UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BLVD
ARLINGTON, TEXAS 76011-4511

February 8, 2012

Donna Jacobs, Vice President, Operations
Entergy Operations, Inc.
Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-0751

Subject: WATERFORD STEAM ELECTRIC STATION, UNIT 3 – NRC INTEGRATED INSPECTION REPORT 05000382/2011005

Dear Ms. Jacobs:

On December 31, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Waterford Steam Electric Station, Unit 3. The enclosed inspection report documents the inspection results which were discussed on January 19, 2012, with you and other members of your staff.

The inspections examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Four NRC identified findings of very low safety significance (Green) were identified during this inspection.

These findings were determined to involve violations of NRC requirements. Additionally, the NRC has determined that a traditional enforcement Severity Level IV violation occurred. Further, a licensee-identified violation which was determined to be of very low safety significance is listed in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC Enforcement Policy.

If you contest these non-cited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Waterford Steam Electric Station, Unit 3 facility.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV; and the NRC Resident Inspector at the Waterford Steam Electric Station, Unit 3 facility.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Donald B. Allen
Chief, Project Branch E
Division of Reactor Projects

Docket No.: 05000382
License No.: NPF-38

Enclosure: Inspection Report 05000382/2011005
Attachments
1. Supplemental Information
2. Information Request for inspection activities documented in 71124.06, 71124.07, and 71124.08

cc: w/encl: Electronic Distribution

Electronic distribution by RIV:
Regional Administrator (Elmo.Collins@nrc.gov)
Deputy Regional Administrator (Art.Howell@nrc.gov)
DRP Director (Kriss.Kennedy@nrc.gov)
DRP Deputy Director (Troy.Pruett@nrc.gov)
DRS Director (Anton.Vegel@nrc.gov)
DRS Deputy Director (Tom.Blount@nrc.gov)
Senior Resident Inspector (Marlone.Davis@nrc.gov)
Resident Inspector (Dean.Overland@nrc.gov)
Branch Chief, DRP/E (Don.Allen@nrc.gov)
Senior Project Engineer, DRP/E (Ray.Azua@nrc.gov)
Project Engineer (Jim.Melfi@nrc.gov)
Project Engineer (Daniel.Bradley@nrc.gov)
WAT Administrative Assistant (Linda.Dufrene@nrc.gov)
Public Affairs Officer (Victor.Dricks@nrc.gov)
Public Affairs Officer (Lara.Uselding@nrc.gov)
Project Manager (Kaly.Kalyanam@nrc.gov)
Acting Branch Chief, DRS/TSB (Ryan.Alexander@nrc.gov)
RITS Coordinator (Marisa.Herrera@nrc.gov)
Regional Counsel (Karla.Fuller@nrc.gov)
Congressional Affairs Officer (Jenny.Weil@nrc.gov)
OEMail Resource
ROPreports
RSLO (Bill.Maier@nrc.gov)
NSIR (Robert.Kahler@nrc.gov)
NSIR/DPR/EP (Eric.Schrader@nrc.gov)
OEDO RIV Coordinator (Lydia.Chang@nrc.gov)

ML120400136

R:_REACTORS_WAT\2011\WAT2011005-RP-MD.docx

SUNSI Rev Compl.	☑ Yes ☐ No	ADAMS	☑ Yes ☐ No	Reviewer Initials	JFM1
Publicly Avail	☑ Yes ☐ No	Sensitive	☐ Yes ☑ No	Sens. Type Initials	JFM1

SRI:DRP/E	RI:DRP/E	SPE:DRP/E	C:DRS/EB1	C:DRS/EB2
MDavis	DOverland	RAzua	TFarnholtz	GMiller
/RA via E/	***/RA via E/***	***/RA/***	***/RA/***	***/RA/***
02/03/12	02/07/12	02/03/12	02/06/12	02/03/12
C:DRS/OB	C:DRS/PSB1	C:DRS/PSB2	C:DRS/TSB	C:DRP/E
MHaire	MHay	GWerner	DPowers	DAllen
/SGarchow for/	***/RA/***	***/RA/***	***/RA/***	***/RA/***
02/06/12	02/06/12	02/07/12	02/06/12	02/08/12

OFFICIAL RECORD COPY T=Telephone E=E-mail F=Fax

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	50-382
License:	NPF-38
Report:	05000382/2011005
Licensee:	Entergy Operations, Inc.
Facility:	Waterford Steam Electric Station, Unit 3
Location:	Killona, LA
Dates:	October 1 through December 31, 2011
Inspectors:	M. Davis, Senior Resident Inspector D. Overland, Resident Inspector C. Smith, Project Engineer L. Carson II, Senior Health Physicist L. Ricketson, P.E., Senior Health Physicist N. Greene, Ph.D., Health Physicist G. George, Senior Reactor Inspector S. Hedger, Operations Engineer G. Guerra, CHP, Emergency Preparedness Inspector P. Elkmann, Senior Emergency Preparedness Inspector B. Correll, Reactor Inspector
Accompanied By:	Dan Bradley, Project Engineer
Approved By:	Don Allen, Chief, Project Branch E Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000382/2011005; 10/01/2011–12/31/2011; Waterford Steam Electric Station, Unit 3, Integrated Resident Report; Heat Sink Perf., Maint. Effect., Rad. Solid Waste Process & Rad. Material Handl. Stor. & Transp., Perf. Ind. Ver., Prob. Ident. & Resolution

The report covered a 3-month period of inspection by resident inspectors and announced baseline inspections by regional based inspectors. Four Green non-cited violations of significance were identified. In addition, one Severity Level IV non-cited violation of significance was identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." The crosscutting aspect is determined using Inspection Manual Chapter 0310, "Components within the Cross Cutting Areas." Findings for which the significance determination process does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified Findings and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of 10CFR50, Appendix B, Criterion XVI because the licensee failed to identify and correct a condition adverse to quality associated with the main feedwater isolation valve. Specifically, the licensee did not identify that varnish deposits were causing the main feedwater isolation valve to fail its inservice testing. As a result, corrective actions that were implemented did not address the adverse condition, leading to a subsequent test failure. The licensee entered this issue into their corrective action program as CR-WF3-2011-2005 and CR-WF3-2011-8140. The corrective actions included the replacement of the actuator, a shortening of the replacement frequency of the four-way hydraulic valves to a 36 month interval, and an evaluation of the current methods of gathering and implementing operating experience.

  The performance deficiency is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the main feedwater isolation valve is credited for closure during a main feedwater line break. The inspectors performed the initial significance determination using the NRC Inspection Manual 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The finding screened to a Phase 2 significance determination because it involved a loss of one train of safety related equipment for longer than the technical specification allowed outage time. A Region IV senior reactor analyst performed a Phase 2 significance determination and used the pre-solved worksheet from the "Risk Informed Inspection Notebook for the Waterford-3 Nuclear Power Plant," Revision 2.01a. However, the main feedwater isolation valves were not included in the pre-solved worksheet and the valves did not appear as components in the Phase 2

significance determination worksheets. The senior reactor analyst performed a Phase 3 significance determination for this issue. The analyst noted that the main feed isolation valves were not a significant contributor to core damage frequency and were not included in the NRC's SPAR model. These valves close to mitigate core overcooling events or to isolate feedwater flow to a ruptured feedwater line inside containment. Overcooling events do not lead to core damage. A ruptured feedwater line could challenge containment integrity, but without core damage there would be no potential for a large early release. If a valve failed to close on demand, the licensee had other means to isolate feedwater flow to a steam generator or into containment. Operators could secure feedwater pumps, close a block valve, or close the main feedwater flow control valves. Accordingly, the contribution to core damage was much less than E-6. Therefore, the inspectors determined that this finding had very low safety significance (Green). This finding has a cross-cutting aspect in the operating experience component of the problem identification and resolution area in that the licensee did not collect and evaluate relevant external operating experience to identify that other sites experienced similar failures of feedwater isolation valves due to varnish deposits on the interior surface [P.2.(a)] (Section 1R12).

