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Waterford 3 – Quarterly Plant Inspection Findings

3Q/2017 – Plant Inspection Findings

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Initiating Events

Significance: G Mar 31, 2017

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Perform Field Changes in Accordance with Design Control Measures

The inspectors reviewed a self-revealed, non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," because the licensee failed to perform field changes in accordance with design control measures. Specifically, following maintenance on reactor coolant pump 1B, the licensee performed unauthorized field changes by not reinstalling two design supports for the differential pressure instrument line. As a result, the instrument line developed a vibration-induced flaw, which caused an increase in reactor coolant system unidentified leakage, and consequently, an unplanned reactor shutdown. The licensee entered this condition into their corrective action program as Condition Report CR-WF3-2016-06698. The licensee's corrective actions included replacing the damaged instrument line and installing the missing supports.

The performance deficiency was more than minor, and therefore a finding, because it affected the equipment performance attribute of the Initiating Events Cornerstone and its objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the licensee's failure to reinstall the required supports on the reactor coolant pump 1B instrumentation line resulted in plant operation with increased reactor coolant system unidentified leakage, requiring an unplanned reactor shutdown to perform repairs. The inspectors screened the finding in accordance with NRC Inspection Manual Chapter 0609, "Significance Determination Process." Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," the inspectors determined that the finding was of very low safety significance (Green) because the instrument line flaw, after a reasonable assessment of degradation, could not result in exceeding the reactor coolant system leak rate for a small loss-of-coolant accident, and could not likely affect other systems used to mitigate a loss-of-coolant accident, resulting in a total loss of their function. Because the licensee's review indicated that no work had been performed in this instrument line within the last three years, and a specific date

for the performance deficiency was not identified, the inspectors concluded that the finding does not reflect current licensee performance, and therefore, did not assign a cross-cutting aspect.

Inspection Report# : 2017001 (*pdf*)

Mitigating Systems

Significance:  Jun 30, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Ensure Appropriate Testing of TSP Baskets Inside Containment

The inspectors identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to assure that testing required to demonstrate that structures, systems, and components will perform satisfactorily while in service was identified and performed in accordance with written test procedures incorporating the requirements and acceptance limits contained in the applicable design documents. Specifically, prior to performing Licensee Procedure OP-903-027, "Inspection of Containment," Attachment 10.3, "Trisodium Phosphate Storage Basket Inspection," the licensee routinely performed a preliminary check to fill the trisodium phosphate storage baskets, thereby ensuring the successful completion of the technical specification-required surveillance. As a result, following unsatisfactory preliminary checks, the trisodium phosphate storage baskets were not evaluated for past operability. The licensee entered this condition into their corrective action program as Condition Report CR-WF3-2017-05108. The licensee's corrective actions will include performing the surveillance procedure as an as-found check and evaluating failed surveillances for past operability.

The performance deficiency was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected its objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, conducting preliminary checks of the trisodium phosphate storage baskets and refilling them prior to performing the technical specification surveillance can mask the as-found condition of the test and preclude an evaluation of past operability if the levels are below the technical specification-required values. The inspectors screened the finding in accordance with NRC Inspection Manual Chapter 0609, "Significance Determination Process." Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," instructed the inspectors to use Appendix G, "Shutdown Operations Significance Determination Process." Using Appendix G, Attachment 1, Exhibit 3, "Mitigating Systems Screening Questions," the inspectors determined that the finding was of very low safety significance (Green) because the finding: (1) was not a deficiency affecting the design or qualification of a mitigating structure, system, or component; (2) did not represent a loss of system safety function; (3) did not represent an actual loss of safety function of at least a single train for greater than its technical specification allowed outage time or two separate safety systems out-of-service for greater than its technical specification allowed outage time; (4) with the cavity flooded, it did not represent an actual loss of safety function of one or more nontechnical specification trains of equipment during shutdown designated as risk-significant, for greater than 24 hours; (5) did not degrade the reactor coolant system level indication and/or core exit thermal couples when the cavity was not flooded; (6) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event; (7) did not involve fire brigade training and qualification requirements, or brigade staffing; (8) did not involve the response time of the fire brigade to a fire, and; (9) did not involve fire extinguishers, fire hoses, or fire hose stations.

