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## Grand Gulf 1 – Quarterly Plant Inspection Findings

### 4Q/2017 – Plant Inspection Findings

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### Initiating Events

**Significance:** G Oct 27, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

#### **Failure to Have Adequate Procedures**

The team identified two examples of a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to have adequate procedures for activities affecting quality. Specifically, Grand Gulf Nuclear Station failed to have adequate procedures for feedwater, condensate, and shutdown cooling activities. The licensee implemented corrective actions to revise the procedures. The licensee entered this issue into their corrective action program as Condition Reports CR-GGN-2016-08334, 08273, and 08290.

The failure to have adequate procedures for activities affecting quality was a performance deficiency. Example (1) of this performance deficiency was more than minor, and therefore a finding, because it was associated with the procedure quality attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, not having procedural guidance for the alternate decay heat removal system alignment resulted in misalignment of the system and its subsequent inability to perform its required function if needed. A detailed risk evaluation (Attachment 2) calculated an increase in core damage frequency of  $3.2E-7$ /year and an increase in large early release frequency of  $7.3E-8$ /year, which has a very low safety significance (Green). Example (2) of this performance deficiency was more than minor, and therefore a finding, because it was associated with the procedure quality attribute of the Initiating Events Cornerstone and affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown operations. Specifically, not having procedural guidance for feedwater isolation valve operation resulted in inadvertent overfill of the reactor vessel. This violation is associated

with a finding having very low safety significance (Green). The team did not assign a cross-cutting aspect because the performance deficiency was not reflective of current plant performance.

Inspection Report# : 2016008 (*pdf*)

## Mitigating Systems

**Significance:**  Oct 27, 2017

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

### **Failure to Have Alternate Decay Heat Removal Capability**

The team reviewed a self-revealed, non-cited violation of Technical Specification 3.4.10, "Residual Heat Removal Shutdown Cooling System ? Cold Shutdown," for the licensee's failure to verify an alternate method of decay heat removal was available when residual heat removal subsystem A was inoperable and unavailable due to a pump replacement. Specifically, the licensee inappropriately credited the alternate decay heat removal system as an available alternate method of decay heat removal. Credit for this system was inappropriate because, although the licensee believed the system had been aligned in standby, the alternate decay heat removal heat exchanger isolation valves had remained tagged closed, rendering the system unavailable to satisfy the technical specification requirement during the time period that residual heat removal subsystem A was unavailable. The licensee restored compliance by restoring residual heat removal subsystem A to available status. The licensee entered this issue into their corrective action program as Condition Report CR-GGN-2016-07281.

The failure to perform the required action to verify an alternate method of decay heat removal was available, when a residual heat removal shutdown cooling system was inoperable, was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the human performance attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. A detailed risk evaluation (Attachment 2) calculated an increase in core damage frequency of  $3.2E-7$ /year and an increase in large early release frequency of  $7.3E-8$ /year. Therefore, this violation is associated with a finding having very low safety significance (Green). The team determined the finding had a cross-cutting aspect within the human performance area, field presence, because leaders failed to reinforce standards and expectations in the work areas of the plant.

Inspection Report# : 2016008 (*pdf*)

**Significance:**  Oct 27, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Follow Operations Procedures**

The team identified a non-cited violation of Technical Specification 5.4.1.a, "Procedures," for the licensee's failure to implement procedures required by Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Specifically,

contrary to procedures, on September 23, 2016, operations personnel failed to verify adequate plant service water flow to the alternate decay heat removal heat exchangers while placing the system in service. The licensee implemented corrective actions which included high intensity training to improve nuclear worker behaviors and clarifying the directions in the procedure. The licensee entered this issue into the corrective action program as Condition Report CR-GGN-2016-08333.

The failure to implement procedures, as required by Technical Specification 5.4.1.a, was a performance deficiency. This performance deficiency was more than minor, and therefore a finding, because, if left uncorrected, the failure to implement procedures as required by Technical Specification would have the potential to lead to a more significant safety concern. Using Inspection Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process," and Inspection Manual Chapter 0609, Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Initial Screening and Characterization of Findings," the team determined that the finding was of very low safety significance (Green) because it did not affect the design or qualification of a mitigating system structure, system, or component and did not directly prevent the alternate decay heat removal system from maintaining its functionality. The team identified a cross-cutting aspect the area of human performance, challenge the unknown, because individuals failed to stop when faced with uncertain conditions and risks were not evaluated and managed before proceeding.

