

## Waterford 3

### 4Q/2005 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 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:**  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\(pdf\)](#)

**G****Significance:** 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\(pdf\)](#)**G****Significance:** Jun 26, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

**Inadequate Design Control of the Train B Emergency Diesel Fuel Oil Storage Tank Level Instrument Sensing Line**

The inspectors identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, for the failure to maintain design control of the Train B emergency diesel fuel oil storage tank level instrument sensing line resulting in level indication error. This error affected the ability of Train B fuel oil storage tank to provide sufficient fuel oil to support 7 days of continuous diesel generator operations following a loss of offsite power and a design-bases accident. This finding was greater than minor because it affected the mitigating systems cornerstone objective of ensuring the capability of emergency power to respond to initiating events to prevent undesirable consequences. Since the finding represented an actual loss of safety function, for a single train, for greater than its Technical Specification-allowed outage time, the finding was analyzed using Phase 2 of the Significant Determination Process. The finding was of very low safety significance because the licensee staff would have sufficient time to order replacement fuel, procedures existed to order replacement fuel and training was conducted on the existing procedures under conditions similar to the initiating event assumed.

Inspection Report# : [2005003\(pdf\)](#)**G****Significance:** Apr 07, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Prevent a Reoccurrence Cycle Timer Failure in the Essential Chiller**

The inspectors identified a Green noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, for the failure to implement effective corrective actions to prevent recurrence for a significant condition adverse to quality affecting operability of the essential chillers. Specifically, on multiple occasions the essential chillers have failed to function as required due to cycle timer switch failure. Essential chiller malfunction could result in elevated chilled water system temperature used to cool areas containing safety significant equipment. This finding was more than minor in significance because it affected the mitigating systems cornerstone objective to ensure the availability of systems that respond to initiating events and would become a more significant condition if left uncorrected. The inspectors utilized NRC Inspection Manual Chapter 0609, Significance Determination Process, Appendix A, Significance Determination Process Phase 1 Screening Worksheet, dated December 1, 2004, for Initiating Events, Mitigating Systems, and Barrier Cornerstones to assess the safety significance. The finding was determined to be of very low risk significance because, for each essential chiller malfunction, the affected train was inoperable for less than the Technical Specification allowed outage time. A problem identification and resolution crosscutting aspect was identified for the failure to correct the condition which resulted in multiple timer failures (Section 40A2).

Inspection Report# : [2005002\(pdf\)](#)**G****Significance:** Mar 10, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to develop and maintain procedures affecting a design basis limit.**

A noncited violation of Waterford Technical Specification 6.8.1 was identified for failure to properly develop and implement procedures. Technical Specification 6.8.1 states in part that written procedures shall be established, implemented and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, which references activities affecting safety-related structures.

Contrary to this, station personnel failed to develop and implement procedures to relate the design basis ambient conditions to the operation of the ultimate heat sink cooling tower fans. As a result, no monitoring to recognize that a design basis limit has been exceeded, nor any actions required in the event that the design basis limit has been exceeded have been included in station procedures. This issue was entered into the corrective action program as Condition Report CR-WF3-2005-0000590. The finding is greater than minor because it affects the Mitigating Systems Cornerstone objective, in that, if left uncorrected could result in the plant operating outside the design basis limits. The team determined this finding to be of very low safety significance because there was no evidence found that the licensee had exceeded their design basis limit.

Inspection Report# : [2005008\(pdf\)](#)

**Significance:**  Mar 10, 2005

Identified By: NRC

Item Type: FIN Finding

**Failure to analyze the Dry Cooling Tower diesel driven sump pump discharge hose supports.**

A finding of very low safety significance was identified for inadequate design of the diesel-driven sump pump associated with the dry cooling tower in that it did not provide an analysis to ensure that the support arrangement of the discharge hoses was adequate to support the discharge line. This finding is important to safety but not covered under 10 CFR Part 50, Appendix B Criterion. This finding was entered this issue into their corrective action program as Condition Report CR-WF3-2005-00592. This finding is greater than minor because it affected an attribute and the objective of the Mitigating Systems Cornerstone in that the design inadequacies did not provide assurance that the support arrangement for the diesel-driven sump pump was structurally adequate. The finding is of very low safety significance because, although it represented a design inadequacy, it did not contribute to a loss-of-mitigation equipment function, and did not increase the likelihood of a flood.