The finding had a change management cross-cutting aspect in the area of human performance because leaders did not use a systematic process for evaluating and implementing change so that nuclear safety remains the overriding priority. Specifically, when the licensee implemented the preliminary check practice in 2012, they did not evaluate the unintended consequences of how that practice would impact the results of the technical specification surveillance. Additionally, the licensee performed the preliminary check during each successive refueling outage between 2012 and 2017 giving the licensee an opportunity to identify the improper practice. As a result, the inspectors concluded this

performance deficiency was indicative of current performance.

Inspection Report# : 2017002 (*pdf*)

Significance:  Jun 30, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Perform a Post Maintenance Test on a Main Steam Isolation Valve Solenoid Valve

The inspectors identified a non-cited violation of Technical Specification 6.8, "Procedures and Programs," and Regulatory Guide 1.33, "Quality Assurance Program Requirements," for the licensee's failure to perform operability testing on a safety-related component. Specifically, following the coil replacement of main steam isolation valve 2 solenoid valve, a safety-related component, the licensee did not perform a retest of the solenoid valve. As a result, main steam isolation valve 2 was returned to service without the assurance that no new deficiencies had been introduced, calling into question its operability. The licensee entered this condition into their corrective action program as Condition Report CR-WF3-2017-05507. The licensee's corrective action was to perform a voltage check of the solenoid valve to ensure it would energize in the event that a main steam isolation valve 2 closure was needed.

The performance deficiency was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee restored main steam isolation valve 2 to an operable status without ensuring that its solenoid valve, which is a main steam isolation valve support system, was properly retested following maintenance. The inspectors screened the finding in accordance with NRC Inspection Manual Chapter 0609, "Significance Determination Process." Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," instructed the inspectors to use Appendix A, "Significance Determination Process for Findings At-Power." Using Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined the finding to be of very low safety significance (Green) because it: (1) was not a deficiency affecting the design or qualification of a mitigating structure, system, or component; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time or two separate safety systems out-of-service for greater than its technical specification allowed outage time; and (4) did not represent an actual loss of function of one or more nontechnical specification trains of equipment designated as high safety-significant in accordance with licensee's maintenance rule program for greater than 24 hours.

The finding had a conservative bias cross-cutting aspect in the area of human performance because individuals did not use decision making-practices that emphasized prudent choices over those that were simply allowable. Specifically, the licensee did not make a conservative decision when determining whether the main steam isolation valve or its solenoid valve should be tested prior to proceeding with plant startup.

Inspection Report# : 2017002 (*pdf*)

Significance:  Jun 30, 2017

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Perform Maintenance on the Correct Safety-Related Component

The inspectors reviewed a self-revealed, non-cited violation of Technical Specification 6.8, "Procedures and Programs," and Regulatory Guide 1.33, "Quality Assurance Program Requirements," which occurred due to the licensee's failure to perform field work on reactor coolant loop 2 shutdown cooling warm-up valve, SI-135A. Specifically, mechanical maintenance technicians, who were assigned work on safety injection train A, erroneously performed work on safety injection train B on reactor coolant loop 1 shutdown cooling warm-up valve, SI-135B. As a result, both trains of emergency core cooling systems were simultaneously inoperable, which placed the plant in a

1-hour technical specification shutdown action statement. The licensee entered this condition into their corrective action program as Condition Report CR-WF3-2017-01433. The licensee's corrective actions included a revision of the model work order to require concurrent verification for component identification, and adding the valves to the protected equipment list for when the opposite train is inoperable.

