



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

February 8, 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 05000416/2016004**

Dear Mr. Fallacara:

On December 31, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Grand Gulf Nuclear Station. On January 13, 2017, the NRC inspectors discussed the results of this inspection with you and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. Both 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.

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.

V. Fallacara

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Sincerely,

**/RA/**

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

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

Enclosure:  
Inspection Report 05000416/2016004  
w/ Attachments:  
1. Supplemental Information  
2. Occupational Radiation Safety Inspection  
Document Request

GRAND GULF NUCLEAR STATION - NRC INTEGRATED INSPECTION  
REPORT 05000416/2016004 DATED FEBRUARY 8, 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)  
Acting Senior Resident Inspector (Wayne.Sifre@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 (James.Kim@nrc.gov)  
Team Leader, DRS/IPAT (Thomas.Hipschman@nrc.gov)  
Project Engineer, IPAT (Eduardo.Uribe@nrc.gov)  
RITS Coordinator (Marisa.Herrera@nrc.gov)  
ACES (R4Enforcement.Resource@nrc.gov)  
Regional Counsel (Karla.Fuller@nrc.gov)  
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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

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket: 05000416

License: NPF-29

Report: 05000416/2016004

Licensee: Entergy Operations, Inc.

Facility: Grand Gulf Nuclear Station, Unit 1

Location: 7003 Baldhill Road  
Port Gibson, MS 39150

Dates: October 1 through December 31, 2016

Inspectors: M. Young, Senior Resident Inspector  
W. Sifre, Acting Senior Resident Inspector  
N. Day, Resident Inspector  
J. Drake, Senior Reactor Inspector  
C. Young, Senior Project Engineer  
L. Carson, Senior Health Physicist  
N. Greene, Health Physicist  
P. Elkmann, Senior Emergency Preparedness Inspector  
M. Hayes, Operations Engineer

Approved By: Greg Warnick  
Chief, Project Branch C  
Division of Reactor Projects

Enclosure

## SUMMARY

IR 05000416/2016004; 10/1/2016 – 12/31/2016; Grand Gulf Nuclear Station; Operability Determinations and Functionality Assessments, Occupational ALARA Planning and Controls.

The inspection activities described in this report were performed between October 1 and December 31, 2016, by the resident inspectors at Grand Gulf Nuclear Station and inspectors from the NRC's Region IV office. Two findings of very low safety significance (Green) are documented in this report. Both of these findings involved violations of NRC requirements. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is 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.

### Cornerstone: Mitigating Systems

- Green. The inspector identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," involving the failure to implement appropriate design control measures associated with a safety-related service water flow calculation. Specifically, several unverified and potentially nonconservative inputs were identified associated with Calculation MC-QIP41-97020, Revision 11, "Determination of Minimum Allowable SSW Flows (LOCA Lineup) to Safety Related Heat Exchangers," used to analyze minimum service water flow to the vital switchgear room coolers. The licensee entered this issue into their corrective action program as Condition Report CR-GGN-2016-07597, initiated action to update Calculation MC-QIP41-97020, and initiated actions to analyze the ability of vital switchgear room cooling to meet its specified safety function.

This performance deficiency was more than minor, and therefore a finding, because it was associated with the design control attribute of the Mitigating Systems Cornerstone, and it adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee did not assure that the vital switchgear ventilation system was capable of maintaining the rooms' temperature below design requirements under all conditions. The NRC performed an initial screening of the finding in accordance with NRC Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Using Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," dated July 1, 2012, this finding had very low safety significance (Green) because it: (1) was not a deficiency affecting the design or qualification of a mitigating system; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of a single train for greater than its technical specification allowed outage time; and (4) did not 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. This finding had a cross-cutting aspect in the documentation aspect of the human performance cross-cutting area because the licensee failed to maintain complete, accurate, and up-to-date documentation of the design temperature limits for safety-related equipment. Specifically, the licensee failed to document and evaluate a change to

temperature limits related to switchgear cooling to ensure that its use as a design parameter was consistent with original design specifications of the equipment [H.7]. (Section 1R15)

### **Cornerstone: Occupational Radiation Safety**

- Green. The inspectors identified a non-cited violation of 10 CFR 20.1101(b) for the licensee's failure to implement radiation exposure reduction procedures and engineering controls to minimize unplanned and unintended radiation dose to workers and to maintain occupational doses as low as is reasonably achievable (ALARA). Several radiological work permits exceeded initial dose estimates with minimal or no actions taken to evaluate the basis for the dose overrides and to develop mitigating strategies. The primary contributor to the unplanned exposures was elevated dose rates from increased cobalt-60 activity associated with a failure to properly plan and execute spent fuel pool and reactor cavity cleanup operations. In addition, the licensee failed to observe radiological work permit hold points, to initiate ALARA Management Committee meetings, and to perform radiological assessments of radiological work permit dose estimates as procedurally required. As immediate corrective actions, the licensee reviewed the work activity, documented lessons learned, and generated Condition Reports CR-GGN-2016-03151 and CR-GGN-2016-08543 to address these programmatic weaknesses for future outages.

The failure to implement procedures and engineering controls to minimize unplanned and unintended radiation dose and to maintain occupational doses as low as is reasonably achievable was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the Occupational Radiation Safety Cornerstone attribute of program and process (ALARA planning) and adversely affected the cornerstone objective to ensure the adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, inadequate ALARA planning and radiological controls resulted in unplanned, unintended dose for a number of work activities in which the actual collective dose exceeded 5 person-rem and exceeded the planned, intended dose by more than 50 percent. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspectors determined this finding to be of very low safety significance (Green) because the finding involved ALARA planning and controls, and because the licensee's latest 3-year rolling average did not exceed 240 person-rem per unit for boiling water reactors. The finding had a cross-cutting aspect in the area of problem identification and resolution, associated with operating experience, in that, the licensee's organization failed to systematically and effectively collect, evaluate, and implement relevant internal and external operating experience in a timely manner. Specifically, the licensee failed to implement and incorporate relevant internal operating experience from Refueling Outage 18, which was of similar radiological circumstances, to mitigate the effects of cobalt-60 activity in the reactor cavity and unplanned spent fuel pool cleanup outages [P.5]. (Section 2RS2)

## PLANT STATUS

Grand Gulf Nuclear Station remained in an extended outage and in Mode 4 for the duration of this inspection period to address concerns with operator fundamentals.

## REPORT DETAILS

### 1. REACTOR SAFETY

#### Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R01 Adverse Weather Protection (71111.01)

##### Readiness for Seasonal Extreme Weather Conditions

##### a. Inspection Scope

On December 16, 2016, the inspectors completed an inspection of the station's readiness for seasonal adverse weather conditions. The inspectors reviewed the licensee's adverse weather procedures for extreme cold weather and evaluated the licensee's implementation of these procedures. The inspectors verified that prior to the onset of cold weather, the licensee had corrected weather-related equipment deficiencies identified during the previous weather season.

The inspectors selected three risk-significant systems that were required to be protected from a cold weather condition:

- Standby service water pump house and valve house, trains A and B
- Firewater system pumphouse
- Emergency diesel generator rooms, Divisions 1, 2, and 3, as well as, the emergency diesel generator corridor which contains service water piping

The inspectors reviewed the licensee's procedures and design information to ensure the systems and components would remain functional when challenged by cold weather. The inspectors verified that operator actions described in the licensee's procedures were adequate to maintain readiness of these systems. The inspectors walked down portions of these systems to verify the physical condition of cold weather protection features.

These activities constituted one sample of readiness for seasonal adverse weather, as defined in Inspection Procedure 71111.01.

##### b. Findings

No findings were identified.

## **1R04 Equipment Alignment (71111.04)**

### **.1 Partial Walk-Down**

#### **a. Inspection Scope**

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

- December 15, 2016, standby service water, train B
- December 16, 2016, firewater system
- December 20, 2016, emergency diesel generator, Division 2, lube oil, jacket water, starting air and fuel oil systems

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 three partial system walk-down samples, as defined in Inspection Procedure 71111.04.

#### **b. Findings**

No findings were identified.

### **.2 Complete Walk-Down**

#### **a. Inspection Scope**

From October 6-7, 2016, the inspectors performed a complete system walk-down inspection of the alternate decay heat removal system. The inspectors reviewed the licensee's procedures and system design information to determine the correct system lineup for the existing plant configuration. The inspectors also reviewed outstanding work orders, open condition reports, and other open items tracked by the licensee's operations and engineering departments. The inspectors then visually verified that the system was correctly aligned for the existing plant configuration.

These activities constituted one complete system walk-down sample, as defined in Inspection Procedure 71111.04.

#### **b. Findings**

No findings were identified.