- Green. The inspectors identified a non-cited violation of 10CFR50, Appendix B, Criterion III because the licensee did not translate applicable regulatory requirements and the design basis into specifications and instructions. Specifically, the licensee did not translate the design basis tornado event into a design calculation. This outage-specific calculation was referenced by operations as the basis to ensure that the number of dry cooling tower fans needed for decay heat removal remained available. As a result, additional analysis needed to be performed to verify that the ultimate heat sink would have been able to perform its design function had a design basis tornado occurred during refueling outage RF-17. The licensee entered this issue into their corrective action program as CR-WF3- 2011-6480. The immediate corrective actions taken to restore compliance included analysis of the condition and actions to ensure that future outage specific calculations include the tornado design basis event.

  The performance deficiency is more than minor because it challenges the equipment performance attribute of the Mitigating Systems cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Since the calculation was used when the plant was shutdown, the inspectors used Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process," and Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Operational Checklists." The issue was determined to have a very low safety significance (Green) because it did not require a quantitative assessment. Through calculation review, the inspectors concluded that this failure resulted in the potential to enter an unanalyzed condition. This finding had a crosscutting aspect in the resources component of the human performance area in that the licensee failed to incorporate accurate design information into instructions [H.2.(c)] (Section 4OA1.2).

- Green. The inspectors identified a non-cited violation of Technical Specification 6.8.1.a because the licensee did not follow work order instructions to install a pressure gage in an air line used to measure and maintain pressure for the hydraulic accumulators that close the main feedwater isolation valve. Specifically, the licensee did not follow the instructions to assemble and tighten a Swagelok fitting according to the work order. As a result, the fitting failed, preventing the valve from being able to perform its safety-related function. The licensee entered this issue into their corrective action program as CR-WF3-2010-1166 and CR-WF3-2011-7469. The immediate corrective actions included repairing the Swagelok fitting and completing an apparent cause evaluation to determine the nature of the fitting failure and failure to follow procedure.

  The performance deficiency is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspector performed the initial significance determination using NRC Inspection Manual 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The finding screened to a Phase 2 significance determination because it involved a potential loss of one train of safety related equipment for longer than the technical specification allowed outage time. A Region IV senior reactor analyst performed a Phase 2 significance determination and used the pre-solved worksheet from the "Risk Informed Inspection Notebook for the Waterford-3 Nuclear Power Plant," Revision 2.01a. However, the main feedwater isolation valves were not included in the pre-solved worksheet and the valves did not appear as components in the Phase 2 significance determination worksheets. The senior reactor analyst performed a Phase 3 significance determination for this issue. The analyst noted that the main feed isolation valves were not a significant contributor to core damage frequency and were not included in the NRC's SPAR model. These valves close to mitigate core overcooling events or to isolate feedwater flow to a ruptured feedwater line inside containment. Overcooling events do not lead to core damage. A ruptured feedwater line could challenge containment integrity, but without core damage there would be no potential for a large early release. If a valve failed to close on demand, the licensee had other means to isolate feedwater flow to a steam generator or into containment. Operators could secure feedwater pumps, close a block valve, or close the main feedwater flow control valves. Accordingly, the contribution to core damage was much less than E-6. As a result, this finding had a very low safety significance (Green). This finding does not have a crosscutting aspect since it is not indicative of current plant performance (Section 4OA2.4).

Cornerstone: Barrier Integrity

- Green. The inspectors identified a non-cited violation of Technical Specification Limiting Condition for Operation 3.6.2.2, "Containment Cooling System", which requires in Modes 1, 2, 3, and 4 that "Two independent trains of containment cooling shall be OPERABLE with one fan cooler to each train. The Technical

Specification Action statement requires that "With one train of containment cooling inoperable, restore the inoperable train to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the inoperable containment cooling train to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the next 30 hours. Specifically, from July 11, 2009, to July 19, 2009, the licensee failed to declare train B of the containment cooling system inoperable, and restore it to operable status within 72 hours or place the unit in hot standby in 6 hours. This finding has been entered into the licensee's corrective action program as Condition Reports CR-WF3-2011-08150.

The inspectors determined that the failure to meet Technical Specification Limiting Condition for Operation 3.6.2.2 was a performance deficiency. The finding was more than minor because it adversely affected the structures, systems, and components and barrier performance attribute of the Barrier Integrity cornerstone objective to provide reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the component cooling water flow for containment cooling system train B decreased below the minimum flow limits of Technical Specification Surveillance Requirement 4.6.2.2. In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," the issue was determined to have very low safety significance (Green) because it did not represent an actual open pathway in the physical integrity of reactor containment and heat removal components, and did not involve an actual reduction in the function of hydrogen igniters in the reactor containment. This finding was determined to have a crosscutting aspect in the area of human performance associated with the decision making component because the licensee did not use conservative assumptions in decision making and adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement to demonstrate that it is unsafe in order to disapprove the action [H.1.(b)] (Section 1R07).

Cornerstone: Public Radiation Safety

- Severity Level IV. The inspectors identified a non-cited violation of 10 CFR 50.71 "Maintenance of Records," because the licensee failed to update their updated final safety analysis report with submittals that include a change made to the facility. Specifically, the licensee built the low level radwaste storage facility in 1995 on the owner controlled area for interim radwaste storage of dry and solidified radioactive waste and failed to update the updated final safety analysis report to include these changes. This issue was entered in the licensee's corrective action program as condition report WF3-2011-07711.

  This issue was dispositioned using traditional enforcement because it had the potential for impacting the NRC's ability to perform its regulatory function. The finding is more than minor because it has a material impact on licensed activities in that stored radwaste materials with a significant radioactive source term has been relocated from the plant radiologically controlled area to the owner controlled area.

In addition, the radwaste management program has been affected because the licensee was not originally licensed to act as a low level waste facility. However, the termination of the Barnwell Low Level Radioactive Waste Management facility has forced the licensee to build such a storage area and make changes to the facility, significantly increasing the onsite storage capacity. The inspectors determined that this finding did not reflect present performance because it is an issue with changes made to the facility more than 15 years previously. Therefore, there was no cross-cutting aspect associated with this finding. This finding is characterized as a Severity Level IV non-cited violation in accordance with NRC Enforcement Policy, Section 6.1, and was treated as a non-cited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy (Section 2RS08).

B. Licensee-Identified Violations

A violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and its associated corrective action tracking number are listed in Section 4OA7.

