



Entergy Operations, Inc.  
P. O. Box 756  
Port Gibson, MS 39150

Eric A. Larson  
Site Vice President  
Grand Gulf Nuclear Station  
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10CFR50.73

GNRO-2018/00030

November 16, 2018

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

SUBJECT: Supplemental Licensee Event Report 2017-006-01, Completion of Grand Gulf Nuclear Station Shutdown Required By Technical Specifications Because Of An Inoperable A Residual Heat Removal Pump  
Grand Gulf Nuclear Station, Unit 1  
Docket No. 50-416  
License No. NPF-29

Dear Sir or Madam:

Attached is Supplemental Licensee Event Report 2017-006-01. This report is being submitted in accordance with 10CFR50.73(a)(2)(i)(A) as the completion of any nuclear plant shutdown required by the plant's Technical Specifications.

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

Sincerely,

A handwritten signature in black ink, appearing to read "E. Larson", with a long horizontal line extending to the right.

Eric A. Larson  
EAL/tdf

Attachment: Licensee Event Report 2017-006-01

cc: see next page

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

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

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

Attachment

Licensee Event Report (LER) 2017-006-01



**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/>)

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](mailto: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.

<b>1. Facility Name</b> Grand Gulf Nuclear Station Unit 1	<b>2. Docket Number</b> 05000-416	<b>3. Page</b> 1 OF 3
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**4. Title**  
Completion of Grand Gulf Nuclear Station Shutdown Required By Technical Specifications Because Of An Inoperable A Residual Heat Removal Pump

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
8	29	2017	2017	006	01	11	16	2018	N/A	05000 N/A
									N/A	05000 N/A

<b>9. Operating Mode</b> 1	<b>11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)</b>			
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
<b>10. Power Level</b> 65	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(ii)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(iii)
		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A)	

**12. Licensee Contact for this LER**

Licensee Contact Douglas A. Neve, Manager Regulatory Assurance	Telephone Number (Include Area Code) (601) 437-2103
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**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
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

<b>14. Supplemental Report Expected</b> <input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> No	<b>15. Expected Submission Date</b>	Month N/A	Day N/A	Year N/A
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Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On August 22, 2017 at 2321 hours central daylight time, Grand Gulf Nuclear Station (GGNS) entered Technical Specification (TS) conditions for three Limiting Condition for Operations (LCOs) not met due to Residual Heat Removal 'A' system (RHR A) being declared inoperable. Entergy Operations Inc. (Entergy) made the decision to shut down the plant based on the results of troubleshooting performed on the RHR A pump. The A RHR pump TS differential pressure was out of specification (low) and could not be returned to acceptable limits. GGNS initiated plant shutdown as required by Technical Specifications 3.5.1, 3.6.1.7, and 3.6.2.3 at 1200 hours CDT on August 29, 2017, due to expected restoration of RHR A exceeding the completion time of 7 days prior to restoring Operability. The shutdown was completed and entry into MODE 3 occurred at 2217 hours CDT on August 29, 2017.

The direct cause of the event was increased surface roughness from corrosion in the Division I Residual Heat Removal Pump due to suppression pool water quality and lack of pump passivation. Corrective actions include replacement and successful testing of the pump, reanalysis of calculation limits, procedural upgrades, and the enhancement of pump management controls. This condition is reportable as a completion of a plant shutdown required by the TS.



**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

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.

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Grand Gulf Nuclear Station Unit 1	05000-416	2017	- 006	- 01

**NARRATIVE**

**DESCRIPTION**

On August 22, 2017 at 2321 hours central daylight time (CDT), Grand Gulf Nuclear Station entered Technical Specification (TS) conditions for three Limiting Condition for Operations (LCOs) not met due to Residual Heat Removal [BO] 'A' (RHR A) being declared inoperable.

LCOs not met:

- 1) TS 3.5.1 for one low pressure Emergency Core Cooling System [BO] injection/spray subsystem.
- 2) TS 3.6.1.7 for one RHR containment spray subsystem, and
- 3) TS 3.6.2.3 for one RHR suppression pool cooling subsystem.

Entergy Operations Inc. (Entergy) made the decision to shut down the plant based on the results of troubleshooting performed on the RHR A pump. Grand Gulf Nuclear Station initiated plant shutdown required by Technical Specifications 3.5.1, 3.6.1.7, and 3.6.2.3 at 1200 hours CDT on August 29, 2017, due to expected restoration of RHR A exceeding the TS completion time of 7 days prior to restoring Operability. The shutdown was completed and entry into MODE 3 occurred at 2217 hours CDT on August 29, 2017.

**REPORTABILITY**

Entergy completed Event Notification 52936 notifying the Nuclear Regulatory Commission of the commencement of a plant shutdown in accordance with 10CFR50.72(b)(2)(i), due to the anticipated inability to complete the required A RHR Pump repairs prior to exceeding the TS LCO time limits.

The completion of the shutdown reported in Event Notification 52936 is reportable in accordance with 10CFR50.73(a)(2)(i)(A), the completion of any nuclear plant shutdown required by the plant's Technical Specifications. LCOs not met:

- 1) TS 3.5.1 for one low pressure ECCS injection/spray subsystem.
- 2) TS 3.6.1.7 for one RHR containment spray subsystem, and
- 3) TS 3.6.2.3 for one RHR suppression pool cooling subsystem.

**CAUSE**

The A RHR pump TS differential pressure was out of specification (low) and could not be returned to acceptable limits prior to exceeding the 7 day limiting condition for operation time.

The direct cause of the event was increased corrosion in the Division I Residual Heat Removal Pump resulting in loss of total developed head due to increased surface roughness.



**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Grand Gulf Nuclear Station Unit 1	05000-416	2017	- 006	- 01

**NARRATIVE**

**CORRECTIVE ACTIONS**

Completed Corrective Actions:

- Replacement of A RHR pump and restoration of the pump to operable status.
- Reviewed Containment Spray Calculations to identify potential excessive margin.
- Revised calculation ECCS uncertainty analysis for relaxed parameters [MC-Q1111-84016].
- Revised procedure 06-OP-1E12-Q-0023, LPCI/RHR [low pressure coolant injection/residual heat removal] Subsystem A Quarterly Functional Test.
- Developed passivation plan for the A RHR pump.
- Developed an online fill and vent plan.
- Established suppression pool cleanliness standards.

**SAFETY SIGNIFICANCE**

The event posed no threat to the health and safety of the general public or to nuclear safety as safety-systems performed as designed. No Technical Specification safety limits were violated. Industrial safety was not challenged, and there was no potential or actual radiological release during the event.

**PREVIOUS SIMILAR OCCURRENCES**

LER 2004-002-00, Loss of RHR B Operability

LER 2016-007-01, Technical Specification Shutdown because of the Loss of the Residual Heat Removal Pump

The review of causes and corrective actions associated with these previous similar events concluded that the corrective actions would not have prevented the cause of this event.