UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 E. LAMAR BLVD
ARLINGTON, TX 76011-4511

March 15, 2017

Mr. Vincent Fallacara
Acting 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 05000416/2017009

Dear Mr. Fallacara:

On February 17, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Grand Gulf Nuclear Station and 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.

The NRC inspectors did not identify any findings or violations of more than minor significance.

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/

Greg Warnick, Branch Chief
Project Branch C
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000416/2017009
w/ Attachment: Supplemental Information

cc w/enclosure: Electronic Distribution

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000416
License:	NPF-29
Report:	05000416/2017009
Licensee:	Entergy Operations, Inc.
Facility:	Grand Gulf Nuclear Station, Unit 1
Location:	7003 Baldhill Road Port Gibson, MS 39150
Dates:	January 17 through February 17, 2017
Inspectors:	M. Haire, Branch Chief, Plant Support Branch 1 F. Ramirez, Senior Resident Inspector J. Sowa, Senior Resident Inspector M. Young, Senior Resident Inspector J. McHugh, Senior Reactor Technology Instructor N. Day, Resident Inspector B. Parks, Resident Inspector M. Kirk, Project Engineer
Approved By:	Greg Warnick Chief, Project Branch C Division of Reactor Projects

Enclosure

SUMMARY

IR 05000416/2017009; 01/17/2017 – 02/17/2017; Grand Gulf Nuclear Station; Integrated Inspection Report.

The inspection activities described in this report were performed between January 17 and February 17, 2017, by the resident inspectors at Grand Gulf Nuclear Station, River Bend Nuclear Station, Waterford 3 Steam Electric Station, and inspectors from the NRC's Region IV office and other NRC offices. The NRC inspectors did not identify any findings or violations of more than minor significance. The significance of inspection findings is indicated by their color (i.e., Green, greater than Green, White, Yellow, or Red), determined using Inspection Manual Chapter 0609, "Significance Determination Process," dated April 29, 2015. Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014. Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," dated July 2016.

No findings were identified.

PLANT STATUS

Grand Gulf Nuclear Station started this inspection period in an extended outage and in Mode 4. On January 31, 2017, operations personnel transitioned the plant to Mode 1. On February 9, 2017, operations personnel completed power ascension to 100 percent power. On February 10, 2017, operations personnel reduced power to 76 percent due to a condensate booster pump B outboard mechanical seal failure. On February 13, 2017, operations personnel completed power ascension to 100 percent power.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

The inspectors performed partial system walk-downs of the following risk-significant systems:

- January 18, 2017, high pressure core spray system
- January 19, 2017, reactor core isolation cooling system
- January 19, 2017, Division 1 standby service water
- January 27, 2017, secondary containment boundaries upon entry into Mode 2

The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the systems. They visually verified that critical portions of the systems or trains were correctly aligned for the existing plant configuration.

These activities constituted four partial system walk-down samples, as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)

.1 Review of Licensed Operator Requalification

a. Inspection Scope

The inspectors observed simulator training for operating crews. The inspectors assessed the performance of the operators and the evaluators' critique of their performance.

- January 19, 2017, the inspectors observed "Just-In-Time" simulator training for an operating crew which consisted of implementation of the startup integrated operating instruction.

- January 21, 2017, the inspectors also observed a directed learning activity for a shift manager which focused on a weakness identified during high intensity training.

These activities constituted completion of two quarterly licensed operator requalification program samples, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

The inspectors observed the performance of on-shift licensed operators in the plant's main control room. The inspectors observed the operators' performance of plant startup activities following a forced outage:

- January 27 - 29, 2017, the inspectors observed operations personnel complete pre-startup check sheets for Balance of Plant and Mode 2 and 3 restraints, withdraw control rods until the reactor was critical, and then transition the plant to Mode 2;

- January 31, 2017, during plant startup activities following a forced outage, the inspectors observed operations personnel transition the plant to Mode 1 by withdrawing control rods and synchronizing the generator to the grid.

In addition, the inspectors assessed the operators' adherence to plant procedures, including EN-OP-115, "Conduct of Operations," Revision 18, and other operations department policies.