REPORT DETAILS

Summary of Plant Status

The Waterford Steam Electric Station, Unit 3, began the inspection period at approximately 100 percent power and remained at approximately 100 percent power for the rest of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignments (71111.04)

Partial Walkdown

a. Inspection Scope

The inspectors performed partial system walkdowns of the following risk-significant systems:

- On October 5, 2011, train B of the electrical distribution switchgear and emergency diesel generators A and B during a scheduled maintenance outage of startup transformer A

- On October 11, 2011, train B of the component cooling water system during emergent maintenance on train A

The inspectors selected these systems based on their risk significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could affect the function of the system, and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, updated final safety analysts report, technical specification requirements, administrative technical specifications, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also inspected accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two (2) partial system walkdown samples as defined in Inspection Procedure 71111.04-05.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05)

Quarterly Fire Inspection Tours

a. Inspection Scope

The inspectors conducted fire protection walkdowns that were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- On September 28, 2011, reactor auxiliary building -35 foot elevation fire area RAB 40, diesel storage tank A
- On September 28, 2011, reactor auxiliary building -35 foot elevation fire area RAB 41, diesel storage tank B
- On November 21, 2011, reactor auxiliary building +21 foot elevation fire zone RAB 8A, vital switchgear room A
- On November 23, 2011, reactor auxiliary building +35 foot elevation fire area RAB 5, electrical penetration room B

The inspectors reviewed areas to assess if licensee personnel had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant; effectively maintained fire detection and suppression capability; maintained passive fire protection features in good material condition; and had implemented adequate compensatory measures for out of service, degraded or inoperable fire protection equipment, systems, or features, in accordance with the licensee's fire plan. The inspectors selected fire areas based on their overall contribution to internal fire risk as documented in the plant's Individual Plant Examination of External Events with later additional insights, their potential to affect equipment that could initiate or mitigate a plant transient, or their impact on the plant's ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee's corrective action program. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four (4) quarterly fire-protection inspection samples as defined in Inspection Procedure 71111.05-05.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors reviewed the updated final safety analysts report, the flooding analysis, and plant procedures to assess susceptibilities involving internal flooding; reviewed the corrective action program to determine if licensee personnel identified and corrected flooding problems; inspected underground bunkers/manholes to verify the adequacy of sump pumps, level alarm circuits, cable splices subject to submergence, and drainage for bunkers/manholes; and verified that operator actions for coping with flooding can reasonably achieve the desired outcomes. The inspectors also inspected the areas listed below to verify the adequacy of equipment seals located below the flood line, floor and wall penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, and control circuits, and temporary or removable flood barriers. Specific documents reviewed during this inspection are listed in the attachment.

- On December 22, 2011, reactor auxiliary building and dry cooling tower areas

These activities constitute completion of one (1) bunker/manhole sample as defined in Inspection Procedure 71111.06-05.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07T)

a. Inspection Scope

The inspectors reviewed licensee programs, verified performance against industry standards, and reviewed critical operating parameters and maintenance records for the following heat exchangers:

- containment cooling system fan cooler train B, 3B-SB and 3D-SB
- diesel jacket water cooler train 3A-S
- essential water chiller, train A

The inspectors verified that performance tests were satisfactorily conducted for heat exchangers/heat sinks and reviewed for problems or errors; the licensee utilized the periodic maintenance method outlined in EPRI Report NP 7552, “Heat Exchanger Performance Monitoring Guidelines,” the licensee properly utilized biofouling controls;

the licensee's heat exchanger inspections adequately assessed the state of cleanliness of their tubes; and the heat exchangers were correctly categorized under 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three (3) triennial heat sink inspection samples as defined in Inspection Procedure 71111.07-05.

b. Findings

Inoperable Train of Containment Cooling System

Introduction. The inspectors identified a Green non-cited violation of Waterford 3 Technical Specification 3.6.2.2, "Containment Cooling System." Specifically, the licensee failed to meet Technical Specification Limiting Condition for Operation 3.6.2.2 to have two independent operable trains of containment cooling with one fan cooler to each train while in Mode 1.

Description. The inspectors reviewed the calendar year 2009 trends of component cooling water flow through train B of the containment cooling system. Train B of the containment cooling system consists of containment fan coolers B and D. The inspectors observed that, from July 8, 2009, to July 19, 2009, the component cooling water flow rate decreased below the Surveillance Requirement 4.6.2.2 acceptance criteria flow rate of 625 gallons per minute (gpm) for each containment fan cooler.

The inspectors reviewed the control room operator logs during the 11 day time period to determine if the control room operators declared train B of the containment cooling system inoperable. The control room operator logs contained no declaration for the containment cooling system. Additionally, no entry into the Technical Specification Action 3.6.2.2 was made.

Technical Specification Surveillance Requirement 4.6.2.2 states:

"Each train of containment cooling shall be demonstrated OPERABLE:

a. At least once per 31 days by:

    1. Starting each operational fan not already running from the control room and verifying that each operational fan operates for at least 15 minutes.

    2. Verifying a cooling water flow rate of greater than or equal to 625 gpm to each cooler."

Additionally, the basis for Surveillance Requirement 4.6.2.2 states, "Operating each containment cooling train fan unit for 15 minutes and verifying a cooling water flow rate of 625 gpm ensures that all trains are OPERABLE and that all associated controls are functioning properly."

The inspectors determined that the decreased component cooling water flow for both containment fan coolers B and D was an indication to the operators that the train B containment cooling system temperature control valve, CC-835B, was not functioning properly. Additionally, because flow was below the surveillance requirement acceptance criteria, the licensee could not ensure that the surveillance requirement could be met. The surveillance requirement applicability, Surveillance Requirement 4.0.1 states, in part, "Surveillance Requirements shall be met during the MODES or other specified in the Applicability for individual [Limiting Condition for Operation], unless otherwise stated in the Surveillance. Failure to meet a Surveillance, whether such failure is experienced during the performance of the Surveillance or between performances of the Surveillance, shall be failure to meet the [Limiting Condition for Operation]." Based on this information, train B of the containment cooling system should have been declared inoperable on July 8, 2009, and the licensee should have entered Technical Specification Action 3.6.2.2 to restore train B to operable status. Train B of the containment cooling system was restored to an operable but degraded configuration on July 19, 2009, when operators removed containment fan cooler B from service and established the required flow through containment fan cooler D. The licensee later repaired the CC-835B valve control system air regulators and solenoids to correct the adverse conditions.

The licensee previously identified low component cooling water flow conditions to containment fan cooler B on at least four occasions in 2008 and 2009. The most recent low flow condition was identified on July 6, 2009. On each occasion, the operability determinations stated that "CR-WF3-2003-0856 provides the Licensing position that not achieving 625 gpm does not mean the [containment fan coolers] are inoperable or that entry into TS 3.6.2.2 is required." The licensing position was based on a review of regulatory documentation, Standard Technical Specifications for Combustion Engineering plants, and technical specification from other plants that did not incorporate a minimum flow value. In addition, the minimum flow value was not used in the Waterford 3 Updated Safety Analysis Report. Therefore, the licensee declared the containment cooling system operable.

The inspectors determined that the basis for operability was invalid because the justification in CR-WF3-2003-0856 was contrary to the applicability statement of Surveillance Requirement 4.0.1. Additionally, using the justification of CR-WF3-2003-0856 caused the licensee to miss an opportunity to declare train B of the containment cooling system inoperable and enter the Technical Specification Action 3.6.2.2 on July 8, 2009, when flow decreased below the minimum value of Surveillance Requirement 4.6.2.2.

