

## Waterford 3

### 4Q/2015 Plant Inspection Findings

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## Initiating Events

**Significance:** G Oct 03, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Properly Pre-Plan and Perform Maintenance on the Core Element Assembly Calculators**

The inspectors reviewed a self-revealing, Green, non-cited violation of Technical Specification 6.8.1.a associated with the licensee's failure to properly pre-plan and perform maintenance in accordance with EN-DC-153, "Preventative Maintenance Component Classification." The licensee entered this condition into their corrective action program as condition report CR-WF3-2015-06438. In their review of the event, the licensee found that, as part of a maintenance-optimization program in 2008, they had changed the classification of the CEACs from "High Critical" to "Low Critical." Consequently, the licensee discontinued the preventive-maintenance programs that had previously affected the CEACs, and had begun replacing them only as required. The licensee restored compliance by properly classifying the components as High Critical in accordance with EN-DC-153, Revision 2, and by initiating development of appropriate preventative-maintenance for the CEACs. In addition, the licensee initiated work to improve the reliability of the CEACs, including reviewing card refurbishments to enhance circuit card reliability.

The failure to pre-plan and perform preventative maintenance on CEAC components as required by EN-DC-153 step 5.2[6](c)(4) was a performance deficiency which was reasonably within the licensee's ability to foresee and correct. The performance deficiency is more than minor, and therefore is a finding, because it is associated with the Equipment Performance attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, inappropriate preventative maintenance on the circuit cards associated with the CEACs ultimately contributed to a plant trip on October 3, 2015. The inspectors screened the finding in accordance with NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process." Using IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," the inspectors determined that the finding was of very low significance (Green) because the finding did not cause a trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition.

Because the performance deficiency occurred in 2008, the inspectors concluded that the finding does not reflect current licensee performance and therefore did not assign a cross-cutting aspect.

Inspection Report# : [2015004](#) (*pdf*)

**Significance:** G Apr 24, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Identify and Secure Potential Tornado-Borne Missile Hazards**

The inspectors identified a non-cited violation of Technical Specification 6.8.1.a and Regulatory Guide 1.33, Revision 2, Appendix A, for the licensee's failure to follow procedure OP-901-521, "Severe Weather and Flooding," Revision 313. Specifically, on April 24, 2015, the licensee failed to assess and control potential tornado-borne missile hazards on-site as

required by the procedure. The licensee entered this condition into their corrective action program as condition report CR-WF3-2015-02556. The licensee restored compliance by securing the identified hazards.

This finding was more than minor because it was associated with the protection against external factors attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective of limiting the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, in the event of a tornado at the site, the loose items could have become missiles with the potential to initiate a loss of off-site power adversely impacting safety-related equipment and personnel. The inspectors performed the initial significance determination for the finding using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 4, "External Event Screening Questions," dated June 12, 2012. The finding required a detailed evaluation because it had the potential to degrade at least one train of a system that supports a risk significant system or function. Therefore, a senior reactor analyst performed a bounding detailed risk evaluation. The analyst determined that the finding was of very low safety significance (Green). The bounding change to the core damage frequency was less than  $1.1E-7$ /year. The finding was not significant with respect to the large early release frequency. The dominant core damage sequences included tornado induced losses of off-site power, and random and common cause diesel generator failures. The ability to recover the diesel generators helped to minimize the significance of the event. The finding has a Resolution cross-cutting aspect in the area of Problem Identification and Resolution, because the licensee did not take effective corrective actions to address issues in a timely manner commensurate with their safety significance. Specifically, the licensee did not take effective corrective actions to address the issue after the inspectors identified it during previous tornado watches in 2013 and 2014.

Inspection Report# : [2015002](#) (pdf)

## Mitigating Systems

**Significance:**  Sep 30, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Establish Design Control Measures for Safety-Related Emergency Feedwater System Valves**

The inspectors reviewed a self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," because the licensee failed to verify the adequacy of the design of the emergency feedwater system. As a result, on June 3, 2015, following a manual plant trip that occurred due to a loss of the main feedwater system, the emergency feedwater back-up flow control valves oscillated so severely that control room personnel removed the system from automatic operations and manually controlled flow to the steam generators. The licensee entered this condition into their corrective action program as condition report CR-WF3-2015-03565. Long term corrective actions are to

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develop a modification to the system for better flow control, and complete testing that would demonstrate the automatic function of these valves.

