

Grand Gulf 1

4Q/2014 Plant Inspection Findings

Initiating Events

Significance:  Sep 30, 2014

Identified By: Self-Revealing

Item Type: FIN Finding

Failure to Implement Corrective Actions Leads to Automatic Plant Scram

The inspectors reviewed a self-revealing finding for the licensee's failure to follow procedure EN-LI-102, "Corrective Action Process", Revision 12, which requires the licensee to appropriately complete assigned corrective actions within the prescribed time frame. On March 29, 2014, with Grand Gulf Nuclear Station operating at 87 percent power, a capacitor in a multiplier module of the main turbine overspeed protection circuit failed, causing the load reject relay to actuate. The main turbine control valves closed and an automatic actuation of the reactor protection system occurred, resulting in a plant scram. The root cause analysis noted that a corrective action initially assigned in 2007 in association with a single point vulnerability review was not completed in the prescribed time frame. The corrective action required that the module in question, which contained a single point vulnerability, either be rebuilt so as to reduce the probability that an age-related failure capable of triggering the vulnerability would occur, or replaced with a new design that eliminated the vulnerability altogether. The licensee entered this issue into the corrective action program under Condition Report CR-GGN-2014-03131. Immediate corrective actions following the scram included replacing the failed module with a spare module that had been visually inspected and functionally checked. Long term corrective actions include replacing the module with a component that does not exhibit single point vulnerability. The licensee's failure to follow procedure by failing to appropriately complete assigned corrective actions 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 Initiating Events Cornerstone and adversely affected the cornerstone objective, in that it increased the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. Using NRC Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," dated June 19, 2012, the inspectors determined that the issue affected the Initiating Events Cornerstone. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," dated June 19th, 2012, the finding was determined to be of very low safety significance (Green) because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigating equipment would not be available. The finding was a latent issue and is not reflective of present licensee performance; therefore, no cross-cutting aspect was assigned.

Inspection Report# : [2014004](#) (*pdf*)

Significance:  Jun 20, 2014

Identified By: NRC

Item Type: FIN Finding

Failure to Correct Degraded Viewing Ports in a Timely Manner

The inspectors identified a Green finding resulting from the licensee's failure to follow Procedure EN-LI-102, "Corrective Action Process," Revision 23, and Procedure EN-OP-104, "Operability Determination Process," Revision 7, for an adverse condition. The licensee failed to repair degraded viewing ports on the isophase bus ducting in a timely manner. The licensee documented this issue in their corrective action program as Condition Report CR-GGN-2013-00319.

The failure to implement adequate corrective actions in a timely manner after the discovery and evaluation that the

viewing windows on the isophase bus duct had the potential to cause a reactor scram is a performance deficiency. The performance deficiency was more than minor because it was associated with the Initiating Events cornerstone attribute of Human Performance and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during power operations. Using Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process (SDP) for Findings At Power," dated June 19, 2012, Exhibit 1, Section B, Transient Initiators, the inspectors determined that the issue has a very low safety significance (Green) because it only caused a reactor trip and did not cause a loss of mitigating equipment relied on to transition the plant from the onset of a trip to a stable shutdown condition. This finding has a cross-cutting aspect in the problem identification and resolution area, associated with operating experience, because the licensee failed to systematically and effectively collect, evaluate, and implement relevant internal and external operation experience in a timely manner [P.5].

Inspection Report# : [2014009](#) (*pdf*)

Significance:  Jun 20, 2014

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Correct A Significant Condition Adverse to Quality and Preclude Repetition

The inspectors reviewed a self-revealing, Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "corrective Action," resulting from the licensee's failure to prevent the repetition of a break of the first stage turbine sensing line, which resulted in a reactor scram. The licensee documented this issue in their corrective action program as Condition Report CR-GGN-2014-02824.

The failure to implement adequate corrective actions from the previous first stage turbine pressure sensing line break to preclude repetition of a significant condition adverse to quality was the performance deficiency. The performance deficiency was more than minor because it was associated with the Initiating Events cornerstone attribute of Human Performance and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during power operations. Using Inspection Manual Chapter 0609, Appendix A, "Significance Determination Process (SDP) for Findings At Power," dated June 19, 2012, Exhibit 1, Section B, Transient Initiators, the inspectors determined that the issue required a detailed risk evaluation by the senior reactor analyst because the violation caused a reactor trip and the loss of mitigation equipment. The licensee performed an inadequate evaluation of the root cause of the 2012 steam sensing line break, resulting in inadequate corrective actions to prevent repetition. Therefore, this violation has a cross-cutting aspect in the problem identification and resolution performance area, associated with evaluation, because the licensee failed to thoroughly evaluate the issue to ensure that resolutions address causes and extent of conditions commensurate with their safety significance [P.2].

