect procedure during the previous execution of the 1B Delta T/T-Average channel COT on October 5, 2007.

The lead/lag circuit card in its correct configuration dynamically compensates the 1B Delta T signal with an eight second lead and a 3 second lag time constant, such that the card output leads the input. The incorrect card configuration resulted in an 8 second lag-only time constant, such that the card output lagged the input. Therefore, the 1B Delta T signal response would have been delayed/slowed, resulting in a longer time to trip on the OTDT and/or OPDT setpoints. As a consequence of this delay in trip, the 1B Delta T/T-Average channel OTDT and OPDT functions were unknowingly inoperable from October 5, 2007 until October 19, 2007 and from October 31, 2007 until January 4, 2008. From October 19, 2007 to October 31, 2007, Unit 1 was in Mode 5, which is a non-applicable mode for TS 3.3.1.

Having an OTDT and OPDT channel inoperable and not complying with condition E of TS 3.3.1 is a condition prohibited by TS and consequently reportable to the NRC in accordance with 10 CFR 50.73 (a)(2)(i)(b).

The remaining seven Delta T/T-Average COT procedures (three channels for Unit 1 and four channels for Unit 2) were reviewed and determined to contain the correct jumper configurations.

C. Cause of the Event

The eight Delta T/T-Average COT procedures were significantly revised recently to improve the method used to control the jumper position on the circuit cards. The incorrect jumper positions for the lead/lag card in the 1B Delta T/T-Average COT procedure were the same as the correct jumper positions for another card in the next step of the procedure. During the procedure revision development process for the eight Delta T/T-Average COT procedures, the jumper positions for the lead/lag card for the 1B Delta channel were inadvertently transposed from another card. The subsequent procedure review and approval process did not identify this error. This is considered a human performance deficiency.

D. Safety Analysis

There was minimal safety significance to this condition. The other three available Delta T/T-Average channels were operable to provide input into the OTDT and OPDT reactor trip functions. Considering a single failure of another Delta T/T-Average channel in response to an overtemperature or overpower condition, two channels remained operable to trip the reactor. Other Delta T/T-Average channel COTs on Unit 1 were performed during this time period. In this condition the channel undergoing the COT is placed in the tripped condition, thus leaving two operable channels to provide the remaining single trip signal.

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E. Corrective Actions

The correct jumper configuration was determined and the 1B Delta T/T-Average procedure revised to restore the circuit card to the proper configuration.

An extent of condition review was conducted with other procedure revisions involving the personnel involved in preparation and review. No similar discrepancies were discovered.

The investigation report and associated lessons learned have been communicated with Maintenance procedure writers and reviewers.

F. Previous Occurrences

There have been no Maintenance procedure errors leading to a significant event, such as a Technical Specifications non-compliance in the past two years.