Analysis. The inspectors determined that the failure to meet Technical Specification Limiting Condition for Operation 3.6.2.2 was a performance deficiency. The finding is more than minor because it adversely affected the structures, systems, and components and barrier performance attribute of the Barrier Integrity cornerstone objective to provide reasonable assurance that physical design barriers (containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the component

cooling water flow for train B of the containment cooling system decreased below the minimum flow limits of Technical Specification Surveillance Requirement 4.6.2.2. In accordance with NRC Inspection Manual Chapter 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," the issue was determined to have very low safety significance (Green) because it did not represent an actual open pathway in the physical integrity of reactor containment and heat removal components, and did not involve an actual reduction in the function of hydrogen igniters in the reactor containment. The finding had a crosscutting aspect in the area of human performance, decision making component, because the licensee decisions failed to demonstrate that nuclear safety is an overriding priority. This finding was determined to have a crosscutting aspect in the area of human performance associated with the decision making component because the licensee did not use conservative assumptions in decision making and adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than a requirement to demonstrate that it is unsafe in order to disapprove the action. Specifically, the licensee failed to use conservative assumptions in decision making when determining the operability of containment cooling system. [H.1(b)]

Enforcement. Technical Specification Limiting Condition for Operation 3.6.2.2, "Containment Cooling System", requires in Modes 1, 2, 3, and 4 that "Two independent trains of containment cooling shall be OPERABLE with one fan cooler to each train." The Technical Specification Action statement requires that "With one train of containment cooling inoperable, restore the inoperable train to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the inoperable containment cooling train to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the next 30 hours." Contrary to the above, from July 11, 2009, to July 19, 2009 the licensee failed to have two operable independent trains of containment cooling with one fan cooler to each train. Specifically, while in Mode 1, the licensee failed to declare train B of the containment cooling system inoperable, then failed to restore it to operable status within 72 hours or place the unit in hot standby in the following 6 hours. This finding has been entered into the licensee's corrective action program as Condition Report CR-WF3-2011-08150. Because this finding is of very low safety significance and was entered into the licensee's corrective action program, this violation is being treated as a non-cited violation, consistent with the NRC Enforcement Policy: NCV 05000382/2011005-01: "Inoperable Train of Containment Cooling System."

1R11 Licensed Operator Requalification Program (71111.11)

a. Inspection Scope

On October 24, 2011, the inspectors observed a crew of licensed operators in the plant's simulator to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems, and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- Licensed operator performance

- Crew's clarity and formality of communications
- Crew's ability to take timely actions in the conservative direction
- Crew's prioritization, interpretation, and verification of annunciator alarms
- Crew's correct use and implementation of abnormal and emergency procedures
- Control board manipulations
- Oversight and direction from supervisors
- Crew's ability to identify and implement appropriate technical specification actions and emergency plan actions and notifications

The inspectors compared the crew's performance in these areas to preestablished operator action expectations and successful critical task completion requirements. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one (1) quarterly licensed-operator requalification program sample as defined in Inspection Procedure 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors evaluated degraded performance issues involving the following risk significant systems:

- On October 13, 2011, auxiliary component cooling water outlet temperature control valve (ACC-126A) on the A header
- On October 25, 2011, repetitive failures of main feedwater isolation valve in-service testing
- On December 21, 2011, emergency feedwater pump steam supply check valve (MS-402B)

The inspectors reviewed events such as where ineffective equipment maintenance has resulted in valid or invalid automatic actuations of engineered safeguards systems and independently verified the licensee's actions to address system performance or condition problems in terms of the following:

- Implementing appropriate work practices
- Identifying and addressing common cause failures
- Scoping of systems in accordance with 10 CFR 50.65(b)
- Characterizing system reliability issues for performance
- Charging unavailability for performance
- Trending key parameters for condition monitoring
- Ensuring proper classification in accordance with 10 CFR 50.65(a)(1) or -(a)(2)
- Verifying appropriate performance criteria for structures, systems, and components classified as having an adequate demonstration of performance through preventive maintenance, as described in 10 CFR 50.65(a)(2), or as requiring the establishment of appropriate and adequate goals and corrective actions for systems classified as not having adequate performance, as described in 10 CFR 50.65(a)(1)

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the system. In addition, the inspectors verified maintenance effectiveness issues were entered into the corrective action program with the appropriate significance characterization. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of three (3) quarterly maintenance effectiveness samples as defined in Inspection Procedure 71111.12-05.

b. Findings

Introduction. The inspectors identified a Green non-cited violation of 10CFR50, Appendix B, Criterion XVI because the licensee failed to identify and correct a condition adverse to quality. Specifically, the licensee did not identify that varnish deposits were causing the main feedwater isolation valve to fail its inservice testing. As a result, corrective actions that were implemented did not address the adverse condition, leading to a subsequent test failure.

Description. During a 2009 inservice test (IST), both main feedwater isolation valves (MFIV) failed to close in the required time period. The licensee performed an apparent cause evaluation and determined that the failure was caused by gelling of the Fyrquel hydraulic fluid due to an introduction of moisture in the lines. Based on the causal investigation, the licensee implemented corrective actions to monitor hydraulic fluid quality and increase the replacement frequency. The inspectors noted that the licensee's review of industry operating experience provided "no new information."

In 2011, during the next IST, both MFIVs again failed to meet the test acceptance criteria. The root cause was determined to be varnish deposits on the interior surface of the four-way hydraulic actuator valves. The varnish deposits interfered with the piston operation, causing it to stick. The licensee concluded that the interior of the four-way hydraulic valves probably had a varnish build-up for some time, but it did not interfere with valve operation until the applied pneumatic pressure was reduced from 115 psi to 88 psi to comply with system design specifications. This design change was performed in May 2008 per engineering change EC-4598.

Industry operating experience showed that a similar condition occurred at another site in 2000. Varnish deposits on the interior surface of a MFIV four-way hydraulic valve prevented the valve from stroking closed. The inspectors determined that this information was readily available during the apparent cause evaluation operating experience review in 2009, however it was not identified as pertinent at the time.

A review of the safety analysis showed that a failure of the MFIV to close on demand would have very low safety significance since other valves, such as the feedwater regulating valve, would have closed to isolate an affected steam generator. The licensee entered this condition into the corrective action program as CR-WF3-2011-2005 and CR-WF3-2011-8140. The corrective actions included the replacement of the actuator, a shortening of the replacement frequency of the four-way hydraulic valves to a 36 month interval, and an evaluation of the current methods of gathering and implementing operating experience.

Analysis. The failure to identify and correct a condition adverse to quality is a performance deficiency. The inspectors determined that this issue was reasonably within the licensee's ability to foresee and correct and should have been prevented. This performance deficiency is more than minor because it is associated with the equipment performance attribute of the mitigating systems cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the main feedwater isolation valve is credited for closure during a main feedwater line break. The inspectors performed the initial significance determination for the main feedwater isolation valve failure using the NRC Inspection Manual 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The finding screened to a Phase 2 significance determination because it involved a loss of one train of safety related equipment for longer than the technical specification allowed outage time. A Region IV senior reactor analyst performed a Phase 2 significance determination and used the pre-solved worksheet from the "Risk Informed Inspection Notebook for the Waterford-3 Nuclear Power Plant," Revision 2.01a. However, the main feedwater isolation valves were not included in the pre-solved worksheet and the valves did not appear as components in the Phase 2 significance determination worksheets. The senior reactor analyst performed a Phase 3 significance determination for this issue. The analyst noted that the main feed isolation valves were not a significant contributor to core damage frequency and were not included in the NRC's SPAR model. These valves close to mitigate core overcooling events or to isolate feedwater flow to a ruptured feedwater line inside containment. Overcooling events do not lead to core damage. A ruptured feedwater line could challenge containment integrity, but without core damage

there would be no potential for a large early release. If a valve failed to close on demand, the licensee had other means to isolate feedwater flow to a steam generator or into containment. Operators could secure feedwater pumps, close a block valve, or close the main feedwater flow control valves. Accordingly, the contribution to core damage was much less than E-6 and this finding had very low safety significance (Green). This finding has a cross-cutting aspect in the operating experience component of the problem identification and resolution area in that the licensee did not collect and evaluate relevant external operating experience to identify that other sites experienced similar failures of feedwater isolation valves due to varnish deposits on the interior surface [P.2.(a)].