Inspection Report# : [2014009](#) (*pdf*)

Mitigating Systems

Significance:  Dec 31, 2014

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Assure Quality Installation on RCIC Steam Line

The inspectors reviewed a self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for failure to assure quality installation of the steam line tubing of the reactor core isolation cooling (RCIC) system. Specifically, the licensee failed to assure that rated performance limits of the ferrule connection, installed at

the tee between the steam line and the pressure transmitter tube line, were met during initial installation. This failure resulted in an unplanned inoperability of the RCIC system. The licensee entered this issue into the corrective action program as Condition Report CR-GGN-2014-06792. As an immediate corrective action, the licensee replaced the tubing, the failed transmitter, and recalibrated the instruments. Furthermore, the licensee revised their system operation procedure for the RCIC system. This revision requires all steam isolation valves to be closed during this test, and that system recovery starts by opening Valve 1E51F076 (warming bypass valve around the 1E51F063) to allow adequate warming of the steam lines after isolation.

The inspectors determined that the failure to assure quality installation of the ferrule connection on the steam line flow Transmitter 1E31N083B was a performance deficiency. The performance deficiency is more than minor and therefore a finding because it is associated with the design control attribute of the Mitigating Systems Cornerstone. Specifically, failure to assure steam lines in the RCIC system meet rated performance limits, may result in the unavailability and unreliability of a system that is relied upon to respond to initiating events to prevent undesirable consequences. Using NRC Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings at Power," dated June 19, 2012, the inspectors determined that the issue required a detailed risk evaluation by the regional senior reactor analyst. This was because the finding represented an actual loss of a safety function due to the RCIC system being a single train system that was out of service for approximately 40 hours for repairs. The senior reactor analyst determined the change to the core damage frequency was $8.7E-8$ /year, and since the change to core damage frequency was less than $E-7$, no evaluation of external events or the large early release frequency was required. The finding was of very low safety significance (Green). The inspectors did not identify a cross-cutting aspect, as the performance deficiency is not reflective of current plant performance.

Inspection Report# : [2014005](#) (pdf)

Significance:  Sep 30, 2014

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Control Transient Combustible Material in Accordance with a Fire Protection Procedure

The inspectors identified a non-cited violation of License Condition 2.C(41), "Fire Protection Program," for the failure to control transient combustibles in accordance with a fire protection program procedure. On August 13, 2014, the inspectors identified unattended transient combustible material stored within a combustible exclusion zone in Fire Zone 1A222 of the auxiliary building 119' elevation. The inspectors reported the occurrence to the operations shift manager and determined licensee personnel had not performed a transient combustible evaluation of the contents of the carts. The licensee documented this issue in Condition Report CR-GGN-2014-05842. As an immediate corrective action, the licensee moved the material to an appropriate designated area.

The failure to control transient combustible material in accordance with the approved fire protection program is a performance deficiency. The performance deficiency was more than minor and therefore a finding because it was associated with the protection against external factors attribute of the Mitigating System Cornerstone and adversely affected the cornerstone objective in that the transient combustible materials decreased the external event mitigation for fire prevention. Using NRC Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," June 19, 2012, the inspectors determined that the issue affected the Mitigation Systems Cornerstone and that the finding pertained to a failure to adequately implement fire prevention and administrative controls for transient combustible materials. As a result, the inspectors were directed to Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," September 20, 2013. The inspectors evaluated the finding through Appendix F, Attachment 1, "Fire Protection Significance Determination Process Worksheet," September 20, 2013, and determined that the finding was of very low safety consequence (Green) because the Fire Prevention and Administrative Controls finding would not prevent the reactor from reaching and maintaining a safe shutdown condition. The apparent cause of this finding was incorrect assumptions and mental shortcuts or biases. This finding had a cross-cutting aspect in the human performance area associated with conservative bias, in that licensee staff failed to use decision making-practices that emphasize prudent choices over those that are simply allowable [H.14].

