UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

May 14, 2018

Mr. Eric Larson
Site Vice President
Entergy Operations, Inc.
Grand Gulf Nuclear Station
P.O. Box 756
Port Gibson, MS 39150

SUBJECT: GRAND GULF NUCLEAR STATION – NRC INTEGRATED INSPECTION REPORT 05000416/2018001

Dear Mr. Larson:

On March 31, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Grand Gulf Nuclear Station. On May 11, 2018, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented four findings of very low safety significance (Green) in this report. All of these findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

Further, inspectors documented a licensee-identified violation which was determined to be Severity Level IV in this report. The NRC is treating this violation as a NCV consistent with Section 2.3.2.a of the Enforcement Policy.

Further, the inspectors documented one Severity Level IV traditional enforcement violation associated with impeding the regulatory process. Inspection Procedure 92723, “Follow up Inspection for Three or More Severity Level IV Traditional Enforcement Violations in the Same Area in a 12-Month Period,” will be performed for three previous violations as described in NRC Inspection Report 05000416/2016007 dated December 9, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16348A222). The additional Severity Level IV traditional enforcement violation documented in this report will be included in the population of violations for which the NRC plans to conduct an additional Inspection Procedure 92723 inspection to assess your evaluation of the violations and review the adequacy of associated corrective actions.

If you contest the violations or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement; and the NRC resident inspector at the Grand Gulf Nuclear Station.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; and the NRC resident inspector at the Grand Gulf Nuclear Station.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Jason Kozal, Branch Chief
Project Branch C
Division of Reactor Projects

Docket No. 50-416
License No. NPF-29

Enclosure:
Inspection Report 05000416/2018001
w/ Attachment: Documents Reviewed

U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number:	05000416
License Number:	NPF-29
Report Number:	05000416/2018001
Enterprise Identifier:	I-2018-001-0008
Licensee:	Entergy Operations, Inc.
Facility:	Grand Gulf Nuclear Station, Unit 1
Location:	7003 Baldhill Road Port Gibson, MS 39150
Inspection Dates:	January 1, 2018 to March 31, 2018
Inspectors:	M. Young, Senior Resident Inspector N. Day, Acting Senior Resident Inspector A. Athar, Acting Resident Inspector
Approved By:	J. Kozal, Branch Chief Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Grand Gulf Nuclear Station, Unit 1, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to https://www.nrc.gov/reactors/operating/oversight.html for more information. Violations being considered in the NRC's assessment are summarized in the table below. A licensee-identified, non-cited violation is documented in report section: 71111.13 – Maintenance Risk Assessment.

List of Findings and Violations

Failure to Promptly Correct Lube Oil Leak on Division 2 Diesel Generator			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000416/2018001-01 Closed	[H.5] – Human Performance, Work Management	71111.19 – Post Maintenance Testing
The inspectors reviewed a self-revealed non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action", associated with the licensee's failure to promptly correct an identified condition adverse to quality. Specifically, the licensee failed to correct an identified oil leak on the division 2 diesel generator before the leak worsened to a condition that rendered the diesel generator inoperable.			

Failure to Follow Procedure when Returning Containment Airlock to Operable Status			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000416/2018001-02 Closed	[H.13] – Human Performance, Consistent Process	71111.19 – Post Maintenance Testing
The inspectors reviewed a self-revealed non-cited violation of Technical Specification 5.4.1.a, "Procedures", for the licensee's failure to follow written procedures for returning a technical specification component to service. Specifically, the licensee failed to follow Procedure 01-S-06-12, "Surveillance Program Procedure", Revision 112, when performing a completion review on the 208 foot elevation inner door personnel airlock seal test, which is a Technical Specification required surveillance.			

Inadequate Procedural Guidance Which Resulted in Control Room Air Conditioning Inoperability			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000416/2018001-03 Closed	[H.12] – Human Performance, Avoid Complacency	71111.19 – Post Maintenance Testing
The inspectors reviewed a self-revealed non-cited violation of Technical Specification 5.4.1.a, "Procedures", for the licensee's failure to have adequate procedural guidance while performing a standby service water surveillance procedure. Specifically, the licensee's procedural			

guidance was not adequate to prevent the control room air conditioning subsystem B compressor from starting while condenser cooling water was isolated, which caused damage and rendered the subsystem inoperable and unavailable.

Inadequate Procedural Guidance which Resulted in Undemanded Control Valve Movements and Manual Scram			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000416/2018001-04 Closed	[H.1] – Human Performance, Resources	71153 – Follow-up of Events and Notices of Enforcement Discretion
The inspectors reviewed a self-revealed non-cited violation of Technical Specification 5.4.1.a, "Procedures", associated with the licensee's failure to provide appropriate procedural guidance while performing calibration of a steam line compensator. Specifically, Work Order 4449267, Task 14 did not contain adequate instructions to calibrate a steam line compensator circuit card potentiometer, which led to undemanded control valve opening and closing and a subsequent manual reactor scram.			

