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Grand Gulf Nuclear Station
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GNRO-2016/00026

May 25, 2016

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Licensee Event Report (LER) 2016-002-00, Automatic Actuation of the
Reactor Protection System due to 'B' Main Transformer Wiring
Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

Dear Sir or Madam:

Attached is Licensee Event Report (LER) 2016-002-00, Automatic Actuation of the Reactor Protection System due to 'B' Main Transformer Wiring. This report is submitted in accordance with Title 10 Code of Federal Regulations 50.73(a)(2)(iv)(A).

This letter contains no new commitments. Should you have any questions or require additional information, please contact James Nadeau at (601) 437-2103.

Sincerely,


JJN/tmc

Attachment: Licensee Event Report (LER) 2016-002-00

cc: (See Next Page)

cc: U.S. Nuclear Regulatory Commission
ATTN: Mr. Jim Kim, NRR/DORL (w/2)
Mail Stop OWFN 8 B1
Rockville, MD 20852-2738

U.S. Nuclear Regulatory Commission
ATTN: Mr. Marc Dapas (w/2)
Regional Administrator, Region IV
1600 East Lamar Boulevard
Arlington, TX 76011-4511

NRC Senior Resident Inspector
Grand Gulf Nuclear Station
Port Gibson, MS 39150

Attachment to GNRO-2016/00026
Licensee Event Report (LER) 2016-002-00

**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: 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 Section (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

Grand Gulf Nuclear Station, Unit 1

2. DOCKET NUMBER**05000 416****3. PAGE****1 OF 4****4. TITLE**

Automatic Actuation of the Reactor Protection System due to 'B' Main Transformer Wiring

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
03	29	2016	2016 - 002 - 00			05	25	2016	N/A	05000 N/A
									N/A	05000 N/A

9. OPERATING MODE

1

10. POWER LEVEL

37

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (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) |
| <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 checked="" 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 type="checkbox"/> 50.73(a)(2)(v)(D) | Specify in Abstract below
or in NRC Form 366A |

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME

James Nadeau / Manager, Regulatory Assurance

TELEPHONE NUMBER (Include Area Code)

(601) 437-2103

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
A	XFMR	XCT	N/A	Y	N/A	N/A	N/A	N/A	N/A

14. SUPPLEMENTAL REPORT EXPECTED☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR
N/A	N/A	N/A

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

On March 29, 2016, at 1123 Central Daylight Time, Grand Gulf Nuclear Station was operating in Mode 1 and ascending in power at approximately 37% when an unplanned uncomplicated automatic reactor SCRAM occurred. A generator lockout was received due to a Main Transformer 'B' Differential Relay Trip which was followed by a turbine control valve fast closure, turbine trip, and reactor SCRAM. The Reactor Protection System and all other safety systems functioned as designed. The cause of the Main Transformer 'B' Differential Relay Trip was identified during forced outage investigation of the 'B' Main Transformer control cabinet. The high voltage current transformer wiring was incorrectly landed at the X1/X2 terminals instead of the X1/X3 terminals. This wiring configuration resulted in a turns ratio of 1000:5 instead of the designed 2200:5, causing relay actuation at a point lower than designed. The erroneous wiring configuration was corrected and all remaining wiring for the 'A', 'B', and 'C' Main Transformer wiring was verified correct prior to startup from the forced outage. This event posed no threat to public health and safety.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

APPROVED BY OMB: NO. 3150-0104

EXPIRES: 10/31/2018

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.
Grand Gulf Nuclear Station, Unit 1	05000 416		2016-002-00	

NARRATIVE

PLANT CONDITIONS PRIOR TO THE EVENT

At the time of the event, Grand Gulf Nuclear Station (GGNS) Unit 1 was in Mode 1 and ascending in power at approximately 37% rated thermal power. All systems, structures and components that were necessary to mitigate, reduce the consequences of, or limit the safety implications of the event were available. No safety significant components were out of service.

DESCRIPTION

On March 29, 2016, Grand Gulf Nuclear Station (GGNS) was ascending in power for the unit startup following Refueling Outage 20 (RF 20). As reactor power reached approximately 37% rated thermal power, a generator lockout was received followed by a turbine control valve fast closure and turbine trip which resulted in an uncomplicated automatic reactor SCRAM. The generator lockout was the result of the Main Transformer 'B' Differential Relay Trip. The reactor protection system (RPS) [JC] and all safety systems functioned as designed and expected.