The performance deficiency is more than minor because it is 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, the failure to ensure that the safety-related emergency feedwater back-up flow control valves would

perform as designed, impacted the system's ability to perform its safety function during the feedwater loss event on June 3, 2015. A bounding detailed risk evaluation determined that the finding was of very low safety significance (Green) and was not significant to the large early release frequency. The dominant sequences included losses of off-site power, failure of the backup essential feedwater valves in the closed direction, and random failures of the primary essential feedwater flow control valves in the closed direction. The primary essential feedwater flow control valves and the diversity of the emergency feedwater system helped to minimize the risk.

The finding does not have a cross-cutting aspect because the most significant contributor to the performance deficiency of not identifying the design flaws or the need for a test occurred more than two years ago and did not reflect current licensee performance.

Inspection Report# : [2015003](#) (*pdf*)

**Significance:**  Sep 30, 2015

Identified By: NRC

Item Type: FIN Finding

### **Failure to Follow Procedures when Changing Materials Used for Feedwater Heater Level Control Valves**

Inspection Report# : [2015003](#) (*pdf*)

**Significance:**  Sep 17, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Inadequate Procedures for a Design Basis Tornado Event**

Green. The team identified two examples of a Green, non-cited violation of Technical Specification 6.8.1, which states, in part, "Written procedures shall be established, implemented, and maintained, covering the activities including procedures recommended in Regulatory Guide 1.33, Revision 2, Appendix A.6.w, Acts of Nature (e.g., tornado, flood, damn failure, earthquakes)." Specifically, in the first example, prior to August 27, 2015, the licensee failed to establish adequate procedures to ensure the manual actions required within specified time limits can be completed before full draindown of the ultimate heat sink (wet cooling tower basins) after a tornado event. In the second example, prior to August 27, 2015, the licensee failed to establish adequate procedures to clarify whether the main steam isolation valve area was considered outdoors and therefore subject to the requirements for unmonitored items stored in the protected area. Unsecured scaffold material stored in this area had not been evaluated for potential to become projectiles and endangering nearby safety-related equipment during high winds. In response to this issue, the licensee inspected the area and secured all loose debris. This finding was entered into the licensee's corrective action program as Condition Reports CR-WF3-2015-05624 and CR-WF3-2015-05601.

The team determined that the failure to maintain adequate procedures to ensure compliance with technical specifications and Regulatory Guide 1.33 was a performance deficiency. This finding was more than minor because it was associated with the procedure quality 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 licensee failed to establish adequate procedures to ensure availability of mitigating equipment during and after an event involving acts of nature. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, Exhibit 2, "Mitigating Systems Screening Questions." The issue screened to Exhibit 4, "External Events Screening Questions," because both examples involved a design basis tornado. Per Exhibit 4, the issue screened to a more detailed risk evaluation because: 1) the first issue could starve safety systems of water, failing the safety function, and 2) the second issue could cause a plant trip and a loss of condenser heat sink initiating event. Therefore, the Region IV senior reactor analyst performed a more detailed risk evaluation that included both issues. Given that there was no change in core damage frequency for the first issue, and the change in core damage frequency for the second example was

1.2 x 10<sup>-9</sup> per year, combined, the analyst determined that the finding was of very low safety significance (Green). This finding had a cross-cutting aspect in the area of problem identification and resolution, evaluation, because the licensee failed to thoroughly evaluate issues to ensure that resolutions address causes and extent of conditions commensurate with their safety significance (P.2).

Inspection Report# : [2015008](#) (*pdf*)

**Significance:**  Mar 02, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Follow Instructions in Painting Procedure while Painting on Safety-Related Equipment**

The inspectors reviewed a self-revealing non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to follow procedure PMC-002-007, "Maintenance and Construction Painting," while performing work on emergency diesel generator A. Specifically, while conducting painting activities in the emergency diesel generator cubicle between June 2014 and October 2014, the licensee failed to ensure that painting activities would not have an adverse impact on the moving parts and surfaces of the emergency diesel generator. Consequently, emergency diesel generator A failed to operate properly during a surveillance test on March 2, 2015. Immediate corrective actions included replacing the cylinder 7R fuel injector and fuel injection pump. The licensee restored emergency diesel generator A to operable status on March 4, 2015. The licensee entered this issue into their corrective action program as CR-WF3-2015-02626.

This finding was more than minor because it was associated with the human performance 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, the licensee conducted painting on and around the emergency diesel generator in such a manner that paint was inadvertently deposited and remained in a location which caused the cylinder 7R fuel metering rod to jam at the full-fuel position, which ultimately caused emergency diesel generator A to fail its surveillance test on March 2, 2015, and be declared inoperable. Using NRC Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined that this finding was of very low safety significance (Green) because it did not represent a design or qualification deficiency, did not represent a loss of safety function for a single train for greater than its technical specification allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a Field Presence cross-cutting aspect in the area of Human Performance in that the licensee failed to provide adequate supervisory and management oversight of work activities to ensure deviations from standards and expectations were corrected promptly.