Enforcement. Title 10 of CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that conditions adverse to quality are promptly identified and corrected. Contrary to the above, in 2009 the licensee did not promptly identify the adverse condition (varnish deposits) during their causal determination. This condition existed from the first failure, until causal determination and repair in 2011. This violation was entered into the licensee's corrective action program as CR-WF3-2011-2005 and CR-WF3-2011-8140. Corrective actions include a shortening of the replacement frequency of the four-way hydraulic valves to a 36 month interval and an evaluation of the current methods of gathering and implementing operating experience. This violation of Appendix B, Criterion XVI, is being treated as an NRC identified non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy: NCV 05000382/2011005-02, "Failure to Identify and Correct a Condition Adverse to Quality Associated with the Main Feedwater Isolation Valves."

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed licensee personnel's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant and safety-related equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- On October 20, 2011, emergent maintenance activities on the essential chilled water loop B with scheduled maintenance on the emergency feedwater pump AB

The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that licensee personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When licensee personnel performed emergent work, the inspectors verified that the licensee personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed the technical specification requirements and inspected portions of redundant safety systems, when applicable, to verify risk

analysis assumptions were valid and applicable requirements were met. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one (1) maintenance risk assessments and emergent work control inspection sample as defined in Inspection Procedure 71111.13-05.

b. Findings

No findings were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following issues:

- On October 2, 2011, operability evaluation of the auxiliary component cooling water train A
- On October 18, 2011, operability evaluation of the containment cooler temperature control valve (CC-835B) on train B

The inspectors selected these potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that technical specification operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the technical specifications and updated final safety analysis report to the licensee personnel's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. Additionally, the inspectors also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two (2) operability evaluations inspection samples as defined in Inspection Procedure 71111.15-04

b. Findings

No findings were identified.

1R19 Postmaintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the following postmaintenance activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

- On October 14, 2011, emergent corrective maintenance on the auxiliary component cooling water outlet temperature control valve (ACC-126A) on header A

- On October 19, 2011, emergent corrective maintenance on the train B containment cooler temperature control valve (CC-835B)

- On November 8, 2011, corrective maintenance on the train B feedwater isolation valve FW-184B pneumatic pressure switch line following a nitrogen leak from a loose Swagelok fitting

- On November 10, 2011,corrective maintenance to replace leaking relief valve RFR-107C on essential chiller AB

The inspectors selected these activities based upon the structure, system, or component's ability to affect risk. The inspectors evaluated these activities for the following (as applicable):

- The effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed

- Acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate

The inspectors evaluated the activities against the technical specifications, the updated final safety analysts report, 10 CFR Part 50 requirements, licensee procedures, and various NRC generic communications to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with postmaintenance tests to determine whether the licensee was identifying problems and entering them in the corrective action program and that the problems were being corrected commensurate with their importance to safety. Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of four (4) postmaintenance testing inspection samples as defined in Inspection Procedure 71111.19-05.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the updated final safety analysts report, procedure requirements, and technical specifications to ensure that the surveillance activities listed below demonstrated that the systems, structures, and/or components tested were capable of performing their intended safety functions. The inspectors either witnessed or reviewed test data to verify that the significant surveillance test attributes were adequate to address the following:

- Preconditioning
- Evaluation of testing impact on the plant
- Acceptance criteria
- Test equipment
- Procedures
- Jumper/lifted lead controls
- Test data
- Testing frequency and method demonstrated technical specification operability
- Test equipment removal
- Restoration of plant systems
- Fulfillment of ASME Code requirements
- Updating of performance indicator data
- Engineering evaluations, root causes, and bases for returning tested systems, structures, and components not meeting the test acceptance criteria were correct
- Reference setting data
- Annunciators and alarms setpoints

The inspectors also verified that licensee personnel identified and implemented any needed corrective actions associated with the surveillance testing.

- On October 14, 2011, emergent surveillance to verify operability of the train A auxiliary component cooling water outlet temperature control valve (In-service Test)

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of one (1) surveillance testing inspection sample as defined in Inspection Procedure 71111.22-05.

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP1 Exercise Evaluation (71114.01)

a. Inspection Scope

The inspectors reviewed the objectives and scenario for the 2011 biennial emergency plan exercise to determine if the exercise would acceptably test major elements of the emergency plan. The scenario simulated a response to a terrorist threat, malfunctions in a safety uninterruptible power supply, fire alarm panel, and a pressurizer pressure instrument; a steam generator tube leak, a high pressure safety injection suction flange leak, malfunctions with an essential chiller, containment spray pump, a charging pump, instrument air leakage, and an emergency feedwater pump; a reactor coolant pump shaft seizure combined with a failure of the reactor protection system to initiate an automatic reactor trip, which led to core damage, fission product barrier failures, and a radiological release to the environment via a failed open steam generator atmospheric dump valve to demonstrate the licensee's capabilities to implement the emergency plan.

The inspectors evaluated exercise performance by focusing on the risk-significant activities of event classification, offsite notification, recognition of offsite dose consequences, and development of protective action recommendations, in the control room simulator and the following dedicated emergency response facilities:

- Technical Support Center
- Operations Support Center
- Emergency Operations Facility

The inspectors also assessed recognition of and response to abnormal and emergency plant conditions, the transfer of decision-making authority and emergency function responsibilities between facilities, onsite and offsite communications, protection of emergency workers, emergency repair evaluation and capability, and the overall

implementation of the emergency plan to protect public health and safety and the environment. The inspectors reviewed the current revision of the facility Emergency Plan, and emergency plan implementing procedures associated with operation of the above facilities and performance of the associated emergency functions. These procedures are listed in the attachment to this report.

The inspectors compared the observed exercise performance with the requirements in the facility Emergency Plan, 10 CFR 50.47(b), 10 CFR 50 Appendix E, and with the guidance in the emergency plan implementing procedures and other federal guidance.

The inspectors attended the post-exercise critiques in each of the above facilities to evaluate the initial licensee self-assessment of exercise performance. The inspectors also attended a subsequent formal presentation of critique items to plant management.

These activities constitute completion of one (1) sample as defined in Inspection Procedure 71114.01-05.

b. Findings

No findings were identified.

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspectors performed on-site reviews of the Waterford 3 Emergency Plan, Revision 41, and emergency plan implementing procedure EP-001-001, "Recognition and Classification of Emergency Conditions," Revision 29. These revisions changed the basis of the licensee's emergency action level scheme from Nuclear Energy Institute Report 99-01, Revision 4, to Nuclear Energy Institute Report 99-01, Revision 5. The licensee's Nuclear Energy Institute Report 99-01, Revision 5, scheme was approved by the NRC by letter dated July 18, 2011 (ADAMS Accession Number ML 111380558).

These revisions were compared to their previous revisions, to the criteria of NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, to Nuclear Energy Institute Report 99-01, "Emergency Action Level Methodology," Revisions 4 and 5, and to the standards in 10 CFR 50.47(b) to determine if the revisions adequately implemented the requirements of 10 CFR 50.54(q). This review was not documented in a safety evaluation report and did not constitute approval of licensee-generated changes; therefore, these revisions are subject to future inspection. The specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of two (2) samples as defined in Inspection Procedure 71114.04-05.

b. Findings

No findings were identified.