The performance deficiency was more than minor because it was associated with the configuration control attribute of the Mitigating Systems Cornerstone and adversely affected its objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, when the mechanics worked on valve SI-135B instead of valve SI-135A, they simultaneously made both trains of emergency core cooling systems inoperable. The inspectors screened the finding in accordance with NRC Inspection Manual Chapter 0609, "Significance Determination Process." Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," instructed the inspectors to use Appendix A, "Significance Determination Process for Findings At-Power." Using Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the inspectors determined the finding to be of very low safety significance (Green) because it: (1) was not a deficiency affecting the design or qualification of a mitigating structure, system, and component; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time or two separate safety systems out-of-service for greater than its technical specification allowed outage time; and (4) did not represent an actual loss of function of one or more nontechnical specification trains of equipment designated as high safety-significant in accordance with licensee's maintenance rule program for greater than 24 hours.

The finding had an avoid complacency cross-cutting aspect in the area of human performance because individuals did not recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes, and did not implement appropriate error reduction tools. Specifically, maintenance technicians repeatedly visited the incorrect work location and didn't properly verify the valve number to ensure they would work on the correct component.

Inspection Report# : 2017002 (*pdf*)

Significance:  Dec 31, 2016

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Ensure Appropriate Post-Maintenance Testing on Essential Chiller B

A self-revealed, non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," occurred because the licensee did not assure that the procedures for post-maintenance testing of activities affecting quality included appropriate quantitative or qualitative acceptance criteria for determining that maintenance activities were satisfactorily accomplished. Specifically, the licensee did not assure that post-maintenance testing of essential chiller B would identify inappropriately assembled guide vanes, following maintenance on April 11, 2016, resulting in the unexpected inoperability of essential chiller B on August 12, 2016. The licensee entered this condition into their corrective action program as Condition Report CR-WF3-2016-05155. The corrective action taken to restore compliance was to issue work instructions for post-maintenance testing of the essential chillers that ensures the guide vanes respond to load changes.

The performance deficiency was more than minor, and therefore a finding, because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to perform maintenance with procedures appropriate to the circumstances resulted in the inoperability of essential chiller B. The inspectors determined the significance of the finding using NRC Inspection Manual Chapter 0609, "Significance Determination Process." Using Appendix A, "The Significance Determination Process for Findings At-Power," the inspectors determined that the finding was of very low

safety significance (Green) because all the screening questions in Exhibit 2, "Mitigating Systems Screening Questions," were answered 'No.' The finding had a cross-cutting aspect in the area of human performance, teamwork, because the licensee did not ensure that individual and work groups communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety was maintained. Specifically, electrical and mechanical maintenance personnel did not communicate and coordinate work to ensure that the guide vane arm and actuator linkage were assembled appropriately.

Inspection Report# : 2016004 (*pdf*)

Significance:  Dec 16, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Control Nonconforming Parts

The team identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion XV, "Nonconforming Materials, Parts, or Components," which occurred when the licensee failed to dedicate commercial-grade relays for use in safety related applications. After receiving information from a vendor that more than 124 relays potentially installed in safety-related applications did not conform to quality assurance standards, the licensee failed to take appropriate steps to accept these commercial-grade relays as basic components. After discussion with the team, the licensee documented this condition in Condition Report CR-WF3-2016-07710 and initiated actions to ensure compliance with quality assurance requirements.

The failure to dedicate commercial-grade relays used as or intended for use as basic components (in safety-related applications) as required by plant procedures and by 10 CFR Part 21 was a performance deficiency. This performance deficiency was more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the objective of ensuring the availability, reliability, and capability of systems that respond to initiating events. Using Inspection Manual Chapter 0609, Appendix A, dated June 19, 2012, the team determined that this finding was of very low safety significance (Green) because it was a deficiency affecting the design or qualification of a structure, system, or component, and operability was maintained. The finding has a conservative bias cross-cutting aspect in the human performance cross-cutting area because licensee personnel improperly rationalized the adequacy of the nonconforming components to perform their safety-related functions.

Because this performance deficiency was also a violation that impacted the regulatory process, in that the licensee accepted a change to plant design without appropriate evaluation and notification, it was also evaluated for traditional enforcement. The team determined that the violation was Severity Level IV because it was similar to several examples in Section 6.5.d of the NRC Enforcement Policy.