PLANT STATUS

Grand Gulf Nuclear Station began the inspection period at rated thermal power. On January 8, 2018, the unit was shut down to fix a steam leak in the condenser bay. A reactor startup was performed on January 17, 2018. A reactor shutdown was performed on January 30, 2018, to perform troubleshooting on the turbine control system. A reactor startup was performed on February 2, 2018. The unit was returned to rated thermal power on February 21, 2018. The station lowered power on March 4, 2018, to approximately 70 percent to replace the seal of condensate booster pump C. The unit reached rated thermal power on March 11, 2018. The unit remained at or near rated thermal power for the remainder of the inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed plant status activities described in IMC 2515, Appendix D, "Plant Status," and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Impending Severe Weather (1 Sample)

The inspectors evaluated readiness for impending adverse weather conditions for a severe thunderstorm warning in Claiborne County on February 21, 2018.

71111.04 - Equipment Alignment

Partial Walkdown (2 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

(1) Residual heat removal, Subsystem A, on March 13, 2018

(2) Standby liquid control, Subsystem A, on March 22, 2018

71111.05 - Fire Protection

Quarterly Inspection - 71111.05Q (4 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

(1) Condenser bay, 113 and 133 feet elevations, on January 10, 2018

(2) Flex building 1 on January 24, 2018

(3) Auxiliary building, 166 feet elevation, on February 17, 2018

(4) High pressure core spray pump room on March 21, 2018

Annual Inspection - 71111.05A (1 Sample)

The inspectors evaluated fire brigade performance on January 17, 2018.

71111.11 - Licensed Operator Requalification Program and Licensed Operator Performance

Operator Requalification (1 Sample)

The inspectors observed and evaluated a simulated loss of site power event on March 7, 2018.

Operator Performance (1 Sample)

The inspectors observed and evaluated a plant shutdown due on January 8, 2018.

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness (2 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

(1) Standby service water

(2) Residual heat removal

71111.13 - Maintenance Risk Assessments and Emergent Work Control (4 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

(1) Failure of the P multiplexer on January 12, 2018

(2) Elevated (Yellow) risk due to planned reactor core isolation cooling outage on February 1, 2018

(3) Technical Specification 3.0.4.b risk evaluation for unavailable indication of standby service water B flow at the remote shutdown panel

(4) Elevated (Orange) risk due to unplanned inoperability and unavailability of division 2 and 3 diesel generators

71111.15 - Operability Determinations and Functionality Assessments (4 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

(1) High pressure core spray battery cracking and support configuration Condition Report 2018-0342 on January 12, 2018

(2) Fuel pool cooling and cleanup pump A trip Condition Report 2018-0164 on January 5, 2018.

(3) Standby service water valve nest room temperature Condition Report 2018-0087 on January 4, 2018

(4) Corroded high pressure core spray pump seal bolts Condition Report 2018-1936 on March 1, 2018

71111.18 - Plant Modifications (1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

(1) Main steam line vent modification due to weld cracks on January 18, 2018

71111.19 - Post Maintenance Testing (4 Samples)

The inspectors evaluated the following post maintenance tests:

(1) Standby service water A following pump motor replacement on January 26, 2018

(2) 208 feet elevation of auxiliary building to containment airlock inner door following maintenance on February 12, 2018

(3) Division 2 standby emergency diesel generator following corrective maintenance to replace the right bank lube oil to engine seal

(4) Control room air conditioner B following compressor rebuild

71111.20 - Refueling and Other Outage Activities (2 Samples)

The inspectors evaluated forced outage activities from:

(1) January 8 to January 11, 2018

(2) January 30 to February 2, 2018

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (3 Samples)

(1) Average power range monitor channels 2 and 4 on January 8, 2018

(2) Standby service water fan D test on February 15, 2018

(3) Fire water pump A test on March 25, 2018

In-service (1 Sample)

(1) Standby liquid control pump B quarterly surveillance on March 6, 2018

71114.06—Drill Evaluation

Emergency Planning Drill (1 Sample)

The inspectors evaluated the Backup Emergency Operations Facility Drill on February 28, 2018.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

(1) IE01: Unplanned Scrams per 7000 Critical Hours Sample (January 1, 2017, through December 31, 2017)

(2) IE03: Unplanned Power Changes per 7000 Critical Hours Sample (January 1, 2017, through December 31, 2017)

(3) IE04: Unplanned Scrams with Complications (USwC) Sample (January 1, 2017, through December 31, 2017)

71152 - Problem Identification and Resolution

Annual Follow-up of Selected Issues (1 Sample)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issue:

(1) CR-GGN-2018-2693, related to a Part 21 for the Woodward Governors on the Division 1 and 2 standby diesel generators.

