

Waterford 3

1Q/2008 Plant Inspection Findings

Initiating Events

Significance:  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Maintenance Procedure

Green. A self-revealing Green noncited violation of 10 CFR 50, Appendix B, Criterion V was identified for an inadequate maintenance procedure. Specifically, MM-006-054, "Check Valve Inspection (Tilting Disc)", lacked sufficient detail to prevent poor workmanship during maintenance on safety injection Tank 1A discharge check Valve SI-335A. This poor workmanship allowed Valve SI-335A to be reassembled with a cocked hinge pin cover, resulting in reactor coolant system (RCS) leakage. The licensee entered this issue into their corrective action program for resolution.

The finding is more than minor because it challenges the procedure quality attribute of the initiating events cornerstone objective to limit the likelihood of those events that upset plant stability during power operations. Using Manual Chapter 0609, Appendix A Phase 1 screening worksheet, the issue screened as having very low safety significance because assuming worst case degradation, the Valve SI-335A leak would not result in exceeding the Technical Specification limit for identified RCS leakage. This finding had a crosscutting aspect in the resources component of the human performance area. Specifically, the licensee failed to provide the maintenance technician with a complete and accurate maintenance procedure [H.2(c)].

Inspection Report# : [2007005](#) (*pdf*)

Significance:  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Reactor Coolant Pump 1A Seal Leak

Green. A self-revealing Green noncited violation of 10 CFR 50, Appendix B, Criterion XVI was identified for the licensee's failure to promptly identify and correct a significant condition adverse to quality. Specifically, the licensee did not identify a seal leak on reactor coolant Pump 1A in a timely fashion. During efforts to identify the source of leakage, the licensee effectively ruled out the reactor coolant pump seal areas based on an incorrect assumption. When no other significant sources of leakage could be found, the decision was made to monitor the leakage and take no further actions until the mid-cycle outage. This unidentified reactor coolant system leakage caused degradation to the reactor coolant pump cover, main casing stud nuts, shroud wall, and carbon steel flanges. The licensee entered this issue into their corrective action program for resolution.

The finding is more than minor because it challenges the equipment performance attribute of the initiating events cornerstone objective to limit the likelihood of those events that upset plant stability during power operations. Using Manual Chapter 0609, Appendix A Phase 1 screening worksheet, the issue screened as having very low safety significance because, although the finding contributes to the likelihood of a reactor trip, mitigation equipment is still available. This finding had a crosscutting aspect in the area of human performance associated with decision-making in that the licensee did not use conservative assumptions in the reactor coolant system leakage investigation [H.1(b)].

Inspection Report# : [2007005](#) (*pdf*)

Mitigating Systems

Significance:  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Follow Procedure Review Process

Green. The inspectors identified a Green noncited violation of Technical Specification 6.8.1.a (Procedures) for failure to correctly implement a procedure recommended in Appendix A of Regulatory Guide 1.33. Specifically, the failure to follow Site Procedure W2.109, "Procedure Development, Review, and Approval," led to the unapproved deletion of the Special Scope section of the Quality Assurance Program Manual. The Special Scope section contained the fire protection quality assurance (QA) program components and discussion for their implementation. This deleted information is required by the Waterford 3 Steam Electric Station License Condition 2.C.9. The licensee entered this issue into their corrective action program for resolution.

The finding was more than minor because if left uncorrected, it would become a more significant safety concern.

Using Inspection Manual Chapter 0609, Appendix F, this finding can be assigned a low degradation rating and screen as green, since current QA audit standards contain a similar level of detail as the criteria contained in the deleted Special Scope document.