## **1R05 Fire Protection (71111.05)**

### **.1 Quarterly Inspection**

#### **a. Inspection Scope**

The inspectors evaluated the licensee's fire protection program for operational status and material condition. The inspectors focused their inspection on four plant areas important to safety:

- October 24, 2016, emergency diesel generator room, Division 3, Fire Zone 1D304
- December 9, 2016, control room, control panel, suspended ceiling and support areas, Fire Zones OC501, OC502, OC503, OC504, OC516, and OC517
- December 14, 2016, residual heat removal room, train C, and alternate decay heat removal room, Fire Zone 1A118
- December 15, 2016, standby service water pump house and valve house, trains A and B, Fire Zones 2M110, 2M112 and Basin No. 2

For each area, the inspectors evaluated the fire plan against defined hazards and defense-in-depth features in the licensee's fire protection program. The inspectors evaluated control of transient combustibles and ignition sources, fire detection and suppression systems, manual firefighting equipment and capability, passive fire protection features, and compensatory measures for degraded conditions.

These activities constituted four quarterly inspection samples, as defined in Inspection Procedure 71111.05.

#### **b. Findings**

No findings were identified.

### **.2 Annual Inspection**

#### **a. Inspection Scope**

On October 6, 2016, the inspectors completed their annual evaluation of the licensee's fire brigade performance. This evaluation included observation of an unannounced fire drill for Area 4, 133 foot turbine switchgear room 1T323. During this drill, the inspectors evaluated the capability of the fire brigade members, the leadership ability of the brigade leader, the brigade's use of turnout gear and fire-fighting equipment, and the effectiveness of the fire brigade's team operation. The inspectors also reviewed whether the licensee's fire brigade met NRC requirements for training, dedicated size and membership, and equipment.

These activities constituted one annual inspection sample, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

**1R06 Flood Protection Measures (71111.06)**

a. Inspection Scope

On December 28, 2016, the inspectors completed an inspection of the station's ability to mitigate flooding due to internal causes. After reviewing the licensee's flooding analysis, the inspectors chose the residual heat removal, train B, pump room which contains risk-significant structures, systems, and components that are susceptible to flooding.

The inspectors reviewed plant design features and licensee procedures for coping with internal flooding. The inspectors walked down the selected areas to inspect the design features, including the material condition of seals, drains, and flood barriers. The inspectors evaluated whether operator actions credited for flood mitigation could be successfully accomplished.

In addition, on December 12, 2016, the inspectors completed an inspection of underground vaults susceptible to flooding. The inspectors selected three underground vaults/manholes that contained risk-significant or multiple-train cables whose failure could disable risk-significant equipment:

- Manhole MH 01, SP45MH01
- Manhole MH 02, SP45MH02
- Manhole MH 03, SP45MH03

The inspectors observed the material condition of the cables and splices contained in the vaults/manholes and looked for evidence of cable degradation due to water intrusion. The inspectors verified that the cables and vaults met design requirements.

These activities constituted completion of one flood protection measures sample and one vault/manhole sample, as defined in Inspection Procedure 71111.06.

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

On December 1 and December 14, 2016, the inspectors observed high intensity simulator training for operating crews. The inspectors assessed the performance of the operators and the evaluators' critique of their performance. The inspectors also assessed the modeling and performance of the simulator during the activities.

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

b. Findings

No findings were identified.

.2 Review of Licensed Operator Performance

a. Inspection Scope

On December 14, 2016, the inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, the plant was in a period of heightened activity and risk due to preparation for a full pressure in-service leakage test and surveillance tests.

In addition, the inspectors assessed the operators' adherence to plant procedures, including conduct of operations procedure and other operations department policies.

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

b. Findings

No findings were identified.

.3 Annual Review of Requalification Examination Results

a. Inspection Scope

The inspector conducted an in-office review of the annual requalification training program to determine the results of this program.

On November 21, 2016, the licensee informed the inspector of the following Grand Gulf Nuclear Station operating test results:

- 6 of 6 crews passed the simulator portion of the operating test
- 39 of 39 licensed operators passed the simulator portion of the operating test
- 39 of 39 licensed operators passed the job performance measure portion of the operating test

There were no remediations performed for the Grand Gulf Nuclear Station operating tests.

These activities constituted completion of one annual licensed operator requalification program sample, as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

## **1R12 Maintenance Effectiveness (71111.12)**

### **.1 Routine Maintenance Effectiveness**

#### **a. Inspection Scope**

The inspectors reviewed six instances of degraded performance or condition of safety-related structures, systems, and components (SSCs):

- October 12, 2016, plant air compressors, due to excess unavailability
- October 12, 2016, standby liquid control system, train B, due to high vibrations and leak on the pump
- October 26, 2016, standby service water system, train C, due to degraded piping supports in the service water basin
- November 29, 2016, standby gas treatment system, due to excess unavailability
- December 1, 2016, reactor water clean-up system, due to seal leakage
- December 29, 2016, control rod drive system, train A, due to excess unavailability

The inspectors reviewed the extent of condition of possible common cause SSC failures and evaluated the adequacy of the licensee's corrective actions. The inspectors reviewed the licensee's work practices to evaluate whether these may have played a role in the degradation of the SSCs. The inspectors assessed the licensee's characterization of the degradation in accordance with 10 CFR 50.65 (the Maintenance Rule), and verified that the licensee was appropriately tracking degraded performance and conditions in accordance with the Maintenance Rule.

These activities constituted completion of six maintenance effectiveness samples, as defined in Inspection Procedure 71111.12.

#### **b. Findings**

No findings were identified.

### **.2 Quality Control**

#### **a. Inspection Scope**

On October 20, 2016, the inspectors reviewed the licensee's quality control activities through an inspection of replacement O-rings installed in the residual heat removal pump, train A, which were purchased as commercial-grade parts but were dedicated prior to installation to a quality-grade.

These activities constituted completion of one quality control sample, as defined in Inspection Procedure 71111.12.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed three risk assessments performed by the licensee prior to changes in plant configuration and the risk management actions taken by the licensee in response to elevated risk:

- October 19, 2016, electrical power shutdown risk due to Division 3 emergency diesel generator maintenance that caused Division 3 AC and DC power to be unavailable
- November 1, 2016, risk assessment for lifting the standby service water C pump with a crane and the potential impact on the standby service water A pump
- November 3, 2016, risk assessment for lifting the Division 3 emergency diesel generator fuel oil storage tank concrete plug with a crane and the potential impact on the Division 1 and 2 emergency diesel generator fuel oil storage tanks

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 result of the assessments.

These activities constituted completion of three maintenance risk assessment inspection samples, as defined in Inspection Procedure 71111.13.

b. Findings

No findings were identified.

**1R15 Operability Determinations and Functionality Assessments (71111.15)**

a. Inspection Scope

The inspectors reviewed two operability determinations that the licensee performed for degraded or nonconforming structures, systems, or components (SSCs):

- December 19, 2016, operability determination for secondary containment and standby gas treatment system during an operation with potential to drain the vessel (OPDRV) when the containment equipment hatch was in the open position
- December 9, 2016, operability determination of the vital switchgear room coolers

The inspectors reviewed the timeliness and technical adequacy of the licensee's evaluations. Where the licensee determined the degraded SSC to be operable, the

inspectors verified that the licensee's compensatory measures were appropriate to provide reasonable assurance of operability. The inspectors verified that the licensee had considered the effect of other degraded conditions on the operability of the degraded SSC.

These activities constituted completion of two operability review samples, as defined in Inspection Procedure 71111.15.

b. Findings

Introduction. The inspectors identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," involving the failure to translate applicable design requirements into the specifications for plant systems. Specifically, the inspector identified that the licensee failed to use appropriate design control measures when analyzing the ability of vital switchgear room cooling to ensure operability requirements were satisfied for the associated equipment under all design conditions.

Description. Calculation MC-QIP41-97020, Revision 11, "Determination of Minimum Allowable SSW Flows (LOCA Lineup) to Safety-Related Heat Exchangers," states, that, "Revision 11 incorporates the minimum flow rate calculated using the FORTRAN model approved in EC 61493 in response to a degraded flow condition of the 1T46B001B Electrical Switchgear Room Cooler. The cooling water flow rate of 3.4 GPM was calculated while maintaining the room temperature at or below 135 (degrees) F (Fahrenheit)." While reviewing the calculation and associated design documents for the vital electrical switch gear room coolers, the inspector noted the following inconsistencies:

- Calculation M3.3.013-0, Revision 300, "Safety-Related Electrical Equipment Cooling In Auxiliary Building," states that the maximum allowable indoor temperature for the electrical switchgear rooms is 104 degrees Fahrenheit.
- Design Specification 22A6926, Revision 0, "Boiling Water Reactor Equipment Environmental Interface," Section 1.1 states, that, "This document specifies the environmental plant design limits in the design of the nuclear steam supply system (NSSS) equipment supplied or specified by the General Electric Company." Section 3.1 states, "This document specifies the allowable environmental extremes for those portions of the environmental zones containing General Electric supplied and specified equipment." Section 3.4 states, "Table 2 defines the allowable environmental extremes and corresponding duration for each environmental zone and plant design condition." Table 2, "Environmental Conditions and Limits for Equipment," lists a temperature limit during accident conditions of 104 degrees Fahrenheit and 90 degrees Fahrenheit for normal conditions for Zone AB-1, auxiliary building - electric switchgear and remote shutdown panel rooms.
- Design Specification 22A3093, Revision 2, "Boiling Water Reactor Equipment Environmental Interface Data," Section 1.1 states, in part, "This document specifies the indoor environmental data, in Compliance with 10 CFR Part 50, Appendices A and B, that is used for design of equipment supplied and specified by General Electric Company." To ensure the integrity of this equipment, the purchasing utility is required to provide and to control the operational and

accident environmental conditions so that the limits established in this document, for areas in which General Electric supplied and specified equipment is installed, are not exceeded. Section 5 lists the thermal limits for the Auxiliary Building Electrical Areas as 104 degrees Fahrenheit.