71153 - Follow-up of Events and Notices of Enforcement Discretion

Events (1 Sample)

The inspectors evaluated the manual reactor scram due to undemanded turbine control valve movements and licensee's response on January 30, 2018.

INSPECTION RESULTS

Failure to Promptly Correct Lube Oil Leak on Division 2 Diesel Generator			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000416/2018001-01 Closed	[H.5] – Human Performance, Work Management	71111.19 – Post Maintenance Testing

The inspectors reviewed a self-revealed non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action", associated with the licensee's failure to promptly correct an identified condition adverse to quality. Specifically, the licensee failed to correct an identified oil leak on the division 2 diesel generator before the leak worsened to a condition that rendered the diesel generator inoperable.

Description:

On March 15, 2017, during a monthly division 2 (Div 2) diesel generator (DG) run, a 30 drops per minute (dpm) leak was identified coming from the right bank main lube oil header, where it connected to the engine. This lube oil leak was active only while the engine was operating. The following day, after the flanged connection was tightened, the diesel was run again and the leak increased to approximately 60 dpm. These issues were entered into the licensee's corrective action program as Condition Reports CR-GGN-2017-2643 and 2697.

On February 14, 2018, during a monthly operability run, the leak increased to approximately 110 dpm. This issue was entered into the corrective action program as Condition Reports CR-GGN-2018-1265, 1347, and 1403. Because of the increase of oil usage due to the leak, the Div 2 DG could no longer meet the required operating time to fulfil its specified safety function and the licensee declared it inoperable. The Div 2 DG was taken out of service for corrective maintenance to replace the right bank main lube oil header to engine seal. The Div 2 DG was returned to operable status on February 18, 2018, following the seal replacement.

When reviewing the condition reports for the leaks discovered on March 15, 2017, the inspectors noted that the licensee declared the Div 2 DG operable and closed the condition reports to the work management system in order to plan and schedule repairs. The licensee generated and scheduled a work order to correct the condition in December 2021, over 4 years after discovery of the condition. The inspectors noted that the scheduled date for this work order was not commensurate with the safety significance of the deficiency the work order was intended to correct. This untimely scheduling of the work order allowed the condition to degrade to the point that the Div 2 DG became inoperable prior to correcting the deficiency.

The inspectors noted that no attempts to quantify the leak rate for the leaking seal identified on March 16, 2017, were documented between March 16, 2017, and January 11, 2018. Additionally, the inspectors discovered that the operations department did not have any formal mechanism in place to monitor the leak for further degradation of the condition. On January 11, 2018, CR-GGN-2018-275 was written identifying a housekeeping issue for oil leakage under the Div 2 DG. The condition report also identified that the issue was caused by the same lube oil leak identified on March 16, 2017, and that the leak, "may be somewhat worse than initially found." The operators did not run the Div 2 DG at this time and determined that the issue described on January 11, 2018, was still bounded by the operability determination performed in on March 15, 2017. The inspectors noted that without operating

the Div 2 DG it would be impossible to properly quantify the leak rate since the leak only existed when the engine was running. The January 11, 2018, condition report was closed to the same work order as the March 16, 2017, condition report.

The inspectors reviewed CR-GGN-2014-4996, written on June 29, 2014, which identified a lube oil leak coming from the left bank main lube oil header, where it connected to the Div 2 DG engine. This seal is an identical seal to the seal identified to be leaking in March 2017. The licensee determined that the leak identified on June 29, 2014, made the Div 2 DG inoperable. The licensee declared the generator inoperable and repaired the leaking seal. The licensee then closed CR-GGN-2014-4996 to no further action based on fixing the leak, and noted in the condition report that the leak did not constitute a critical component failure. The inspectors reviewed licensee Procedures EN-DC-345, "Equipment Reliability Clock," Revision 2, and EN-LI-102, "Corrective Action Program," Revision 23, and determined that the seal failure on June 29, 2014, should have been classified as a high-critical component failure. Additionally, EN-LI-102 required that an Equipment Apparent Cause Evaluation be done for a high-critical component failure. The inspectors determined that the licensee had failed to perform this evaluation, which was another opportunity to put actions into place that could have prevented the February 2018 Div 2 DG inoperability.