Inspection Report# : [2007005](#) (pdf)

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Significance: Oct 07, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Procedure for a Fire in Vital Switchgear Room B

The inspectors identified two examples of a noncited violation of Waterford Steam Electric Station, Unit 3 Facility Operating License Condition 2.C.9 for failure to implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report for the facility. In the first example, the pre-fire strategy for vital switchgear Room B did not contain adequate information regarding the doors required to be open to allow the desired ventilation flowpath, nor did it contain the required number of smoke ejectors necessary to desmoke the switchgear room in a manner that would allow the implementation of OP-901-524, "Fire In Areas Affecting Safe Shutdown." In the second example, the licensee did not take corrective actions for a previously identified issue in a timely fashion. Specifically, the deficiencies in the pre-fire strategy for vital switchgear Room B were first identified on August 21, 2006. The deficient procedure was not corrected until September 14, 2007, after the senior resident inspector discussed the non-conformance with licensee management. The licensee entered this deficiency into their corrective action program for resolution. The finding was more than minor because it was associated with the mitigating systems cornerstone objective (Protection Against External Factors) to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the Manual Chapter 0609, Appendix F, Phase 1 initial qualitative screening, the issue screened as having very low safety significance because the compensatory manual action required to safely shut down the plant is not needed in order to reach hot shutdown. This finding had a crosscutting aspect in the area of problem identification and resolution. Specifically, the licensee's personnel corrective action process failed to take appropriate corrective actions to address the safety issue in a timely manner (P.1(d)).

Inspection Report# : [2007004](#) (pdf)

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Significance: Sep 12, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Boric Acid Leak Evaluation

The inspectors identified a noncited violation of Technical Specification 6.8.1.a (Procedures) for an inadequate boric acid evaluation procedure and for the failure to follow the same procedure. Specifically, the procedure noted that small amounts of boric acid could severely corrode carbon and low alloy carbon steel, but only had engineers check drawings for carbon steel components. Components with low alloy steel on the containment spray pumps were sometimes ignored. In addition, the procedure required pictures of the boric acid condition but, for some evaluations, no pictures were taken of the containment spray pump leaks. This made trending of the condition, to check for worsening, difficult. The inspectors determined that engineers were not following the boric acid evaluation procedure when performing the evaluations, they simply filled out the forms. The procedure contained valuable insights vital for proper boric acid evaluations, whereas the forms did not. The finding was more than minor because it could, if left uncorrected, result in a more significant safety concern. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet, the finding was determined to have very low safety significance (Green) because it did not result in an actual loss of safety function for the containment spray system. The cause of the finding has a cross-

cutting aspect in the area of human performance, work practices component, in that the licensee failed to effectively communicate the expectations regarding procedural compliance and personnel follow procedures (H.4(b)).

Inspection Report# : [2007004](#) (pdf)

Significance:  May 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Meet Maintenance Rule Requirements for Dry Cooling Tower Sump Pumps Failure to Meet Maintenance Rule Requirements for Dry Cooling Tower Sump Pumps

DRAFT - Green. The team identified a non-cited violation of 10 CFR 50.65(a)(2) for the failure to adequately demonstrate the performance or condition of the dry cooling tower motor-driven sump pumps. Specifically, the licensee failed to periodically verify that the pump flow rates were consistent with their design basis requirements and pump performance problems were likely to go unnoticed. Therefore, the licensee had no technical justification for continued Maintenance Rule (a)(2) status.

Failure to develop and implement technically justifiable performance criteria for the motor-driven sump pumps, for compliance with provisions of the Maintenance Rule, was a performance deficiency. The finding was greater than minor because it could be a more significant safety concern if left uncorrected. In addition, the finding was similar to non-minor finding Example 7.b in NRC Inspection Manual Chapter 0612 Appendix E, "Examples of Minor Issues," in that there were performance concerns associated with the dry cooling tower sump pumps. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to be a design deficiency confirmed not to result in loss of operability per Part 9900, Technical guidance, Operability Determination Process for Operability and Functional Assessment.

Inspection Report# : [2007007](#) (pdf)

Significance:  May 31, 2007

Identified By: NRC

Item Type: FIN Finding

Failure to Implement FME Procedure for Dry Cooling Tower Sumps

DRAFT - The team identified a finding for the failure to properly implement the site foreign material exclusion procedure for the dry cooling tower sumps. Specifically, the procedure required the establishment of a foreign material exclusion area if foreign materials could adversely impact equipment function. The area surrounding the dry cooling tower sumps met this criteria but the licensee failed to establish a foreign material exclusion area to protect the sump pump system from damage. The sump pumps had previously suffered damage due to foreign material intrusion.