1EP6 Drill Evaluation (71114.06)

Training Observations

a. Inspection Scope

The inspectors observed a simulator training evolution for licensed operators on October 25, 2011, which required emergency plan implementation by a licensee operations crew. This evolution was planned to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post evolution critique for the scenario. The focus of the inspectors' activities was to note any weaknesses and deficiencies in the crew's performance and ensure that the licensee evaluators noted the same issues and entered them into the corrective action program. As part of the inspection, the inspectors reviewed the scenario package and other documents listed in the attachment.

These activities constitute completion of one (1) sample as defined in Inspection Procedure 71114.06-05.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational and Public Radiation Safety

2RS06 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

a. Inspection Scope

This area was inspected to: (1) ensure the gaseous and liquid effluent processing systems are maintained so radiological discharges are properly mitigated, monitored, and evaluated with respect to public exposure; (2) ensure abnormal radioactive gaseous or liquid discharges and conditions, when effluent radiation monitors are out-of-service, are controlled in accordance with the applicable regulatory requirements and licensee procedures; (3) verify the licensee's quality control program ensures the radioactive effluent sampling and analysis requirements are satisfied so discharges of radioactive materials are adequately quantified and evaluated; and (4) verify the adequacy of public dose projections resulting from radioactive effluent discharges. The inspectors used the requirements in 10 CFR Part 20; 10 CFR Part 50, Appendices A and I; 40 CFR Part 190; the Offsite Dose Calculation Manual, and licensee procedures required by the technical

specifications as criteria for determining compliance. The inspectors interviewed licensee personnel and reviewed and/or observed the following items:

- Radiological effluent release reports since the previous inspection and reports related to the effluent program issued since the previous inspection, if any
- Effluent program implementing procedures, including sampling, monitor setpoint determinations and dose calculations
- Equipment configuration and flow paths of selected gaseous and liquid discharge system components, filtered ventilation system material condition, and significant changes to their effluent release points, if any, and associated 10 CFR 50.59 reviews
- Selected portions of the routine processing and discharge of radioactive gaseous and liquid effluents (including sample collection and analysis)
- Controls used to ensure representative sampling and appropriate compensatory sampling
- Results of the inter-laboratory comparison program
- Effluent stack flow rates
- Surveillance test results of technical specification-required ventilation effluent discharge systems since the previous inspection
- Significant changes in reported dose values, if any
- A selection of radioactive liquid and gaseous waste discharge permits
- Part 61 analyses and methods used to determine which isotopes are included in the source term
- Offsite dose calculation manual changes, if any
- Meteorological dispersion and deposition factors
- Latest land use census
- Records of abnormal gaseous or liquid tank discharges, if any
- Groundwater monitoring results
- Changes to the licensee's written program for indentifying and controlling contaminated spills/leaks to groundwater, if any

- Identified leakage or spill events and entries made into 10 CFR 50.75 (g) records, if any, and associated evaluations of the extent of the contamination and the radiological source term

- Offsite notifications and reports of events associated with spills, leaks, or groundwater monitoring results, if any

- Audits, self-assessments, reports, and corrective action documents related to radioactive gaseous and liquid effluent treatment since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the one (1) required sample, as defined in Inspection Procedure 71124.06-05.

b. Findings

No findings were identified.

2RS07 Radiological Environmental Monitoring Program (71124.07)

a. Inspection Scope

This area was inspected to: (1) ensure that the radiological environmental monitoring program verifies the impact of radioactive effluent releases to the environment and sufficiently validates the integrity of the radioactive gaseous and liquid effluent release program; (2) verify that the radiological environmental monitoring program is implemented consistent with the licensee's technical specifications and/or offsite dose calculation manual, and to validate that the radioactive effluent release program meets the design objective contained in Appendix I to 10 CFR Part 50; and (3) ensure that the radiological environmental monitoring program monitors non-effluent exposure pathways, is based on sound principles and assumptions, and validates that doses to members of the public are within the dose limits of 10 CFR Part 20 and 40 CFR Part 190, as applicable. The inspectors reviewed and/or observed the following items:

- Annual environmental monitoring reports and offsite dose calculation manual

- Selected air sampling and thermoluminescence dosimeter monitoring stations

- Collection and preparation of environmental samples

- Operability, calibration, and maintenance of meteorological instruments

- Selected events documented in the annual environmental monitoring report which involved a missed sample, inoperable sampler, lost thermoluminescence dosimeter, or anomalous measurement

- Selected structures, systems, or components that may contain licensed material and has a credible mechanism for licensed material to reach ground water

- Records required by 10 CFR 50.75(g)

- Significant changes made by the licensee to the offsite dose calculation manual as the result of changes to the land census or sampler station modifications since the last inspection

- Calibration and maintenance records for selected air samplers, composite water samplers, and environmental sample radiation measurement instrumentation

- Interlaboratory comparison program results

- Audits, self-assessments, reports, and corrective action documents related to the radiological environmental monitoring program since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the one (1) required sample as defined in Inspection Procedure 71124.07-05.

b. Findings

No findings were identified.

2RS08 Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation (71124.08)

a. Inspection Scope

This area was inspected to verify the effectiveness of the licensee's programs for processing, handling, storage, and transportation of radioactive material. The inspectors used the requirements of 10 CFR Parts 20, 61, and 71 and Department of Transportation regulations contained in 49 CFR Parts 171-180 for determining compliance. The inspectors interviewed licensee personnel and reviewed the following items:

- The solid radioactive waste system description, process control program, and the scope of the licensee's audit program

- Control of radioactive waste storage areas including container labeling/marking and monitoring containers for deformation or signs of waste decomposition

- Changes to the liquid and solid waste processing system configuration including a review of waste processing equipment that is not operational or abandoned in place

- Radio-chemical sample analysis results for radioactive waste streams and use of scaling factors and calculations to account for difficult-to-measure radionuclides

- Processes for waste classification including use of scaling factors and 10 CFR Part 61 analysis

- Shipment packaging, surveying, labeling, marking, placarding, vehicle checking, driver instructing, and preparation of the disposal manifest

- Audits, self-assessments, reports, and corrective action reports radioactive solid waste processing, and radioactive material handling, storage, and transportation performed since the last inspection

Specific documents reviewed during this inspection are listed in the attachment.

These activities constitute completion of the one (1) required sample as defined in Inspection Procedure 71124.08-05.

b. Findings

Introduction. The inspectors identified a Severity Level IV non-cited violation of 10 CFR Part 50.71, “Maintenance of Records,” because the licensee failed to update its Updated Final Safety Analysis Report (UFSAR) with submittals that include the effects of a change made to the facility. This finding was determined to be of very low safety significance.

Description. While inspecting the licensee’s activities related to solid radwaste management and storage, the inspectors identified that the low level radwaste storage facility was not adequately described in Chapters 11 and 12 of the UFSAR. The licensee built the low level radwaste storage facility on the owner controlled area, outside of the protected area, for interim radwaste storage of dry active waste and solidified radioactive waste. Currently, the UFSAR, Chapters 11 and 12, Sections 11.4, “Solid Waste Management”, and 12.2.1, "Contained Radiation Sources," describe facilities for the storage of radioactive material, such as the dry active waste handling and spent resin handling system. Section 12.2.1.7 of the UFSAR also describes principal sources of radioactivity not enclosed by plant structures. This section included maximum activity inventory of different waste management system components, including the laundry tank, waste condensate tank, and spent resin tank. The low level radwaste storage facility was not described in the UFSAR in adequate detail.