These activities constituted completion of two quarterly licensed operator performance samples, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

On January 28, 2017, the inspectors reviewed risk assessments performed by the licensee because of an unplanned Orange risk entry associated with the failure of the high pressure core spray jockey pump. The inspectors verified that these risk assessments were performed timely and in accordance with the requirements of 10 CFR 50.65 (the Maintenance Rule) and plant procedures. The inspectors reviewed the accuracy and completeness of the licensee's risk assessments and verified that the licensee implemented appropriate risk management actions based on the results of the assessments.

The inspectors also observed portions of three emergent work activities that had the potential to affect the functional capability of mitigating systems and/or to impact barrier integrity:

- January 27, 2017, the reactor core isolation cooling motor operated valve inoperable/power loss annunciator illuminated; the licensee stopped withdrawing control rods and performed immediate troubleshooting of thirteen isolation valves prior to verifying the capability of the reactor core isolation cooling system to perform its function.

- January 28 – 29, 2017, the intermediate range monitor C failed; the licensee stopped withdrawing control rods and performed immediate troubleshooting that revealed a damaged cable.

- January 31 – February 3, 2017, the local power range monitor inputs to the 3D Monicore program failed to transmit data such that safety limits could be readily verified; the licensee stopped withdrawing control rods, maintained power below 21.8 percent, performed troubleshooting, and ultimately replaced the computer system.

The inspectors verified that the licensee appropriately developed and followed a work plan for these activities. The inspectors verified that the licensee took precautions to minimize the impact of the work activities on unaffected structures, systems, and components (SSCs).

These activities constituted completion of four maintenance risk assessments and emergent work control inspection samples, as defined in Inspection Procedure 71111.13.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed three post-maintenance testing activities that affected risk-significant structures, systems, or components (SSCs):

- January 18, 2017, high pressure core spray following maintenance on a flow restricting orifice;

- January 28, 2017, high pressure core spray following bearing replacement on the jockey pump;

- January 29, 2017, reactor core isolation cooling flow controller following replacement due to controller drift when in manual.

The inspectors reviewed licensing- and design-basis documents for the SSCs and the maintenance and post-maintenance test procedures. The inspectors observed the performance of the post-maintenance tests to verify that the licensee performed the tests

in accordance with approved procedures, satisfied the established acceptance criteria, and restored the operability of the affected SSCs.

These activities constituted completion of three post-maintenance testing inspection samples, as defined in Inspection Procedure 71111.19.

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

During the station's extended outage that concluded on January 31, 2017, the inspectors evaluated the licensee's outage activities. The inspectors verified that the licensee considered risk in developing and implementing the outage plan, appropriately managed personnel fatigue, and developed mitigation strategies for losses of key safety functions. This verification included the following:

- Review and verification of the licensee's fatigue management activities;
- Verification that the licensee maintained defense-in-depth during outage activities;
- Observation and review of operations with a potential for draining the reactor vessel;
- Review of high intensity training for operations crews;
- Performance of a drywell closeout inspection;
- Monitoring of heat-up and startup activities.

These activities constituted completion of one outage activities sample, as defined in Inspection Procedure 71111.20.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed three risk-significant surveillance tests and reviewed test results to verify that these tests adequately demonstrated that the structures, systems, and components (SSCs) were capable of performing their safety functions:

In-service tests:

- January 18, 2017, high pressure core spray quarterly surveillance test

Other surveillance tests:

- February 2, 2017, turbine bypass stop and control valve test utilizing the automatic turbine tester
- February 1, 2017, turbine mechanical overspeed operability test

The inspectors verified that these tests met technical specification requirements, that the licensee performed the tests in accordance with their procedures, and that the results of the test satisfied appropriate acceptance criteria. The inspectors verified that the licensee restored the operability of the affected SSCs following testing.