Inspection Report# : 2016008 (*pdf*)

**Significance:**  Aug 03, 2017

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

### **Failure to Establish an Appropriate Preventative Maintenance Procedure for the HPCS Jockey Pump**

The inspectors reviewed a self-revealed, non-cited violation of Technical Specification 5.4.1.a, for the licensee's failure to establish appropriate procedural instructions for performing preventative maintenance on the high pressure core spray jockey pump. Specifically, on January 27, 2017, the high pressure core spray jockey pump failed because the licensee did not establish a preventative maintenance procedure that prescribes oil analysis and additional performance trending for the high pressure core spray jockey pump every 6 months consistent with the licensee's preventative maintenance strategy template. On January 29, 2017, the licensee completed repairs and returned the high pressure core spray jockey pump and high pressure core spray system to operable status. The licensee has also incorporated oil analysis and performance trending into the preventative maintenance for jockey pumps. This issue has been entered into the licensee's corrective action program as Condition Report CR-GGN-2017-0917.

The failure to establish appropriate preventative maintenance instructions for the high pressure core spray jockey pump was a performance deficiency. The performance deficiency was more than minor, and therefore a finding, because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to establish appropriate preventative and predictive maintenance work instructions resulted in the unplanned inoperability and unavailability of the high pressure core spray system. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, and Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating

Systems Screening Questions," the inspectors determined that the finding resulted in a loss of system and/or function; therefore, a detailed risk evaluation was performed. A senior reactor analyst performed a detailed risk evaluation in accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings at Power." The NRC determined that the increase in core damage frequency for internal initiators was  $1.59E-7$ /year, and a bounding analysis of external initiators indicated that these events would not result in a change in the color of the finding. Therefore, this finding is of very low safety significance (Green). The analyst also determined that an estimation of large early release frequency (LERF) was required. The result was an increase in LERF of  $3.19E-8$ /year, which is of very low safety significance for LERF (Green).

This finding had a cross-cutting aspect in the area of human performance associated with consistent process because the licensee did not use a consistent, systematic approach to make decisions. Specifically, the licensee did not use a consistent approach in developing a preventative maintenance strategy for the high pressure core spray jockey pump by utilizing the approved preventative maintenance strategy template.

Inspection Report# : 2017002 (*pdf*)

**Significance:**  Jun 02, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

#### **Untimely Corrective Action**

The team identified a non-cited violation of License Condition 2.C.(41) for failure to correct a condition adverse to fire protection in a timely manner. Specifically, the licensee failed to complete evaluations of multiple spurious operations (MSO) concerns identified in 2011. The licensee entered this finding into their corrective action program as Condition Report CR GGN 2017-03996.

The failure to correct a condition adverse to fire protection in a timely manner was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external events (fire) attribute of the Mitigating Systems cornerstone and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, untimely resolution of these MSO actuations placed the facility at risk of being unable to safely shutdown the facility in response to a fire.

The finding was screened in accordance with Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," Attachment 4, "Initial Characterization of Findings," dated June 19, 2012. Because the finding affected the ability to achieve and maintain post-fire safe shutdown, the team reviewed the finding using IMC 0609, Appendix F, Attachment 1, "Fire Protection Significance Determination Process Worksheet," dated September 20, 2013. The finding was screened as a Green finding of very low safety significance in accordance with Task 1.3, "Ability to Achieve Safe Shutdown," Question A. Although the licensee failed to completely evaluate the impact of MSOs that could potentially result in the loss of suppression pool inventory, the team determined that for all fire areas one division of the residual heat removal system and the supporting standby service water system remained available along with suppression pool level indication. The team confirmed that suppression pool makeup for the standby service water system would remain available. For the postulated control room fire that led to control room evacuation, a senior reactor analyst performed a

Phase 3 evaluation to determine the risk significance of this finding. The senior reactor analyst determined this finding was of very low safety significance. The finding had a cross-cutting aspect in the Conservative Bias component of the Human Performance area because the licensee failed to use decision making-practices that emphasize prudent choices over those that are simply allowable. Specifically, the licensee reclassified a condition report to be non-adverse allowing resolution to be given a lower priority prior to completing the evaluations required to provide a technical basis for that decision.

Inspection Report# : 2017008 (*pdf*)

**Significance:**  Apr 21, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Inadequate Alternative Shutdown Procedure Timing**

The team identified a Green non-cited violation of Technical Specification 5.4.1.a for the failure to implement and maintain adequate written procedures covering a fire in the control room. Specifically, the licensee failed to maintain an alternative shutdown procedure that ensured operators could safely shut down the plant under all postulated fire scenarios within the time limits established by the thermal hydraulic analysis. The licensee entered this finding into their corrective action program as Condition Report CR-GGN-2017-04011. As an immediate compensatory measure, the license issued Standing Order 17-0010 to provide operators additional guidance.