The licensee is committed to Regulatory Guide 1.70, “Standard, Format, and Content of a Safety Analysis Report,” Revision 2, dated September 1975, which describes the

content of Chapter 11, Section 11.4, “Solid Waste Management System.” Regulatory Guide 1.70 states that this section should describe the capabilities of the plant to control, collect, handle, process, package, and temporarily store prior to shipment of solid radioactive waste generated as a result of normal operation, including anticipated operational occurrences. Regulatory Guide 1.70 also describes Chapter 12 of a safety analysis report and states, in part, that it should provide information on methods for radiation protection, estimated occupational radiation exposures to personnel during normal operation and anticipated operational occurrences, including radioactive material handling, processing, use, storage, and disposal. Section 12.2.1, “Radiation Contained Sources,” is the basis for the radiation protection design that should be described in the manner needed as input to the shield design calculations. Those sources that are contained in equipment like the radioactive waste management systems should be described. The source location in the plant should be specified so that all important sources of radioactivity can be located on plant layout drawings. Also, the UFSAR should provide a listing of isotope, quantity, form, and use of all sources that exceed 100 millicuries.

The low level radwaste storage facility has been in use since 1995 and contains a mixture of dry active waste and spent resin materials in separate storage compartments. The 50.59 screening performed for this facility stated that the low level radwaste storage facility will have onsite storage space for a total of five years based on estimates of waste generation. This storage facility has been in operation for approximately 16 years. The storage facility currently contains a significant source of radioactivity, 689.52 curies in total, which is not adequately described in the licensee’s UFSAR.

Analysis. The performance deficiency associated with this finding was failure of the licensee to update the UFSAR to reflect changes made to the facility. This issue was dispositioned using traditional enforcement because it had the potential for impacting the NRC’s ability to perform its regulatory function. The finding is more than minor because it has a material impact on licensed activities in that stored radwaste materials with a significant radioactive source term has been relocated from the plant radiologically controlled area to the owner controlled area. In addition, the radwaste management program has been affected because the licensee was not originally licensed to act as a low level waste facility. However, the termination of the Barnwell Low Level Radioactive Waste Management facility has forced the licensee to build such a storage area and make changes to the facility, significantly increasing the onsite storage capacity. The inspectors determined that this finding did not reflect present performance because it is an issue with changes made to the facility more than 15 years previously. Therefore, there was no cross-cutting aspect associated with this finding.

Enforcement. Title 10 CFR 50.71, “Maintenance of Records,” Section (e), requires, in part, that licensees periodically update their UFSAR with submittals that include the effects of all changes made in the facility or procedures as described in the UFSAR, and all safety analyses and evaluations performed by the licensee in support of conclusions that changes did not require a license amendment in accordance with 10 CFR 50.59(c)(2). Contrary to this requirement, from 1995 through the present, the licensee made changes to the facility, but failed to adequately update the UFSAR to

include these changes. Specifically, the licensee built the low level radwaste storage facility for storing dry radioactive waste and solidified radioactive waste outside of the protected area for an interim storage period and did not update the UFSAR to include this facility. Because the finding was a Severity Level IV violation and has been entered into the licensee's corrective action program as condition report WF3-2011-07711. This finding is characterized as a Severity Level IV noncited violation in accordance with NRC Enforcement Policy, Section 6.1, and was treated as a noncited violation consistent with Section 2.3.2.a of the NRC Enforcement Policy NCV 05000382/2011005-03, "Failure to Periodically Update the UFSAR."

4. OTHER ACTIVITIES

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Physical Protection

4OA1 Performance Indicator Verification (71151)

.1 Data Submission Issue

a. Inspection Scope

The inspectors performed a review of the data submitted by the licensee for the third Quarter 2011 performance indicators for any obvious inconsistencies prior to its public release in accordance with Inspection Manual Chapter 0608, "Performance Indicator Program."

This review was performed as part of the inspectors' normal plant status activities and, as such, did not constitute a separate inspection sample.

b. Findings

No findings were identified.

.2 Mitigating Systems Performance Index - Cooling Water Systems (MS10)

a. Inspection Scope

The inspectors sampled licensee submittals for the mitigating systems performance index - cooling water systems performance indicator for the period from the fourth quarter 2010 through the third quarter 2011. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator narrative logs, issue reports, mitigating systems performance index derivation reports, event reports, and NRC integrated inspection reports for the period of October 2010 through September 2011 to validate the accuracy of the submittals. The inspectors reviewed the mitigating systems performance index component risk coefficient to

determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one (1) mitigating systems performance index - cooling water system sample as defined in Inspection Procedure 71151-05.

b. Findings

Introduction. The inspectors identified a non-cited violation of 10CFR50, Appendix B, Criterion III because the licensee did not translate applicable regulatory requirements and the design basis into specifications and instructions. Specifically, the licensee did not translate the design basis tornado event into a design calculation. This outage specific calculation was referenced by operations as the basis to ensure that the number of dry cooling tower (DCT) fans needed for decay heat removal remained available. As a result, additional analysis needed to be performed to verify that the ultimate heat sink (UHS) would have been able to perform its design function had a design basis tornado occurred during refueling outage RF-17.

Description. In plant Modes 5 and 6, design calculation ECM-98-067, "Limiting Single Failure Thermal-Hydraulic Analysis of Waterford 3 Spent Fuel Pool," Revision 1, requires all 15 DCT fans to be operable unless a condition-specific engineering change calculation has been completed to ensure that fewer fans are sufficient for the UHS heat removal requirements. Several operational procedures also require all 15 DCT fans be available unless the outage specific calculation has been completed. These procedures direct operators to reference the outage specific calculation to justify fewer than 15 fans.

During refuel outage RF-17, the licensee performed engineering change EC-24830 to determine the required number of DCT fans needed for each train. EC-24830 concluded that up to three DCT fans per train could be unavailable without impacting the DCT's ability to maintain cooling requirements. However, EC-24830 did not place any additional restrictions on fan unavailability during a tornado watch. Through calculation review, the inspectors recognized that if three of the missile-protected fans (9 of 15 fans are missile-protected) were unavailable (as allowed by EC-24830) and a design basis tornado occurred, the DCTs would potentially have only six fans available for cooling spent fuel. Since this condition had not been analyzed, compliance with EC-24830 could have placed the licensee in a condition where UHS heat removal capabilities would have been unknown and design basis requirements may not have been met. Therefore, inspectors determined that the licensee failed to ensure that the design basis cooling requirements were properly translated into EC-24830.

The licensee conducted an analysis to show that UHS heat removal requirements would have been met with only six DCT fans available, therefore this non-cited violation has very low safety significance. Additional actions include incorporating tornado

consideration into the case specific calculations for DCT fan requirements during future refuel outages.

Analysis. The failure to translate design basis into procedures and instructions is a performance deficiency. The inspectors determined that this issue was reasonably within the licensee's ability to foresee and correct and should have been prevented. The performance deficiency is more than minor because it challenges the equipment performance attribute of the mitigating systems cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Since the calculation was used when the plant was shutdown, the inspectors used Manual Chapter 0609, Appendix G, "Shutdown Operations Significance Determination Process," and Appendix G, Attachment 1, "Shutdown Operations Significance Determination Process Phase 1 Operational Checklists." The issue was determined to have very low safety significance (Green) because it did not require a quantitative assessment. This finding had a cross-cutting aspect in the resources component of the human performance area in that the licensee did not incorporate accurate design information into instructions [H.2(c)].

