Waterford 3
2Q/2009 Plant Inspection Findings

Initiating Events

Significance: G Dec 31, 2008
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Inadequate Test Procedure for Safety Injection Valves S1-405A(B) Post Modification Testing
Green. The inspectors reviewed a self revealing noncited violation of 10 CFR 50, Appendix B, Criterion III due to the failure by the licensee to perform adequate post modification testing to evaluate the adequacy of design modifications made to the actuators of low pressure safety injection Isolation Valves SI-405A(B). This led to the licensee failing to identify a fundamental difference in the manner that the air operated valve actuator operated resulting in the valve popping open instead of slowly opening, creating a pressure transient that resulted in the lifting of the low temperature overpressure relief valve causing an intersystem loss-of-coolant event. The licensee entered this deficiency into their corrective action program as Condition Report CR-WF3-2008-4161.
This finding was more than minor because, if left uncorrected, it would have become a more significant safety concern. The inspectors utilized NRC Manual Chapter 0609, Appendix G, “Shutdown Operations Significance Determination Process,” to characterize the significance of the issue. Using the worst case scenario of having both Valves SI-405A(B) inoperable, the finding was of very low safety significance because multiple systems or components would still be available to remove decay heat and respond to a loss-of-inventory event. This performance deficiency would not result in any loss of instrumentation needed for safe shutdown and cool down of the plant. This finding had a crosscutting aspect in Human Performance, specifically the Resources aspect [H.2(a)] because the licensee failed to maintain adequate design margins. Specifically, the licensee’s pneumatic actuator for SI-405B could not overcome the pressure locking mechanism until twelve minutes into a fifteen minute time limit, after receiving the open demand signal. This led to the instantaneous valve disc displacement when the valve popped open causing the pressure surge, which resulted in the opening of relief valve SI-406B and subsequent loss of inventory event (Section 4OA5).

Inspection Report# : 2008005 *(pdf)*

Mitigating Systems

Significance: G Apr 07, 2009
Identified By: NRC
Item Type: FIN Finding
Failure to Follow Commitment Tracking Procedures
The inspectors identified a finding because the licensee inadvertently deleted procedural steps to recover an emergency diesel generator during a severe accident. The steps were part of a formal commitment to the NRC. The licensee had failed to follow the site commitment management program when making the procedure change and the procedure writer failed to understand the basis for the steps prior to deleting them. The licensee entered this finding in their corrective action program as Condition Reports CR WF3-2009-0193 and CR WF3-2009-1616.

The finding was more than minor because, if left uncorrected, it could result in a more significant safety concern. Specifically, during a severe accident, operators would not have an appropriate mitigation strategy for starting an emergency diesel generator under certain severe accident conditions. Using the Inspection Manual Chapter 0609, “Significance Determination Process,” Phase 1 screening worksheet, the finding was of very low risk significance because the finding: (1) could result in a loss of functionality of an emergency diesel generator; (2) did not represent a

loss of safety function; (3) did not represent an actual loss of a single train of equipment for more than its technical specification allowed outage time; (4) did not involve non-technical specification equipment; and (5) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding had a crosscutting aspect in the area of Human Performance, Decision Making component [H.1(a)], because the licensee failed to use a systematic process when removing the procedural steps

Inspection Report# : 2009002 *(pdf)*

Significance: G Apr 07, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Obtain Voltage Readings Following a Single Cell Battery Charge
The inspectors identified a noncited violation of 10 CFR 50, Appendix B, Criterion V (Instructions, Procedures and Drawings) because the licensee failed to implement instructions that were intended to help troubleshoot a defective 125 Vdc battery cell. In response to the degraded cell, the licensee had established additional measures to monitor the cell following charging to ensure proper cell operation. However, the licensee did not perform the monitoring. Once identified by the inspectors, the licensee performed more frequent cell tests. The licensee subsequently replaced the faulty cell. The licensee entered this finding into their corrective action program as Condition Reports CR-WF3-2009-1088 and CR-WF3-2009-1099.