Inspection Report# : [2015002](#) (*pdf*)

**Significance:**  Feb 21, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Identify and Perform Testing of Safety-Related Dry Cooling Tower Tube Bundle Isolation Valves**

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," because the licensee did not identify and perform testing for safety-related components to demonstrate that they would perform satisfactorily in service.

Specifically, prior to February 12, 2015, the licensee did not identify and perform testing to demonstrate that, as described in the licensee's design basis, the dry cooling tower tube bundle isolation valves could be used to isolate a dry cooling tower tube bundle following a tornado missile strike on the non-missile-protected portions of the dry cooling tower. The licensee entered this condition into their corrective action program as Condition Report CR-WF3-2015-00828. The planned corrective actions are to develop seat leakage criteria for the dry cooling tower tube bundle isolation valves and to perform periodic seat leakage testing.

The inspectors determined that the performance deficiency was more than minor because it was associated with the protection against external factors 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, the failure to establish a test program for a safety-related component to demonstrate that it would perform satisfactorily following a tornado missile strike could impact the system's ability to perform its safety function in the event of a tornado. The inspectors performed the initial significance determination using NRC Inspection Manual 0609, Appendix A, Exhibit 4, "External Event Screening Questions." The finding required a detailed evaluation because it would degrade one or more trains of a system that supports a risk significant system or function. Therefore, a senior reactor analyst performed a bounding detailed risk evaluation. The analyst determined that the finding was of very low safety significance (Green). The bounding change to the core damage frequency was less than  $2.9E-7$ /year. The finding was not significant with respect to the large early release frequency. The dominant core damage sequences included tornado-induced losses of offsite power, failure of the train B dry cooling tower pressure boundary, random failure of the train A component cooling water system, random failures of the emergency diesel generators, and failure to recover offsite power in 4 hours. Risk was minimized because the diesel generators have air cooled radiators and do not require component cooling water to remain functional. The low tornado frequency also minimized the risk.

The inspectors concluded that the finding did not have a cross-cutting aspect because the most significant contributor to the performance deficiency of not identifying the need for a leak test occurred more than two years ago and did not reflect current licensee performance.

Inspection Report# : [2015001](#) (pdf)

**Significance:**  Feb 13, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Inadequate Fire Area Boundary**

The team identified a non-cited violation of License Condition 2.C.(9), "Fire Protection," for the failure to ensure the required separation between fire areas. Specifically, the licensee installed fire barriers on two ventilation ducts which were not in a configuration demonstrated to provide the required three-hour fire-rated separation between fire areas. The licensee entered this issue into their corrective action program as Condition Report CR-WF3-2015-00540 and established an hourly fire watch as a compensatory measure until corrective actions can be taken (Fire Impairments 15-30 and 15-31).

The failure to ensure the required separation between fire areas 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. The team

evaluated this finding using Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," dated September 20, 2013. Both emergency diesel generator rooms were equipped with pre-action sprinkler systems which would limit temperatures near the ceiling around the room exhaust ducts; therefore, the finding screened to Green at Section 1.4.3.C.

This finding did not have a cross-cutting aspect since it was not indicative of current licensee performance since this fire barrier configuration was installed in the 1980s.

Inspection Report# : [2015007](#) (pdf)

**Significance:**  Feb 13, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Provide a Bounding Calculation for Time Critical Actions**

The team identified a non-cited violation of License Condition 2.C.9, "Fire Protection," for the failure to adequately correct a previous violation. Specifically, the licensee failed to provide a bounding calculation for the amount of time available for operators to establish component cooling water during an alternative shutdown. The licensee developed this calculation in response to Non-cited Violation 2012007-02. The licensee entered this issue into their corrective action program as Condition Report CR-WF3-2015-0859 and implemented a fire impairment as a compensatory measure.

The failure to provide a bounding calculation for the amount of time available for operators to establish component cooling water during an alternative shutdown 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. 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 and determined this violation was of very low safety significance.

This finding had a cross-cutting aspect associated with resolution within the problem identification and resolution area since the licensee failed to take effective corrective actions to address issues in a timely manner commensurate with their safety significance. Specifically, the team determined that the licensee's corrective actions were not effective since the licensee failed to provide a bounding calculation for the amount of time available for operators to establish component cooling water during an alternative shutdown (P.3).