These activities constituted completion of three surveillance testing inspection samples, as defined in Inspection Procedure 71111.22.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review

a. Inspection Scope

Throughout the inspection period, the inspectors performed daily reviews of items entered into the licensee's corrective action program. The inspectors verified that licensee personnel were identifying problems at an appropriate threshold and entering these problems into the corrective action program for resolution. The inspectors verified that the licensee developed and implemented corrective actions commensurate with the significance of the problems identified. The inspectors also reviewed the licensee's problem identification and resolution activities during the performance of the other inspection activities documented in this report.

b. Findings

No findings were identified.

.2 Annual Follow-up of Selected Issues

a. Inspection Scope

On February 8, 2017, the inspectors completed a review of Grand Gulf Nuclear Station's recovery plan, specifically focused on the restart plan corrective actions and operator high intensity training. Grand Gulf Nuclear Station performed a technical specification required shutdown on September 8, 2016, to address an issue with the residual heat removal pump A. During the shutdown, the licensee had two human performance errors in the operations department. On September 27, 2016, Grand Gulf Nuclear Station plant management notified the NRC of their intent to delay start-up of the plant, following the forced outage, to implement corrective actions to assess and resolve operational

performance concerns (See Preliminary Notification PNO-IV-16-003, Agencywide Documents Access and Management System (ADAMS) Accession No. ML16273A330).

b. Observations and Assessments

1. Restart Corrective Actions

- The inspectors reviewed the licensee's restart plan, dated January 4, 2017, and focused on the corrective actions that the licensee had designated as, "Actions required for restart." Of the nine corrective actions with this designation, the inspectors concluded that four were satisfactorily completed, four had received due date extensions that extended beyond the date of the restart without documented justification, and one was closed without documentation demonstrating that the intent of the corrective action was met.

  The four due date extended corrective actions were centered on performing external assessments/benchmarking to ensure that normal and off-normal procedures were up to industry standards. The actions were also to address benchmarking in the area of immediate operator actions. These corrective actions were identified because inadequate procedures and operator actions played a significant role in the events leading up to the decision to stay shutdown for over four months.

  Following the team's questions, the licensee provided written discussions to be documented in the corrective actions that justified the due date extensions. In addition, the licensee was able to demonstrate that the corrective action which was closed without documenting that the intent had been met was actually accomplished through another corrective action. They performed out-of-the-box evaluations (OBE's) with first line supervisors in the maintenance department which met the intent of the closed corrective action.

  The inspectors assessed the licensee's problem identification threshold, cause analyses, extent of condition reviews, and compensatory actions. The inspectors verified that the licensee appropriately prioritized the planned corrective actions and that these actions were adequate to correct identified weaknesses in operator fundamentals and station weaknesses.

2. Roles and Responsibilities

- The inspectors noted weaknesses in the outage control center's precision, rigor, and leadership. The inspectors did not observe the outage control center driving completion of work items, and instead noted a more reactive mode of operation.

- The team noted that the operations manager occasionally stepped outside of his broader oversight role and provided specific guidance on the performance of a procedure to answer the questions of the at-the-controls operator. The inspectors concluded this was, more appropriately, the responsibility of the control room supervisor.

3. Communications

- The inspectors observed that three way communication in the control room and the field has improved significantly.

- The inspectors noted that pre-job briefs tended to be lengthy, unfocused, and unengaging. For instance, reading a procedure from start to finish was not uncommon, and the level of engagement by the operators diminished significantly after a few minutes.

- The inspectors observed that communications between the outage control center, the control room, and the in-the-field crews were not consistent, and this resulted in multiple miscommunications. On numerous occasions, while trying to ascertain status or schedule of activities, neither the shift manager nor the outage control center could provide an accurate answer.

- The inspectors observed that control room log entries lacked detail which made it difficult for an independent reviewer to assess the events reflected in the entries.

4. Procedure Use and Adherence

- During the inspection, the team observed activities that involved the operations, maintenance, and radiation protection departments. The team observed that procedure use and adherence was generally improved and that discrepancies or ambiguities in procedural steps were addressed by stopping and involving supervisors to get the problems resolved.

5. Operator Fundamentals

- The inspectors observed that the high intensity training has had a substantial impact on the operating crews, and it appears that the new higher standards are being applied throughout the operations organization. The team observed many activities in the field, which involved licensed and non-licensed operators, and directly observed the new standards in use.