Inspection Report# : 2016008 (*pdf*)

Significance:  Dec 16, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Perform Operability Determinations for Nonconforming Conditions

The team identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," that occurred when the licensee failed on two occasions to perform an operability determination for a nonconforming condition affecting numerous safety-related components. Following receipt of information from a vendor that more than 124 relays potentially installed in safety-related applications did not conform to quality requirements, licensee personnel failed to perform an operability evaluation. Later, during a Part 21 evaluation for the potential defect, the evaluator noted that an operability determination was needed, but failed to initiate the appropriate processes. After discussion with the team, the licensee documented this condition in Condition Report CR-WF3-2016-

07710, declared the affected components operable, but degraded, and initiated actions to restore full qualification.

Failures to perform an operability determination following identification of a nonconforming condition as required by station procedures were two examples of a performance deficiency. This performance deficiency was more-than-minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the objective of ensuring the availability, reliability, and capability of systems that respond to initiating events. Using Inspection Manual Chapter 0609, Appendix A, dated June 19, 2012, the team determined that this finding was of very low safety significance (Green) because it did not represent the actual loss of function of any system or train. The finding has an identification cross-cutting aspect in the problem identification and resolution cross-cutting area because licensee personnel failed to recognize a nonconforming condition as a condition adverse to quality.

Inspection Report# : 2016008 (*pdf*)

Significance:  Dec 16, 2016

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Include Appropriate Quantitative Acceptance Criteria for the Reconstituted Feedwater/Emergency Feedwater Monitoring Plan Associated with Steam Generator Replacement Induced Vibration

The team identified a finding of very low safety significance and associated non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee's failure to include appropriate quantitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Specifically, the licensee's reconstituted feedwater and emergency feedwater system monitoring plan, which was created to monitor both systems' vibrations following the site's steam generators' replacement, did not include a range for acceptable vibration levels for all the components that were being monitored. As a result, sufficient controls were not in place to ensure that a corrective action to prevent recurrence could prevent future piping failures. The licensee entered this issue into their corrective action program as Condition Report CR-WF3-2016-07487. The licensee will restore compliance by addressing the discrepancies between the requirements of the reconstituted feedwater/emergency feedwater monitoring plan associated with steam generator replacement induced vibration and the vibration data routinely collected by plant personnel.

The team determined that the performance deficiency was 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 objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the licensee did not adequately monitor vibrations in six components of the feedwater and emergency feedwater systems such that vibration-induced piping degradation could be detected and the availability and reliability of these systems would be maintained. Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process for Findings At-Power," and Inspection Manual Chapter 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," the team determined that the finding was of very low safety significance because the answer to all the screening questions was 'no'. This finding has a resolution cross-cutting aspect in the area of problem identification and resolution because the organization did not take effective corrective actions to address issues in a timely manner commensurate with their safety significance. Specifically, corrective actions to prevent recurrence of an adverse condition were closed without the issue being fully resolved.

Inspection Report# : 2016008 (*pdf*)

Barrier Integrity

Significance:  Jun 30, 2017

Identified By: NRC

Item Type: NCV Non-Cited Violation

Failure to Prepare the Site for Impending Adverse Weather

The inspectors identified multiple examples of a non-cited violation of Technical Specification 6.8, "Procedures and Programs," and Regulatory Guide 1.33, "Quality Assurance Program Requirements," for the licensee's failure to follow Licensee Procedure OP-901-521, "Severe Weather and Flooding," Revision 323. Specifically, on three occasions, the licensee did not close exterior doors when required by the procedure due to potential severe weather conditions. As a result, plant equipment was at an increased failure risk due to severe weather at the site. The licensee entered this condition into their corrective action program as Condition Reports CR-WF3-2017-03961 and CR-WF3-2017-04944. The licensee is planning corrective actions to ensure doors do not remain blocked open during conditions that require their closure.

