Entergy

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10 CFR 50.73

GNRO-2021/00022

August 19, 2021

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

SUBJECT: Grand Gulf Nuclear Station, Unit 1 Revised Licensee Event Report 2020-005-02

Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
Renewed License No. NPF-29

Attached is revised Licensee Event Report 2020-005-02, Primary Water System Flow Lowered Causing Turbine Trip and Subsequent Reactor Scram. This report is being submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A), for any event or condition that resulted in manual or automatic actuation of the Reactor Protection System (RPS).

This letter contains no new Regulatory Commitments. Should you have any questions concerning the content of this letter, please contact Jeff Hardy, Regulatory Assurance Manager at 269-764-2011.

Sincerely,

Jeff A. Hardy
JAH/fas

Attachments: Licensee Event Report 2020-005-02

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

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

Attachment
Revised Licensee Event Report 2020-005-02

NRC FORM 366 (08-2020)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

(See Page 3 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2023

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 Information Services Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: oira_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. Facility Name	2. Docket Number	3. Page
Grand Gulf Nuclear Station, Unit 1	05000416	1 OF 3

4. Title

Primary Water System Flow Lowered Causing Turbine Trip and Subsequent Reactor Scram

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
									N/A	05000 N/A
11	06	2020	2020	- 005 -	02	08	19	2021	Facility Name	Docket Number
									N/A	05000 N/A

9. Operating Mode	10. Power Level
1	84

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*

10 CFR Part 20	☐ 20.2203(a)(2)(vi)	☐ 50.36(c)(2)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(4)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(1)(i)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(i)
☐ 20.2203(a)(2)(iii)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.77(a)(2)(ii)
☐ 20.2203(a)(2)(iv)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	
☐ 20.2203(a)(2)(v)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	

☐ Other (Specify here, in abstract, or NRC 366A)

12. Licensee Contact for this LER

Licensee Contact	Telephone Number (Include Area Code)
Jeff Hardy, Manager Regulatory Assurance	(269)-764-2011

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable To IRIS	Cause	System	Component	Manufacturer	Reportable To IRIS
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

14. Supplemental Report Expected	15. Expected Submission Date	Month	Day	Year
☐ Yes (If yes, complete 15. Expected Submission Date) ☒ No		N/A	N/A	N/A

Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)

On November 6, 2020 at 0239 CT, while operating in MODE 1 at approximately 84 percent power, Grand Gulf Nuclear Station received a signal for low Primary Water system flow to generator bushing C, which resulted in an automatic turbine trip and reactor Scram. All control rods fully inserted and there were no complications associated with the Scram. All systems responded as designed and the plant was stabilized in MODE 3.

Primary water is non-radioactive ultra-purified water circulated to and from the generator to cool the generator stator, bushings, and rotor. The root cause of the event is that Entergy Engineering Leadership (Corporate Projects and Site Engineering) made changes to the design of the primary water bushing flow instrumentation loop without fully evaluating the impacts of the changes to the instrumentation feedback quality and existing operating margins to a generator trip.

The corrective actions to preclude repetition was to revise EN-HU-104, Technical Task Risk & Rigor, to require creation of a detailed table listing generation risk parameters (setpoints, settings, dimensions) for engineering changes with high generation risk.

Corrective action to preclude repetition included modifying the sensing lines for all primary water flow transmitters to obtain the proper slope and to allow back filling the flow instruments. Additionally, the margin between the low flow alarm and low flow trip setpoint was increased.

There were no consequences to the general safety of the public, nuclear safety, industrial safety, or radiological safety. No radiological release occurred due to this event. This report is made in accordance with 10 CFR 50.73(a)(2)(iv)(A), any event or condition that resulted in manual or automatic actuation of the Reactor Protection System.

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2023
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 Information Services Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: oira_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Grand Gulf Nuclear Station, Unit 1	05000-416	2020	- 005	- 02

NARRATIVE

Plant Conditions:
Grand Gulf Nuclear Station (GGNS) Unit 1 was operating at 84 percent power in MODE 1. There were no Structures, Systems, or Components that were inoperable that contributed to this event.

Event Description:
Primary water is non-radioactive ultra-purified water circulated to and from the generator to cool the generator stator, bushings, and rotor.

On November 6, 2020 at 0132 CT, during normal steady state operation, the control room received and alarm for low Primary Water (PW) system flow to main generator bushing Phase C. One of the three channels for bushing C flow caused the alarm and then cleared. Indication for all nine flow transmitters in Phases A, B, and C had drifted down in a slow trend over the course of 2-3 hours, with C phase having a steeper rate of degradation. Overall flow indications degraded slightly and the instrument noise level increased significantly the combination of which eventually led to the low flow trip. An actual low flow condition (overall bushing flow below trip setpoint) did not exist in any of the Primary Water flow paths. Alarms continued to come in with increasing frequency.

On November 6, 2020 at 0239 CT, while operating in MODE 1 at 84 percent power, GGNS received a signal for primary water system flow to generator bushing C, which lowered below its trip setpoint resulting in an automatic generator and turbine (TA) trip and subsequent automatic reactor Scram.

All control rods fully inserted and there were no complications associated with the Scram. All system responded as designed and the plant was stabilized in MODE 3. No radiological releases occurred due to this event.

This event was reported under 10 CFR 50.72(b)(2)(iv)(B), as any event or condition that results in actuation of the Reactor Protection System when the reactor is critical. (EN 54986)

This report is made in accordance with 10 CFR 50.73(a)(2)(iv)(A), any event or condition that resulted in manual or automatic actuation of the Reactor Protection System.

Safety Assessment:
The reactor Scram due to the turbine trip did not result in actual consequences to safety of the general public, nuclear safety, industrial safety, or radiological safety. The safety significance of this event is determined to be low.

Event Cause(s):
The direct cause of the generator and turbine trip was gas voids in the primary water system, which degraded generator bushing primary water flow and increased instrument noise in the bushing primary water flow transmitters. This resulted in the bushing flow indication dropping and then reaching its trip setpoint.

The root cause of the event is that Entergy Engineering Leadership (Corporate Projects and Site Engineering) made changes to the design of the primary water bushing flow instrumentation loop without fully evaluating the impacts of the changes to the instrumentation feedback quality and existing operating margins to a generator trip.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
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Corrective Actions:

- To preclude repetition, the Primary Water system flow to generator bushing Phase A, B, and C flow instrument tubing slope was corrected and backfill valves were added. This action is complete.
- To preclude repetition, Entergy increased primary water flow transmitter damping and trip delay. This action is complete.
- To preclude repetition, lowered the low bushing flow trip setpoint from 27.9 gpm to 25.5 gpm in order to increase margin between normal operating flow and the trip point. This action is complete.
- To preclude repetition, Entergy raised primary water bushing flow alarm setpoint from 29.8 gpm to 31.5 gpm in order to increase margin between receipt of the alarm and when the trip signal is received. This action is complete.
- To preclude repetition, increased primary water head tank level alarm setpoint to increase margin between receipt of the alarm and when the trip signal is received. This action is complete.
- To preclude repetition, Entergy's procedure EN-HU-104, Technical Task Risk and Rigor, was revised to require creation of a detailed table listing generation risk parameters (setpoints, settings, dimensions) being revised for engineering changes with high generation risk. This table is to list the old parameter, new, and basis for acceptability. This table would then be presented for challenge such as Independent Third-Party Review, and challenge board. This action is complete.

Previous Similar Events:

None.