- Updated Final Safety Analysis Report, Section 9.4.5.2.5, "ESF (Engineered Safety Feature) Electrical Switchgear Rooms," states, in part, "The fan coil units located in switchgear rooms 1A308 and 1A309, El. 139' 0", will maintain the temperature of the rooms at less than 90 F during all modes of normal plant operation and at less than 105 F during all modes of emergency plant operation."
- Technical Requirements Manual Table 6.7.3-1, the temperature limit for the ESF switchgear rooms is 104 degrees Fahrenheit. Limiting Condition for Operation (LCO) 6.7.3 C states, "One or more areas exceeding the temperature limits shown in Table 6.7.3-1 > 30F. Note: The 30F allowance is for equipment in the room. This does not include the diesel generators. Required action is to immediately provide a record of the amount and the cumulative time the temperature in the affected area exceeded its limit and an analysis to demonstrate the operability of the affected equipment. Declare the equipment within the affected area inoperable within 4 hours."

When the inspector questioned the source of the 30 degrees Fahrenheit allowance, the licensee was unable to provide or reference any documentation to support this higher temperature allowance.

The inspector's review of Calculation MC-QIP41-97020, Revision 11, identified that it failed to translate the design basis requirements of switchgear room cooling because it used a nonconservative temperature limit obtained from the Technical Requirements Manual LCO 6.7.3 C utilizing a 30 degree increase that could not be justified by any documentation the licensee referenced. Specifically, the 135 degree Fahrenheit limit used in the calculation exceeded the design temperature limit specified in the design documents by 31 degrees Fahrenheit. Consequently, the inspector determined that the licensee's calculated minimum service water flow was inadequate because they failed to analyze the ability of switchgear cooling to maintain room temperature below design limits during all design scenarios. The licensee entered this issue into the corrective action program as CR-GGN-2016-07597 and initiated actions to analyze the ability of vital switchgear room cooling to meet its specified safety function.

Analysis. The failure to translate applicable design basis into specifications in accordance with 10 CFR Part 50, Appendix B, design control for vital switchgear cooling was a performance deficiency. This performance deficiency was more than minor, and therefore a finding, because it was associated with the design control attribute of the Mitigating Systems Cornerstone, and it adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee did not assure that the vital switchgear ventilation system was capable of maintaining the rooms' temperature below design requirements under all conditions. The inspector performed an initial screening of the finding in accordance with NRC Inspection Manual Chapter (IMC) 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Using IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," dated July 1, 2012, this finding had very low safety significance (Green) because it:

(1) was not a deficiency affecting the design or qualification of a mitigating system; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of a single train for greater than its technical specification allowed outage time; and (4) did not 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. This finding had a cross-cutting aspect in the documentation aspect of the human performance cross-cutting area because the licensee failed to maintain complete, accurate, and up to date documentation of the design temperature limits for safety-related equipment. Specifically, the licensee failed to document and evaluate a change to temperature limits related to switchgear cooling to ensure that its use as a design parameter was consistent with original design specifications of the equipment [H.7].

Enforcement. Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in §50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions. Contrary to the above, from June 2016 until present, measures established by the licensee did not assure that applicable regulatory requirements and design bases were correctly translated into specifications, drawings, procedures, and instructions. Specifically, measures established by the licensee did not assure that the vital switchgear ventilation system was capable of maintaining the rooms' temperature below design requirements under all conditions. This issue does not represent an immediate safety concern because the current service water flow rates measured during the most recent surveillances were sufficient to maintain room temperatures. Because this violation was of very low safety significance and was entered into the licensee's corrective action program as Condition Report CR-GGN-2016-07597, it is being treated as a non-cited violation consistent with Section 2.3.2.a of the NRC's Enforcement Policy. (NCV 05000416/2016004-01, "Failure to Incorporate Design Requirements for Switchgear Room Cooling")

## **1R19 Post-Maintenance Testing (71111.19)**

### **a. Inspection Scope**

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

- October 10, 2016, residual heat removal system room cooler, train B, following pressure relief valve replacement
- October 22, 2016, standby service water pump, train C, following repair of the basin underwater supports
- November 22, 2016, standby service water pump, train C, following repair of the boot seal
- November 28, 2016, diesel fuel oil storage tank transfer pump, Division 3, following replacement of the pump



- December 20, 2016, emergency diesel generator, Division 3, following modification of the engine crankcase pressure relay trip input
- December 20, 2016, emergency diesel generator, Division 3, following maintenance on the Division 3 emergency diesel generator breaker, 152-1701, to the 17AC bus
- December 22, 2016, standby service water to jacket water heat exchanger, Division 2, following draining of the system and pressure relief valve replacement
- December 27, 2016, hydraulic control unit, 36-25 JF, following pencil strainer replacement

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 eight 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 forced outage, which began on September 8, 2016, 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 of the licensee's outage plan prior to the outage
- Review and verification of the licensee's fatigue management activities
- Monitoring of shut-down and cool-down activities
- Verification that the licensee maintained defense-in-depth during outage activities
- Review of high intensity training for operations crews
- Review of operations with potential to drain the vessel

These activities constituted completion of one partial outage activity 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:

Reactor coolant system leak detection tests:

- December 13, 2016, reactor coolant system leak detection surveillance test

Other surveillance tests:

- October 25, 2016, DC battery, Divisions 1 and 3, weekly surveillance test
- November 2, 2016, reactor coolant system chemistry surveillance

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.

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

### **b. Findings**

No findings were identified.

## **Cornerstone: Emergency Preparedness**

## **1EP6 Drill Evaluation (71114.06)**

### **Training Evolution Observation**

#### **a. Inspection Scope**

On October 5, 2016, the inspectors observed a simulator-based emergency drill that included implementation of the licensee's emergency plan. The inspectors verified that the licensee's emergency classifications, off-site notifications, and protective action recommendations were appropriate and timely. The inspectors verified that any emergency preparedness weaknesses were appropriately identified by the evaluators and entered into the corrective action program for resolution.

These activities constituted completion of one training observation sample, as defined in Inspection Procedure 71114.06.

#### **b. Findings**

No findings were identified.

## 2. RADIATION SAFETY

### Cornerstones: Public Radiation Safety and Occupational Radiation Safety

#### 2RS2 Occupational ALARA Planning and Controls (71124.02)

##### a. Inspection Scope

The inspectors assessed licensee performance with respect to maintaining individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors performed this portion of the attachment as a post-outage review. During the inspection the inspectors interviewed licensee personnel, reviewed licensee documents, and evaluated licensee performance in the following areas:

- Radiological work planning, including work activities of exposure significance, radiological work planning ALARA evaluations, initial and revised exposure estimates, and exposure mitigation requirements. The inspectors also verified that the licensee's planning identified appropriate dose reduction techniques, reviewed any inconsistencies between intended and actual work activity doses, and determined if post-job (work activity) reviews were conducted to identify lessons learned.
- Verification of dose estimates and exposure tracking systems, including the basis for exposure estimates and measures to track, trend, and if necessary to reduce occupational doses for ongoing work activities. The inspectors evaluated the licensee's method for adjusting exposure estimates and reviewed the licensee's evaluations of inconsistent or incongruent results from the licensee's intended radiological outcomes.
- Problem identification and resolution for ALARA planning. The inspectors reviewed audits, self-assessments, and corrective action program documents to verify problems were being identified and properly addressed for resolution.

These activities constituted completion of three of the five required samples of the occupational ALARA planning and controls program, as defined in Inspection Procedure 71124.02, and completes the inspection.