Inspection Report# : [2015007](#) (pdf)

**Significance:**  Feb 13, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Periodically Test Emergency Lighting Units**

The team identified a non-cited violation of License Condition 2.C.9, "Fire Protection," for the failure to periodically test and demonstrate the 8-hour capacity of the Appendix R emergency lighting units. The licensee entered this issue into their corrective action program as Condition Report CR-WF3-2015-00856 and operators had flashlights available as a compensatory measure.

The failure to periodically test and demonstrate the 8-hour capacity of the Appendix R emergency lighting units 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. 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 it would not prevent reaching and maintaining safe shutdown conditions in the event of a control room fire. Specifically, the team had reasonable assurance that the emergency lighting units would provide adequate illumination for a sufficient amount of time for operators to perform the most time critical actions. In addition, the team determined that operators performing an alternative shutdown had flashlights available in the Appendix R equipment lockers. Because the team assigned a low degradation rating, this finding screened as having very low safety significance.

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

Inspection Report# : [2015007](#) (pdf)

**Significance:**  Feb 13, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Correct Long Standing Deficiencies with the Appendix R Emergency Lighting Units**

The team identified a non-cited violation of License Condition 2.C.9, “Fire Protection,” for the failure to correct adverse conditions associated with fire protection. Specifically, the licensee failed to correct longstanding deficiencies with the Appendix R emergency lighting units. The licensee entered this issue into their corrective action program as Condition Report CR-WF3-2015-00593 and operators had flashlights available as a compensatory measure.

The failure to correct longstanding deficiencies with the Appendix R emergency lighting units 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. 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 an alternative shutdown had flashlights available in the Appendix R equipment lockers. Because the team assigned a low degradation rating, this finding screened as having very low safety significance.

This finding had a cross-cutting aspect associated with resolution within the problem identification and resolution area since the licensee failed to take effective corrective actions to address issues in a timely manner commensurate with their safety significance. Specifically, the team determined that the licensee failed to take corrective actions to address the nonfunctional emergency lighting units in a timely manner (P.3).

Inspection Report# : [2015007](#) (pdf)

**Significance:**  Jan 12, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Identify and Evaluate Elevated Bus Voltages**

Green. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” which states, in part, “Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly

identified and corrected.” Specifically, during the periods of October 27 through December 13, 2012, and on May 1, 2014, the licensee failed to identify and evaluate the impact of elevated bus voltages that exceeded the allowable voltage on the 480 VAC Class 1E Bus 3B31, a condition adverse to quality. In response to this issue, the licensee completed an operability determination with plans to evaluate any trends requiring additional actions. This finding was entered into the licensee’s corrective action program as Condition Report CR WF3 2014-05458.

The team determined that the failure to identify and evaluate the impact of elevated bus voltages was a performance deficiency. This finding was more than minor 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 events to prevent undesirable consequences. Specifically, the licensee failed to identify and evaluate elevated voltages on the 480 VAC Class 1E Bus 3B31 that exceeded allowable operability limits. In accordance with Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” dated June 19, 2012, Exhibit 2, “Mitigating Systems Screening Questions,” the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk significant due to seismic, flooding, or severe weather. This finding had a crosscutting aspect in the area of problem identification and resolution associated with trending because the licensee failed to periodically analyze information in the aggregate to identify programmatic and common cause issues. [P.4](Section 1R21.2.2)

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

**Significance:**  Jan 12, 2015

Identified By: NRC

Item Type: FIN Finding

#### **Inadequate Station Procedures for Temporary Emergency Diesel Generator**

Green. The team identified a Green finding for inadequate station procedures for the temporary emergency diesel generators. Specifically, the licensee failed to ensure that Procedures OP-TEM-008, “Emergency Diesel Generator A (B) Backup Temporary Diesel Generators,” and ME-001-012, “Temporary Power from Temporary Diesel for 3A2 and 3B2 4kV Buses (MODES 1-6),” were maintained to ensure that the temporary diesels had enough capacity to supply auxiliary power to the required safe-shutdown loads. The team determined that the licensee failed to clearly establish appropriate instructions to ensure that operators would be running and verifying loads according to the prime rating, that three temporary diesels were capable of operating/connecting in parallel, and that required and desired loads were consistent between procedures and evaluations. In response to this issue, the licensee evaluated and updated station procedures, specified prime loading limitations, updated vendor contract, incorporated procedure improvements as a result of training, and updated the adverse weather procedure. This finding was entered into the licensee’s corrective action program as Condition Reports CR-WF3-2014-05662 and CR WF3 2014 05582.

