

Waterford 3

2Q/2006 Plant Inspection Findings

Initiating Events

G**Significance:** Dec 31, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Reactor Coolant System Leakage Detection System

The inspectors identified a noncited violation for the failure to comply with Technical Specification 3.4.5, "Leakage Detection Systems" based on a method of reactor coolant system leakage detection not meeting design standards of Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection System." Specifically, the containment fan cooler condensate flow switches were identified to not meet the the design requirements for detecting a one gallon per minute reactor coolant system leak. The licensee took prompt corrective actions and entered this issue into the corrective action program.

The finding is greater than minor because it is associated with the Initiating Event cornerstone attribute of equipment performance and affects the associated cornerstone objective to limit the likelihood of an event that might upset plant stability and challenge critical safety functions in that a reactor coolant system leak could go undetected until it became more severe. The Phase 1 worksheets in Manual Chapter 0609, "Significance Determination Process," were used to conclude that the finding was of very low safety significance (Green) because other methods of reactor coolant system leakage detection were available, mitigating systems would not be affected, and it did not contribute to the likelihood of a reactor trip. The finding has a crosscutting element related to problem identification and resolution in that the licensee missed several opportunities to identify this non-conforming condition (Section R22).

Inspection Report# : [2005005\(pdf\)](#)**G****Significance:** Sep 14, 2005

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

(1) Failure to implement required procedure for RCS draindown; (2) Failure to implement required procedure for peer-checking; and (3) Failure to perform an adequate prejob brief prior to reducing level

A self-revealing noncited violation with three examples of Technical Specification 6.8.1.a was identified. The first involved the failure to implement Procedure OP-001-003, "RCS Drain Down," in establishing a reactor coolant system vent path when a nuclear auxiliary operator failed to open the reactor vessel vent line isolation valve as required. The licensee documented this issue and its corrective actions in Condition Report CR-WF3-2005-1463. The second violation of Technical Specification 6.8.1.a involved the failure to implement Procedure OP-100-001, "Operation Standards and Management Expectations," for providing a proper peer check for valve manipulations when a nuclear auxiliary operator failed to provide the required local peer check for opening the reactor vessel vent line isolation valve and erroneously agreed with the report that the valve had been properly opened and a vessel head vent path had been established. The licensee documented this issue and its corrective actions in Condition Report CR-WF3-2005-1463. The third violation of Technical Specification 6.8.1.a was identified for failure of the prejob brief to provide the nuclear auxiliary operators the required knowledge and information needed to successfully establish vent paths for the pressurizer and reactor vessel as required by procedure. The nuclear auxiliary operators responsible for establishing the vent paths did not attend this briefing as required. The licensee documented this issue and its corrective actions in Condition Report CR-WF3-2005-1463. This finding has human performance crosscutting aspects associated with three failures to follow procedure. This finding is more than minor because if left uncorrected it could have become a more safety significant concern, it was associated with the human performance attribute of the initiating events cornerstone, and it affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenged critical safety functions during shutdown operations. This finding was evaluated utilizing Inspection Manual Chapter 0609, Significance Determination Process, Appendix G, "Shutdown Operations," Checklist 2. Using the Phase 1 guidelines, the inspectors determined that the finding increased the likelihood that a loss of decay heat removal would occur due to a decrease in the available net positive suction head available to the operating shutdown cooling pumps at the low reactor coolant system pressure. The inspectors determined the finding required a Phase 2 analysis and was sent to the regional Senior Reactor Analysts for risk quantification. The risk was determined to be of very low safety significance because, in this case, the reactor coolant system level was being administratively limited at a level where the system was not vulnerable to air binding the shutdown cooling pumps (Sections 3.3.1, 3.3.2, and 3.3.4).

Inspection Report# : [2005010\(pdf\)](#)**G****Significance:** Sep 14, 2005

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to establish an adequate procedure for reactor coolant system draindown