##### b. Findings

Introduction. The inspectors identified a Green, non-cited violation of 10 CFR 20.1101(b) for the licensee's failure to implement radiation exposure reduction procedures and engineering controls necessary to minimize unplanned and unintended radiation dose to workers and to maintain occupational doses as low as is reasonably achievable. During Refueling Outage 20 (RF 20), several work activities exceeded their initial dose estimates. There were minimal or no actions taken to evaluate the basis for the dose overrides and to develop mitigating strategies to reduce workers' exposures.

Description. During the inspectors' review of the Grand Gulf Nuclear Station (GGNS) post-outage (RF 20) ALARA performance, the inspectors identified several examples of work activities in which the licensee failed to follow procedural requirements and standards necessary to ensure that personnel doses were maintained consistent with their planned, intended doses. A number of these work activities lacked the use of

suitable engineering controls necessary to maintain radiation exposures ALARA. The use of these engineering controls would have directly contributed to maintaining workers' occupational doses ALARA and within the bounds of the planned and intended exposures.

During discussions with the licensee, staff stated that the major issue throughout RF 20 was elevated dose rates due to the higher concentration of cobalt-60 (Co-60) during the expanded crud burst. The inspectors noted the higher concentrations of Co-60 and the associated increased dose rates in the reactor cavity area. However, the inspectors determined the resultant increases in collective radiation exposures for work activities in the reactor cavity area were primarily due to inadequate planning, administration, and execution of radiological engineering controls associated with reactor cavity cleanup and spent fuel pool cleanup (SFPCU) operations. The licensee also identified that resource issues, such as limited staff availability, poor decontamination efforts due to unfunded equipment, and an overwhelmed outage staff, likely contributed to increased worker dose. The licensee also concluded that the extensive use of new-to-nuclear workers, without appropriate compensatory actions (e.g. enhanced worker training or mock-ups), likely contributed to their unplanned dose and weakness of documentation.

The inspectors reviewed Procedure EN-CY-112, "BWR Shutdown and Startup Chemistry," Revision 2, and the GGNS Chemistry Management Plan, which were used to control reactor vessel and cavity Co-60 radioactivity. The inspectors determined that the licensee's dose reduction strategy during reactor cavity operations required that reactor water cleanup and SFPCU remained operable to maintain Co-60 radioactivity levels low and occupational radiation exposures ALARA. Specifically, Procedure EN-CY-112, Section 5.2.[9], required, in part, that:

- Fuel pool cooling filter/demineralizer system operate at maximum capacity after flood-up and during fuel off-load.
- Removal efficiency of the filter/demineralizer for Co-60 be monitored during shutdown operation through fuel off-loads or fuel shuffles.

However, during two periods of reactor cavity operations (between February and March 9, 2016), SFPCU filter/demineralizer, train B, was inoperable for at least 16 days. The SFPCU filter/demineralizer, train A, was operable but with degraded conditions for controlling Co-60 effectively. The licensee stated the station could not regenerate the train A SFPCU filter/demineralizer due to resource restraints. By March 9, 2016, (19 days into the refueling outage), the Co-60 concentration in the reactor cavity and spent fuel pool area had peaked, with general area radiation levels on the reactor cavity floor increasing from 0.5 millirem/hour to 6.0 millirem/hour. The misadministration of radiological engineering controls directly contributed to the increased collective radiation exposures at the station during the refueling outage.

The inspectors found that as early as calendar year 2010, the GGNS operating experience and corrective action programs had documented the effects of Co-60 activity in the reactor cavity and unplanned SFPCU outages. The licensee knew from past experience that workers being unaware of these circumstances on the refueling floor had resulted in unplanned and unintended doses.

Section 5 of Procedure EN-CY-112 and Section 3.4.1 of the GGNS Chemistry Management Plan also have a post-reactor-cavity-filled quality hold point to maintain Co-60 activity less than  $5.0 \text{ E-4}$  microcuries/milliliter ( $\mu\text{Ci/ml}$ ). Data reviewed by the inspectors showed that from February 20, 2016, through March 15, 2016, the Co-60 activity in the reactor cavity ranged from  $5.0 \text{ E-4}$   $\mu\text{Ci/ml}$  to  $90 \text{ E-4}$   $\mu\text{Ci/ml}$ , exceeding the hold point threshold. Procedure EN-CY-112 states, in part, that the limits (hold point) can be changed on a case-by-case basis with a detailed ALARA assessment and the approval of the site chemistry manager, radiation protection manager, and executive approval (site or senior vice-president). The procedure further requires that the ALARA assessment documents the justification for changing the hold point, addressing outage length impact for present and proposed limits, expected dose consequences for present and proposed limits, re-sequencing work activities as an alternative, and action to be taken to mitigate the effects of the proposed limits. Section 3.0 of the GGNS Chemistry Management Plan states that an ALARA Management Committee (AMC) meeting, or equivalent, shall be convened to challenge when Co-60 values are approached, before continuing with outage activities.

The inspectors reviewed AMC meeting records for RF 20. There were no specific entries or actionable items in the records identified as addressing management's concern and their oversight of Co-60 activity in the reactor cavity increasing collective radiation doses on the refueling deck, especially during periods when the SFPCU (demineralizers) were out of service. When the inspectors inquired about the apparent lack of mitigating actions by station management in the AMC meeting minutes, licensee staff stated that they had 'equivalent' discussions during RF 20 shift turnover meetings. However, these 'equivalent' AMC meeting discussions and/or ALARA assessments were not documented by the licensee, as required by Procedure EN-CY-112. More importantly, the inspectors could not identify any actionable items taken by the station to reduce or manage workers' radiological exposures as an outcome of these equivalent meetings. Thus, the inspectors identified no evidence that the licensee evaluated the consequences of the degraded engineering controls or obtained approval for changing the Co-60 activity hold point to allow outage activities to continue.

The inspectors also reviewed licensee Procedure EN-RP-110, "ALARA Program," Revision 13. Procedure EN-RP-110, Section 4.0[6], defines the responsibilities of the AMC to be:

- Evaluate and approve revisions when the radiation work permit (RWP) dose estimate, after revision, is equal to or greater than 1 person-rem AND is 25 percent over the initial dose estimate;
- The revised exposure estimate must clearly identify any unexpected changes in scope or any failures to control the work that resulted in dose greater than planned;
- The RWPs shall be removed from service until the AMC approves a revised exposure estimate that clearly identifies and documents unexpected changes in scope or corrective actions related to any failures to control the work.

As defined by the procedure, the AMC is tasked with conducting an ALARA assessment of the cause(s) of the dose being greater than planned, establishing corrective actions to address the identified causes and/or mitigate the causes, and ensuring execution of the

corrective actions when work on the RWP is resumed. The inspectors noted that stop work requirements, in the form of removing the RWP from service, were to be implemented during performance of this ALARA assessment. The inspectors found no evidence of these actions occurring. However, the licensee suggested that there was a reluctance by management to stop work during critical path activities.

The inspectors reviewed five RWPs exceeding 5 rem collective dose that accrued significantly more dose than their initial dose estimate. The accrued dose on three of the five RWPs nearly exceeded 50 percent of the dose estimates (RWP 2016-1400, RWP 2016-1508, and RWP 2016-1512). Two RWPs accrued dose that exceeded 50 percent of the dose estimates. In each case, the licensee failed to effectively use the AMC as required by Procedure EN-RP-110 to ensure doses were being appropriately controlled. Work activities in which workers received unplanned dose exceeding 50 percent of the initial collective dose estimate included:

- RWP 2016-1402, "Refuel Floor High Water Activities." The collective dose and hours for refuel floor work activities was 13.17 person-rem. In contrast, the planned estimate was 7.970 person-rem. The post-ALARA review package indicated there were five changes to the RWP dose estimate. However, when revising the exposure estimate, the licensee did not clearly document any unexpected changes in work scope or any failures to control the work that resulted in dose greater than planned. In addition, the licensee did not evaluate strategies and implement effective radiation exposure controls in RWP 2016-1402 to address the effects of Co-60 in the reactor cavity. Additionally, corrective actions related to any failures to control the work were not identified.
- RWP 2016-1403, "Reactor Vessel Disassembly and Re-Assembly." The collective dose for reactor vessel activities was 20.247 person-rem. In contrast, the planned estimate was 10.700 person-rem. The inspectors could not determine if all procedurally required AMC meetings were held, as only one AMC meeting was documented. The weakness was documented in the post-job ALARA review package for RWP 2016-1403, which stated, "Inadequate ALARA plans at times and in-progress reviews did not consistently capture poor dose performance." The post-job review further stated that, "Three in-progress reviews were performed, but no radiological concerns were noted." These statements validated the inspectors' observation that the licensee did not consistently evaluate and approve revisions to dose estimates and did not clearly identify changes in scope or any failures to control the work which resulted in dose greater than planned. Additionally, there was no indication that RWP 2016-1403 was removed from service until the AMC clearly identified unexpected changes in work scope or failures to control the work, evaluated and, as appropriate, implemented radiation exposure reduction strategies, and approved a revised exposure.