The team determined that failure to maintain procedures that ensure the temporary diesels have enough capacity to supply auxiliary power to required safe-shutdown loads was included in station procedures was a performance deficiency. This finding was more than minor 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 events to prevent undesirable consequences. Specifically, the licensee failed to update Procedures OP TEM 008 and ME-001-012, and vendor documents in accordance with engineering evaluation EC-47496, in a timely manner and prior to performance of the emergency diesel generator outage in January 2014. In accordance with Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” dated June 19, 2012, Exhibit 2, “Mitigating Systems Screening Questions,” the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety

function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk significant due to seismic, flooding, or severe weather. This finding had a crosscutting aspect in the area of human performance associated with teamwork because the licensee failed to ensure that individuals and work groups communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained. [H.4](Section 1R21.2.7)

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

**Significance:**  Jan 12, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Initiate a Condition Report for a Condition Adverse to Quality**

Green. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” which states, in part, “Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected.” Specifically, between October 8 and 16, 2014, the licensee failed to initiate a condition report to evaluate the lack of missile protection on the emergency diesel generator A and B storage tank vents, a nonconformance that is a condition adverse to quality for eight days. In response to this issue, the licensee performed an operability determination to address the team’s concerns and initiated a separate condition report to document the lack of initiating and evaluating a condition report for a condition adverse to quality in a timely manner. This finding was entered into the licensee’s corrective action program as Condition Reports CR WF3 2014-05341 and CR WF3 2014 05738.

The team determined that the failure to initiate a condition report to evaluate the lack of missile protection on the emergency diesel generator A and B storage tank vents for eight days was a performance deficiency. This finding was more than minor because it was associated with the design control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to events to prevent undesirable consequences. Specifically, the licensee failed to initiate and evaluate a condition adverse to quality, a design nonconformance on the emergency diesel generator A and B storage tank vents for missile protection for eight days. In accordance with Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” dated June 19, 2012, Exhibit 2, “Mitigating Systems Screening Questions,” the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk significant due to seismic, flooding, or severe weather. This finding had a crosscutting aspect in the area of human performance associated with work management because the licensee failed to implement a process where nuclear safety is the overriding priority and the need for coordinating with different work groups. [H.5](Section 1R21.2.12.1)

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

**Significance:**  Jan 12, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Evaluate Missile Protection Requirements for Emergency Diesel Generator Day and Storage Tank Vents**

Green. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” which states, in part, “design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or

by the performance of a suitable testing program.” Specifically, prior to November 6, 2014, the licensee did not verify the adequacy of design of the emergency diesel generator A and B day and storage tank vents to have missile protection installed, or an approved exemption excluding missile protection requirements. In response to this issue, the licensee performed a TORMIS evaluation that supported an operable determination and a future licensing basis change. TORMIS is an EPRI methodology documented in EPRI NP 2005, “Tornado Missile Simulation and Design Methodology,” dated August 1981, and was approved for use by Waterford in the Safety Evaluation related to License Amendment 168. This finding was entered into the licensee’s corrective action program as Condition Reports CR WF 2014 05131, CR WF3 2014 5341, and CR-WF3-2014-5412.

The team determined that the failure to evaluate the lack of missile protection on the emergency diesel generator A and B day and storage tank vents was a performance deficiency. This finding was more than minor because it was associated with the design control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to events to prevent undesirable consequences. Specifically, the licensee failed to evaluate a design nonconformance on the emergency diesel generator A and B day and storage tank vents for lack of missile protection. In accordance with Inspection Manual Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” dated June 19, 2012, Exhibit 2, “Mitigating Systems Screening Questions,” the issue screened as having very low safety significance (Green) because it was a design or qualification deficiency that did not represent a loss of operability or functionality; did not represent an actual loss of safety function of the system or train; did not result in the loss of one or more trains of non-technical specification equipment; and did not screen as potentially risk significant due to seismic, flooding, or severe weather. The team determined that this finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance. (Section 1R21.2.12.2)

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

**Significance:**  Jan 12, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

#### **Failure to Identify and Correct Through Wall Corrosion on Emergency Diesel Generator A and B Day Tank Vents**

- TBD. The team identified an apparent violation of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” which states, in part, “Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected.” Specifically, prior to October 22, 2014, the licensee failed to identify and correct through wall corrosion on the emergency diesel generator A and B day tank vents, a condition adverse to quality. The team asked the licensee if the corrosion had been previously evaluated. The licensee determined that it had not been aware of the corrosion so it had not been evaluated. The corrosion was significant enough that a through wall hole had formed at the base of the each vent pipe where it penetrates the roof. Consequently, any water that collects on the roof of the building would have the potential to drain into the respective day tank. In response to this issue, the licensee performed an immediate operability determination based on severe weather in the area, installed a temporary repair using a rubber wrap, and installed a small concrete berm to minimize the potential amount of water in the immediate area. This finding was entered in to the licensee’s corrective action program as Condition Report CR WF3 2014 05413.

