Brunswick 1
3Q/2014 Plant Inspection Findings

Initiating Events

Mitigating Systems

Significance: G Jun 30, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Include Flood Protection Features in the Maintenance Rule Program
An NRC-identified Green non-cited violation (NCV) of 10 CFR 50.65(b)(2)(ii) was identified for the failure of the licensee to scope flood protection features in the maintenance rule (MR) program. Specifically, from July 10, 1996, to May 8, 2014, the licensee failed to include floor drain flood protection features in the MR program that are nonsafety-related but whose failure could prevent safety-related structures, systems, and components (SSCs) from fulfilling their safety-related function. The licensee's corrective actions included scoping the floor drains into the MR program. The licensee entered this issue into the corrective action program (CAP) as nuclear condition report (NCR) 677850.

The inspectors determined that the failure of the licensee to monitor flood protection features in the MR program, as required by 10 CFR 50.65(b)(2)(ii), was a performance deficiency. The finding is more than minor because it is associated with the protection against external factors (i.e. flood hazard) attribute of the Mitigating Systems Cornerstone and adversely affects the cornerstone objective of ensuring the availability, reliability, and capability of the safety related systems to respond to initiating events to prevent undesirable consequences. Specifically, the finding is more than minor because failing to monitor flood protection features resulted in degradation of various flood protection features which could have impacted safety-related equipment. Using IMC 0609, Appendix A, issued June 9, 2012, The SDP for Findings At-Power, Exhibit 2, the inspectors determined the finding is of very low safety significance (Green) because it did not represent an actual loss of function of one or more non-TS trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. The finding has a cross-cutting aspect in the area of problem identification and resolution associated with the resolution attribute because the organization failed to take effective corrective actions to address issues in a timely manner commensurate with their safety significance. Specifically, the licensee failed to scope the credited flood protection floor drains into the MR program. [P.3]

Inspection Report# : 2014003 *(pdf)*

Significance: G Dec 31, 2013
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Design Control for Required Service Water Flow to the Emergency Diesel Generators
An NRC-identified Green NCV of 10 CFR Part 50, Appendix B, Criterion III, Design Control, was identified for the failure of the licensee to verify the adequacy of design of the emergency diesel generator (EDG) service water flow. Specifically, from May 1, 1989, until October 28, 2013, Calculation M-89-0008, contained non-conservative values for EDG maximum loading, service water inlet temperatures, and heat exchanger fouling factor, resulting in a non-

conservative calculation for required service water flow to the EDG jacket water heat exchanger, which called into question the operability of EDG 3. The licensee re-performed Calculation M-89-0008 and determined EDG 3 was operable. The licensee entered this issue into the corrective action program (CAP) as nuclear condition report (NCR) 592035.
The inspectors determined that the failure of the licensee to have an accurate calculation for required service water flow to the EDG jacket water heat exchanger was a performance deficiency. The finding was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the non-conservative calculation called into question the operability of EDG 3. Using IMC 0609, Appendix A, issued June 19, 2012, the SDP for Findings At-Power, the inspectors determined the finding was of very low safety significance (Green) because the finding did not affect the design or qualification of a mitigating structures, systems, and components (SSC), the finding did not represent a loss of system and/or function, the finding did not represent an actual loss of a function of a single train for greater than the technical specification (TS) allowed outage time, the finding did not represent an actual loss of a function of one or more non-TS trains of equipment, and did not screen as potentially risk-significant due to a seismic, flooding, or severe weather initiating event. The finding has a cross-cutting
aspect in the area of human performance associated with the resources attribute because the licensee did not have complete, accurate and up-to-date design documentation for EDG service water flow. Specifically, due to the inspector's questions, Calculation M-89-0008 required revision due to non-conservatisms in August 2013 and in November 2013. H.2(c)

Inspection Report# : 2013005 *(pdf)*

Significance: G Dec 31, 2013
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Procedure to Perform Preventative Maintenance on the Residual Heat Removal Room Coolers
A self-revealing Green NCV of TS 5.4.1a, Procedures, was identified for the failure of the licensee to have an adequate procedure for preventative maintenance on the 1B residual heat removal (RHR) room cooler damper limit switch. Specifically, between May 1990 and September 26, 2013, the licensee did not have an adequate preventative maintenance procedure to replace the 1B RHR room cooler damper limit switch and to tighten the paddle arm on the limit switch. This resulted in the failure of the 1B RHR room cooler to start and the inoperability of the 1B RHR train. The licensee replaced the limit switch on the damper, tightened the paddle arm on the limit switch, returned the room cooler to operable, and entered this issue into the CAP as NCR 607986.