Inspection Report# : [2014004](#) (pdf)

Significance:  Jun 30, 2014

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Promptly Reinstate an Essential-Critical Preventative Maintenance Task for a High-Critical Component

The inspectors reviewed a self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” for the failure to promptly reinstate an essential-critical preventative maintenance task after they identified that it had been improperly retired. Specifically, the licensee did not reinstate and complete Preventive Maintenance Task PMRQ 50024451-04 prior to the failure of diode CR6 on May 21, 2013, which resulted in the division 2 diesel generator failing its monthly functional test and the licensee declaring it inoperable. The operators secured the diesel generator and wrote Condition Report CR-GGN-2013-03423 documenting the issue. The licensee performed a

Failure Modes Analysis evaluation to determine the possible cause for the observed conditions. During troubleshooting efforts, the licensee addressed the potential transformer (PT1), the potential transformer’s fuses, inline fuses, and the voltage regulator circuit bridge diodes. The Failure Modes Analysis evaluation showed that all of the listed components were in satisfactory condition, except that one of the six diodes used in the voltage regulator circuit diode bridge, Diode CR6, had shorted. The licensee replaced the shorted diode and returned the diesel generator to operational status on May 24, 2013.

The licensee’s failure to implement PMRQ 50024451-04 after discovering it had been improperly retired was a performance deficiency, in that it represented a failure to promptly correct a condition adverse to quality. The performance deficiency is more than minor and therefore a finding because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone’s objective of ensuring the availability, reliability, and capability of systems that respond to prevent undesirable consequences. Specifically, Diode CR6 remained in the voltage regulator circuit bridge until it failed, thereby triggering a failure of the division 2 diesel generator, which caused the diesel generator to be inoperable. Using NRC Inspection Manual Chapter 0609, Attachment 4, “Initial Characterization of Findings,” dated June 19, 2012, the inspectors determined that the issue affected the Mitigating Systems Cornerstone. In accordance with NRC Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings at Power,” dated June 19, 2012, the inspectors determined that the issue required a detailed risk evaluation because the finding represents an actual loss of function of a single train for greater than its Technical Specification allowed outage time. The total exposure period was 15 days. The allowed outage time was 14 days. The senior reactor analyst performed a detailed risk analysis and determined the delta-CDF was less than 1.0×10^{-6} and the delta-LERF was less than 1.0×10^{-7} , therefore this finding was of very low safety significance (Green). The apparent cause of this finding was that the licensee did not recognize the risk of not performing the preventive maintenance task, which led to the decision to exclude the task from the division 2 allowed outage time schedule. Therefore, the finding has a cross-cutting aspect in the human performance area associated with conservative bias because the licensee did not use decision-making practices that emphasize prudent choices over those that are simply allowable.

Inspection Report# : [2014003](#) (*pdf*)

Significance:  May 02, 2014

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Provide Adequate Emergency Lighting

The team identified a Green non-cited violation of License Condition 2.C.(41), “Fire Protection Program,” for the failure to provide adequate 8-hour emergency lights. Specifically, the licensee failed to provide adequate lighting at all locations operators perform actions within 8 hours during an alternative shutdown outside of the control room. The licensee entered this issue into their corrective action program as Condition Report CR-GGN-2014-03508 and confirmed operators are required to carry flashlights.

The failure to provide adequate 8-hour emergency lights for safe shutdown outside of the control room 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 because it affected the ability to reach and maintain safe shutdown conditions in case of a fire. The team evaluated this finding using Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013. The team assigned the finding a low degradation rating because the failure to provide adequate 8-hour emergency lights at all locations would not prevent reaching and maintaining safe shutdown conditions in the event of a control room fire. Specifically, the team determined that operators performing the alternative shutdown are required to carry flashlights. Because this finding had a low degradation rating, it screened as having very low safety significance (Green).

The team reviewed Inspection Manual Chapter 0310 and assigned a cross-cutting aspect in the area of Human Performance for failure to ensure equipment was available and adequate to support nuclear safety. Specifically, the Licensee added steps to operate breakers in an electrical panel in 2005 and 2012. On both occasions the Licensee failed to provide adequate emergency lighting at that location as required by the fire protection program [H.1].