The team determined that the failure to identify and correct through wall corrosion on the emergency diesel generator A and B day tank vents was a performance deficiency. This finding was more than minor because it was associated with the design control and equipment performance attributes of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to events to prevent undesirable consequences. Specifically, the licensee failed to identify, evaluate, and correct through wall corrosion on the emergency diesel generator A and B day tank vents. In accordance with Inspection Manual

Chapter 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” dated June 19, 2012, Exhibit 2, “Mitigating Systems Screening Questions,” the issue screened to Exhibit 4, “External Events Screening Questions,” because it screened as potentially risk significant due to seismic, flooding, or severe weather. Per Exhibit 4 the issue screened to a Detailed Risk Evaluation because if the safety function were assumed completely failed, emergency diesel generator A and B, it would degrade two trains of a multi-train system and it would degrade one or more trains of a system that supports a risk significant system.

A Region IV senior reactor analyst performed a detailed risk evaluation. The finding was potentially Greater than Green in significance and the NRC requested the licensee to provide additional information to enable the NRC to determine the final significance. The risk important sequences included heavy rain induced losses of offsite power with the consequential failure of both emergency diesel generators. The ability to restore offsite power within 4 hours was important to avoid core damage. The finding was not significant to the large early release frequency. See Attachment 2, Detailed Risk Evaluation, for a detailed review of the Appendix M evaluation.

This finding had a crosscutting aspect in the area of human performance associated with procedure adherence because the licensee failed to ensure that individuals follow process, procedures, and work instructions. [H.8](Section 1R21.2.12.3)

(Update)

The finding was determined to be of very low safety significance (Green), in part based on the licensee's testing of the roof drain and the Cooper Bessemer diesel tolerance to water. The change to the core damage frequency was approximately  $4 \times 10^{-7}$ /year. The risk-important sequences included a heavy rain event greater than or equal to 6 inches per hour followed by a random loss of offsite power within the next two weeks. The risk significance was mitigated by the tolerance of the diesel generators to water in the fuel oil and the operators' ability to restore offsite power within 4 hours of the loss of offsite power. (IR 05000382/2015001 and 05000382/2015009 dated May 14, 2015)

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

Inspection Report# : [2015009](#) (pdf)

**Significance:**  Jan 09, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Inadequate Procedure for Tightening Thermal Overload Connections for Safety-Related Components**

A self-revealing, non-cited violation of Technical Specification 6.8.1.a and Regulatory Guide 1.33, Revision 2, Appendix A, was identified for the failure to perform maintenance that could affect the performance of safety-related equipment in accordance

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with written procedures, documented instructions, or drawings appropriate to the circumstances. Specifically, prior to December 17, 2014, the licensee used a procedure that contained insufficient detail for tightening a thermal overload connection that resulted in a loose connection on a motor starter and eventual trip of a wet cooling tower fan, resulting in the A train of ultimate heat sink being declared inoperable. The licensee entered this condition into their corrective action program as Condition Report CR-WF3-2014-04430. The corrective action taken to restore compliance was to add additional detail to the procedure to ensure thermal overload connections are verified secure after their mechanical connections are tightened.

The inspectors determined that the performance deficiency was 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 the availability,

reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to ensure successful tightening of the thermal overload connections for the wet cooling tower fans adversely impacted the capability of the system to perform its function. The inspectors performed the initial significance determination using NRC Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings." The inspectors determined the finding was of very low safety significance (Green) because it affected one train for less than the allowed outage time.

When the A train of ultimate heat sink was declared inoperable, the B train of ultimate heat sink was already inoperable for planned maintenance. As a result, the B train maintenance was unrelated to the performance deficiency. In addition, the finding did not affect the design or qualification of the system, did not represent the loss of a safety system or function, did not represent the loss of function of at least a single train for greater than its Technical Specification allowed outage time, and did not represent an actual loss of function of one or more non-Technical Specification trains of equipment.

The inspectors concluded that the finding did not have a cross-cutting aspect because the most significant contributor to the performance deficiency occurred more than two years ago and did not reflect current licensee performance.