The performance deficiency was more than minor because it was associated with the design control attribute of the Barrier Integrity Cornerstone and adversely affected its objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the failure to maintain all of the doors required by Licensee Procedure OP-901-521 with all fuel offloaded to the spent fuel pool threatened the licensee's ability to maintain the functionality of the spent fuel pool cooling system. The inspectors screened the finding in accordance with NRC Inspection Manual Chapter 0609, "Significance Determination Process," and determined that a qualitative analysis by a senior reactor analyst was required. The senior reactor analyst determined that the finding was of very low safety significance (Green). Using Inspection Manual Chapter 0609, Appendix M, "Significance Determination Process Using Qualitative Criteria," the senior reactor analyst performed a bounding analysis indicated that the total increase in core damage frequency from the failure to close the doors during severe weather was less than 1E-6.

The finding had a work management cross-cutting aspect in the area of human performance because the organization did not implement a process of planning, controlling, and executing work activities such that nuclear safety was the overriding priority and the work process did not include the identification and management of risk commensurate to the work and the need for coordination with different groups of job activities. Specifically, during the planning and executing of work activities associated with Refueling Outage 21, the licensee did not consider the nuclear safety implications of blocking open exterior watertight and tornado doors and the work process did not include the identification and management of the risk associated with the blocked-open doors.

Inspection Report# : 2017002 (*pdf*)

Significance:  Jun 30, 2017

Identified By: Self-Revealing

Item Type: NCV Non-Cited Violation

Failure to Ensure Containment Equipment Hatch Closure Prior to RCS Time to Boil

The inspectors reviewed a self-revealed, non-cited violation of Technical Specification 6.8, "Procedures and Programs," and Regulatory Guide 1.33, "Quality Assurance Program Requirements," which occurred because the licensee did not implement instructions for maintaining containment integrity. Specifically, on April 18, 2017, the licensee did not ensure that the containment equipment hatch could be closed within the calculated reactor coolant system time to boil as required by Licensee Procedure OP-010-006, "Outage Operations," Revision 330. The licensee entered this condition into their corrective action program as Condition Report CR-WF3-2017-02541. The licensee's corrective actions included exiting the applicable condition, re-performing the equipment hatch closure drill to show the equipment hatch could be closed prior to the reactor coolant system time to boil, and performing repairs to the containment equipment hatch.

The performance deficiency was more than minor because it was associated with the human performance attribute of the Barrier Integrity Cornerstone and adversely affected its objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the licensee must close containment penetrations prior to the reactor coolant system time to boil in order to minimize radionuclide releases under accident conditions. The inspectors screened the finding in accordance with NRC Inspection Manual Chapter 0609, "Significance Determination Process." Inspection Manual Chapter 0609, instructed the inspectors to use Appendix H, "Containment Integrity Significance Determination Process," the inspectors determined the finding to be of very low safety significance (Green) because licensee maintained in-depth shutdown capability and because the duration of the performance deficiency was less than 8 hours.

The inspectors concluded that the finding had a teamwork cross-cutting aspect in the area of human performance because individuals and work groups did not communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety was maintained. Specifically, personnel performed work resulting in a short calculated reactor coolant system time to boil without first communicating their actions to operations or the outage control center, resulting in an unexpected plant condition.

Inspection Report# : 2017002 (*pdf*)

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Security

The security cornerstone is an important component of the ROP, which includes various security inspection activities the NRC uses to verify licensee compliance with Commission regulations and thus ensure public health and safety. The Commission determined in the staff requirements memorandum (SRM) for SECY-04-0191, "Withholding Sensitive Unclassified Information Concerning Nuclear Power Reactors from Public Disclosure," dated November 9, 2004, that specific information related to findings and performance indicators associated with the security cornerstone will not be publicly available to ensure that security-related information is not provided to a possible adversary. Security inspection report cover letters will be available on the NRC Web site; however, security-related information on the details of inspection finding(s) will not be displayed.

Miscellaneous

Current data as of : November 29, 2017

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