- The inspectors observed operators being engaged and deliberate when manipulating controls in the control room; the operators discussed the action, the expected outcome, and verified the desired outcome following manipulations.

6. Training for Other Departments

- The inspectors noted that the licensee invested significant resources in high intensity training and improving operator fundamentals, standards, expectations, and procedures for the operations department. However, the inspectors noted that the licensee invested fewer resources in improving the performance of the maintenance department, and the team noted that very little emphasis was placed on training, procedure quality, and setting standards and expectations in the engineering, security, chemistry, and radiation departments.

These activities constituted completion of one annual follow-up sample, as defined in Inspection Procedure 71152.

c. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On February 17, 2017, the inspectors presented the inspection results to Mr. V. Fallacara, Acting Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

A. Boyd, Electrical Maintenance
S. Dupont, Regulatory Assurance
R. Falk, Regulatory Assurance
V. Fallacara, Acting Site Vice President
M. Giacini, General Manager Plant Operations
J. Hallenback, Manager, Design Engineering
W. Johnson, Operations
R. Liddell, Superintendent, Operations Training
J. Mathis, Assistant Manager, Regulatory Assurance
R. Meister, Senior Specialist, Regulatory Assurance
R. Myer, Assistant Operations Manager
J. Nadeau, Manager, Regulatory Assurance
L. Simmons, Work Week Manager
S. Sweet, Engineer, Regulatory Assurance
L. Wilmot, Equipment Reliability Coordinator
S. Wood, Specialist, Regulatory Assurance

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures

Number	Title	Revision
04-1-01-E22-1	High Pressure Core Spray System	121
04-1-01-P41-1	Standby Service Water System	143
04-1-03-746-1	“A” ESF Switchgear Room Coolers Flow Test	001

Condition Reports (CR-GGN-)

2017-00601 2017-00608

Section 1R11: Licensed Operator Requalification Program and Licensed Operator Performance

Miscellaneous Documents

Title

Crew B Notebook for Restart Readiness

Crew E Notebook for Restart Readiness

Procedures

Number	Title	Revision/Date
02-S-01-27	Operations Philosophy	069
03-1-01-1 SU	Cold Shutdown to Generator Carrying Minimum Load	170
EN-HU-102	Human Performance Traps & Tools	014
EN-OP-115	Conduct of Operations	018
EN-TQ-114	LOR Requalification Training Program Description	010
EN-TQ-217	Examination Security	005
GSMS-LOR-00202	Startup Training Lesson Plan	
MS-26	GGNS Operational Focus	003
MS-34	GGNS Operator Aggregate Impact Index Standards	October 11, 2016
TE-26	Training Standards and Expectations	000

Condition Reports (CR-GGN-)

2017-00480

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

Number	Title	Revision/Date
06-OP-1C51-V-0002-6	IRM Functional Test	109
06-OP-1C51-V-0002-6	IRM Functional Test	110
06-OP-1C51-V-0002-6	IRM Functional Test	January 30, 2017
EN-MA-125	Troubleshooting Control of Maintenance	020
EN-MA-125	HPCS Jockey Pump Troubleshooting Plan	January 27, 2017

Procedures

Number	Title	Revision/Date
EN-MA-125	IRM "C" Troubleshooting Plan	January 29, 2017

Condition Reports (CR-GGN-)

2017-00917

Work Orders (WOs)

466256 466272 52718248

Section 1R19: Post-Maintenance Testing

Procedures

Number	Title	Revision/Date
06-OP-1E51-Q-0003	RCIC System Quarterly Pump Operability Verification	137
06-OP-1E51-Q-0003	RCIC System Quarterly Pump Operability Verification	January 29, 2017
07-S-53-E51-2	Loop Calibration Instruction – RCIC Turbine Governing Valve Control	013

Work Orders (WOs)

446492 464324

Section 1R20: Refueling and Other Outage Activities

Procedures

Number	Title	Revision/Date
02-S-01-32	Control Building Rounds	032
02-S-01-34	Auxiliary Building Rounds	042
03-1-01-2	Power Operations	168
04-1-01-C11-2 SU	Rod Control and Information System	041
MS-35	Startup Affirmation Board	000
SOPP	Shutdown Operations Protection Plan	September 7, 2016