The inspectors reviewed licensee Procedure EN-MA-121, "Fluid Leak Prevention and Management Program," Revision 7. This program directs the licensee to identify and categorize leaks such as the leak identified on March 16, 2017. The guidance in EN-MA-121 should have led to a categorization of the leak and would have directed monitoring this leak quarterly until repaired. Further, the procedure directs preventive maintenance to be scheduled in the normal maintenance schedule if the repair will not be completed for greater than two monitoring periods (i.e. beyond two quarters). The inspectors did not identify any evidence of quarterly monitoring or any preventive maintenance being initiated. The inspectors determined that the licensee had failed to implement EN-MA-121 appropriately for the leak identified on March 16, 2017, which was an additional opportunity to initiate actions that could have prevented the February 2018 Div 2 DG generator inoperability.

Corrective Actions: Licensee corrective actions included replacing the Div 2 DG right bank main lube oil header to engine seal. It was determined that the seal had been installed in the system for 21 years and failed due to age. After an extent of condition review, licensee corrective actions also include a planned replacement of the division 1 diesel generator right bank main lube oil header to engine seal and left bank main lube oil header to engine seal in April 2019. The Div 2 DG left bank main lube oil header to engine seal was previously replaced in 2014. Additionally, the licensee plans to initiate a preventive maintenance task to replace these seals on a 15 year frequency.

Corrective Action Reference(s): The licensee entered the inoperable diesel generator due to a previously identified lube oil leak that further degraded into the corrective action program as Condition Report CR-GGN-2018-1403.

Performance Assessment:

Performance Deficiency: The failure to promptly correct an identified lube oil leak on the Div 2 DG was a performance deficiency. As required by 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action", conditions adverse to quality shall be promptly identified and corrected.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, failing to correct the identified lube oil leak in a timely manner led to unplanned inoperability and unavailability of the division 2 diesel generator.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," dated October 7, 2016, and Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," and determined that the finding was of very low safety significance (Green) because it did not: (1) affect design or qualification of a mitigating system, (2) represent a loss of system and/or function, (3) represent actual loss of function of at least a single train for greater than its technical specification allowed outage time OR two separate safety systems out-of-service for greater than the technical specification allowed outage time, or (4) represent an actual loss of function of one or more nontechnical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours.

Cross-cutting Aspect: The finding had a cross-cutting aspect in the area of human performance associated with work management, because the licensee failed to appropriately plan, control, and execute work activities such that nuclear safety is the overriding priority. Specifically, a work order to replace the leaking seal was not appropriately scheduled [H.5].

Enforcement:

Violation: 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action", requires, in part, that conditions adverse to quality are promptly identified and corrected.

Contrary to the above, from March 15, 2017, until February 14, 2018, the licensee failed to promptly correct an identified condition adverse to quality. Specifically, on March 15, 2017, the leaking right bank main lube oil header to engine seal was identified as leaking 30 drops per minute, and further degraded to 110 drops per minute on February 14, 2018, resulting in inoperability of the division 2 diesel generator.

Disposition: This violation is being treated as a non-cited violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy.

Failure to Follow Procedure when Returning Containment Airlock to Operable Status			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Barrier Integrity	Green NCV 05000416/2018001-02 Closed	[H.13] – Human Performance, Consistent Process	71111.19 – Post Maintenance Testing

The inspectors reviewed a self-revealed non-cited violation of Technical Specification 5.4.1.a, "Procedures", for the licensee's failure to follow written procedures for returning a technical specification component to service. Specifically, the licensee failed to follow Procedure 01-S-06-12, "Surveillance Program Procedure", Revision 112, when performing a completion review on the 208 foot elevation inner door personnel airlock seal test, which is a Technical Specification required surveillance.

Description: On February 5, 2018, following a planned maintenance outage, Grand Gulf Nuclear Station tested the 208 foot elevation inner door personnel airlock seal as required per Technical Specification Surveillance Requirement (SR) 3.6.1.2.4.

The purpose of this test is to verify the air tanks have enough pressure to adequately inflate the door seals in the event of a loss of plant air and to compensate for any possible leakage in the system. The acceptance criteria specified in SR 3.6.1.2.4 is a maximum of 2 psi drop in a 48 hour period. This correlates to a drop of 0.04167 psi in an hour. This test is performed by mechanical maintenance personnel, and engineering personnel review and analyze the data from the test. Operations management evaluates the system, in the form of a completion review, in order to return the system to operable status, if the acceptance criteria is achieved.

Per Procedure 06-ME-1M23-R-0001, Revision 115, step A5.23, the test is satisfied by curve fit analysis. The procedural acceptance criteria (which credits completion of SR 3.6.1.2.4) is the test data line must cross the acceptance line, and the test data line must have a flatter slope than the acceptance line. The test data line did not meet either of these acceptance criteria during the February 5, 2018, test.