Inspection Report# : [2015001](#) (pdf)

**Significance:**  Jan 08, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

**Failure to Identify and Correct a Condition Adverse to Fire Protection**

The inspectors identified a finding of very low safety significance and an associated non-cited violation of Waterford Steam Electric Station, Unit 3, License Condition 2.C.9, and the fire protection program for the licensee's failure to identify and correct a condition adverse to fire protection. Specifically, the inspectors identified that the ventilation dampers that are used to maintain the environmental conditions of the No. 2 diesel fire pump room and that are needed for pump protection were damaged and not functional for an extended period of time. As a result, the reliability of the No. 2 diesel fire pump could have been impacted at high environmental temperatures. The licensee entered this condition into their corrective action program as Condition Report CR-WF3-2015-00132. The licensee manually opened the dampers and additional planned corrective actions included repairing the broken dampers' linkage before the temperatures outside reach 90°F.

This performance deficiency was determined to be more than minor because if left uncorrected, the performance deficiency had the potential to lead to a more significant safety concern. Specifically, if left uncorrected, the licensee's failure to repair the damaged ventilation damper in the No. 2 diesel fire pump room would result in an ongoing degraded condition, which could have impacted the capability of the No. 2 diesel fire pump to fulfill its function of providing a water supply to the site's Fire Protection Systems. Using Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," the inspectors determined that the use of Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," was required because the finding involved fixed fire protection systems. Using Inspection Manual Chapter 0609, Appendix F, Attachment 1, "Fire Protection SDP Phase 1 Worksheet," the finding screened as Green because the reactor would have been able to reach and maintain a safe shutdown condition. Specifically, since only the No. 2 diesel fire pump was impacted by the performance deficiency, the No. 1 diesel fire pump and the motor driven pump would have been able to supply the fire systems because they are all rated for full flow capacity.

This finding had a cross-cutting aspect in the area of human performance, avoid complacency,

because individuals did not recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Specifically, licensee personnel frequently tour the fire pump house for operations and maintenance activities; however, a thorough review of the work site had not been performed.  
Inspection Report# : [2015001](#) (*pdf*)

## Barrier Integrity

**Significance:**  Jan 12, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### **Failure to Properly Evaluate Main Feedwater Isolation Valve Required Thrust**

Green. The team identified a Green, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, "design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program." Specifically, since January 18, 2006, the licensee failed to evaluate the adequacy of design for the required thrust for the main feedwater isolation valves in accordance with the licensee's analysis methodology presented in EPRI TR 103237-R2, "EPRI MOV Performance Prediction Program." In response to this issue, the licensee recalculated the required thrust and performed an evaluation of the remaining margin on the main feedwater isolation valves that supported an operable determination. This finding was entered into the licensee's corrective action program as Condition Report CR-WF3-2014-05690.

The team determined that the failure to evaluate the required thrust for the main feedwater isolation valves, assuming an appropriate valve disk to seat coefficient of friction, was a performance deficiency. This finding was more than minor because it was associated with the design control attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the incorrect coefficient of friction assumption resulted in a reasonable question of operability of the main feedwater isolation valves to operate under design basis conditions; during a main steam line break when auxiliary feedwater was supplying inventory to the steam generators. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued June 19, 2012, Exhibit 3, "Barrier Integrity Screening Questions," the issue screened as having very low safety significance (Green) because the finding did not represent an actual open pathway in the physical integrity of reactor containment and did not involve an actual reduction in function of the hydrogen igniters in reactor containment. The team determined that this finding did not have a crosscutting aspect because the most significant contributor did not reflect current licensee performance. (Section 1R21.2.15)

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

**Significance:**  Jan 12, 2015

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

### **Failure to Properly Evaluate Main Steam Isolation Valve Weak Link**

The team identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.

Specifically, since January 18, 2006, the licensee has failed to evaluate the adequacy of design of the main feedwater isolation valve operators to provide adequate thrust in accordance with the licensee's analysis methodology described in EPRI topical report TR 103237-R2, "EPRI MOV Performance Prediction Program." In response to this issue, the licensee recalculated the required thrust and performed an evaluation that supported a determination that the valves remained operable. This finding was entered into the licensee's corrective action program as CR WF3-2014-05690.

The team determined that the failure to evaluate the required thrust for operation of the main feedwater isolation valves, assuming an appropriate valve-disk-to-seat coefficient of friction, was a performance deficiency. This performance deficiency was more than minor because it was associated with the design control attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events.

Specifically, the incorrect coefficient of friction assumption resulted in a reasonable question of operability of the main feedwater isolation valves to operate under the design basis condition of a main steam line break while auxiliary feedwater is supplying inventory to the steam generators. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued June 19, 2012, Exhibit 3, "Barrier Integrity Screening Questions," this finding screened as having very low safety significance (Green) because the finding did not represent an actual open pathway in the physical integrity of reactor containment and did not involve an actual reduction in function of the hydrogen igniters in reactor containment. The team determined that this finding did not have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance. (Section 1R21.2.15)

- Green. The team reviewed a self-revealing Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which states, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. Specifically, prior to the failure of main steam isolation valve MS-124A on January 5, 2013, the licensee failed to have an adequate weak-link evaluation for the main steam isolation valves. In response to this event, the licensee performed a seismic weak-link evaluation of the main steam isolation valves that supported a determination that the valves were operable. This finding was entered into the licensee's corrective action program as CR-WF3-2014-05708.