The inspectors concluded that the licensee missed several opportunities during RF 20 to conduct ALARA assessments, understand the basis for unexpected changes in work scope and changed radiological conditions, approve revised exposure estimates, and assess and implement appropriate exposure mitigation actions. The failure of the licensee to ensure effective ALARA assessments were performed, as required by procedures, contributed to the unplanned and unintended collective dose. Because the

licensee failed to develop plans to control Co-60 activity or implement mitigating strategies to address the elevated dose rates, collective dose was significantly greater (near 50 percent for three RWPs, greater than 50 percent for two RWPs) than the dose estimate for several work activities.

The licensee initiated Condition Report CR-GGN-2016-08543 to address issues with AMC performance. The licensee also initiated CR-GGN-2016-03151 to address issues such as limited staff availability, use of new-to-nuclear workers, and inadequate water management resource planning. The licensee's immediate corrective actions included generating these condition reports and documenting lessons learned to prevent these issues from reoccurring during future work activities.

Analysis. The failure to implement procedures and engineering controls to minimize unplanned and unintended radiation dose and to maintain occupational doses ALARA is a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the Occupational Radiation Safety Cornerstone attribute of program and process (ALARA planning) and adversely affected the cornerstone objective to ensure the adequate protection of the worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, inadequate ALARA planning and radiological controls resulted in unplanned, unintended dose for a number of work activities in which the actual collective dose exceeded 5 person-rem and exceeded the planned, intended dose by more than 50 percent. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the inspectors determined this finding to be of very low safety significance (Green) because the finding involved ALARA planning and controls and because the licensee's latest rolling 3-year rolling average did not exceed 240 person rem per unit for boiling water reactors. The finding had a cross-cutting aspect in the area of problem identification and resolution, associated with operating experience, in that, the licensee's organization failed to systematically and effectively collect, evaluate, and implement relevant internal and external operating experience in a timely manner. Specifically, the licensee failed to implement and incorporate relevant internal operating experience from Refueling Outage 18, which was of similar radiological circumstances, to mitigate the effects of Co-60 activity in the reactor cavity and unplanned SFPCU outages [P.5].

Enforcement. Title 10 CFR 20.1101(b) states, in part, that the licensee shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses that are ALARA. Contrary to the above, from February 19, 2016, through March 23, 2016, the licensee failed to use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses that are ALARA. Specifically, the licensee routinely failed to implement procedural requirements and engineering controls intended to ensure exposures were maintained ALARA, including maintaining SFPCU operable, observing radiological hold points, assessing unexpected changes in scope and failures to radiologically control work, and implementing mitigating strategies prior to approving dose estimate revisions. The licensee's immediate corrective actions included generating two condition reports and documenting lessons learned to prevent these issues from reoccurring during future work activities. Because this violation is of very low safety significance (Green) and the licensee has entered the issue into their corrective action program, this violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the NRC Enforcement Policy.

(NCV 05000416/2016004-02, "Failure to Use Procedures and Engineering Controls to Maintain Occupational Doses ALARA")

## **2RS4 Occupational Dose Assessment (71124.04)**

### **a. Inspection Scope**

The inspectors evaluated the accuracy and operability of the licensee's personnel monitoring equipment, verified the accuracy and effectiveness of the licensee's methods for determining total effective dose equivalent, and verified that the licensee was appropriately monitoring occupational dose. The inspectors interviewed licensee personnel, walked down various portions of the plant, and reviewed licensee performance in the following areas:

- Source term characterization, including characterization of radiation types and energies, hard-to-detect isotopes, and scaling factors;
- External dosimetry including National Voluntary Laboratory Accreditation Program (NVLAP) accreditation, storage, issue, use, and processing of active and passive dosimeters;
- Internal dosimetry, including the licensee's use of whole body counting, use of in vitro bioassay methods, dose assessments based on airborne monitoring, and the adequacy of internal dose assessments;
- Special dosimetric situations, including declared pregnant workers, dosimeter placement and assessment of effective dose equivalent for external exposures (EDEX), shallow dose equivalent, and neutron dose assessment;
- Problem identification and resolution for occupational dose assessment. The inspectors reviewed audits, self-assessments, and corrective action program documents to verify problems were being identified and properly addressed for resolution.

These activities constituted completion of the five required samples of the occupational dose assessment program, as defined in Inspection Procedure 71124.04.

### **b. Findings**

No findings were identified.



#### 4. OTHER ACTIVITIES

**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security**

##### 4OA1 Performance Indicator Verification (71151)

###### .1 Reactor Coolant System Specific Activity (BI01)

###### a. Inspection Scope

The inspectors reviewed the licensee's reactor coolant system chemistry sample analyses for the period of October 1, 2015, through September 30, 2016, to verify the accuracy and completeness of the reported data. The inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample on November 2, 2016. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the reactor coolant system specific activity performance indicator, as defined in Inspection Procedure 71151.

###### b. Findings

No findings were identified.

###### .2 Reactor Coolant System Total Leakage (BI02)

###### a. Inspection Scope

The inspectors reviewed the licensee's records of reactor coolant system total leakage for the period of October 1, 2015, through September 30, 2016, to verify the accuracy and completeness of the reported data. The inspectors observed the performance of the reactor coolant leak detection surveillance procedure on December 13, 2016. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the reactor coolant system leakage performance indicator, as defined in Inspection Procedure 71151.

###### b. Findings

No findings were identified.

###### .3 Drill/Exercise Performance (EP01)

###### a. Inspection Scope

The inspector reviewed the licensee's evaluated exercises and selected drill and training evolutions that occurred between August 2015 and September 2016 to verify the

accuracy of the licensee's data for classification, notification, and protective action recommendation (PAR) opportunities. The inspector reviewed a sample of the licensee's completed classifications, notifications, and PARs to verify their timeliness and accuracy. The inspector used Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data. The specific documents reviewed are described in the attachment to this report.

These activities constituted verification of the drill/exercise performance indicator, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.4 Emergency Response Organization Drill Participation (EP02)

a. Inspection Scope

The inspector reviewed the licensee's records for participation in drill and training evolutions between August 2015 and September 2016 to verify the accuracy of the licensee's data for drill participation opportunities. The inspector verified that all members of the licensee's emergency response organization (ERO) in the identified key positions had been counted in the reported performance indicator data. The inspector reviewed the licensee's basis for reporting the percentage of ERO members who participated in a drill. The inspector reviewed drill attendance records and verified a sample of those reported as participating. The inspector used Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data. The specific documents reviewed are described in the attachment to this report.

These activities constituted verification of the emergency response organization drill participation performance indicator, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.5 Alert and Notification System Reliability (EP03)

a. Inspection Scope

The inspector reviewed the licensee's records of alert and notification system tests conducted between August 2015 and September 2016 to verify the accuracy of the licensee's data for siren system testing opportunities. The inspector reviewed procedural guidance on assessing alert and notification system opportunities and the results of periodic alert and notification system operability tests. The inspector used Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data. The specific documents reviewed are described in the attachment to this report.

These activities constituted verification of the alert and notification system reliability performance indicator, as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

**40A2 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 and periodically attended the licensee's condition report screening meetings. 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 Semiannual Trend Review

a. Inspection Scope

The inspectors reviewed the licensee's corrective action program, performance indicators, plan of the day documentation, and other documentation to identify trends that might indicate the existence of a more significant safety issue. The inspectors also attended control room shift turnovers/briefings and outage control center shift briefings. The inspectors identified a weakness in the consistency and accuracy of the communications and coordination between the control room, the outage control center and the plan of the day packages. The inspectors verified that the licensee has entered this identified weakness into their corrective action program as Condition Report CR-GGN-1-2016-09760 and are initiating corrective actions to address identified adverse trends.

These activities constituted completion of one semiannual trend review sample, as defined in Inspection Procedure 71152.

b. Observations and Assessments

The inspectors identified a weakness in the consistency and accuracy of the communications and coordination between the control room, the outage control center and the plan of the day packages. The communication and coordination weakness resulted in ineffectively communicating station priorities and risk to work crews and other stakeholders. This had revealed a weakness in creating and maintaining an accurate

work schedule. The licensee had also identified gaps in communication in many condition reports. Additional examples have been identified by the NRC resident inspectors and are listed below:

- On December 13 and December 20, 2016, two activities that elevated risk were performed onsite and not communicated to the site appropriately. The control room and outage control center briefings incorporated discussion of this risk; however, the plan of the day package that communicates the risk to the entire site did not include these activities.
- On December 14, 2016, the plan of the day package and the outage control center had a surveillance scheduled that the control room did not want to perform. The control room supervisor told the outage control center that they did not want this surveillance to occur because the control room operators were involved in preparing for the in-service leakage test and control rod scram time testing. While the NRC resident inspectors were in the control room, an unexpected control room annunciator came in, which caused the control room to respond. It was identified quickly by the operators that this alarm was not an actual plant condition. The alarm was identified to be a part of the surveillance that was not supposed to be completed. The outage control center did not communicate to the instrumentation and controls personnel that this surveillance was delayed, and the crew performed the surveillance as scheduled.
- On December 19, 2016, the outage control center manager briefed the NRC resident inspectors that the hydraulic control unit pencil strainers would be replaced during that shift. However, when the resident inspectors discussed this activity later with the control room, they stated that the pencil strainers were replaced the day before. The outage control center was not in alignment with the control room and plant activities.

c. Findings

No findings were identified.