The failure to implement and maintain adequate written procedures covering timed operator actions during a fire in the control room was a performance deficiency. The performance deficiency was more than minor because it was associated with the procedure quality attribute of the Mitigating Systems Cornerstone and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the alternative shutdown procedure failed to ensure operators could safely shut down the plant under all postulated fire scenarios within the time limits established by the thermal hydraulic analysis. The team evaluated this finding using Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013, because it affected the ability to reach and maintain safe shutdown conditions in case of a fire. A senior reactor analyst performed a Phase 3 evaluation to determine the risk significance of this finding since it involved a postulated control room fire that led to control room evacuation. The senior reactor analyst determined this finding was of very low safety significance.

The finding did not have a cross-cutting aspect since it was not indicative of present performance in that the performance deficiency occurred more than 3 years ago.

Inspection Report# : 2017008 (*pdf*)

**Significance:**  Apr 21, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Isolate Control Circuits for Safe Shutdown Equipment From the Effects of a Control Room Fire**

The team identified a Green non-cited violation of License Condition 2.C.(41) for the failure to implement and maintain in effect all provisions of the approved fire protection program. Specifically, the licensee failed to adequately isolate control circuits for safe shutdown equipment to ensure independence from the effects of a fire in the control room. The licensee entered this finding into their corrective action program as Condition Report CR GGN 2017 04028. As an immediate compensatory measure, the licensee issued Standing Order 17-0010 to provide operators additional guidance.

The failure to adequately isolate control circuits for safe shutdown equipment from the effects of a control room fire was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external events (fire) attribute of the Mitigating Systems Cornerstone and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the spurious actuation of safety relief valves would adversely affect the safe shutdown equipment relied upon to achieve and maintain safe shutdown conditions. The team evaluated this finding using Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013, because it affected the ability to reach and maintain safe shutdown conditions in case of a fire. A senior reactor analyst performed a Phase 3 evaluation to determine the risk significance of this finding since it involved a postulated control room fire that led to control room evacuation. The senior reactor analyst determined this finding was of very low safety significance.

The finding did not have a cross-cutting aspect since it was not indicative of present performance in that the performance deficiency occurred more than 3 years ago.

Inspection Report# : 2017008 (*pdf*)

**Significance:**  Apr 21, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Inadequate Alternative Shutdown Procedure Steps**

The team identified a Green non-cited violation of Technical Specification 5.4.1.a for the failure to maintain adequate written procedures covering a fire in the control room. Specifically, the licensee failed to ensure that all steps in Procedure 05-1-02-II-1, "Shutdown from the Remote Shutdown Panel," could be performed as written. Specifically, the licensee's procedure did not provide specific guidance to the control room staff on how to actuate the low pressure core spray pump breaker lockout relay. The licensee initiated Condition Report CR-GGN-2017-03368 to address the deficiency and immediately implemented Standing Order 17-0009, which provides specific guidance to the control room staff on how to actuate the low pressure core spray pump breaker lockout relay.

The failure to provide a procedure that operators understood to implement the requirements of the approved fire protection program for a fire in the control room was a performance deficiency. The performance deficiency was more than minor because it was associated with the procedure quality attribute of the Mitigating Systems Cornerstone and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the alternative shutdown procedure failed to ensure operators could safely shut down the plant during a control room fire causing circuit faults. The team evaluated this finding using Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013, because it affected the ability to reach and maintain safe shutdown conditions in case of a fire. A senior reactor analyst performed a Phase 3 evaluation to determine the risk significance of this finding since it involved a postulated control room fire that led to control room evacuation. The Senior Reactor Analyst determined this finding was of very low safety significance.

The finding did not have a cross-cutting aspect since it was not indicative of present performance in that the performance deficiency occurred more than 3 years ago.

Inspection Report# : 2017008 (*pdf*)

## **Barrier Integrity Emergency Preparedness**

**Significance:** **G** May 15, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Conduct a Drill Required by the Site Emergency Plan in 2014**

The inspectors identified a non-cited violation of 10 CFR 50.54(q)(2) associated with the licensee's failure to conduct a drill required by the site emergency plan in 2014. The licensee was required to conduct a drill involving both the site first-aid team and a local hospital. This violation is not an immediate safety concern because drills were conducted involving the site first-aid team and other drills were conducted at local hospitals. This issue has been entered into the licensee's corrective action program as Condition Report

CR-GGN-2017-00311.

The performance deficiency was more than minor, and therefore a finding, because it was associated with the emergency response organization performance (drills and exercises) cornerstone attribute and adversely affected the Emergency Preparedness Cornerstone objective of being capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The finding was evaluated using Inspection Manual Chapter 0609, Appendix B, "Emergency Preparedness Significance Determination Process," dated September 22, 2015. The finding was determined to be of very low safety significance (Green) because it was a failure to comply with NRC requirements, was not associated with the risk-significant planning standards, and was not a degraded planning standard function. The finding had a cross-cutting aspect in the area of human performance associated with training because the licensee did not maintain a workforce knowledgeable about the requirements of the emergency plan.