The inspectors determined that the failure of the licensee to have an adequate procedure to replace the 1B RHR room cooler limit switch and tighten the limit switch paddle arm was a performance deficiency. The finding was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to replace the limit switch and tighten the limit switch paddle arm resulted in a failure of the cooler fan and damper, and the inoperability of the 1B RHR train. Using IMC 0609, Appendix A, issued June 19, 2012, the SDP for Findings At-Power, the inspectors determined the finding was of very low safety significance (Green) because the finding did not affect the design or qualification of a mitigating SSC, the finding did not represent a loss of system and/or function, the finding did not represent an actual loss of a function of a single train for greater than the TS allowed outage time, the finding did not represent an actual loss of a function of one or more non-TS trains of equipment, and did not screen as potentially risk-significant due to a seismic, flooding, or severe weather initiating event. The finding does not have a cross-cutting aspect since the performance deficiency is not indicative of current plant performance. Vendor Manual QTR155, NAMCO Controls, which required periodic replacement of the limit switch and checking the limit switch for tightness was provided to the licensee in May 1990.

Inspection Report# : 2013005 *(pdf)*

Significance: G Dec 31, 2013
Identified By: NRC
Item Type: VIO Violation
Failure to Identify and Correct Flood Protection Degradation in Safety-Related Buildings
The NRC identified an AV of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, with two examples. The first example involved the failure of the licensee to promptly identify and correct conditions adverse to quality associated with flood protection of multiple safety-related buildings. Specifically, the licensee failed to promptly identify or correct safety-related buildings that contained openings that would have adversely impacted their ability to mitigate external flooding of these buildings in the event of a design basis probable maximum hurricane (PMH). The second example involved the failure of the licensee to correct a significant condition adverse to quality. Specifically, the licensee failed to implement a corrective action to preclude repetition by not adequately developing an engineering program to mitigate the consequences of external events (flooding, high winds, and seismic) that ensured appropriate equipment classifications, with interfacing programs of maintenance rule (MR) and zero tolerance for equipment failures.

This resulted in a violation of technical specification (TS) 3.7.2, Service Water (SW) System and Ultimate Heat Sink, and TS 3.5.2, Emergency Core Cooling System (ECCS) – Shutdown, since the inoperability of the required number of service water pumps (SWPs) would violate TS 3.7.2, and TS 3.5.2 since SW cools the residual heat removal (RHR) system heat exchangers.

The inspectors determined the failure to identify and correct the missing and degraded flood barriers in multiple safety-related buildings, and the failure to implement a corrective action to preclude repetition by not developing an engineering program to mitigate the consequences of external events that ensured appropriate equipment classifications, with interfacing programs of MR and zero tolerance for equipment failures, was a performance deficiency. The finding was more than minor because it was associated with the protection against external factors attribute (flood hazard) of the
Mitigating Systems Cornerstone and adversely affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, nine of the ten Unit 1 and Unit 2 SWPs would be potentially inoperable and unavailable during specified PMH events. Because the finding involved reactor shutdown operations and conditions, IMC 0609, Appendix G, Shutdown Operations Significance Determination Process (SDP), Attachment 1, issued May 25, 2004, Phase 1 Operational Checklists for Both pressurized water reactors (PWRs) and boiling water reactors (BWRs), was used. The inspectors used Checklist 5, BWR Hot Shutdown: Time to Boil < 2 Hours, and determined the finding increased the likelihood that a loss of decay heat removal (DHR) will occur due to failure of the system itself or support systems, degraded the licensee's ability to cope with a loss of offsite power (LOOP), degraded the licensee's ability to add reactor coolant system (RCS) inventory when needed, and degraded the licensee's ability to establish an alternate core cooling path if DHR could not be re-established for 24 hours. Further, the performance deficiency involved external events. Consequently a Phase 2 analysis could not be performed and the issue screened directly to a Phase 3 analysis. The significance of this issue is "To Be Determined" (TBD) and its final significance will be dispositioned in separate transmittal. The issue is not an immediate safety concern because the licensee has taken appropriate corrective actions. The finding has a cross-cutting aspect in the area of human performance associated with the field presence attribute because deviations from standards and expectations were not corrected promptly, and the licensee did not ensure supervisory and management oversight of work activities, including contractors. Specifically, licensee management failed to ensure degradation associated with flood protection of the safety-related buildings was identified and corrected. [H.2] (Section 1R01.1)

