Entergy

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10 CFR 50.73

GNRO-2021/00020

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 2020-003-01

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

Attached is Licensee Event Report 2020-003-01, Manual Reactor Scram Due to Turbine High Pressure Control Valve Malfunction and Automatic Reactor Water Level 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: Revised Licensee Event Report 2020-003-01

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 2020-003-01

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 FOIA, Library, and Information Collections 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 all: 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	05000 416	1 OF 4

4. Title

Manual Reactor Scram Due To Turbine High Pressure Control Valve Malfunction And Automatic Reactor Water Level 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
08	08	2020	2020	- 003 -	01	08	19	2021	Facility Name	Docket Number
									N/A	05000 N/A

9. Operating Mode	10. Power Level
1	86

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	(601) 437-2103

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

Cause	System	Component	Manufacturer	Reportable To ICES	Cause	System	Component	Manufacturer	Reportable To ICES
B	TA	PCV	Emerson Process	Y	B	SJ	LCV	Control Components	Y

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

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

At 0127 CT on August 8, 2020, while operating in MODE 1 at approximately 86 percent power, Grand Gulf Nuclear Station Control Room staff inserted a manual reactor Scram in response to main turbine high pressure control valve oscillations >5% peak to peak and Average Power Range Monitor power swings 7% peak to peak. All systems responded as designed and the plant was stabilized in MODE 3. Subsequently, at 0159 CT on August 8, 2020, reactor water level reached level 3, resulting in initiation of the Reactor Protection System, and an automatic reactor Scram due to a malfunction of the Feedwater Startup Level Control Valve.

The Root Causes for this event were: 1) Entergy Engineering Leadership did not ensure the actuator assembly design was fully evaluated and the effects of vibration on the equipment in the Engineering Change were fully evaluated and 2) Entergy Engineering Leadership did not ensure full implementation of Entergy processes as intended to verify Vendor Quality of the valve actuator assembly.

The cause of reactor water level reaching level 3 was caused by a malfunction of the Feedwater Startup Level Control Valve. There were no consequences to the general safety of the public, nuclear safety, industrial safety or radiological safety. This report is made in accordance with 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.

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 FOIA, Library, and Information Collections 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	- 003	- 01

NARRATIVE

Plant Conditions:

Grand Gulf Nuclear Station (GGNS) Unit 1 was operating at approximately 86 percent power in MODE 1. Plant conditions prior to inserting the manual Scram were as follows: pressure control valve oscillations greater than five (5) percent peak-to-peak with Average Power Range Monitor (APRM) power swings seven (7) percent peak-to-peak and 80 Megawatt electric (MWE) swings peak-to-peak on generator output. There were no other structures, systems, or components that were inoperable that contributed to this event.

Event Description:

At 0127 CT on August 8, 2020, while operating in MODE 1 at approximately 86 percent power, GGNS Control Room staff inserted a manual reactor Scram in response to pressure control valve oscillations greater than five (5) percent. The manual shutdown was due to a Main Turbine [TA] High Pressure Control Valve actuator malfunction. Reactor pressure was controlled with bypass control valves to the main condenser. Reactor level was maintained with condensate and feedwater through Startup Level Control.

All control rods fully inserted and there were no complications associated with the Scram. All systems responded as designed and the plant was stable in MODE 3.

This event was reported in accordance with 10 CFR 50.72(b)(2)(iv)(B), as any event or condition that results in actuation of the Reactor Protection System (RPS) when the reactor is critical. (Event number 54824.)

At approximately 0159 CT on August 8, 2020, reactor water level reached level 3, resulted in initiation of the RPS and an automatic reactor Scram due to a malfunction of the Feedwater [SJ] Startup Level Control Valve.

This event was reported in accordance with 10 CFR 50.72(b)(3)(iv)(A), as any event or condition that results in a valid actuation of any of the systems listed in 10 CFR 50.72(b)(3)(iv)(B). (Event number 54824.)

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 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. The response to the Scram was performed in accordance with plant procedures.

Event Cause(s):

The direct cause of the pressure control valve oscillations was a loose threaded connection for the LVRT driver plate on the hydraulic actuator for Main Turbine Control Valve 1N11F026D.

The first Root Cause of the event is that Entergy Engineering Leadership (Corporate Projects and Site Engineering) did not ensure the actuator assembly design was fully evaluated and the effects of vibration on the equipment in EC 72780, Turbine Control Protection System – Non-Safety, were fully evaluated. Vibration on equipment was determined to cause equipment issues with alignment, assembly fasteners to loosen, and assembly parts critical to the function of the actuator assembly

to back out. The vibration conditions were measured and evaluated as part of EC72780 but were not fully evaluated for the effects of vibration on the entire assembly to identify weaknesses. The vibration issues ultimately resulted in the component not being capable of functioning for the expected service period resulting in a plant down power and then a plant manual scram.

The second Root Cause of this event is the Engineering Leadership (Corporate Projects and Site Engineering) did not ensure full implementation of Entergy processes as intended to verify Vendor Quality of the valve actuator assembly fabrication, installation coordination of work activities, vendor work planning, control of work activities performed by supplemental vendor support on-site thru execution phase by supplemental support. (Less than adequate vendor oversight)

The reactor water level reaching Level 3 and resulting in an automatic reactor Scram was caused by a malfunction of the Feedwater Startup Level Control Valve.

Corrective Actions:

The immediate actions to correct the condition included torquing of the LVRT connection, application of thread treatment, and pinning the connection for all the hydraulic actuators installed in the upgrade.

The corrective action to preclude repetition for the first Root Cause will include implementation of a permanent Engineering Change based on engineering analysis which incorporates design features to reduce and control the effects of vibration on the actuator assembly. Completion date is scheduled for April 29, 2022.

The corrective action to preclude repetition for the second Root Cause was to revise EN-MP-100, Critical Procurements, to incorporate requirements to document and track specific methods utilized to verify critical characteristics are met. Additionally, procedure EN-HU-104, Technical Task Risk & Rigor, was revised to require creation of a detailed table listing generation risk parameters (setpoints, settings, dimensions) being revised for EC's with high generation risk. Table is to list the old parameter, new, and basis for acceptability. This table would then be presented for challenge such as ITPR, and challenge board. This action is complete.

The volume booster on the Feedwater startup level control valve was replaced.

Previous Similar Events:

None.