Inspection Report# : 2017001 (*pdf*)

## **Occupational Radiation Safety Public Radiation Safety**

**Significance:** **G** Aug 22, 2017

Identified By: NRC

Item Type: VIO Violation

### **Failure to Correct Instrument Calibration Process in a Timely Manner**

The inspectors identified a violation of 10 CFR 20.1501(c) for the failure to properly calibrate installed radiation monitors using industry accepted calibration methods and tolerances. Specifically, since January 2012, the licensee failed to properly calibrate the following radiation monitors: main steam line, containment high range, and the drywell high range. This violation was originally entered into the licensee's corrective action program in March 2015 as Condition Report CR-GGNS-2015-01832. However, in 2017, inspectors determined that subsequent to 2015, the licensee failed to implement corrective actions to properly calibrate the instruments. The licensee entered this repetitive issue into their corrective action process as Condition Report CR-GGN-2017-06826.

The failure to properly calibrate radiation monitors is a performance deficiency. The performance deficiency is more than minor because it is associated with the cornerstone attribute of plant instrumentation and adversely affects the cornerstone objective to ensure adequate protection of employee health and safety during routine civilian nuclear

reactor operation and is therefore a finding. Specifically, the failure to properly calibrate radiation monitors impacts the licensee's ability to assess dose rates. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," dated August 19, 2008, the inspectors determined the finding to be of very low safety significance because it was not an as low as reasonably achievable (ALARA) issue, there was no overexposure or substantial potential for overexposure, and the licensee's ability to assess dose was not compromised. This finding has a cross-cutting aspect in the resources component of the Problem Identification and Resolution area because the licensee did not ensure that effective corrective actions were implemented to address issues in a timely manner commensurate with the safety significance.

Inspection Report# : 2017012 (*pdf*)

**Significance:**  Aug 22, 2017

Identified By: NRC

Item Type: FIN Finding

### **Failure to Operate the Gaseous Radwaste System Within Design Specifications**

The inspectors identified a finding associated with the licensee's failure to operate the gaseous radwaste system within design specifications. These deficiencies in design specifications were associated with the off gas charcoal adsorber and vault refrigeration components of the gaseous radwaste system, which has impacted the system's reliability and efficiency since at least 2007. The design parameters for offgas flow rate into the charcoal adsorbers and vault refrigeration temperature were 30 scfm and 0 degrees Fahrenheit, respectively. In contrast, the gaseous radwaste system is being operated with an approximate flow rate is 80 scfm and vault refrigeration temperature is 15 degrees Fahrenheit. The licensee has developed a system improvement plan to address resolution of these issues during the next scheduled outages. This performance deficiency was entered into the licensee's corrective action program as Condition Report CR-GGN-2017-06875.

The failure to operate the offgas gaseous radwaste system within design specifications, resulting in elevated radiological effluent releases, is a performance deficiency. The finding is more than minor because it is associated with the plant equipment attribute of the Public Radiation Safety cornerstone and adversely affected the cornerstone objective to ensure adequate protection of public health and safety from exposure of radioactive materials released into the public domain as a result of routine civilian nuclear plant operation. Using Inspection Manual Chapter 0609, Appendix D, "Public Radiation Safety Significance Determination Process," the finding was determined to be of very low safety significance (Green) because it involved the Effluent Release Program, it did not impair the ability to assess dose, and did not exceed the 10 CFR Part 50, Appendix I, or 10 CFR 20.1301(d) limits. The finding has a cross-cutting aspect in the area of problem identification and resolution, associated with the resolution component, because the licensee failed to take effective corrective actions in a timely manner to minimize the unreliability and inefficiency of the gaseous radwaste system.

Inspection Report# : 2017012 (*pdf*)

### **Security**

The security cornerstone is an important component of the ROP, which includes various security inspection activities the NRC uses to verify licensee compliance with Commission regulations and thus ensure public health and safety. The Commission determined in the staff requirements memorandum (SRM) for SECY-04-0191, "Withholding Sensitive Unclassified Information Concerning Nuclear Power Reactors from Public Disclosure," dated November 9, 2004, that

specific information related to findings and performance indicators associated with the security cornerstone will not be publicly available to ensure that security-related information is not provided to a possible adversary. Security inspection report cover letters will be available on the NRC Web site; however, security-related information on the details of inspection finding(s) will not be displayed.

## **Miscellaneous**

Current data as of : February 01, 2018

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