Operations management erroneously concluded that the test was acceptable and returned the door to operable status. Furthermore, after finishing the inner door, the licensee started maintenance on the outer airlock door, which rendered it inoperable. When preparing for the outer door return to service test, the licensee discovered that the inner door test had not passed its acceptance criteria and was a failed test. At this time, the licensee declared both airlock doors inoperable, and entered Technical Specification 3.6.1.2, Action C.3, which requires the airlock to be restored to operable status within 24 hours, or commence a reactor shutdown. This condition was reported by the licensee to the Nuclear Regulatory Commission under Event Report 53201. The licensee was able to return the outer airlock door to operable status before the expiration of the action statement, and therefore did not shut down the reactor.

Following troubleshooting and retesting, a satisfactory 208 foot elevation inner door personnel airlock seal test, required per SR 3.6.1.2.4, was performed on February 18, 2018.

Grand Gulf Nuclear Station Procedure 01-S-06-12, "Surveillance Program Procedure", Revision 112, requires operations management to perform a completion review prior to returning systems to service. Specifically, step 5.8.13.1.e requires operations management to ensure technical specification operability requirements are marked either acceptable or

unacceptable based on whether the test data meets technical specification surveillance requirements for operability. The inspector concluded that the test failed to meet the acceptance criteria per Procedure 06-ME-1M23-R-0001, Revision 115, step A5.23, and the system should not have been returned to service per Procedure 01-S-06-12.

Corrective Actions: The licensee reviewed the past 3 years of similar test data. They concluded that on two other occasions an airlock door that did not meet the acceptance criteria of the technical specification surveillance test was inappropriately restored to service. Specifically, an April 2015 test on the 119 foot elevation inner airlock door and an August 2016 test on the 119 foot elevation inner airlock door did not pass the technical specification surveillance test. The licensee documented these errors in CR-GGN-2018-1409. The licensee extrapolated test data from each failed test out for the duration the airlocks are required to perform their specified safety function, which is 30 days. They determined that although the tests failed the SR, in all three cases the door seal accumulators would have retained at least 30 psig over the peak accident pressure inside of containment. This 30 psid limit would have ensured the inner doors' safety function was met per Vendor Manual 460000254.

Corrective Action Reference(s): The licensee entered the failed 208 foot elevation inner door personnel airlock seal as required per Technical Specification SR 3.6.1.2.4 into their corrective action program as CR-GGN-2018-1245.

Performance Assessment:

Performance Deficiency: The licensee's failure to perform an adequate completion review prior to returning a technical specification related system to service per Procedure 01-S-06-12, "Surveillance Program Procedure", Revision 112, was a performance deficiency. Procedure 01-S-06-12, Revision 112 requires operations management to ensure technical specification operability requirements are marked either acceptable or unacceptable based on whether the test data meets technical specification surveillance requirements for operability.

Screening: The inspectors determined the performance deficiency was more than minor, because if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern. Specifically, returning safety related structures, systems, and components to operable status, when they do not meet technical specification surveillance requirement acceptance criteria, could lead to a more significant safety concern.

Significance: The affected cornerstone as determined by Inspection Manual Chapter 0609, Attachment 4, was Barrier Integrity. The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," dated October 7, 2016, and Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process for Findings At-Power," Exhibit 3, "Barrier Integrity Screening Questions," and determined it was of very low safety significance (Green) because it did not: (1) represent an actual open pathway in the physical integrity of reactor containment, containment isolation system, or heat removal components, or (2) involve an actual reduction in function of hydrogen igniters in the reactor containment.

Cross-cutting Aspect: The finding had a cross-cutting aspect in the area of human performance associated with consistent process, because the licensee failed to use a consistent, systematic approach to make decisions. Specifically, operators did not use a

systematic approach to returning a technical specification component to service, and therefore, the procedure was not followed as written [H.13].

Enforcement: Technical Specification 5.4.1.a, “Procedures”, requires, in part, that written procedures shall be established, implemented, and maintained for activities that are recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Appendix A, Section 1.h. of Regulatory Guide 1.33 requires administrative procedures for log entries, record retention, and review procedures.

Grand Gulf Nuclear Station Procedure 01-S-06-12, “Surveillance Program Procedure”, Revision 112, requires operators to perform a completion review prior to returning systems to service. Specifically, step 5.8.13.1.e requires operations management to ensure technical specification operability requirements are marked either acceptable or unacceptable based on whether the test as performed meets technical specification surveillance requirements for operability.