The finding was more than minor because it could have resulted in a more significant safety concern if left uncorrected. Specifically, the normal monitoring period for the cell was weekly. The cell may not have remained operable between weekly tests. Using the Inspection Manual Chapter 0609, “Significance Determination Process,” Phase 1 screening worksheet, the finding was of very low risk significance because it: (1) could have resulted in a loss of operability of the 125 Vdc battery; (2) did not represent a loss of safety function; (3) did not represent an actual loss of a single train of equipment for more than its technical specification allowed outage time; (4) did not involve non-technical specification equipment; and (5) did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding had a crosscutting aspect in the area of Problem Identification and Resolution, because the licensee failed to implement corrective measures intended to address a condition adverse to quality [P.1(d)]

Inspection Report# : 2009002 *(pdf)*

Significance: G Dec 31, 2008
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Untimely Corrective Actions
• Green. The inspectors reviewed a self revealing noncited violation of 10 CFR 50, Appendix B, Criterion XVI due to the failure by the licensee to take prompt corrective actions following the identification of an inadequate testing method used for determining the integrity of the Essential Chiller B heat exchanger tubing. Failure to take this timely action resulted in an inadvertent tube rupture and inoperability of Essential Chiller B. The licensee entered this deficiency into their corrective action program as Condition Report CR-WF3-2008-5342.
This finding was more than minor because it is associated with the Mitigating Systems attributes for Equipment Performance and would impact the availability and reliability of systems that respond to initiating events. The inspectors evaluated this finding using Manual Chapter 0609, Attachment 4, and determined that it was of very low safety significance (Green) because, assuming worst case degradation of both the B and AB Essential Chillers failing, the redundant A Essential Chiller would still have been available for accident mitigation. This finding had a crosscutting aspect in Problem Identification and Resolution, specifically the Corrective Action Program aspect [P.1 (d)] because the licensee failed to take appropriate corrective actions to address a degrading condition in a timely manner. Specifically, the failure to perform timely tube inspections of Essential Chiller B, following the identification of an inadequate testing methodology used for identifying Essential Chiller heat exchanger tubing degradation (Section 4OA2).

Inspection Report# : 2008005 *(pdf)*

Significance: G Dec 31, 2008
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Essential Chiller AB Component Failure Due to Inadequate Procedural Guidance
• Green. The inspectors reviewed a self revealing noncited violation of Technical Specification 6.8.1.a for failure to provide documented instructions appropriate to the circumstances as recommended in Appendix A of Regulatory Guide 1.33. The failure by the licensee to provide adequate guidance for the replacement of the Essential Chiller AB compressor motor temperature sensor resulted in the reintroduction of a failure mechanism that had previously been corrected. This subsequently led to the failure of the temperature sensor wiring and inoperability of Essential Chiller AB. The licensee entered this deficiency into their corrective action program as Condition Report CR-WF3-2008-5471.
This finding was more than minor because it is associated with the Mitigating Systems attributes for Equipment Performance and would impact the availability and reliability of systems that respond to initiating events. The inspectors evaluated this finding using Manual Chapter 0609, Attachment 4, and determined that it was of very low safety significance (Green) because the redundant Essential Chillers A and B would still have been available for accident mitigation. Based on the guidance provided in Manual Chapter 0612, Appendix B, Section 1-5, “Screen for Cross-Cutting Aspects,” this finding did not have a crosscutting aspect because it was not considered to be reflective of current licensee performance. Specifically, the licensee’s failure to update the model work instructions in 2000 was a latent issue, whereby the licensee did not have a reasonable opportunity to identify the problem prior to August, 2008. In addition, the licensee has since instituted programs and processes such that the problem would not reasonably occur today (Section 4OA2).