Condition Reports (CR-GGN-)

2017-01521 2017-01589

Section 1R22: Surveillance Testing

Procedures

Number	Title	Revision
06-OP-1E22-Q-0005	HPCS Operability Functional Test	124
06-OP-1N32-M-0002	ATT Turbine Bypass Stop and Control Valve Test	101
06-OP-1N32-V-0002	Turbine Mechanical Overspeed Operability	113

Condition Reports (CR-GGN-)

2017-01116

Work Orders (WOs)

52690298

Section 4OA2: Problem Identification and Resolution

Miscellaneous Documents

Number	Title	Date
LO-GLO-2016-00137	Grand Gulf Recovery Plan – Action Tracking	September 14, 2016

Procedures

Number	Title	Revision/Date
	Grand Gulf Site Recovery Plan	January 4, 2017
EN-LI-102	Corrective Action Program	028

Condition Reports (CR-GGN-)

2017-00546 2017-00585 2017-00589 2016-03001 2016-04834

2016-07281 2016-07975

GRAND GULF NUCLEAR STATION – NRC INTEGRATED INSPECTION
REPORT 05000416/2017009 – March 15, 2017

DISTRIBUTION:
Regional Administrator (Kriss.Kennedy@nrc.gov)
Deputy Regional Administrator (Scott.Morris@nrc.gov)
DRP Director (Troy.Pruett@nrc.gov)
DRP Deputy Director (Ryan.Lantz@nrc.gov)
DRS Director (Anton.Vegel@nrc.gov)
DRS Deputy Director (Jeff.Clark@nrc.gov)
Senior Resident Inspector (Matt.Young@nrc.gov)
Resident Inspector (Neil.Day@nrc.gov)
Site Administrative Assistant (Amy.Elam@nrc.gov)
Branch Chief, DRP/C (Greg.Warnick@nrc.gov)
Senior Project Engineer, DRP/C (Cale.Young@nrc.gov)
Project Engineer, DRP/C (Michael.Stafford@nrc.gov)
Public Affairs Officer (Victor.Dricks@nrc.gov)
Project Manager (Siva.Lingam@nrc.gov)
Team Leader, DRS/IPAT (Thomas.Hipschman@nrc.gov)
Project Engineer, DRS/IPAT (Eduardo.Uribe@nrc.gov)
RITS Coordinator (Marisa.Herrera@nrc.gov)
ACES (R4Enforcement.Resource@nrc.gov)
Regional Counsel (Karla.Fuller@nrc.gov)
Senior Congressional Affairs Officer (Jenny.Weil@nrc.gov)
RIV Congressional Affairs Officer (Angel.Moreno@nrc.gov)
RIV/ETA: OEDO (Jeremy.Bowen@nrc.gov)
RIV RSLO (Bill.Maier@nrc.gov)
ROPreports.Resource@nrc.gov
ROPassessment.Resource@nrc.gov

ADAMS ACCESSION NUMBER: ML17074A265

☒ SUNSI Review By: GWarnick	ADAMS: ☒ Yes ☐ No	☐ Non-Publicly Available ☒ Publicly Available	☒ Non-Sensitive ☐ Sensitive	Keyword: SUNSI

OFFICE	SRI:DRP/C	SRI:DRP/D	SRI:DRP/C	SRTI:TTC	RI:DRP/C	RI:DRP/C
NAME	MYoung	FRamirez	JSowa	JMcHugh	NDay	BParks
SIGNATURE	/RA/	/RA/ via email	/RA/	/RA/ via email	/RA/	/RA/
DATE	3/6/2017	3/8/2017	3/6/2017	3/3/2017	3/8/2017	3/7/2017
OFFICE	PE:DRP/A	BC:PSB1	BC:DRP/C			
NAME	MKirk	MHaire	GWarnick			
SIGNATURE	/RA/	/RA/	/RA/			
DATE	3/7/2017	3/8/2017	03/15/2017			

OFFICIAL RECORD COPY