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10CFR50.73

GNRO-2018/00036

October 2, 2018

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

SUBJECT: Supplemental Licensee Event Report 2017-003-02, Reactor Shutdown Because of Condensate System Inventory Depletion and a Manual Reactor Core Isolation Cooling (RCIC) Initiation Because of a Feedwater System Shutdown
Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

Dear Sir or Madam:

Attached is Supplemental Licensee Event Report 2017-003-02. This supplement provides additional information related to the cause and corrective actions for this event.

This letter contains no new commitments. If you have any questions or require additional information, please contact Douglas Neve at 601-437-2103.

Sincerely,

E. A. La

Eric A. Larson
Site Vice President
Grand Gulf Nuclear Station
EAL/jw

Attachment: Supplemental Licensee Event Report 2017-003-02

cc: see next page

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

U.S. Nuclear Regulatory Commission
ATTN: Ms. Lisa M. Regner
Mail Stop OWFN 8 B1
Rockville, MD 20852-2738

U.S. Nuclear Regulatory Commission
ATTN: Mr. Kriss Kennedy, NRR/DORL (w2)
Regional Administrator, Region IV
1600 East Lamar Boulevard
Arlington, TX 76011-4511

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Attachment

Supplemental Licensee Event Report 2017-003-02

NRC FORM 366 (02-2018) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 03/31/2020

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-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by 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.

LICENSEE EVENT REPORT (LER)

(See Page 2 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/)

1. Facility Name	2. Docket Number	3. Page
Grand Gulf Nuclear Station, Unit 1	05000416	1 OF 4

4. Title

Reactor Shutdown Because of Condensate System Inventory Depletion and a Manual Reactor Core Isolation Cooling (RCIC) Initiation Because of Feedwater System Shutdown

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	05000N/A
04	04	2017	2017	- 003	- 02	10	2	2018	Facility Name	Docket Number
									N/A	05000N/A

9. Operating Mode	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. Power Level	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
75%	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(ii)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(iii)
		☐ 50.73(a)(2)(i)(C)	☐ Other (Specify in Abstract below or in NRC Form 366A	

12. Licensee Contact for this LER

Licensee Contact	Telephone Number (Include Area Code)
Douglas Neve / 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
X	SD	INV	Utility	Y	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 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

At 00:10 on April 4, 2017, the reactor was manually shutdown from approximately 75 percent core thermal power due to condensate storage tank level lowering to 24 feet. All control rods fully inserted and all systems actuated and operated as designed. No safety relief valves actuated. Reactor level and pressure were controlled within normal bands. Reactor core isolation cooling (RCIC) was manually initiated for level control. Decay heat was removed via steam discharge to the condenser, and to the suppression pool via RCIC. The electrical grid was stable and supplying plant loads. The cause of the condensate depletion was a condensate system leak.

The condensate system leak was a failed pipe connection caused by cycling water injection valves that induced excessive vibration on the pipe flange. A failing Turbine Control Card caused the faulty signals, which led to the water injection valves' cycling. The piping and flange connection were repaired, and the Turbine Control Card was replaced. In addition, the Turbine Control System is planned to be replaced in Refueling Outage 22 in 2020.

All other systems operated as designed, and there were no actual nuclear safety or radiological consequences during the event.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Grand Gulf Nuclear Station, Unit 1	05000-416	2017	- 003	- 02

NARRATIVE

A. PLANT OPERATING CONDITIONS BEFORE THE EVENT

Before the event, Grand Gulf Nuclear Station (GGNS) Unit 1 was in Mode 1 at approximately 75 percent (%) rated thermal power (RTP). 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 known inoperable systems, structures and components, other than the components involved in the likely cause, contributed to the event.

B. DESCRIPTION OF OCCURRENCE

On April 3, 2017 GGNS was in reactor MODE 1 at 100% power. The radwaste control room detected a rise in floor drain water collection and an accelerated decrease in condensate storage tank (CST) level. The radwaste control room informed the main control room, and determined that the floor drain collecting tank increase source was the turbine building west floor drain sump.

An investigation into the change in storage tank parameters was in progress, and the radwaste and main control rooms were attempting to maintain CST level. The CST level first reached 24 feet on day shift and rad waste was able to refill the CST to 27 feet using processed water and demineralized storage tank (DST) water.

At 23:15 on April 3, 2017, when the CST was again approaching 24 feet, no more processed or DST water was available so reactor power was lowered, achieving 70 million pounds mass per hour of core flow (75 percent power) at 23:24 on April 3, 2017. After the power reduction the turbine building sump inflow increased. The control room secured a condensate pump and a condensate booster pump with no change to the sump inflow.

The reactor mode switch was taken to SHUTDOWN at 00:10 on April 4, 2017 when the CST level reached 24 feet. The reactor shut down, with all control rods fully inserted and all systems operating as designed.

No safety relief valves actuated, and reactor level and pressure were maintained within normal bands. Level control was first maintained by the feedwater system, and then maintained by manual initiation of the reactor core isolation cooling (RCIC) system.

Decay heat removal was accomplished by passing steam to the condenser, and by passing steam through the RCIC turbine to the suppression pool.

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NARRATIVE

C. REPORTABLE OCCURRENCE

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 a manual actuation of the reactor protection system (RPS) and the manual initiation of RCIC.

Telephonic notification was made via the U.S. Nuclear Regulatory Commission (NRC) Emergency Notification System 05:57 on April 4, 2017, pursuant to 10 CFR 50.72(b)(3)(iv)(A) and 10 CFR 50.72 (b)(2)(iv)(B).

The notification to the NRC was performed 1 hour and 47 minutes beyond the required 4 hour time required for NRC notification.

D. CAUSE

The lowering CST level was caused by a condensate system leak. Excessive vibration on an under-torqued pipe flange resulted in a failed pipe connection. The vibration was caused by cycling water injection valves, which were receiving faulty signals from a failing Turbine Control Card.

E. CORRECTIVE ACTIONS

Immediate Actions:

- The plant was placed in cold shutdown. Plant walkdowns were performed by Operations, Maintenance, and Engineering, which identified the damaged condensate piping.

Completed Actions:

- The piping and flange connection were repaired, and the Turbine Control Card was replaced.

Planned Actions:

- The Turbine Controls System is planned to be replaced in Refueling Outage 22 in 2020.

F. SAFETY ASSESSMENT

There were no actual nuclear safety consequences or radiological consequences during the event. All systems operated as designed and there was no release of radioactivity.

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
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Grand Gulf Nuclear Station, Unit 1	05000-416	2017	- 003	- 02

G. PREVIOUS SIMILAR EVENTS

On June 25, 2016, an Automatic Reactor SCRAM (LER 2016-005-01) occurred due to a failed operational amplifier installed on a circuit card that provided input to the Turbine Control System. The corrective action to preclude repetition for this event is the same as that for LER 2017-003-02 (replace Turbine Control System with digital control system). The replacement is planned for Refueling Outage 22 in 2020 and therefore does not constitute an ineffective corrective action.