During the investigation, it was discovered inside the 'B' Main Transformer control cabinet that the high voltage current transformer (CT) [XCT] turns ratio wiring was incorrect. The CT wiring was connected in a manner that produced a turns ratio of 1000:5 versus the designed 2200:5. Due to this erroneous configuration the CT trip setpoint was lower than designed. Therefore, the CT and current differential relay actuation was not an equipment failure but an actual sensed actuation based on an incorrect wiring scheme. Work orders that involved working inside this panel during RF 20 were reviewed to determine when the wiring was altered. No work on CT wiring found incorrectly landed was intended to be performed during RF 20. Current Transformer ratio wiring work was not within the scope of the transformer rewiring project carried out during RF20. The most likely time the wiring was incorrectly removed and re-landed would have been during the post modification testing which was performed under a work order at the conclusion of the wiring project.

REPORTABILITY

This Licensee Event Report (LER) is being submitted pursuant to Title 10 Code of Federal Regulations (10 CFR) 50.73(a)(2)(iv)(A) for an automatic actuation of the RPS. Telephonic notification was made to the U.S. Nuclear Regulatory Commission (NRC) Emergency Notification System on March 29, 2016, within 4 hours of the event pursuant to 10 CFR 50.72(b)(2)(iv)(B) and 10 CFR 50.72 (b)(3)(iv)(A) for a valid RPS actuation while the reactor was critical.

NRC FORM
(11-2015)

366A U.S. NUCLEAR REGULATORY COMMISSION



LICENSEE EVENT REPORT (LER)
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Grand Gulf Nuclear Station, Unit 1	05000 416	YEAR	SEQUENTIAL NUMBER	REV. NO.
		2016-002-00		

NARRATIVE

CAUSE

Direct Cause: The 'B' Main Transformer X21 CT wiring was incorrectly landed at X1/X2 terminals instead of the X1/X3 terminals. This changed the ratio of the 'B' Main Transformer Current Differential Relay from the designed 2200:5 to 1000:5, which resulted in a lower trip setting than designed for the 'B' Main Transformer Differential Overcurrent trip.

Cause 1: Vague or inadequate work instructions provided in the testing and troubleshooting work package.

Cause 2: Insufficient testing following completion of all work.

CORRECTIVE ACTIONS

The immediate corrective action was to correct the 'B' Main Transformer CT wiring and verify all other wiring in the 'A', 'B', and 'C' Main Transformer control cabinets was correct. No other issues with wiring was identified during this verification.

Two corrective actions to prevent reoccurrence were identified:

1. Revise procedure(s) to require lifted lead sheet use (or similar table with performer and verifier signatures) in all work instructions where wiring determinations and/or re-terminations are performed at GGNS.

2. Revise the Post Maintenance Testing procedure to include clear guidance from SOER 10-01 (as delineated in the Post Modification Testing and Special Instructions procedure) for transformer work.

SAFETY SIGNIFICANCE

The event posed no threat to the health and safety of the general public or to nuclear safety as RPS performed as designed. All safety systems responded as expected and Operator actions were in accordance with GGNS procedures. No Technical Specification safety limits were challenged or violated. Industrial safety was not challenged, and there was no potential or actual radiological release during the event.

PREVIOUS SIMILAR EVENTS

The Main Transformers were installed in April 2012 to support Extended Power Uprate (EPU). Since the installation, there have been three RPS SCRAMs on main turbine trips associated with CTs prior to this event. These are documented in LER-2012-008-00, LER-2013-01-00, and LER-2015-001-00.

NRC FORM
(11-2015)

366A U.S. NUCLEAR REGULATORY COMMISSION



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		2016-002-00		

NARRATIVE

The cause of LER-2015-001-00 was not similar to the event being reported, and the corrective actions would not have prevented the March 29, 2016 reactor SCRAM.

The cause of LER-2012-008-00 and LER-2013-001-00 was inadequate workmanship and work instructions that did not specify the minimum cold clearance of 0.5 inch between the CT and the micarta plate bolts during installation. The corrective actions addressed revising procedures, testing notes, work instructions, and drawings to ensure the minimum 0.5 inch cold clearance is maintained. Although these two events were attributed to inadequate work instruction, the corrective actions would not have prevented the March 29, 2016 reactor SCRAM.