The failure to properly implement the site foreign material exclusion procedure was a performance deficiency. The finding was more than minor because it affected the mitigating systems cornerstone objective (external factors attribute) to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to be a design deficiency confirmed not to result in loss of operability per Part 9900, Technical guidance, Operability Determination Process for Operability and Functional Assessment. The finding had a crosscutting aspect in the area of human performance (work practices component) in that personnel failed to follow a site procedure (H.4(b)). The finding was indicative of current plant performance because the open sump and the foreign material vulnerability was known to plant personnel on an ongoing basis

Inspection Report# : [2007007](#) (pdf)

Significance:  May 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Procedure for Restoring Power to Dry Cooling Tower Sump Pumps

DRAFT - The team identified a non-cited violation of Technical Specification 6.8.1.a, Procedures, for inadequate procedural guidance for operators to respond to a postulated loss of offsite power event coincident with a design basis rain event. The design basis calculation specified that, during certain rain precipitation events, operators must transfer the pump power to a safety related power source within 30 minutes of a loss of offsite power to protect a safety related

motor control center from flooding. The motor control centers are needed to ensure ultimate heat sink operability. During plant walkdowns, due to the sequencing of steps in the procedure, operators took approximately 50 minutes to transfer essential power to the pumps. In addition, the procedural step was worded inappropriately because it allowed operators to wait the full 30 minutes before starting the action.

The failure to provide an emergency operating procedure that could be consistently completed within the required time limits was a performance deficiency. This finding was more than minor because it affected the mitigating systems cornerstone objective (external factors component) to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. In addition, the finding was similar to non-minor finding Example 3.k in NRC Inspection Manual Chapter 0612 Appendix E, "Examples of Minor Issues," in that there was reasonable doubt of the operability of the system under certain heavy rain conditions. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the team determined that a Phase 2 significance determination was required because the finding potentially represented a loss of system safety function. The team performed a Phase 2 significance determination and found the finding was potentially greater than Green in significance. A Region IV senior reactor analyst performed a Phase 3 significance determination and found the issue was of very low safety significance.

Inspection Report# : [2007007](#) (pdf)

Significance: G May 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Acceptance Criteria for Battery Cell-to-Cell and Terminal Connection Resistance Value

DRAFT - The Team identified a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, Design Control, for the failure to ensure that the 125 Vdc safety-related batteries would remain operable if all the intercell and terminal connections were at the resistance value of 150 micro-ohms as allowed by Technical Specification Surveillance Requirement 4.8.2.1.b.2 and 4.8.2.1.c.3.

The failure to adequately verify or check a design value in accordance with NRC design control requirements was a performance deficiency. The finding was greater than minor because it affected the mitigating systems cornerstone objective (design control attribute) to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to be a design deficiency confirmed not to result in loss of operability per Part 9900, Technical guidance, Operability Determination Process for Operability and Functional Assessment.

Inspection Report# : [2007007](#) (pdf)

Significance: G May 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Take Prompt Corrective Measures to Address Degraded Dry Cooling Towers

DRAFT - The team identified a noncited violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Actions, for the failure to promptly correct a condition adverse to quality (dirt and debris in the dry cooling tower heat exchanger fins). The condition adversely impacted the heat exchangers' heat removal rates. The dry cooling towers had very little design margin under some scenarios. In addition, the licensee failed to respond to trend data that showed degraded heat exchanger performance, had no basis for the specified 5 year cleaning interval specified in their heat exchanger program, and hadn't actually cleaned the towers for approximately 11 years. This issue was entered into the licensee's corrective action program as Condition Report CR-WF3-2007-01433.

This finding was more than minor because it was similar to non-minor Example 3.k in NRC Inspection Manual Chapter 0612 Appendix E, Examples of Minor Issues, in that there was a reasonable doubt of the operability of the dry cooling towers. Using Manual Chapter 0609, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to be of very low safety significance (Green) because the finding was a qualification deficiency confirmed not to result in loss of operability per Part 9900, Technical Guidance, Operability Determination Process for Operability and Functional Assessment. The finding had a crosscutting aspect in the area of Problem Identification and Resolution (corrective action program attribute) in that the issue was identified but corrective actions were not taken in a prompt manner (P.1(d)). The issue was indicative of current performance because the system engineer was aware of the degraded cooling tower condition for several years.