A self-revealing noncited violation of Technical Specification 6.8.1.a was identified for failure to establish an adequate procedure to govern reactor coolant system inventory reductions. The reactor coolant system draindown procedure failed to identify that temporary vent rigs, required by

procedure to properly establish vent paths, included in-line ball valves in series with the vent path and also failed to direct that those ball valves be opened to establish the vent path. As a result of this procedural inadequacy, one of the vent rig ball valves remained closed and the reactor coolant system remained unvented during the subsequent draindown, which caused the pressure in the reactor coolant system to drop below atmospheric. The licensee documented this issue and its corrective actions in Condition Report CR-WF3-2005-1463. This finding has problem identification and resolution crosscutting aspects because the licensee was aware of and did not fix the procedure to address the ball valves in 2002. This finding is more than minor because if left uncorrected it could have become a more safety significant concern, it was associated with the procedure quality attribute of the initiating events cornerstone, and it affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown operations. This finding was evaluated utilizing Inspection Manual Chapter 0609, Significance Determination Process, Appendix G, "Shutdown Operations," Checklist 2. Using the Phase 1 guidelines, the inspectors determined that the finding increased the likelihood that a loss of decay heat removal would occur due to a decrease in the available net positive suction head available to the operating shutdown cooling pumps at low reactor coolant system pressure. The inspectors determined the finding required a Phase 2 analysis and was sent to the regional Senior Reactor Analysts for risk quantification. The risk was determined to be of very low safety significance because, in this case, the reactor coolant system level was being administratively limited at a level where the system was not vulnerable to air binding the shutdown cooling pumps (Section 3.3.3).

Inspection Report# : [2005010\(pdf\)](#)



Significance: G Sep 14, 2005

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to establish an adequate procedure for performing the containment integrated leak rate test

A self-revealing, noncited violation of Technical Specification 6.8.1.a was identified for failure to establish an adequate procedure to govern the integrated leak rate test for the containment vessel. The procedure for the test failed to prevent a plant configuration that allowed air to be entrained in the reactor coolant system and subsequently come out of solution and form a void in the reactor vessel head. The licensee documented this issue and its corrective actions in Condition Report CR-WF3-2005-2461. This finding has a human performance crosscutting aspect associated with procedure quality. This finding is more than minor because it is associated with the configuration control attribute of the initiating events cornerstone and affects the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown operations. The inspector utilized the NRC Inspection Manual Chapter 0609 Significance Determination Process Phase 1 Screen Worksheet for Initiating Events, Mitigating Systems, and Barrier Integrity Cornerstones to assess the safety significance. The finding was determined to be of very low risk significance since adequate mitigation capability remained available (Section 3.13).

Inspection Report# : [2005010\(pdf\)](#)

Mitigating Systems

Significance: SL-IV Sep 26, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

Change to a Method of Evaluation Without Prior NRC Approval

The inspectors identified a Severity Level IV noncited violation of 10 CFR 50.59 for the failure to obtain NRC approval prior to implementing a change to the facility that resulted in a departure from a method of evaluation described in the final safety analysis report used in establishing the design bases. Specifically, the licensee implemented a change that assumed the unprotected dry cooling towers would not be impacted during a tornado event. This change was implemented based on the inappropriate use of a Tornado Missile Risk Evaluation method of evaluation not previously approved by the NRC. The licensee implemented this change to compensate for a licensee identified analysis error that adversely affected the ultimate heat sink capability following a tornado event. The licensee entered this deficiency into their corrective action program for resolution. The cause of this finding is related to the crosscutting element of human performance. The finding is greater than minor in that it affected the mitigating systems cornerstone attribute of equipment availability and function during a design bases tornado event. Regional and NRR staff determined that the change made by the licensee resulted in a departure from a method of evaluation described in the final safety analysis report used in establishing the design bases and that the change would require NRC approval under 10 CFR 50.59 guidance. In accordance with the NRC Enforcement Manual, violations of 10 CFR 50.59 are not processed directly through the significance determination process. Therefore, this issue was considered applicable as traditional enforcement. Although the significance determination process is not designed to assess significance of violations that potentially impact or impede the regulatory process, the technical result or condition of a 10 CFR 50.59 violation can be assessed through the significance determination process. The inspectors and the Region IV reactor analyst discussed the significance of this finding. A significance Determination Process Phase 1 screening was performed and the finding was determined to have very low safety significance because there was no actual loss of mitigating system safety function per Generic Letter 91-18 guidance.