Contrary to the above, on February 5, 2018, Grand Gulf Nuclear Station operations management failed to ensure technical specification operability requirements are marked either acceptable or unacceptable based on whether the test as performed meets technical specification surveillance requirements for operability. Specifically, the licensee failed to adequately perform a completion review on the 208 foot elevation inner door personnel airlock seal test required per Technical Specification Surveillance Requirement 3.6.1.2.4, and inappropriately returned the inner airlock door to operable status.

Disposition: This violation is being treated as a non-cited violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy.

Inadequate Procedural Guidance Which Resulted in Control Room Air Conditioning Inoperability			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating System	Green NCV 05000416/2018001-03 Closed	[H.12] – Human Performance, Avoid Complacency	71111.19 – Post Maintenance Testing

The inspectors reviewed a self-revealed non-cited violation of Technical Specification 5.4.1.a, "Procedures", for the licensee's failure to have adequate procedural guidance while performing a standby service water surveillance procedure. Specifically, the licensee's procedural guidance was not adequate to prevent the control room air conditioning subsystem B compressor from starting while condenser cooling water was isolated, which caused damage and rendered the subsystem inoperable and unavailable.

Description: On February 19, 2018, operations department personnel performed the quarterly standby service water (SSW) subsystem A pump and valve operability surveillance. During this procedure, safety related valves were operated for operability testing and predictive maintenance purposes. Valves associated with providing cooling water to and from the control room air conditioning (AC) system were included in the surveillance.

Grand Gulf Nuclear Station Procedure 06-OP-1P41-Q-0004, "Standby Service Water Loop A Valve and Pump Operability", Revision 125, provided instruction to perform this quarterly surveillance. In order to ensure that the control room AC compressor did not start during the valve operation, procedure step 5.2.17 required the operators to "Shutdown running control room a/c compressors by raising the setpoint of the respective thermostat controller and verify the compressor stops." The inspector noted that there was no specific setpoint (i.e. temperature setting) described in the procedure.

During the February 19, 2018, test, while the plant service water supply to control room air conditioning and Engineered Safety Feature room cooler B valve SP41F125 was closing, the compressor for control room AC subsystem B attempted to automatically start due to temperature reaching the thermostat controller setpoint. This occurred because operators did not raise the thermostat controller to a high enough setpoint. Therefore, control room AC subsystem B tripped on compressor high discharge pressure. Furthermore, the compressor internal gasket set and a system seal were damaged due to the pressure shock in the system. Subsequently, operators declared control room AC subsystem B inoperable.

The inspectors discovered from interviews that the test was accomplished successfully in the past because operators would raise the setpoint high enough that the compressor would not attempt to start while the valves were stroking. In the past, experienced operators recognized the need to raise the setpoint to the maximum allowable setpoint. This information was not in the procedure. The inspectors noted that this indicates a long term weakness that existed in the procedure, and further, a current lack of operator knowledge of standby service water and control room air conditioning system interactions to preclude a compressor from attempting to start without cooling applied.

Corrective Actions: The licensee rebuilt the control room air conditioning B compressor and replaced the damaged mechanical seal. The system was returned to operable status several days later on February 23, 2018.

The licensee performed an equipment failure evaluation under CR-GGN-2018-1527. As a corrective action, the licensee revised Grand Gulf Nuclear Station Procedure 06-OP-1P41-Q-0004, to Revision 127. This revision adds a note prior to performing the work step to raise the setpoint, as well as a procedure step to raise the setpoint to 85 degrees Fahrenheit for control room air conditioning subsystems A and B.

Corrective Action Reference(s): The licensee entered the tripped control room air conditioning subsystem B and inadequate procedural guidance into the corrective action program as CR-GGN-2018-1527.

Performance Assessment:

Performance Deficiency: The failure to have appropriate procedural guidance for performing surveillance testing was a performance deficiency. Specifically, on February 19, 2018, Grand Gulf Nuclear Station Procedure 06-OP-1P41-Q-0004, "Standby Service Water Loop A Valve and Pump Operability", Revision 125, required operators to raise the setpoint on running control room air conditioning compressors. However, the procedure lacked adequate guidance to instruct operators to raise the setpoint high enough to prevent a compressor start and system damage during the surveillance.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the procedure quality attribute of the Mitigating Systems Cornerstone and adversely affected the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, failing to have adequate procedural guidance led to unplanned inoperability and unavailability of the control room AC subsystem B, which is required to support habitability of the operators and safety related equipment located in the control room.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," dated October 7, 2016, and Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process for Findings At-Power," Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined the finding was of very low safety significance (Green) because it did not: (1) affect design or qualification of a mitigating system, (2) represent a loss of system and/or function, (3) represent actual loss of function of at least a single train for greater than its technical specification allowed outage time OR two separate safety systems out-of-service for greater than its technical specification allowed outage time, or (4) represent an actual loss of function of one or more nontechnical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours.