Inspection Report# : 2008005 *(pdf)*

Significance: G Dec 31, 2008
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Calculations Used for Operability determination of SI-405 A(B)
Green. The inspectors identified a noncited violation of 10 CFR 50, Appendix B, Criterion III to address three examples of inadequate calculations involving shutdown cooling Valves SI-405A and SI-405B. The calculations were also used, in part, to support valve operability, which made an existing operability assessment invalid. First, a calculation performed by a contractor to estimate the bounding thrust requirements for pressure locking contained errors and used mathematical formulas out of their intended context without applying uncertainties to account for the differences. Recent operational experience with these valves was inconsistent with the calculation's conclusions. In addition, the licensee failed to meet their quality assurance program requirements that specified that engineers perform a design verification of the calculation prior to use. Second, the licensee's calculation, that demonstrated valve actuator thrust capabilities, contained errors. Specifically, it failed to account for the friction between the actuator piston disk and walls as well as the weight of components. Third, a calculation that determined that the temperature within the valve bonnet would not heat up during small break loss of coolant accidents and faulted steam generator accidents was inadequate, in that it failed to address a faulted steam generator event, it used heat transfer calculation methods on water that were intended only for solid materials, it failed to model all components, and it failed to determine the temperatures inside the valve bonnets, which was the overriding variable of interest. The licensee entered the finding into the corrective action program as Condition Report CR-WF3-2009-00127.

This finding was more than minor because it was similar to non-minor finding Example 3.j in NRC Inspection Manual Chapter 0612 Appendix E, “Examples of Minor Issues,” in that there was a reasonable doubt concerning the operability of Valves SI-405A(B). The inspectors utilized NRC Manual Chapter 0609, Appendix G, “Shutdown Operations Significance Determination Process,” to characterize the significance of the issue. Using the worst case scenario of having both SI-405A(B) valves inoperable, the finding was of very low safety significance because multiple systems or components would still be available to remove decay heat and respond to a loss of inventory event. These systems included the emergency feedwater system, main feedwater system, auxiliary feed water system, atmospheric dump valves, charging pumps, safety injection tanks, and the high-pressure safety injection system. This performance deficiency would not result in any loss of instrumentation needed for safe shutdown and cool down of the plant. The finding had a crosscutting aspect in the area of problem identification and resolution (P.1(c)) because

engineers failed to thoroughly evaluate the potential for valve pressure-locking. The calculations were completed in 2008 and were indicative of current performance (Section 4OA2).

Inspection Report# : 2008005 *(pdf)*

Significance: G Sep 16, 2008
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate pressure locking calculation
Green. The inspectors identified a noncited violation of 10 CFR 50, Appendix B, Criterion III (Design Control) for an inadequate "pressure locking" design calculation for shutdown cooling Valves SI-405A and SI-405B. Plant engineers also used the calculation to support valve operability following a valve malfunction, which appeared to be caused by pressure locking. Entergy engineers had derived valve bonnet leakage rates (for pressure locking conditions) from local leak rate testing results. However, a national laboratory had already proven the Entergy theory invalid and plant engineers had taken no steps to validate the theory themselves. Finally, in response to an NRC generic letter concerning pressure locking and thermal binding of valves, the licensee engineers' conclusions were based on incorrect facts and improper assumptions. Licensee personnel entered the noncited violation into the corrective action program as Condition Report CR WF3 2008 4292.

The failures to perform: (1) an adequate engineering calculation and (2) a valid operability determination were performance deficiencies. This finding was more than minor because it was similar to nonminor finding Example 3.j in NRC Inspection Manual Chapter 0612 Appendix E, “Examples of Minor Issues,” in that, there was a reasonable doubt concerning the operability of Valves SI-405A/B. The inspectors utilized NRC Manual Chapter 0609, Appendix G, “Shutdown Operations Significance Determination Process,” to characterize the significance of the issue. Using the worst case scenario of having both SI 405A/B valves inoperable, the finding was of very low safety significance because multiple systems or components would still be available to remove decay heat and respond to a loss of inventory event. These systems included the emergency feedwater system, main feedwater system, auxiliary feed water system, atmospheric dump valves, charging pumps, safety injection tanks, and the high pressure safety injection system. This performance deficiency would not result in any loss of instrumentation needed for safe shutdown and cool down of the plant. The finding had a crosscutting aspect in the area of problem identification and resolution [P.1 (c)] because engineers failed to thoroughly evaluate the potential for valve pressure locking. The calculation was completed in 2008 and was indicative of current performance.