Inspection Report# : [2005004\(pdf\)](#)



Significance: G Sep 14, 2005

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Failure to promptly identify and correct the vacuum condition in the reactor coolant system

A self-revealing noncited violation of Criterion XVI of Appendix B of 10 CFR Part 50 was identified for the failure to promptly identify and correct

the vacuum condition in the reactor coolant system during draindown, a condition adverse to quality. Control room operators missed several opportunities over a 32.5-hour period to identify that a vacuum had been drawn on the reactor coolant system to correct the vacuum condition. The licensee documented this issue and their corrective actions in Condition Report CR-WF3-2005-1463. This finding has crosscutting aspects associated with problem identification and resolution for the failure to promptly identify and correct the vacuum condition. This finding is greater than minor because if left uncorrected it could have become a more safety significant concern, it was associated with the human performance attribute of the mitigating systems cornerstone, and it affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. This finding was evaluated utilizing Inspection Manual Chapter 0609, Significance Determination Process, Appendix G, "Shutdown Operations," Checklist 2. Using the Phase 1 guidelines, the inspectors determined that the finding increased the likelihood that a loss of decay heat removal would occur due to a decrease in the available net positive suction head available to the operating shutdown cooling pumps at the low reactor coolant system pressure. The inspectors determined the finding required a Phase 2 analysis and was sent to the regional Senior Reactor Analysts for risk quantification. The risk was determined to be of very low safety significance because, in this case, the reactor coolant system level was being administratively limited at a level where the system was not vulnerable to air binding the shutdown cooling pumps (Section 3.8).

Inspection Report# : [2005010\(pdf\)](#)

Barrier Integrity



Significance: Sep 26, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Establish Adequate Procedure for Containment Closure Following a Loss of Shutdown Cooling Event

The inspectors identified a Green noncited violation of Technical Specification 6.8, "Procedures and Programs," for the failure to establish adequate procedures regarding containment closure following loss of shutdown cooling while in reduced reactor coolant inventory conditions. This deficiency could result in loss of the containment barrier when called upon and the failure to maintain occupational radiation exposures as low as reasonably achievable. The licensee entered this deficiency into their corrective action program for resolution. The cause of this finding is related to the crosscutting element of human performance. The failure to establish adequate procedures for containment closure in reduced reactor coolant inventory conditions is greater than minor in that if left uncorrected the finding would become a more significant safety concern that could result in the loss of the containment barrier when called upon and the failure to maintain occupational radiation exposures as low as reasonably achievable. Using Manual Chapter 0609, Appendix H, "Containment Integrity Significance Determination Process," the finding was assessed as a Type B finding. Through interviews and review of additional analysis the licensee provided reasonable assurance that following a loss of shutdown cooling containment closure would be performed prior to core uncover with leakage less than 100 percent containment volume per day through the equipment hatch. Using MC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process," the licensee's three year rolling average collective dose was less than 135 person-rem. Based on these assessments the finding was determined to be of very low safety significance.

Inspection Report# : [2005004\(pdf\)](#)



Significance: Sep 26, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Prevent Recurrence of Main Steam Line Through Wall Pipe Leakage

The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the failure to preclude recurrence of through wall pipe leakage on the main steam line pipe 2MS2-123. This deficiency resulted in an unisolable steam leak requiring NRC approval to deviate from American Society of Mechanical Engineers Boiler and Pressure Vessel Code Case N523-2 to perform temporary repairs preventing a plant shutdown. The licensee entered this deficiency into their corrective action program for resolution. The inspectors determined the cause of this finding was related to the problem identification and resolution crosscutting area. The finding is greater than minor because it affected the reactor safety barrier integrity cornerstone for providing reasonable assurance that the physical design barriers protect the public from radionuclide releases caused by accidents or events. The finding was of very low safety significance because it did not result in an actual open pathway affecting the physical integrity of reactor containment.

Inspection Report# : [2005004\(pdf\)](#)

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

Physical Protection

[Physical Protection](#) information not publicly available.

Miscellaneous

Significance: N/A Mar 24, 2006

Identified By: NRC

Item Type: FIN Finding

identification and Resolution of Problems

The team reviewed approximately 237 corrective action program documents, apparent and root cause analyses, as well as supporting documents to assess problem identification and resolution activities. Based on this review, the team found the licensee's process to identify, prioritize, evaluate, and correct problems was generally effective; thresholds for identifying issues remained appropriately low and, in most cases, corrective actions were adequate to address conditions adverse to quality. However, a number of issues were identified associated with the proper identification of degraded conditions in the plant. The team reviewed corrective actions associated with these degraded conditions and design issues at Waterford Steam Electric Station, Unit 3, which had cross-cutting aspects in the area of problem identification and resolution. The team concluded that a positive safety-conscience work environment exists at Waterford Steam Electric Station, Unit 3 based upon interviews conducted with plant personnel. The team determined that employees and contractors feel free to raise safety concerns to their supervision or bring concerns to the employees concern program.

Inspection Report# : [2006008\(pdf\)](#)

Last modified : August 25, 2006