Entergy Operations, Inc.
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10 CFR 50.73

GNRO-2020/00047

January 2, 2021

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

SUBJECT: Grand Gulf Nuclear Station, Unit 1 Licensee Event Report 2020-005-00, Primary Water System Flow Lowered Causing Turbine Trip and Subsequent Reactor SCRAM.

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

Attached is Licensee Event Report 2020-005-00, 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)(B), for any event or condition that resulted in manual or automatic actuation of the Reactor Protection System.

This letter contains no new Regulatory Commitments. Should you have any questions concerning the content of this letter, please contact Jim Shaw, Manager Regulatory Assurance at 601-437-2103.

Sincerely,

Robert Franssen
RF/fas

Attachments: Licensee Event Report 2020-005-00

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
Licensee Event Report 2020-005-00

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 -	00	01	02	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	Phone Number (Include Area Code)
Jim Shaw, Manager Regulatory Assurance	(601) 437-2103

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		04	01	2021

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 systems responded as designed. No loss of either offsite power or Engineered Safety Feature power occurred. No Emergency Core Cooling System or emergency diesel generator initiations occurred. Main steam isolation valves remained open bypassing steam to the main condenser. Reactor water level was maintained with the condensate system. The plant was stabilized in MODE 3.

The preliminary 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 below its trip setpoint.
Immediate action taken was correcting the Phase C flow instrument tubing slope. Phase A and B flow instrument tubing slope were also corrected. Additional corrective action was to lower the low bushing flow trip setpoint and raise the low flow alarm setpoint.

There were no consequences to the general safety of the public, nuclear safety, industrial safety or radiological safety. No radiological releases occurred due to this event.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Grand Gulf Nuclear Station, Unit 1	05000416	2020	- 005	- 00

NARRATIVE

Plant Conditions:

Grand Gulf Nuclear Station (GGNS) Unit 1 was operating at approximately 84 percent power in MODE 1. There were no structures, systems or components that were inoperable that contributed to this event.

Event Description:

On November 6, 2020 at 0239 CT, while operating in MODE 1 at approximately 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. The unit was shutdown without complication using pressure control through the main condenser.

All control rods fully inserted. All systems responded as designed. Reactor pressure was maintained with main turbine bypass valves. Reactor water level was maintained in required band with the condensate system. 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 pursuant to 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 preliminary 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 below its trip setpoint. The root cause of the event is still under investigation and will be included in a supplement to this LER.

Corrective Actions:

Immediate actions taken were as follows:

- The Primary Water system flow to generator bushing Phase A, B, and C flow instrument tubing slope was corrected and backfill valves were added.
- Temporary modification was made on the primary water bushing flow trip setpoint, which was lowered to 25.5 from 27.9 gallons per minute (gpm).
- Permanent change was made to the primary water bushing flow alarm setpoint, which was raised to 31.5 from 29.8 gpm. This will provide additional margin between receipt of the alarm and when the trip signal is received.
- Alarm Response Instructions (ARI) for bushing low flow alarm has been updated with guidance for verifying degrading/erroneous flows as well as guidance to bypass the trips during erroneous flow conditions while monitoring

the appropriate parameters until the condition can be corrected (04-1-02-1H13-P680 Rev. 256).

- ARI for the Primary Water Tank low level alarm has been enhanced with directions to bypass the primary water flow trips and vent the primary water coolers after restoring proper tank level (04-1-02-1H13-P680 Rev. 256).
- The Primary Water Tank low level alarm setpoint was raised to prevent gas entrainment within instrument tubing.
- Temporary modification to allow bypassing the Primary Water low flow trip functions to mitigate the effects of a spurious signal.

Corrective action(s) to prevent reoccurrence to be determined upon completion of the causal investigation.

Previous Similar Events:

Entergy conducted a three-year review of the relevant licensee event reports and determined that there were no similar events.