Cross-cutting Aspect: The finding had a cross-cutting aspect in the area of human performance associated with avoid complacency, because the licensee did not recognize and plan for the possibly of mistakes and latent issues. Specifically, operators successfully implemented a procedure with nonspecific setpoint criteria, and failed to correct it to prevent a future latent issue [H.12].

Enforcement: Technical Specification 5.4.1.a, "Procedures", requires, in part, that written procedures shall be established, implemented, and maintained for activities that are recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Appendix A, Section 8.b.(2).f of Regulatory Guide 1.33 requires procedures for service water system functional tests.

Contrary to the above, on February 19, 2018, Grand Gulf Nuclear Station failed to establish adequate written procedures for service water system functional tests. Specifically, Procedure 06-OP-1P41-Q-0004, "Standby Service Water Loop A Valve and Pump Operability", Revision 125, instructed operators to perform standby service water loop A valve and pump operability testing. Step 5.2.17 required operators to shutdown running control room air conditioning compressors by raising the setpoint of the respective thermostat controller and by verifying the compressor stops, but the procedure failed to give a specific thermostat setpoint which would prevent an unintended compressor automatic start and avoid potential system damage.

Disposition: This violation is being treated as a non-cited violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy.

Inadequate Procedural Guidance which Resulted in Undemanded Control Valve Movements and Manual Scram			
Cornerstone	Significance	Cross-cutting aspect	Report Section
Initiating Events	Green NCV 05000416-2018-04 Closed	[H.1] – Human Performance, Resources	71153 – Follow-up of Events and Notices of Enforcement Discretion

The inspectors reviewed a self-revealed non-cited violation of Technical Specification 5.4.1.a, "Procedures", associated with the licensee's failure to provide appropriate procedural guidance while performing calibration of a steam line compensator. Specifically, Work Order 4449267, Task 14 did not contain adequate instructions to calibrate a steam line compensator circuit card potentiometer, which led to undemanded control valve opening and closing and a subsequent manual reactor scram.

Description: On January 30, 2018, at 5:48 p.m. Grand Gulf Nuclear Station was operating at approximately 91 percent rated power, and operators were raising power, when the turbine control valves unexpectedly oscillated open and closed, causing reactor power to oscillate approximately two percent of rated power. The operators entered the Off Normal Event Procedure 05-1-02-V-21, "Reactor Pressure Control Malfunctions," Revision 2, due to the unanticipated power oscillations. At 6:22 p.m. the operators shut down the reactor by inserting a manual reactor scram in order to determine the cause of the undemanded turbine control valve movement.

The licensee determined that the undemanded turbine control valve movement was due to an improperly set potentiometer in the turbine control circuit card causing the control system to be susceptible to resonant oscillations at various steam demands. On January 30, 2018, with steam demand at 91 percent, the turbine control system experienced this resonance oscillation, which resulted in the observed turbine control valve movement.

The inappropriately calibrated turbine control circuit card had last been replaced and calibrated in July 2016. When implementing Procedure EN-WM-105, "Planning," Revision 16, during work order planning for the replacement and calibration of turbine control system cards, the licensee used a method of calibration obtained from General Electric and failed to incorporate the method previously described by the original equipment manufacturer, Siemens. Calibrating the turbine control system circuit cards only by the method recommended by General Electric ultimately left the control circuit improperly calibrated and susceptible to resonant oscillations.

Corrective Actions: The licensee properly calibrated the turbine control circuitry by incorporating the method used by Siemens. The licensee has issued an operational decision making instruction to instruct operators that if turbine control valve oscillations occur to either lower reactor power for troubleshooting or insert a manual reactor scram, based on the magnitude of the oscillations,. This guidance is in addition to the "Reactor Pressure Control Malfunctions" Off Normal Event Procedure.

The licensee's extent of condition review considered other turbine control system circuit cards and main bypass control valve control cards. Furthermore, the long term corrective action of replacing the electrohydraulic system and turbine control system with digital controls is planned to take place in Refueling Outage 22, during the Spring 2020 refueling outage.

Corrective Action Reference(s): The licensee entered the undemanded turbine control valve movements and reactor scram into the corrective action program as CR-GGN-2018-918.