Inspection Report# : 2014011 *(pdf)*

Inspection Report# : 2013010 *(pdf)*

Significance: G Dec 31, 2013
Identified By: NRC
Item Type: FIN Finding
Inadequate Procedures for Inspecting Flood Protection Doors and Performing Functionality Assessments
An NRC-identified Green finding for the failure to meet the requirements of licensee procedure PRO-NGGC-0201, NGG Procedure Writer's Guide, was identified with two examples. Specifically, the licensee failed to provide an adequate procedure with appropriate acceptance criteria to inspect flood protection doors for leakage and failed to have an adequate procedure to perform functionality assessments which met the requirements specified in Procedure PRO-NGGC-0201. The licensee entered these issues into the corrective action program (CAP) as nuclear condition reports (NCRs) 631303, and 563113 and 580629, respectively.

The inspectors determined that the failure of the licensee to provide an adequate procedure to inspect flood protection doors for leakage and to have an adequate procedure which met the requirements of licensee Procedure PRO-NGGC-0201 to perform functionality assessments was a performance deficiency. The finding is more than minor because it is associated with the protection against external factors (i.e., flood hazard) attribute of the Mitigating Systems Cornerstone and adversely affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the flood protection door and flood penetration seals were missing or degraded which could have resulted in a flood pathway into the high pressure coolant injection (HPCI) system room and service water building (SWB) during a PMH. Using IMC 0609, Appendix A, issued June 9, 2012, The SDP for Findings At-Power, the inspectors determined the finding screened to Green because the individual door and penetration seal degradations did not involve the total loss of any safety function, identified by the licensee through a probabilistic risk assessment (PRA), individual plant examination of external events (IPEEE), or similar analysis, that contributes to external event initiated core damage accident sequences (i.e., initiated by a seismic, flooding, or severe weather event). The finding has a cross-cutting aspect in the area of human performance associated with the documentation attribute because the licensee failed to create and maintain complete, accurate and, up-to-date documentation to inspect flood protection doors and perform functionality assessments. [H.7] (Section 1R01.2)

Inspection Report# : 2013010 *(pdf)*

Significance: G Dec 31, 2013
Identified By: NRC
Item Type: FIN Finding
Failure to Perform Functionality Assessments for flood Protection Features
An NRC-identified Green finding was identified for the failure of the licensee to follow Procedure OPS-NGGC-1305, Operability Determinations, to perform functionality assessments for degraded or non-conforming flood protection features. Specifically, the licensee failed to perform functionality assessments for flood protection features, including EDG building conduit seals and Unit 2 HPCI sump pump failures. The licensee entered these issues into the CAP as NCRs 613354 and 631442.