The team determined that the failure to evaluate the main steam isolation valve maximum allowed thrust, assuming appropriate values for the structural limitations of the valve and actuator, was a performance deficiency. This performance deficiency was more than minor because it was associated with the design control attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events.

Specifically, the licensee used a non-conservative value for the maximum allowed thrust, and the error resulted in a failure of main steam isolation valve MS-124A, because the allowable nitrogen pressure for the valve actuator was inappropriate. In accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued June 19, 2012, Exhibit 3, "Barrier Integrity Screening Questions," this finding screened as having very low safety significance (Green) because the finding did not represent an actual open pathway in the physical integrity of reactor containment and did not involve an actual reduction in function of the hydrogen igniters in reactor containment. The team determined that this finding did not have a cross-cutting aspect because the most significant contributor did not reflect current licensee performance.

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

## Emergency Preparedness

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## Occupational Radiation Safety

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## Public Radiation Safety

**Significance:**  Jan 14, 2015

Identified By: NRC

Item Type: NCV Non-Cited Violation

### Failure to Develop the Transportation Security Plan

The inspectors identified a non-cited violation of 10 CFR 71.5, "Transportation of Licensed Material," and 49 CFR 172, Subpart I, "Safety and Security Plans." Specifically, licensee personnel failed to adequately develop their transportation security plan. This resulted in three Category 2 shipments being transported on public highways without security risk assessments being performed. The planned corrective actions were still being evaluated. The inspectors determined that no immediate safety concern existed because the shipments that had been made were received with no issues and the licensee had no pending Category 2 or higher shipments. The licensee documented the issue in its corrective action program as Condition Report CR-W3-2015-00506.

The licensee's failure to adequately develop their transportation security plan is a performance deficiency. Procedure EN-RW-106, "Integrated Transportation Security Plan," did not include all the components required by 49 CFR 172.802, "Components of a Security Plan." The performance deficiency is more than minor because it is associated with the program and process attribute of the Public Radiation Safety cornerstone. It adversely affects the cornerstone objective to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain. In accordance with

Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," and Appendix D, "Public Radiation Safety Significance Determination Process," dated February 12, 2008, the inspectors determined the finding has very low safety significance (Green) because Waterford had an issue involving transportation of radioactive waste, but it did not involve: (1) a radiation limit being exceeded, (2) a breach of package during transport, (3) a certificate of compliance issue, (4) a low level burial ground nonconformance, or (5) a failure to make notifications or provide emergency information. The finding has a resources cross-cutting aspect in the human performance cross-cutting area, because licensee management did not ensure that personnel, equipment, procedures, and other resources were available and adequate to support nuclear safety.

Inspection Report# : [2015001](#) (*pdf*)

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## 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.

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## Miscellaneous

**Significance:** N/A Sep 30, 2013

Identified By: NRC

Item Type: VIO Violation

### **Failure to Make a Report Required by 10 CFR 21.21**

The team identified a violation of 10 CFR 21.21 that occurred when the licensee failed to submit a report or interim report on a deviation in a basic component within 60 days of discovery.

The failure of the licensee to adequately evaluate deviations in basic components and to report defects is a performance deficiency. The NRC's significance determination process (SDP) considers the safety significance of findings by evaluating their potential safety consequences. This performance deficiency was of minor safety significance. The traditional enforcement process separately considers the significance of willful violations, violations that impact the regulatory process, and violations that result in actual safety consequences. Traditional enforcement applied to this finding because it involved a violation that impacted the regulatory process. Supplement VII to the version of the NRC Enforcement Policy that was in effect at the time the violation was identified provided as an example of a violation of significant regulatory concern (Severity Level III), "An inadequate review or failure to review such that, if an appropriate review had been made as required, a 10 CFR Part 21 report would have been made." Based on this example, the NRC determined that the violation met the criteria to be cited as a Severity Level III violation. However, because of the circumstances surrounding the violation, including the removal from service of the affected components by an unrelated manufacturer's recall, the severity of the cited violation is being reduced to Severity Level IV. Cross-cutting aspects are not assigned to traditional enforcement violations.

Inspection Report# : [2013004](#) (*pdf*)

Inspection Report# : [2014008](#) (*pdf*)

Last modified : March 01, 2016