#### **4OA6 Meetings, Including Exit**

##### Exit Meeting Summary

On November 21, 2016, the inspectors presented the radiation safety inspection results to Mr. M. Giacini, General Manager, Plant Operations, 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.

On December 13, 2016, the inspector presented the results of the onsite inspection of the licensee's emergency preparedness performance indicator performance 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.

On January 13, 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**

P. Belsterling, Reactor Fuels Engineer  
R. Benson, Superintendent, Radiation Protection  
A. Black, General Manager  
K. Boudreaux, Manager, System Engineering  
K. Brinson, Superintendent, Maintenance Services and Projects  
O. Brooks, Emergency Preparedness Coordinator  
D. Brown, Manager, System Engineering  
G. Burton, Principal Health Physicist, Radiation Protection  
S. Clizbe, Manager, Emergency Preparedness  
T. Coles, Engineer, Regulatory Assurance  
S. Cooper, Plant Fire Marshal  
M. Davis, Manager, Chemistry/Radiation Safety  
J. Dorsey, Manager, Security  
R. Eichenberger, Manager, Operating Experience/Fleet Corrective Action  
V. Fallacara, Acting Site Vice President  
M. Giacini, General Manager Plant Operations  
D. Gregoire, Manager, Regulatory Affairs and Performance Improvement  
J. Hallenback, Manager, Design Engineering  
G. Hettel, Vice President, Operations  
R. Hicks, Dosimetry Technician, Radiation Protection  
G. Higgs, Manager, Maintenance  
M. Hummer, Licensing Engineer  
A. Javorik, Vice President, Engineering  
J. Keir, Manager, Nuclear Independent Oversight  
M. Kellett, Assistant to the Vice President, Operations  
M. Kinmark, Health Physics Staff Advisor, Radiation Protection  
D. Kovacs, Chief Information Officer  
E. Kuhn, Auditor, Quality  
M. Larson, Supervisor, Radiation Protection  
M. Laudisio, Manager, Radiation Protection  
K. McGee, Engineer, Reactor Engineering  
R. Meister, Senior Specialist, Regulatory Assurance  
R. Miller, Manager, Radiation Protection  
C. Moon, Manager, Quality  
C. Moore, ISFSI Supervisor  
Y. Moore, Dosimetry Specialist, Radiation Protection  
J. Nadeau, Manager, Regulatory Assurance  
T. Parmalee, Compliance Engineer, Licensing and Regulatory Affairs  
B. Pease, Manager, Emergency Services  
G. Pierce, Manager, Training  
R. Prewett, Operations Manager  
S. Purdon, Superintendent, Training  
G. Rheume, System Engineering Supervisor, NSSS  
T. Roark, Senior Project Manager, Reactor Services  
F. Rosser, Specialist, Radiation Protection

P. Salgado, Manager, Performance Improvement  
 R. Sanker, Supervisor, Radiation Protection  
 B. Schuetz, Plant General Manager  
 J. Seiter, Manager, Emergency Planning  
 D. Stevens, Assistant Manager, Operations  
 D. Suarez, Regulatory Compliance Engineer  
 S. Sweet, Engineer, Regulatory Assurance  
 K. Sykes, Program Manager, Cyber Security Program  
 K. Van Speybroek, EFIN Supervisor  
 L. Williams, Licensing Supervisor  
 D. Wolfgramm, Compliance Supervisor, Regulatory Affairs  
 E.G. Wright, Supervisor, Radiation Protection  
 G. Wyatt, Supervisor, Simulator and Examination Group  
 J. Zielinski, Cable Condition Monitoring Program Manager

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### Opened and Closed

05000416/2016004-01	NCV	Failure to Incorporate Design Requirements for Switchgear Room Cooling (Section 1R15)
05000416/2016004-02	NCV	Failure to Use Procedures and Engineering Controls to Maintain Occupational Doses ALARA (Section 2RS2)

### **LIST OF DOCUMENTS REVIEWED**

#### **Section 1R01: Adverse Weather Protection**

##### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
04-1-03-A30-1	Cold Weather Protection	023

##### Condition Reports (CR-GGN-)

2016-08632	2016-08969	2016-09726	2016-09728	2016-09734
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##### Work Orders (WOs)

52662332-01

#### **Section 1R04: Equipment Alignment**

##### Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-0035A	Fire Protection System	028
M-0035B	Fire Protection System	047

### Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-1061A	Standby Service Water System	068
M-1061B	Standby Service Water System	052
M-1070A	Standby Diesel Generator System	046
M-1070B	Standby Diesel Generator System	039

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
04-1-01-E12-2	Shutdown Cooling and Alternate Decay Heat Removal Operation	119
04-1-01-P41-1	Standby Service Water System	143
04-1-01-P75-1	Standby Diesel Generator System	104
04-S-01-P64-1	Fire Protection Water System	063

### Condition Reports (CR-GGN-)

2016-07133	2016-07584	2016-09612	2016-09733
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## **Section 1R05: Fire Protection**

### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
A-11	Fire Pre-Plan – RHR C Pump Room	1
C-13	Fire Pre-Plan - Control Room, Control Panel, Suspended Ceiling and Support Areas	4
DG-04	Fire Pre-Plan – HPCS Diesel Generator	7
EN-TQ-125	Fire Brigade Drills – Drill Report Fire Drill in the 133' Turbine Switch Gear Room, Area 4, Room 1T323	October 6, 2016
FTR 16-244	Action Tracker for Continuous Fire Watch due to Halon System	
SSW-02	Fire Pre-Plan – SSW Pump House and Valve Room	4
UFSAR 9A.5.50	Fire Hazard Analysis for Fire Area 50 (Control Room)	November 21, 2016



### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-OP-139	Fire Watch Program	1
EN-TQ-125	Fire Brigade Drills	4
FHA	Fire Hazards Analysis	
TB1-03	Fire Pre-Plan – Turbine Building (133' Elevation)	2

### Condition Reports (CR-GGN-)

2016-08007      2016-09626      2016-09882

## **Section 1R06: Flood Protection Measures**

### Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-1098A	Embedded & Suspended Drains Auxiliary Bldg. – Unit 1	4

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
04-1-03-E12-12	RHR B Pump Room Sump Pump Functional Test	001
05-S-01-EP-4	Auxiliary Building Control	029
EN-WM-105	Planning	16

### Condition Reports (CR-GGN-)

2002-01787      2003-01688      2016-09406

### Work Orders (WOs)

527197      52728764

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

### Miscellaneous Documents

<u>Title</u>	<u>Date</u>
Annual Operating Test Results	November 21, 2016

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
02-S-01-17	Control of Limiting Conditions for Operation	129
02-S-01-27	Operation's Philosophy	069
02-S-01-30	Control of Operations Rounds	006
EN-OP-115	Conduct of Operations	017

**Section 1R12: Maintenance Effectiveness**Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-MP-115	Material Issues and Returns	5
EN-MP-120	Material Receipt	10

Condition Reports (CR-GGN-)

2015-00437	2015-01582	2015-01612	2015-01675	2015-02099
2015-02382	2015-04160	2015-04374	2015-04574	2015-04584
2015-04832	2015-04841	2015-05123	2016-00758	2016-02628
2016-02821	2016-03001	2016-03575	2016-03865	2016-05330
2016-05880	2016-06486	2016-06779	2016-07169	2016-07397
2016-07464	2016-07480	2016-07864	2016-07888	2016-07889
2016-07932	2016-08115	2016-08944	2016-09170	2016-09818

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	Maintenance Rule Database System	
	Plaint Air and Instrument Air System Health Report	October 7, 2016
	Standby Liquid Control System Health Report	October 11, 2016
EC 66845	Evaluation of Acceptable RHR O-ring Durometer Values	0
GGN-16S-552	Commercial Grade Dedication of O-ring	September 20, 2016
TE CGIOR01	Park O Ring EPRI Commercial Grade Evaluation	July 9, 1991
WT-2015-00014	Work Tracker for Maintenance Rule Evaluations	
WT-2014-00245	Work Tracker for Maintenance Rule Evaluations	