Inspection Report# : 2008004 *(pdf)*

Significance: G Sep 16, 2008
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to follow integrated EDG test procedure
Green. The inspectors identified a noncited violation of Technical Specification 6.8.1.c (Procedures) for the failure to open the Train A low pressure safety injection pump suction valve prior to pump operation during a surveillance. The butterfly valve was installed 90 degrees out of position and was closed when operators believed it was open. After starting the pump, operators observed loud noises coming from the unit and secured it 8 minutes later. Pump operation without adequate net positive suction head could cause damage. The valve's postmaintenance test was scheduled after the noted surveillance test, and the surveillance was not intended to check the valve's function. The safety injection train was considered inoperable but available at the time. Licensee personnel entered the noncited violation into the corrective action program as Condition Reports CR-WF3-2008-2280 and CR-WF3-2008-3045.

This finding was more than minor because it affected both the configuration control and the equipment performance attributes of the Mitigating Systems Cornerstone objective to ensure reliability of the low pressure safety injection system. In addition, this condition, if left uncorrected, would also become a more significant safety concern. Equipment could be damaged without adequate postmaintenance checks prior to operation. Using the NRC Manual Chapter 0609, "Significance Determination Process," Phase 1 Screening Worksheet, the finding was of very low risk significance because it did not: (1) represent a loss of safety function; (2) represent an actual loss of a single train of

equipment for more than its Technical Specification allowed outage time; or (3) screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event.

This finding had a crosscutting aspect in the area of human performance, associated with the decision-making component, in that, the plant personnel used nonconservative assumptions and chose to use the pump suction valve for system operation prior to verifying that the valve was properly assembled [H.1(b)]
Inspection Report# : 2008004 *(pdf)*

Barrier Integrity

Significance: G Oct 31, 2008
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to promptly identify and correct a condition adverse to quality.
The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for failure to promptly identify and correct a condition adverse to quality. Specifically, from March 20, 2007, through October 27, 2008, personnel failed to identify and correct a condition, which allowed containment vacuum relief valve differential pressure switches to operate in pressures that exceeded the designed operating pressure of the switches. The licensee implemented interim corrective actions to ensure operability. Specifically, the licensee increased the test frequency and adjusted the switches to reduce the effects of the deficient condition. The licensee entered this deficiency into their corrective action program as Condition Report 2008 05106.

The performance deficiency associated with this finding involved the failure to promptly identify and correct a condition adverse to quality that could affect containment integrity. This finding was greater than minor because it affected the Configuration Control attribute of the Barrier Integrity Cornerstone objective to provide reasonable assurance that the containment physical design barrier protected the public from radionuclide releases caused by an event. Using the NRC Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the team determined the finding had very low safety significance because it did not represent an actual open pathway in the physical integrity of the reactor containment building. This finding had a crosscutting aspect in the area of human performance, associated with the decision making component, in that, licensee personnel failed to make conservative decisions related to equipment operation in accordance with design requirements (H.1(b)).

Inspection Report# : 2008007 *(pdf)*

Significance: G Oct 31, 2008
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate operability determination of a pressure boundary valve
The team identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion V, for a failure to follow procedure, when the licensee failed to complete an adequate operability evaluation for Valve SI 142A. Specifically, on August 21, 2008, the licensee failed to follow Procedure EN OP 104, "Operability Determinations," Revision 3, because personnel did not determine the leak rate solely through the required pressure boundary valve. The licensee entered this deficiency into their corrective action program as Condition Report 2008 05077.

The failure to perform an adequate operability evaluation on safety related plant equipment in accordance with Procedure EN OP 104 is a performance deficiency. The team determined this finding was greater than minor from review of Manual Chapter 0612, Appendix E, "Examples of Minor Issues." The finding was similar to non minor finding Example 3.j in that reasonable doubt existed related to the operability of Valve SI 142A. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings", the team determined the finding had very low safety significance because it did not represent an actual open pathway in the physical integrity of the reactor containment building. The finding had a crosscutting aspect in the area of problem identification and resolution because the licensee failed to thoroughly evaluate valve operability (P.1(c)).

Inspection Report# : 2008007 *(pdf)*

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the cover letters to security inspection reports may be viewed.

Miscellaneous

Last modified : August 31, 2009