Performance Assessment:

Performance Deficiency: The failure to have appropriate procedural guidance for performing maintenance was a performance deficiency. Specifically, on July 20, 2016, Grand Gulf Nuclear Station Work Order 4449267, Task 14, was written to test resonance compensator cards. This work order did not use the test methodology consistent with original equipment manufacturer testing report. Therefore, the turbine control circuit had an inappropriately set potentiometer, which caused undemanded turbine control valve movements and a condition that required a manual reactor scram.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the procedure quality attribute of the Initiating Events Cornerstone and adversely affected the objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, failing to have adequate procedural guidance led to a condition that required a manual reactor scram.

Significance: The inspectors assessed the significance of the finding using Inspection Manual Chapter 0609, Attachment 04, "Initial Characterization of Findings," dated October 7, 2016, and Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process for Findings At-Power," Exhibit 1 "Initiating Events Screening Questions", Section B "Transient Initiators" and determined that the finding was of very low safety significance (Green) because it was a condition that required a manual reactor scram but did not cause the loss of mitigation equipment.

Cross-cutting Aspect: The finding had a cross-cutting aspect in the area of human performance associated with resources. Specifically, licensee leaders did not ensure that all information, e.g. the original manufacturer test procedure, was available to support successful work performance [H.1].

Enforcement: Technical Specification 5.4.1.a, "Procedures", requires, in part, written procedures shall be established, implemented, and maintained for activities that are recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Appendix A, Section 9.a of Regulatory Guide 1.33 requires procedures for maintenance that can affect the performance of safety-related equipment.

Contrary to the above, on July 20, 2016, when performing Work Order 4449267, Task 14, the licensee failed to establish adequate written procedures for maintenance that can affect the performance of safety-related equipment. Specifically, when creating the work instructions the licensee did not include applicable data from the original equipment manufacturer for turbine control system circuit cards. This led to a condition which required a manual reactor scram.

Disposition: This violation is being treated as a non-cited violation (NCV), consistent with Section 2.3.2 of the Enforcement Policy.

Licensee-Identified Non-Cited Violation	71111.13 – Maintenance Risk Assessment
This violation of very low safety significance was identified by the licensee and has been entered into the licensee corrective action program and is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.	
Violation: 10 CFR 50.72(b)(3)(v)(D) requires the licensee to report an event or condition that could have prevented fulfillment of a safety function (accident mitigation). Contrary to the above, from February 18, 2018, until February 23, 2018, Grand Gulf Nuclear Station failed to make a timely event report for an event or condition that could have prevented fulfillment of a safety function (accident mitigation). Specifically, Grand Gulf Nuclear Station experienced the concurrent inoperability of the division 2 diesel generator and the high pressure core spray diesel generator. Per Technical Specification Bases 3.8.1.E.1, there are insufficient standby ac sources available in this condition to power the minimum required engineered safety feature functions. Significance/Severity Level: In accordance with NRC Enforcement Policy, Section 6.9.d.9, the failure to make a report required by 10 CFR 50.72 is a Severity Level IV violation. Corrective Action Reference(s): The licensee entered the failure to make a timely report into the corrective action program as CR-GGN-2018-1595.	

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On May 11, 2018, the inspector presented quarterly resident inspection results to Mr. E. Larson, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

71111.19 - Post-Maintenance Testing

Miscellaneous Documents

Title
Vendor Manual 460000254
Vendor Manual 460000451

Procedures

Number	Title	Revision
01-S-06-12	Surveillance Program Procedure	112
06-OP-1P41-Q-0004	Standby Service Water Loop A Valve and Pump Operability Test	125, 126, 127
EN-MA-121	Fluid Leak Prevention and Management Program	7
OM-ME-1M23-R-0001	Personnel Airlock Door Seal Air System Leak Test	115

Condition Reports (CRs)

CR-GGN-2014-4996	CR-GGN-2017-2643	CR-GGN-2017-2697	CR-GGN-2018-1245
CR-GGN-2018-1265	CR-GGN-2018-1347	CR-GGN-2018-1403	CR-GGN-2018-1527
CR-GGN-2018-1621			

Work Orders

387153	52533088	52624639

71153 - Follow-up of Events and Notices of Enforcement Discretion

Miscellaneous Documents

Number	Title	Revision/Date
	Initial Pressure Controller Drawing	
	Post Trip Analysis for SCRAM Number 150	
302800-V714-30-00506	Initial Pressure/Bypass Control Pressure Controller	May 2,1986
GE SIL	Pressure Regulator Tuning	1
ODMI	Turbine Control Valve Oscillations due to Pressure Regulator Response	February 1,2018

Procedures

Number	Title	Revision/Date
EN-FAP-WM-011	Work Planning Standard	4
EN-WM-105	Planning	16

Condition Reports (CRs)

CR-GGN-2018-918

Work Orders

449267 494327

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05000416/2018001 DATED MAY 14, 2018

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