## **Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
01-S-18-6	Risk Assessment of Maintenance Activities – Removing 1P41C002 HPCS Service Water Pump	October 31, 2016
03-1-01-5	Completed – OPDRV Procedure List	September 14, 2016
EN-OP-119	Completed - Protected Equipment Posting	October 16, 2016
ER-GG-2002-0007-001	Heavy Load Evaluation for Div. 1 SSW Pump Removal	February 13, 2002
OPG-047	Completed - Protected Area Signage for RHR B Protected	

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
01-S-18-6	Risk Assessment of Maintenance Activities	018

### Work Orders (WOs)

418611-01

## **Section 1R15: Operability Determinations and Functionality Assessments**

### Calculations

<u>Number</u>	<u>Title</u>	<u>Revision</u>
MC-Q1P41-97020	Determination of minimum Allowable SSW Flows (LOCA Lineup) to Safety-related Heat Exchangers	10
MC-Q1P41-97020	Determination of minimum Allowable SSW Flows (LOCA Lineup) to Safety-related Heat Exchangers	11

### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
GNRO-93/00123	Safety Evaluation for Secondary Containment Drawdown Surveillance Procedures	October 1, 1993
M1061A	P&I Diagram Standby Service Water System	68
M1061B	P&I Diagram Standby Service Water System	52

### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
M1061C	P&I Diagram Standby Service Water System	38
M1061D	P&I Diagram Standby Service Water System	40

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-OP-104	Operability Determination Process	11

### Thermal Performance Analyses

<u>Number</u>	<u>Title</u>	<u>Date</u>
1T46B002A	Perform Thermal Performance Test Of ESF Room Cooler	April 27, 2016
1T46B002B	Perform Thermal Performance Test Of ESF Room Cooler	December 8, 2015
1T46B003A	Perform Thermal Performance Test Of ESF Room Cooler	April 27, 2016

### Condition Reports (CR-GGN-)

2016-07194	2016-07196	2016-07197	2016-07200	2016-07597
2016-09564				

## **Section 1R19: Post-Maintenance Testing**

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
06-OP-1P41-Q-0006	HPCS Service Water System Valve and Pump Operability Test	November 22, 2016
06-OP-1P75-M-0002	Standby Diesel Generator 12 Functional Test	December 23, 2016
07-S-12-150	General Electric AM 4.16 KV Breaker Overhaul Instructions	002
ECT-66685-02	Verification of Logic Change of HPCS Diesel Generator Crankcase Pressure Trip and Running Trip Checks	December 1, 2016
STI-1602-000	Standby Service Water C Pump Performance Data (Pump Curve)	November 18, 2016

Work Orders (WOs)

418611-40	455705-01	455705-02	455705-12	459567-01
460582-01	52567480	52599191	52717732	

Condition Reports (CR-GGN-)

2016-08066	2016-08097	2016-08114
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**Section 1R20: Refueling and Other Outage Activities**

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
EN-OU-108	Shutdown Safety Management Program (SSMP)	8
SOPP	Shutdown Operations Protection Plan	September 7, 2016

Condition Reports (CR-GGN-)

2016-07894

**Section 1R22: Surveillance Testing**

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
02-S-01-34	Completed Auxillary Building Logs (from Database System)	December 7 - December 13, 2016
06-CH-1B21-W- 0008	Reactor Coolant Dose Equivalent Iodine	105
06-EL-1L11-W- 0001	125 Volt Battery Bank Pilot Cell Check	104

Condition Reports (CR-GGN-)

2016-07912	2016-08071	2016-08077
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Work Orders (WOs)

52700789	52700807	52721880
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## Section 1EP6: Drill Evaluation

### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	GGNS 2016 Fourth Quarter Blue and Red Team Drill Report	October 18, 2016

## Section 2RS2: Occupational ALARA Planning and Controls

### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	GGNS Executive Summary of Refueling Outage 20 RWP's of Interest	March 26, 2016
	GGNS Refueling Outage 20 ALARA Report	March 28, 2016
	OCC Turnover Meeting Agenda	March 12, 2016
201603151	RF 20 Cumulative Exposure Exceeded the Dose Goal	June 7, 2016

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
08-S-01-84	Radiological Work Planning	2
08-S-01-112	Radiation Worker Self-Monitoring Training Program	5
EN-RP-104	Personnel Contamination Events	7
EN-RP-110	ALARA Program	13
EN-RP-110-01	ALARA Initiative Deferrals	1
EN-RP-110-03	Collective Radiation Exposure Reduction Guidelines	4
EN-RP-110-04	Radiation Protection Risk Assessment Process	5
EN-RP-110-05	ALARA Planning and Controls	2
EN-RP-110-06	Outage Dose Estimating and Tracking	1
EN-RP-141	Job Coverage Using Remote Monitoring Technology	1

### Radiological Work Permits and ALARA Packages

<u>Number</u>	<u>Title</u>
2016-1400	RP/Decon Support for Refuel Floor
2016-1402	Refuel Floor High Water Activities

### Radiological Work Permits and ALARA Packages

<u>Number</u>	<u>Title</u>
2016-1403	Reactor Vessel Disassembly and Reassembly
2016-1508	Under Vessel Maintenance and Support Work
2016-1512	Remove and Replace MSRVs
2016-1915	Emergent Work for Maintenance, Tours, and Inspection

### Condition Reports (CR-GGN-)

2012-04288	2012-12401	2013-05990	2015-04251	2016-00351
2016-00695	2016-02042	2016-02715	2016-02740	2016-02743
2016-02753	2016-04224	2016-04531		

## **Section 2RS4: Occupational Dose Assessment**

### Air Sample Surveys

<u>Number</u>	<u>Title</u>	<u>Date</u>
AS-GG-2016-00519	Drywell EL-114' Air Sample	February 23, 2016
AS-GG-2016-01625	Auxiliary Building EL-119' Air Sample	August 5, 2016
AS-GG-2016-01900	Containment EL-208' Air Sample	September 23, 2016

### Audits and Self-Assessments

<u>Number</u>	<u>Title</u>	<u>Date</u>
LO-GLO-2016-00007	Occupational Dose Assessment Self-Assessment	August 24, 2016

### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	2 <sup>nd</sup> Qtr 2016 Quarterly Whole Body Counting Report	November 10, 2016
	3 <sup>rd</sup> Qtr 2016 Quarterly Whole Body Counting Report	November 10, 2016
	Calibration of the Canberra/Nuclear Data People Mover WBC System at the Entergy Grand Gulf	August 8, 2015

### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	NVLAP Certificate of Accreditation – Ionizing Radiation Dosimetry	2016
2015/00028	GGNS 2014 Annual Radioactive Effluent Release Report	April 27, 2015
2016/00039	GGNS 2015 Annual Radioactive Effluent Release Report	July 20, 2016
L66838-1	10 CFR Part 61 Waste Stream Evaluation: DAW-U-NA	March 7, 2016

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
08-S-02-32	Evaluation of In-Vivo Bioassay Results	8
EN-RP-100	Radiation Worker Expectations	10
EN-RP-104	Personnel Contamination Events	9
EN-RP-106	Radiological Survey Documentation	7
EN-RP-131	Air Sampling	15
EN-RP-202	Personnel Monitoring	10
EN-RP-203	Dose Assessment	8
EN-RP-204	Special Monitoring Requirements	10
EN-RP-204-01	Effective Dose Equivalent (EDEX) Monitoring	0
EN-RP-205	Prenatal Monitoring	3
EN-RP-206	Dosimeter of Legal Record Quality Assurance	5
EN-RP-208	Whole Body Counting/In-Vitro Bioassay	6
EN-RP-210	Area Monitoring Program	0

### Condition Reports (CR-GGN-)

2014-01567	2014-01695	2015-04531	2016-01158	2016-03805
2016-04509	2016-05694	2016-06243	2016-06244	2016-06245
2016-06484	2016-06510	2016-06547	2016-06549	2016-06551
2016-07658				