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Significance: Apr 07, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Translate Design Basis into Drawings

The inspectors identified a Green noncited violation of 10 CFR 50 Appendix B, Criterion III, "Design Control," for failure to assure that the design basis, as specified in the license application, was correctly translated into drawings and the actual plant configuration. Specifically, Waterford Final Safety Analysis Report, Section 2.4.2.3.3.d, describes openings in the dry cooling tower cubicles that help preclude the possibility of flooding Motor Control Centers 3A315-S and 3B315-S during the probable maximum precipitation event. These openings serve as a backup to the floor drains located in each cubicle. Current plant configuration and Drawing G-499 S06, "Common Foundation Structure, Masonry," Sheet 6, do not conform to the design basis, in that there are no openings other than the floor drains. These motor control centers control power to the wet and dry cooling tower fans, which act as the ultimate heat sink. The licensee entered this issue into their corrective action program for resolution. This finding is more than minor because it is associated with the design control attribute and affects the Mitigating Systems cornerstone objective to ensure the reliability of the dry cooling tower system during the probable maximum precipitation event on the plant site. The normal floor drains had historically clogged and the drainage openings were needed to limit flood-related challenges to the motor control centers. The finding was determined to be of very low safety significance because the deficiency did not represent an actual loss of the wet and dry cooling tower systems safety functions during the past year per "Part 9900: Technical Guidance, Operability Determinations & Functional Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality".

Inspection Report# : [2007002](#) (pdf)

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Significance: Apr 07, 2007

Identified By: NRC

Item Type: FIN Finding

Failure to Ensure that Written Procedures Adequately Incorporate Regulatory Requirements and Design Basis

The inspectors identified a finding of very low safety significance for failure to assure that the design basis for the dry cooling tower diesel-driven sump pumps was properly implemented. Specifically, the Train B dry cooling tower diesel-driven sump pump was stored near nonseismic equipment which could fall and damage the pump during an operating-basis earthquake. The dry cooling tower diesel-driven sump pumps are equipment important to safety that are required to protect the ultimate heat sink during a standard project storm coincident with an operating-basis earthquake. The licensee entered this deficiency into their corrective action program for resolution. The finding was greater than minor because it affected the mitigating systems cornerstone objective (design control attribute) to assure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using the Phase 1 worksheet in Manual Chapter 0609, "Significance Determination Process," the inspectors determined that this finding was of very low safety significance because the finding was a design deficiency that was confirmed not to result in a loss of operability per "Part 9900, Technical Guidance, Operability Determination Process for Operability and Functional Assessment." The inspectors determined the cause of this finding was not related to a crosscutting element because the performance deficiency does not reflect current operating performance.

Inspection Report# : [2007002](#) (pdf)

Barrier Integrity

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Significance: Oct 07, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Missed Reactor Coolant System Chemistry Samples

The inspectors identified a noncited violation of Technical Specification (TS) 3.4.7 for multiple failures to complete a

radiochemical analysis for EBAR (Average Disintegration Energy) determination within the required periodicity. Specifically, on thirteen out of fifteen occasions, the licensee had failed to complete the analysis and replace the old EBAR value with the new EBAR value within the TS required interval of 136 to 229 days. EBAR is the average of the sum of average beta and gamma energies per disintegration for isotopes, other than radioiodines, with half-lives greater than fifteen minutes. Daily RCS samples are compared to this calculated value in order to ensure that 10CFR50.67 dose limits at the site boundary are not exceeded in the event of an accident scenario. The licensee entered this issue into their corrective action program for resolution. The finding was more than minor because it was associated with the cladding performance attribute of the barrier integrity cornerstone and affected the cornerstone objective of providing reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Using the Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheet, the finding was determined to have very low safety significance (Green) because it only affected the fuel barrier. This finding had a crosscutting aspect in the area of human performance. Specifically, the licensee's personnel work practices failed to support human performance by ensuring that activity status and completion are properly documented (H.4(a)).