The inspectors determined the failure to follow Procedure OPS-NGGC-1305, to perform functionality assessments for degraded or non-conforming flood protection features, was a performance deficiency. The finding is more than minor because it is associated with the protection against external factors (i.e., flood hazard) attribute of the Mitigating Systems Cornerstone and adversely affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the failure to perform functionality assessments for degraded or non-conforming flood protection features could have resulted in a flood pathway into the HPCI room and EDG building during a PMH. Using IMC

0609, Appendix A, issued June 9, 2012, The SDP for Findings At-Power, the inspectors determined the finding screened to Green because the resulting individual functional assessments did not involve the total loss of any safety function, identified by the licensee through a PRA, IPEEE, or similar analysis, that contributes to external event initiated core damage accident sequences (i.e., initiated by a seismic, flooding, or severe weather event). The finding has a cross-cutting aspect in the area of human performance associated with the procedure adherence attribute because the licensee did not follow processes, procedures, and work instructions. Specifically, the licensee revised Procedure OPS-NGGC-1305 for performing functionality assessments but did not effectively communicate the new procedural requirements to operations personnel such that functionality assessments were performed when required. [H.8] (Section 1R01.3)

Inspection Report# : 2013010 *(pdf)*

Significance: G Oct 23, 2013
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Acceptance Criteria for the Class 1E Station Battery Service Capacity Test Procedure
The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to incorporate adequate acceptance criteria in the Class 1E station battery service test procedures. This failure to incorporate adequate acceptance criteria was a performance deficiency. The licensee entered this issue into their corrective action program as nuclear condition reports 632998 and 630621. The licensee performed a prompt determination of operability to verify that the batteries would be capable of supplying the necessary voltage to safety-related direct current loads at the required time intervals specified in design bases calculations.

The performance deficiency was determined to be more than minor because it was associated with the Design Control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, using an acceptance criterion of 105 volts direct current during the service test could result in incorrectly declaring a Class 1E station battery operable when greater terminal voltages, as specified in design bases calculations, were necessary for safety-related equipment to operate during the first minute of a design basis accident. The team determined the finding to be of very low safety significance (Green) because the finding was a deficiency affecting the design or qualification of a mitigating structure, system, or component which maintained its operability or functionality. The team determined that no cross-cutting aspect was applicable because the finding was not indicative of current licensee performance.
Inspection Report# : 2013007 *(pdf)*

Significance: G Oct 23, 2013
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate DC System Calculations – Three Examples
The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," with three examples, for the licensee's failure to properly incorporate the design and licensing bases for the 125 volt direct current system into design calculations. This failure to properly incorporate the design and licensing bases for the 125 volts direct current system into design calculations was a performance deficiency. The licensee entered these issues into their corrective action program as nuclear condition reports 632998, 630621, 633538, and 633889. The licensee conducted a combination ofprompt determinations of operability and engineering evaluations which provided reasonable expectation of operability of the direct current system pending final resolution.

The performance deficiency was determined to be more than minor because it was associated with the Design Control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the

availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, there was reasonable doubt as to whether direct current system components would have adequate voltage to operate during design basis accidents. The team determined the finding to be of very low safety significance (Green) because the finding was a deficiency affecting the design or qualification of a mitigating structure, system, or component which maintained its operability or functionality. The team determined that no cross-cutting aspect was applicable because the finding was not indicative of current licensee performance.
Inspection Report# : 2013007 *(pdf)*

Significance: G Oct 23, 2013
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Verify Adequacy of the Service Water Intake Structure Ventilation System
The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to verify the adequacy of the service water intake structure ventilation design through calculational methods. This failure to verify the adequacy of the service water intake structure ventilation design was a performance deficiency. The licensee entered this issue into their corrective action program as nuclear condition report 627708. The licensee performed a prompt determination of operability and implemented a number of compensatory actions to ensure safety-related components in the intake structure would not fail under the worst case high temperature conditions.

The performance deficiency was determined to be more than minor because it was associated with the Design Control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, there was reasonable doubt as to whether safety-related components in the service water intake structure would be operable under design temperatures. The team determined the finding to be of very low safety significance (Green) because the finding was a deficiency affecting the design or qualification of a mitigating structure, system, or component which maintained its operability or functionality. The team determined that no cross-cutting aspect was applicable because the finding was not indicative of current licensee performance.
Inspection Report# : 2013007 *(pdf)*

Significance: G Oct 23, 2013
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Scope Safety-related Components in the Maintenance Rule Program
The team identified a non-cited violation of 10 CFR 50.65(b)(1), for the licensee's failure to scope the safety-related service water intake structure exhaust fan dampers into the Maintenance Rule program. This failure to scope safety-related service water intake structure exhaust fan dampers was a performance deficiency. The licensee entered this issue into their corrective action program as nuclear condition reports 630922, 627708, 630553, and 630993. The licensee has subsequently implemented corrective actions to include the dampers within the scope of the Maintenance Rule program.

