



Entergy Operations, Inc.  
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Eric A. Larson  
Site Vice President  
Grand Gulf Nuclear Station  
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10CFR50.73

GNRO-2018/00014

April 4, 2018

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

SUBJECT: Licensee Event Report 2018-002-00, Both Containment Air Lock Doors  
Simultaneously Inoperable  
Grand Gulf Nuclear Station, Unit 1  
Docket No. 50-416  
License No. NPF-29

Dear Sir or Madam:

Attached is Licensee Event Report 2018-002-00, Both Containment Air Lock Doors Simultaneously Inoperable. This report is being submitted in accordance with 10CFR50.73(a)(2)(i)(B) as a condition prohibited by Technical Specifications and 10CFR50.73(a)(2)(v)(C) as a condition that could have prevented fulfillment of a safety function (i.e., control the release of radioactive material).

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. A. Larson", with a horizontal line extending to the right.

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

Attachment: Licensee Event Report 2018-002-00

cc: see next page

U.S. Nuclear Regulatory Commission  
ATTN: Mr. Siva Lingam  
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)  
Mail Stop OWFN 8 B1  
Washington, DC 20555-0001

**Attachment**

**Licensee Event Report (LER) 2018-002-00**



**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 4
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**4. TITLE**  
BOTH 208 CONTAINMENT AIR LOCK DOORS SIMULTANEOUSLY INOPERABLE

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
2	10	18	2018-002-00			4	4	2018	N/A	05000 N/A
									N/A	05000 N/A

**11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)**

<b>9. OPERATING MODE</b> 1	<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)
	<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)
<b>10. POWER LEVEL</b> 68%	<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 checked="" type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(i)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)
		<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 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 EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
A	N/A	N/A	N/A	N/A	D	N/A	N/A	N/A	N/A

**14. SUPPLEMENTAL REPORT EXPECTED**

YES (If yes, complete 15. EXPECTED SUBMISSION DATE)  NO

**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On February 10, 2018, at 1835 hours, while in MODE 1 at 68 percent power, the Grand Gulf Nuclear Station entered Technical Specification (TS) 3.6.1.2 Condition C for both 208 foot upper containment air lock doors being inoperable. The upper containment inner door was determined to be inoperable while the air lock outer door was tagged-out for planned maintenance. A seal air system leak test performed on the air lock inner door on February 6, 2018, had been deemed satisfactory. The outer door was subsequently taken out of service for planned maintenance and, while the outer door was out of service, an additional review of the paperwork determined that the test on the inner door was actually unsatisfactory. TS 3.6.1.2 Condition C was entered at that time. Maintenance of the outer door was completed, the air lock was returned to operable status, and ACTION C was exited at 0835 on February 11, 2018, prior to exceeding the TS action completion time of 24 hours. The cause was determined to be human error in transcribing data and interpreting test results. Analyses of test results for inner doors demonstrated that in all cases the doors and air locks remained functional and capable of maintaining containment integrity in the event of an accident. The inner doors and the air locks remained functional, containment integrity was assured throughout the events, and there was no significant impact on the health and safety of the public.



LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET

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		YEAR	SEQUENTIAL NUMBER	REV. NO.
Grand Gulf Nuclear Station, Unit 1	05000 416		2018-002-00	

NARRATIVE

A. PLANT CONDITIONS PRIOR TO THE EVENT

At the time of discovery, Grand Gulf Nuclear Station (GGNS) Unit 1 was in Mode 1 at 68% reactor power, and in Technical Specification (TS) 3.6.1.2, "Primary Containment Air Locks," Condition A with the 208 foot upper air lock outer door tagged out for planned maintenance. There were no other structures, systems or components out of service that contributed to this event.

B. DESCRIPTION

February 6, 2018, GGNS completed the door seal air system leak test, TS Surveillance Requirement (SR) 3.6.1.2.4, on the upper containment air lock inner door [EIIIS:NH][AL][DR] and the acceptance criteria were determined to be met. On February 9, 2018, TS 3.6.1.2 Condition A was entered when the upper containment air lock outer door was taken out of service for maintenance and testing. At 1835 hours central standard time (CST) on February 10, while the outer door was tagged out, an additional review of the paperwork for the inner door determined that the surveillance test on the inner door was actually unsatisfactory. Technical Specification 3.6.1.2 Condition C was entered for both doors being inoperable for reasons other than those stated in Conditions A and B.

Technical Specification 3.6.1.2 Action C requires restoration of the air lock to operable status within 24 hours or comply with Condition D and be in Mode 3 within the next 12 hours. Maintenance of the outer door was completed, the air lock was returned to operable status, and Condition C was exited at 0835 on February 11, 2018, prior to exceeding the Technical Specification required action completion time of 24 hours. The unit remained in TS 3.6.1.2 Condition A while maintenance and testing was performed on the inner door, which was completed on February 18, 2018. Condition A was exited and full operability restored at that time.

When the surveillance test on the inner door was completed on February 6, TS 3.6.1.2 Condition A should have been entered, and the outer door should have been verified closed within 1 hour and locked closed within 24 hours. With Condition A required actions not met, Condition D requires the plant be in Mode 3 within the following 12 hours. This requirement was not met and therefore the plant was in a condition prohibited by the Technical Specifications. In addition, from 2045 hours on February 7 until 0835 hours on February 11, while the outer door was out of service, both doors were inoperable concurrently with no redundant equipment in the same system operable, which constitutes a condition that could have prevented fulfillment of a safety function.