Inspection Report# : [2007004](#) (pdf)

Emergency Preparedness

Occupational Radiation Safety

Significance:  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Obtain Current Radiological Information Prior to Entering a High Radiation Area

Green. The inspector reviewed a self-revealing, noncited violation of Technical Specification 6.12.1.b that resulted when workers did not obtain current radiological information before entering a high radiation area as required by the Technical Specifications. On December 12, 2006, two workers accessed a high radiation area near the Reactor Coolant Pump 1B Cold Leg through a pathway not discussed with radiation protection and received electronic dose rate alarms. Upon investigation, the licensee determined the workers did not clearly communicate the work scope and the travel path for accessing the work areas; therefore, the workers were not briefed for the radiological conditions of the areas near the Reactor Coolant Pump 1B Cold Leg. The peak dose rates for the two workers were 210 millirem per hour and 361 millirem per hour, respectively. Corrective actions implemented by the licensee were that the workers completed an electronic alarming dosimeter dose/dose rate alarm questionnaire and received additional coaching from radiation protection personnel.

The failure to obtain current radiological information prior to entering a high radiation area is a performance deficiency. This finding is greater than minor because it is associated with one of the cornerstone attributes (exposure control) and affected the Occupational Radiation Safety cornerstone objective, in that workers not obtaining high radiation area dose rates does not ensure adequate protection of the worker health and safety from additional personal exposure. The finding was determined to be of very low safety significance because it did not involve: (1) ALARA planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose. Further, this finding had a human performance cross-cutting aspect in the work practices component because the workers did not use human error prevention techniques, such as self and peer checking, when discussing the work scope and work areas with radiation protection staff [H.4.(a)].

Inspection Report# : [2007005](#) (pdf)

Significance:  Dec 31, 2007

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Follow Radiation Work Permit Instructions

Green. The inspector reviewed two examples of a self-revealing, noncited violation of Technical Specification 5.4.1

that resulted when workers failed to follow their radiation work permit instructions. The first example occurred on October 11, 2007, when an operator accessed Valves RC 109 and RC 110 by a travel path not discussed with radiation protection personnel and without obtaining current radiological conditions as specified in the radiation work permit. As the operator passed through the pipe-chase to access the valves, the worker received a dose rate alarm. The highest dose rate levels were 80 millirem per hour along the travel path. The second example occurred on October 12, 2007, when a maintenance mechanic entered the Safeguards "B" room without a current radiological briefing as specified in the radiation work permit. Radiation protection personnel requested the worker wait to access Safeguards "A" room while the radiological conditions were changing (shutdown cooling in progress) and did not know the worker also needed to access the "B" room. The worker, who had previously entered the "B" room but failed to realize this room also had changing radiological conditions, did not receive current radiological conditions for this room and received a dose rate alarm. The worker's peak dose rate was 61 millirem per hour. The licensee's corrective actions for the first example were that a radiation protection supervisor conducted an interview with worker, and the worker completed an electronic alarming dosimeter dose/dose rate alarm questionnaire and human performance error review. For the second example, the immediate corrective action was to exclude the individual from the radiological controlled area then perform a human performance error review.

The failure to follow a radiation work permit instruction is a performance deficiency. This finding is greater than minor because it is associated with one of the cornerstone attributes (exposure control) and affected the Occupational Radiation Safety cornerstone objective, in that workers not following their radiation work permit does not ensure adequate protection of the worker health and safety from additional personal exposure. The finding was determined to be of very low safety significance because it did not involve: (1) ALARA planning and controls, (2) an overexposure, (3) a substantial potential for overexposure, or (4) an impaired ability to assess dose. Further, this finding had a human performance cross-cutting aspect in the work practices component because the workers did not use human error prevention techniques, such as self checking, to ensure the full work scope, locations, and radiological conditions were discussed with radiation protection personnel as required by the radiation work permit [H.4.(a)].
Inspection Report# : [2007005](#) (*pdf*)

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

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