Inspection Report# : [2005008\(pdf\)](#)

**Significance:**  Mar 10, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to maintain design control over Seismic Category 1 structure.**

A noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified for failure to perform a complete and adequate design of a Seismic Category 1 structure. Specifically, the licensee failed to perform a complete analysis of the component cooling water surge tank baffle plate. The surge tank was designed and constructed with a baffle plate internal to the tank, providing two independent trains of component cooling water. The analysis performed on the tank did not include an analysis of the baffle plate welds to ensure adequate performance for all applicable load scenarios. The licensee subsequently performed an analysis to demonstrate the adequacy of the baffle plate welds. This issue was entered into the corrective action program as Condition Report CR-WF3-2005-00313. The finding is greater than minor because it affects the Mitigating Systems Cornerstone objective, in that, not providing adequate design analyses for the baffle plate welds did not ensure that all load scenarios were included in the analysis. Failure of these baffle plate welds could have resulted in a loss of both trains of component cooling water surge tank. This finding is determined to be of very low safety significance because the licensee performed a calculation that demonstrated the adequacy of the welds, and there was no actual loss of a safety function.

Inspection Report# : [2005008\(pdf\)](#)

**Significance:**  Mar 10, 2005

Identified By: NRC

Item Type: FIN Finding

**Degraded performance could be masked and appropriate corrective actions not identified or implemented.**

A finding with two examples of very low safety significance was identified for weaknesses in the maintenance rule program in regards to the component cooling water pumps, the reactor protection system and the reactor trip breakers. Specifically, the team found that the licensee did not monitor the performance or condition of structures, systems, or components in a manner sufficient to provide reasonable assurance that equipment reliability and degraded performance would not be masked and appropriate corrective actions would not be identified or implemented. This finding is more than minor because it affects the Mitigating Systems Cornerstone attributes of equipment reliability, in that, degraded performance could be masked and appropriate corrective actions not identified or implemented. This finding was of very low safety significance because no performance criteria were exceeded and there was no actual loss-of-safety function. Licensee personnel initiated Condition Report CR-WF3-2005-00322 to address this finding. (Section 1R21.4b2)

Inspection Report# : [2005008\(pdf\)](#)

**Significance:**  Mar 10, 2005

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to adequately analyze potential for over pressurizing ASME VIII air accumulators**

A noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified for failure to provide justification for not

providing over-pressure protection to air accumulators servicing safety-related valves, in accordance with ASME Code, Section VIII, Division 1. ASME Code, Section VIII, Division 1, paragraph UG-125, states that all pressure vessels (i.e., air accumulators), irrespective of size or pressure, shall be provided with pressure relief devices to protect against excessive pressure and these devices must be installed so that they may not be readily rendered inoperable. The team identified that the air accumulators, as installed, did not have any unisolable pressure relieving devices, therefore, causing the potential to over-pressure the air accumulators, challenging their structural integrity. The licensee had not provided an engineering analysis or justification for omitting over-pressure protection. The licensee initiated Condition Report CR-W3-2005-00596 to address NRC operability concerns. The finding is greater than minor because it affects Mitigating Systems Cornerstone in that not providing a design analysis did not ensure adequate protection against excessive pressure in air accumulators. Failure of these air accumulators could have resulted in a loss of motive force to the valves during loss of instrument air. Using the Phase 1 worksheet in Manual Chapter 0609 "Significance Determination Process," the finding was determined to have very low safety significance because the air accumulators were later found to have a maximum allowable working pressure greater than the highest pressure that could be achieved in the system; therefore, the structural integrity of the design would not be challenged.

Inspection Report# : [2005008\(pdf\)](#)

---

## Barrier Integrity

**G**

**Significance:** **G** 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\(pdf\)](#)

**G**

**Significance:** **G** 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

**Significance:**  Mar 04, 2005

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Failure to ship radioactive material correctly**

The team reviewed a self-revealing, noncited violation of 10 CFR 71.5, which occurred when the licensee failed to ship radioactive material correctly. A radioactive shipment classified as an "excepted package-limited quantity" exceeded the external dose rate limitation of 0.5 millirem per hour on the surface of the package. The package recipient identified dose rates of 1.2 millirems per hour on the exterior surface of the package and notified the licensee of the problem. The finding is greater than minor because it was associated with a Public Radiation Safety cornerstone attribute (human performance) and it affected the associated cornerstone objective because the failure to correctly ship radioactive material decreases the licensee's assurance that the public will not receive unnecessary dose. However, this finding cannot be evaluated by the Public Radiation Safety Significance Determination Process because it did not involve radioactive shipments classified as Schedule 5 through 11, as described in NUREG-1660, and it did not fit traditional enforcement. Therefore, the finding was reviewed by NRC management and determined to be of very low safety significance. Additionally, this finding had cross-cutting aspects associated with human performance. Licensee personnel directly contributed to the finding when they failed to ensure that the package did not exceed the dose rate limit. The finding was placed into the licensee's corrective action program as Condition Report WF3-2003-03514.

Inspection Report# : [2005009\(pdf\)](#)

---

## Physical Protection

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

---

## Miscellaneous

Last modified : March 03, 2006