Inspection Report# : [2014007](#) (*pdf*)

Significance:  Mar 31, 2014

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Ensure Scaffold Activity Would not Interfere with Fire Brigade Response

The inspectors identified a non-cited violation of License Condition 2.C(41), "Fire Protection Program," for the failure to adhere to procedural requirements to ensure that scaffold installed in the plant would not prevent or restrict the fire brigade from accessing a certain route used for response to a fire in the area. On February 4, 2014, the licensee installed a scaffold in the containment building for an inspection. The licensee's procedure required a walkdown of proposed scaffold to determine if the scaffold would prevent or restrict fire brigade access. The initial reviewer identified that the ladder to access the scaffold would restrict fire brigade access, thus the ladder was not installed until it was required. On March 1, 2014, the ladder was installed for the four hour inspection. Once completed, the licensee failed to remove the scaffold ladder to restore normal access to the area. On March 4, 2014, the inspectors identified that the scaffold ladder was still installed. The inspectors brought their concern to the licensee, who determined that the scaffold would adversely affect the response of fire brigade members to that area of containment. As an immediate corrective action, the licensee removed the scaffold ladder to allow adequate access for the fire brigade members. The licensee documented this issue in Condition Report CR-GGN-2014-02363.

The failure to ensure fire brigade members had adequate access passed a scaffold installed in the containment building was a performance deficiency. The performance deficiency was more than minor and therefore a finding because it adversely impacted the protection against external factors attribute of the Mitigating System Cornerstone in that the fire brigade's inability to gain access to certain areas in containment could result in preventing prompt extinguishing of fires. Using NRC Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," June 19, 2012, the inspectors determined that the issue affected the Mitigating Systems Cornerstone and that the finding pertained to a degraded condition while the plant was shutdown for refueling outage RF19. As a result, the inspectors were directed to Inspection Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process," dated February 28, 2005. The inspectors determined that Appendix G did not address fire brigade issues and solicited input from the senior reactor analyst. The senior reactor analyst performed a detailed risk evaluation and determined that Inspection Manual 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," June 19, 2012, Exhibit 2, "Mitigating System Screening Questions," adequately bounded the performance deficiency. The inspectors determined that the finding involved the response time of the fire brigade to a fire, and the finding was of very low safety consequence (Green) because the fire brigade's response time was mitigated by other defense-in-depth elements such as area combustible limits were not exceeded, installed fire detection systems were functional, and alternate means of safe shutdown were not impacted. Specifically, there were no combustibles in the

area beyond limits, all fire detectors for the area were functional, and the plant was in a shutdown condition with the cavity flooded at the time. The apparent cause of this finding was the work groups involved did not communicate the significance of the impact the scaffold ladder had on fire brigade access to the area and the importance of having the ladder removed upon completion of the work. Therefore, the finding has a cross-cutting aspect in the human performance area associated with team work, in that the individuals and workgroups failed to communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety was maintained.

Inspection Report# : [2014002](#) (*pdf*)

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Significance:  Mar 31, 2014

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to Control a Locked High Radiation Area Due to Unsecured Highly Radioactive Materials Stored in the Pool

The inspectors reviewed a self-revealing, non-cited violation of Technical Specification 5.7.3, resulting from the licensee's failure to control a high radiation area with radiation levels greater than 1000 millirem per hour. As immediate corrective actions, the licensee stopped the work activity, placed a senior radiation protection technician in control of the area, surveyed all affected areas, and properly posted and controlled the area. The licensee also checked qualifications of the involved individuals and conducted a root cause evaluation for the event. This event was documented in the licensee's corrective action program as Condition Reports CR-GGN-2014-02219, CR-GGN-2014-02221, and CR-GGN-2014-02224.

The failure to control a high radiation area with radiation levels greater than 1000 millirem per hour was a performance deficiency and a violation of Technical Specification 5.7.3. The performance deficiency was more than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of program and process (exposure control) and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation because it removed a barrier intended to prevent the worker from receiving unexpected dose. Using Inspection Manual Chapter 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," dated August 19, 2008, the inspectors determined the violation has very low safety significance because: (1) it was not an as low as is reasonably achievable (ALARA) finding, (2) there was no overexposure, (3) there was no substantial potential for an overexposure, and (4) the ability to assess dose was not compromised. This violation has a cross-cutting aspect in the human performance area, associated with procedure adherence, because the licensee failed to follow process, procedures, and work instructions when they did not inventory and ensure control of the dry tube plunger end as it was stored in the horizontal fuel transfer system pool within containment.

Inspection Report# : [2014002](#) (*pdf*)

Public Radiation Safety

Security

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the [cover letters](#) to security inspection reports may be viewed.

Miscellaneous

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