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The containment air lock door seals [EII:SNH][AL][DR][SEAL] are pneumatic inflatable seals that are maintained at a 70 psig nominal pressure by the seal air flask and pneumatic system, which itself is maintained at a pressure of 90 psig. Each door has two seals to ensure they are single failure proof in maintaining the leak tight boundary of the door. SR 3.6.1.2.4 performs a pressure decay test on the pneumatic system to assure sufficient pressure is maintained for the 30 day mission time of the air lock seals. An analysis of the inner door test results compared the seal leakage rate to the functional requirements specified by the vendor. To assure functionality, a minimum differential pressure of 30 psig is required between the seal system and the maximum peak containment pressure of 12.1 psig, or a minimum seal pressure of 42.1 psig (i.e., 56.8 psia). Based on a constant leak rate determined from the results of the surveillance test, the analysis calculated a final seal system pressure after 30 days of 59.2 psia, which is greater than the 56.8 psia required to provide an adequate sealing barrier. The analysis is conservative, since (1) pressure loss is expected to slow as pressure decays and (2) the post-accident pressure in containment would decay over the duration of the event, and demonstrated that the air lock remained functional during the event.

A review determined that the inner door on the primary containment 119 foot lower air lock had failed the same door seal air system leak test (SR 3.6.1.2.4) on April 15, 2015, and on August 11, 2016. A successful surveillance test on the inner door was subsequently performed on January 19, 2017.

When the surveillance test on the lower air lock inner door was completed on April 15, 2015, and the acceptance criteria not met, TS 3.6.1.2 Condition A should have been entered, and the outer door should have been verified closed within 1 hour and locked closed within 24 hours. With Condition A required actions not met, Condition D requires the plant be in Mode 3 within the following 12 hours. This requirement was not met and therefore the plant was in a condition prohibited by the Technical Specifications. During the period when the lower air lock inner door was inoperable, the outer door was operable except when taken out of service for preplanned maintenance activities on January 13, 2016, for a total of 63 hours, and again on August 14, 2016, for a total of 39 hours. Conditions during these maintenance activities, with both doors inoperable concurrently with no redundant equipment in the same system operable, constituted a condition that could have prevented fulfillment of a safety function.

Analysis of the inner door test results from 2015 and 2016 again concluded the seal system would have maintained functionality for the 30 day post-accident mission time. In both cases, based on the test results the final calculated pressure after 30 days was in excess of 85 psia, well above the required 59.2 psia. These analyses demonstrated that the lower air lock remained functional during the interval between the failed 2015 test and the successful 2017 test.

**C. REPORTABILITY**

The events are being reported under 10CFR50.73(a)(2)(i)(B) as a condition prohibited by Technical Specifications and 10CFR50.73(a)(2)(v)(C) as a condition that could have prevented fulfillment of a safety function (i.e., control the release of radioactive material). For 50.73(a)(2)(i)(B), Condition D required the plant to be in Mode 3 within 12 hours when ACTION 3.6.1.A was not met, and for 50.73(a)(2)(v)(C) containment was inoperable with both air lock doors inoperable.



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		2018-002-00		

The event was initially reported under 10CFR50.72(b)(3)(v)(C) on February 10, 2018, via Event Report 53201.

Entergy has performed an analysis of the event and has determined the airlocks would have been able perform their safety function and therefore in accordance with the guidance provided in NEI 99-02, Revision 7, Regulatory Assessment Performance Indicator Guideline, Section 2.2, Mitigating Systems Cornerstone, Sub-Section, Safety System Functional Failures, Page 30, Lines 27 though 30; this condition will not be counted as a safety system functional failure against Performance Indicator MS05, Safety System Functional Failures.

D. CAUSE

Test values were not transcribed correctly and test personnel misread the test results. The causes were all related to human performance. The risk analysis for the original test procedure was inadequate in that the risk of not performing an independent or engineering acceptance review was not recognized and included in the procedure. In addition, a technical task risk review was not completed prior to performing the test, as required by human performance procedures, which resulted in not fully understanding the risk of the task or level of reviews needed for successful performance.

E. CORRECTIVE ACTIONS

The following actions are completed or planned.

Completed:

- An extent of condition evaluation was performed to identify other surveillance test procedures which lack adequate acceptance reviews

Planned actions included in the corrective action program which may be changed in accordance with the program:

- Procedure 06-ME-1M23-R-0001, Personnel Air lock Door Seal Air System Leak Test, will be revised to add a dedicated attachment for the test calculations which will include a preparer and reviewer sign off.
- A briefing describing the event will be developed and distributed to engineering supervisors to establish a threshold for the risk review process.
- The expectation to utilize human performance tools to preclude risk significant event errors will be reinforced through an all hands meeting.



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F. SAFETY SIGNIFICANCE

The seal system pressure for both air locks would have remained above the 56.8 psig required to assure functionality for the entire 30 day mission time. Safety margins are assured by the conservatisms in the analysis; (1) the assumed constant pressure loss in the seals would be expected to slow as pressure decays, and (2) the assumed post-accident pressure in containment would decay over the duration of the event. As shown by the analysis, there was no safety system functional failure. The inner doors and the air locks remained functional, containment integrity was assured throughout the events, and there was no significant impact on the health and safety of the public.

G. PREVIOUS SIMILAR OCCURRENCES

There were no recent similar occurrences.