The performance deficiency was determined to be more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, numerous dampers were found in degraded conditions such that effective control of performance or condition through appropriate preventive maintenance under 10CFR 50.65(a)(2) could not be demonstrated. The team determined the finding to be of very low safety significance (Green) because the finding did not result in an actual loss of function of at least a single service water system train for greater than its technical specifications allowed outage time. The team determined that no cross-cutting aspect was applicable because the

finding was not indicative of current licensee performance.
Inspection Report# : 2013007 *(pdf)*

Significance: G Oct 23, 2013
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Follow Plant Procedure Directing the Performance of Preventive Maintenance on Safety-related Dampers
The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to follow plant procedures specifying requirements for preventive maintenance of safety-related dampers. This failure to follow plant procedures was a performance deficiency. The licensee entered this issue into their corrective action program as nuclear condition reports 631376, 628132, 633710, and 631711. The licensee performed an immediate determination of operability to verify the as-found condition of the dampers did not affect operability of equipment inside the diesel generator building and implemented corrective actions to complete the missed preventive maintenance on the dampers.

The performance deficiency was determined to be more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the programmatic failure to perform preventive maintenance on the nine dampers resulted in decreased availability and reliability of the dampers such that multiple dampers were found in degraded conditions. The team determined the finding to be of very low safety significance (Green) because the finding did not result in an actual loss of function of at least a single emergency diesel generator for greater than its technical specifications allowed outage time. The team determined that this finding was associated with the cross-cutting aspect of Supervisory Oversight in the Work Practices component of the Human Performance area because Brunswick supervisors did not enforce the scheduled preventive maintenance nor did they ensure a justification for not performing preventive maintenance on safety-related components. [H.4(c)]
Inspection Report# : 2013007 *(pdf)*

Barrier Integrity

Emergency Preparedness

Significance: G Jun 30, 2014
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Maintain a Standard Emergency Action Level Scheme for Flooding
An NRC-identified Green NCV of 10 CFR 50.54(q)(2), 10 CFR 50.47(b)(4), and the requirements of Appendix E to 10 CFR Part 50, was identified for the failure of the licensee to maintain the effectiveness of the emergency plan. Specifically, from November 6, 2009, to July 21, 2014, the licensee failed to maintain in effect, a standard emergency action level (EAL) scheme by failing to provide effective means for determining flooding water levels which is required to properly classify an ALERT during a probable maximum hurricane (PMH). The licensee's corrective actions include painting level indication on the service water building visible to the operator stationed at the service water building to determine when the ALERT flood level is reached. The licensee entered this issue into the CAP as

NCRs 688613 and 693590.

The inspectors determined that the failure to provide reliable and timely indication for operators to adequately implement the ALERT flooding EAL HA 1.5 was a performance deficiency. The finding is more than minor because it is associated with the Facilities and Equipment attribute of the Emergency Preparedness (EP) cornerstone and affected the cornerstone objective to ensure the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, the licensee's ability to classify an ALERT for a flooding event was adversely affected because flood levels could not be adequately determined. In accordance with the IMC 0609, Appendix B, "Emergency Preparedness Significance Determination," issued February 24, 2012, and Figure 5.4-1, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency was a condition where an EAL has been rendered ineffective such that an ALERT would not be declared for a flooding event. The finding has a cross-cutting aspect in the area of human performance associated with the resources attribute because leaders failed to ensure that personnel, equipment, procedures, and other resources are available and adequate to support nuclear safety and declare an ALERT for a PMH. [H.1]

Inspection Report# : 2014003 *(pdf)*

Occupational Radiation Safety

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

Last modified : November 26, 2014