## Section 4OA1: Performance Indicator Verification

### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Grand Gulf Nuclear Station Siren Alert Notification System Design Evaluation	March 2008
	Grand Gulf Nuclear Station ANS Design Report	May 2013
	Letter, Ms. L. Hammond, Chief, Technological Hazards Branch, FEMA Region VI, to Mr. T. Knight, Office of Environmental Compliance, Assessment Division	November 27, 2012
	Letter, Mr. C. Burnside, Chief, Technological Hazards Branch, FEMA Region IV, to Mr. J. Browning, Manager, Grand Gulf Nuclear Station, Emergency Preparedness Entergy Operations Inc.	November 28, 2012
	Letter, Mr. H. Sherwood, Chief, Professional Services and Integration Branch, FEMA Headquarters, to Mr. C. Burnside, Chief, Technological Hazards Branch, FEMA Region IV; Subject: Review of Grand Gulf Nuclear Station Alert and Notification System Design Report	October 1, 2014
EN-LI-114, Attachment 9.1	NRC Performance Indicator Technique/Data Sheet – Reactor Coolant System Leakage	4 <sup>th</sup> Qtr, 2015
EN-LI-114, Attachment 9.1	NRC Performance Indicator Technique/Data Sheet – Reactor Coolant System Specific Activity	4 <sup>th</sup> Qtr, 2015
EN-LI-114, Attachment 9.1	NRC Performance Indicator Technique/Data Sheet – Reactor Coolant System Leakage	1 <sup>st</sup> Qtr, 2016
EN-LI-114, Attachment 9.1	NRC Performance Indicator Technique/Data Sheet – Reactor Coolant System Specific Activity	1 <sup>st</sup> Qtr, 2016
EN-LI-114, Attachment 9.1	NRC Performance Indicator Technique/Data Sheet – Reactor Coolant System Leakage	2 <sup>nd</sup> Qtr, 2016
EN-LI-114, Attachment 9.1	NRC Performance Indicator Technique/Data Sheet – Reactor Coolant System Specific Activity	2 <sup>nd</sup> Qtr, 2016
EN-LI-114, Attachment 9.1	NRC Performance Indicator Technique/Data Sheet – Reactor Coolant System Leakage	3 <sup>rd</sup> Qtr, 2016
EN-LI-114, Attachment 9.1	NRC Performance Indicator Technique/Data Sheet – Reactor Coolant System Specific Activity	3 <sup>rd</sup> Qtr, 2016

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
01-S-10-3	Emergency Planning Department Responsibilities	21
EN-LI-114	Regulatory Performance Indicator Process	7

Condition Reports (CR-GGN-)

2015-05818	2015-06460	2016-00677	2016-03810	2016-06238
2016-06265	2016-06843	2016-09779		

**Section 40A2: Problem Identification and Resolution**Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-LI-102	Corrective Action Program	028
EN-LI-121	Trend and Performance Review Process	22

Condition Reports (CR-GGN-)

2016-09511	2016-09641	2016-09666	2016-09700
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**Section 40A5: Other Activities**Calculations

<u>Number</u>	<u>Title</u>	<u>Date</u>
MC-Q1E12-93008	Calculation of Flow Needed for RHR System Flows	August 23, 1999

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
M-1072H	Plant Service Water System	009
M-1085D	Residual Heat Removal System	004

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	E12-021 – ADHR ISOLAT	
	E12-026 – 1E12C002A Tagout	
	Outage Technical Specification 1-OTS-16-0054 Tracker	
	P44-002 – 1E12B003A/B Tagout	
	Risk of Grand Gulf due to 9/26/2016 Site Clock Reset	
	Shutdown Operations Protection Plan	19
	Technical Specification 1-TS-16-0343 Tracker	

### Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
EN-MA-125	Troubleshooting for RHR Subsystem Pump A	September 7, 2016
LER 05000416/2016- 008	Entry into Mode of Applicability with the ADHR System Inoperable	0
TS 3.0.2	Technical Specifications	152
TS 3.4.9	Technical Specifications	142
TS 3.4.10	Technical Specifications	142
UFSAR	Section 3C.3.2	5
UFSAR	Section 5.4.7.5	9

### Procedures

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
01-S-02-9	Procedure Change Process	001
01-S-18-6	Risk Assessment of Maintenance Activities	018
02-S-01-4	Shift Relief and Turnover	043
02-S-01-17	Control of Limiting Conditions for Operation	129
02-S-01-27	Operations Philosophy	066
03-1-01-1	Integrated Operating Instructions for Cold Shutdown to Generator Minimum Load	169
04-S-04-1	System Fill and Vent	012
04-1-01-E12-2	Shutdown Cooling and Alternate Decay Heat Removal Operation	119, 120
04-1-01-N21-1	Feedwater System	074
04-1-01-P44-1	Plant Service Water/Radial Well System	105
05-1-02-III-1	Inadequate Decay Heat Removal	044
06-OP-1E12-Q- 0023	LPCI/RHR Subsystem A Quarterly Functional Test	131
EN-LI-102	Corrective Action Program	027
EN-LI-108	Shutdown Safety Management Program	8
EN-OP-102	Protective and Caution Tagging	018
EN-OP-102-01	Protective and Caution Tagging Forms and Checklist	10
EN-OP-105	Conduct of Operations	017

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
EN-OU-108	Shutdown Safety Management Program	008
EN-WM-105	Work Order Instructions for Obtaining Pump Curves for RHR Subsystem A Post Replacement	June 21, 2011

Condition Reports (CR-GGN-)

2016-06110	2016-07133	2016-07281	2016-07560	2016-07584
2016-07591	2016-07730	2016-07731	2016-07853	2016-07858
2016-07902	2016-08008	2016-08009	2016-08128	2016-08129
2016-08130	2016-08131	2016-08132		

Work Orders (WOs)

00450270

**The following items are requested for the  
Occupational Radiation Safety Inspection**

**Integrated Report 2016-004  
at  
Grand Gulf Nuclear Station  
(November 7 - 10, 2016)**

Inspection areas are listed in the attachments below.

Please provide the requested information on or before **October 28, 2016**

Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.01 should be in a file/folder titled "1- A," applicable organization charts in file/folder "1- B," etc.

If information is placed on *ims.certrec.com*, please ensure the inspection exit date entered is at least 30 days later than the onsite inspection dates, so the inspectors will have access to the information while writing the report.

In addition to the corrective action document lists provided for each inspection procedure listed below, please provide updated lists of corrective action documents at the entrance meeting. The dates for these lists should range from the end dates of the original lists to the day of the entrance meeting.

If more than one inspection procedure is to be conducted and the information requests appear to be redundant, there is no need to provide duplicate copies. Enter a note explaining in which file the information can be found.

If you have any questions or comments, please contact Louis Carson at (817) 200-1221, [Louis.Carson@nrc.gov](mailto:Louis.Carson@nrc.gov) or Natasha Green at (817) 200-1154, [Natasha.Greenel@nrc.gov](mailto:Natasha.Greenel@nrc.gov)

**PAPERWORK REDUCTION ACT STATEMENT**

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150-0011.

**2. Occupational ALARA Planning and Controls (71124.02)**

Date of Last Inspection: March 18, 2016

- A. List of contacts and telephone numbers for ALARA program personnel
- B. Applicable organization charts
- C. Copies of audits, self-assessments, and licensee event reports (LERs), written since date of last inspection, focusing on ALARA
- D. Procedure index for ALARA Program
- E. Please provide specific procedures related to the following areas noted below. Additional specific procedures may be requested by number after the inspector reviews the procedure indexes.
  - 1. ALARA Program
  - 2. ALARA Committee
  - 3. Radiation Work Permit Preparation
- F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the ALARA program. In addition to ALARA, the summary should also address Radiation Work Permit violations, Electronic Dosimeter Alarms, and RWP Dose Estimates

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are “searchable” so that the inspector can perform word searches.

- G. List of work activities greater than 1 rem, since date of last inspection  
Include original dose estimate and actual dose.
- H. Site dose totals and 3-year rolling averages for the past 3 years (based on dose of record)
- I. Outline of source term reduction strategy
- J. If available, provide a copy of the ALARA outage report for the *most recently* completed outages for each unit
- K. Please provide your most recent Annual ALARA Report.

**4. Occupational Dose Assessment (Inspection Procedure 71124.04)**

Date of Last Inspection: November 21, 2014

- A. List of contacts and telephone numbers for the following areas:
  - 1. Dose Assessment personnel
- B. Applicable organization charts
- C. Audits, self-assessments, vendor or Nuclear Procurement Issues Committee audits of contractor support, and LERs written since date of last inspection, related to:
  - 1. Occupational Dose Assessment
- D. Procedure indexes for the following areas
  - 1. Occupational Dose Assessment

- E. Please provide specific procedures related to the following areas noted below. Additional specific procedures will be requested by number after the inspector reviews the procedure indexes.
1. Radiation Protection Program
  2. Radiation Protection Conduct of Operations
  3. Personnel Dosimetry Program
  4. Radiological Posting and Warning Devices
  5. Air Sample Analysis
  6. Performance of High Exposure Work
  7. Declared Pregnant Worker
  8. Bioassay Program
- F. List of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, associated with:
1. National Voluntary Laboratory Accreditation Program
  2. Dosimetry (TLD/OSL, etc.) problems
  3. Electronic alarming dosimeters
  4. Bioassays or internally deposited radionuclides or internal dose
  5. Neutron dose
- NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are "searchable" so that the inspector can perform word searches.
- G. List of positive whole body counts since date of last inspection, names redacted if desired
- H. Part 61 analyses/scaling factors
- I. The most recent National Voluntary Laboratory Accreditation Program accreditation report or, if dosimetry is provided by a vendor, the vendor's most recent results

#### **PAPERWORK REDUCTION ACT STATEMENT**

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150-0011.