Enforcement. Title 10 of CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that the licensee ensures that the design basis is properly translated into specifications and instructions. Contrary to the above, from April 2011 to May 2011, the licensee did not translate the design basis tornado event into a design calculation used to determine the required number of DCT fans needed to operate the plant in Modes 5 and 6. The licensee completed a calculation that allowed less restrictive cooling requirements that could have allowed the site to enter an unanalyzed condition. This condition existed during refuel outage 17. This violation was entered into the licensee's corrective action program as CR-WF3- 2011-6480, and actions taken to restore compliance included analysis of the condition and actions to ensure that future calculations include tornado analysis. This violation of Appendix B, Criterion III, is being treated as an NRC identified noncited violation, consistent with Section 2.3.2 of the Enforcement Policy: NCV 05000382/2011005-04, "Failure to Translate Tornado Impact on the Ultimate Heat Sink During a Refueling Outage."

.3 Reactor Coolant System Specific Activity (BI01)

a. Inspection Scope

On November 17, 2011, the inspectors sampled licensee submittals for the reactor coolant system specific activity performance indicator for the period from the fourth quarter 2010 through the third quarter 2011. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's reactor coolant system chemistry samples, technical specification requirements, issue reports, event reports, and NRC integrated inspection reports for the period from October 2010 through September 2011 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator

and none were identified. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one (1) reactor coolant system specific activity sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.4 Reactor Coolant System Leakage (BI02)

a. Inspection Scope

On November 17, 2011, the inspectors sampled licensee submittals for the reactor coolant system leakage performance indicator for the period from the fourth quarter 2010 through the third quarter 2011. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors reviewed the licensee's operator logs, reactor coolant system leakage tracking data, issue reports, event reports, and NRC integrated inspection reports for the period from October 2010 through September 2011 to validate the accuracy of the submittals. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the performance indicator data collected or transmitted for this indicator and none were identified. Specific documents reviewed are described in the attachment to this report.

These activities constitute completion of one (1) reactor coolant system leakage sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.5 Drill/Exercise Performance (EP01)

a. Inspection Scope

The inspectors sampled licensee submittals for the Drill and Exercise Performance, performance indicator for the period April 2010 through September 2011. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the Nuclear Energy Institute guidance. Specifically, the inspectors reviewed licensee records and processes including

procedural guidance on assessing opportunities for the performance indicator; assessments of performance indicator opportunities during predesignated control room simulator training sessions, performance during the 2011 biennial exercise, and performance during other drills. The specific documents reviewed are described in the attachment to this report.

These activities constitute completion of the drill/exercise performance sample as defined in Inspection Procedure 71151-05.

b. Findings

No findings were identified.

.6 Emergency Response Organization Drill Participation (EP02)

a. Inspection Scope

The inspectors sampled licensee submittals for the Emergency Response Organization Drill Participation performance indicator for the period April 2010 through September 2011. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6, was used. The inspectors reviewed the licensee's records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the Nuclear Energy Institute guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the performance indicator, rosters of personnel assigned to key emergency response organization positions, and exercise participation records. The specific documents reviewed are described in the attachment to this report.

These activities constitute completion of the emergency response organization drill participation sample as defined in Inspection Procedure 71151-05.

b. Finding

No findings were identified.

.7 Alert and Notification System (EP03)

a. Inspection Scope

The inspectors sampled licensee submittals for the Alert and Notification System performance indicator for the period April 2010 through September 2011. To determine the accuracy of the performance indicator data reported during those periods, performance indicator definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6,

was used. The inspectors reviewed the licensee's records associated with the performance indicator to verify that the licensee accurately reported the indicator in accordance with relevant procedures and the Nuclear Energy Institute guidance. Specifically, the inspectors reviewed licensee records and processes including procedural guidance on assessing opportunities for the performance indicator and the results of periodic alert notification system operability tests. The specific documents reviewed are described in the attachment to this report.

These activities constitute completion of the alert and notification system sample as defined in Inspection Procedure 71151-05.

c. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review of Identification and Resolution of Problems

a. Inspection Scope

As part of the various baseline inspection procedures discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action program at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. The inspectors reviewed attributes that included the complete and accurate identification of the problem; the timely correction, commensurate with the safety significance; the evaluation and disposition of performance issues, generic implications, common causes, contributing factors, root causes, extent of condition reviews, and previous occurrences reviews; and the classification, prioritization, focus, and timeliness of corrective actions. Minor issues entered into the licensee's corrective action program because of the inspectors' observations are included in the attached list of documents reviewed.

These routine reviews for the identification and resolution of problems did not constitute any additional inspection samples. Instead, by procedure, they were considered an integral part of the inspections performed during the quarter and documented in Section 1 of this report.

b. Findings

No findings were identified.

.2 Daily Corrective Action Program Reviews

a. Inspection Scope

In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. The inspectors accomplished this through review of the station's daily corrective action documents.

The inspectors performed these daily reviews as part of their daily plant status monitoring activities and, as such, did not constitute any separate inspection samples.

b. Findings

No findings were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

On December 20, 2011, the inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, but also considered the results of daily corrective action item screening discussed in Section 4OA2.2, above, licensee trending efforts, and licensee human performance results. The inspectors nominally considered the 6-month period of June 2011 through December 2011 although some examples expanded beyond those dates where the scope of the trend warranted.

The inspectors also included issues documented outside the normal corrective action program in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self-assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's corrective action program trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

These activities constitute completion of one (1) semi-annual trend inspection sample as defined in Inspection Procedure 71152-05.

b. Findings

No findings were identified.

.4 Selected Issue Follow-up Inspection

a. Inspection Scope

The inspectors performed an in-depth review of the licensee's evaluation and corrective actions related to the failure of a pneumatic line used to close the main feedwater isolation valve (FW-184B). The inspectors reviewed the appropriateness of the assigned significance, the scope and depth of the causal analysis, and the timeliness of the resolution. The inspectors assessed whether the evaluation identified likely causes for the issues and identified appropriate corrective actions to address the identified causes. The inspectors also conducted a review of the corrective actions to verify that appropriate measures were in place to prevent to prevent reoccurrence of the issue. In addition, the inspectors assessed whether the licensee's evaluation considered extent of condition, generic implications, common cause, and previous occurrences. The inspectors reviewed the potential impact on nuclear safety and risk to verify that the licensee had taken corrective actions commensurate with the significance of the issue. The inspectors evaluated these actions against the requirements of the licensee's corrective action program and performance attributes contained in IP 71152, Section 03.06.

These activities constitute completion of one (1) in-depth problem identification and resolution sample as defined in Inspection Procedure 71152-05.

b. Findings

Introduction. The inspectors identified a non-cited violation of Technical Specification 6.8.1.a because the licensee did not follow work order instructions to install a pressure gage in an air line used to measure and maintain pressure for the hydraulic accumulators that close the main feedwater isolation valve. Specifically, the licensee did not follow the instructions to assemble and tighten a Swagelok fitting according to the work order. As a result, the fitting failed, preventing the valve from being able to perform its safety-related function.

Description. In 2005, a plant modification installed a pressure gauge in the main feedwater isolation valve nitrogen line to provide visual indication of accumulator pressure. In 2010, one of the Swagelok fittings used for the installation failed. The licensee replaced the fitting and performed an extent of condition review. Two other fittings that did not meet the manufacturer's tightness specifications were identified, but no additional actions were taken. Initial examination of the failed fitting showed that it had not been correctly assembled and tightened, but no evaluation as to when or how the deficiency occurred was performed. The fitting failure was essentially treated as a broke/fix condition.

The inspectors reviewed Work Order 61044, which provided instructions on installing the modification. Section 5.1 of that work order provided specific instructions on how to assemble and tighten a Swagelok fitting, as well as verify that the fitting was assembled correctly, post installation. Based on this review, the inspectors concluded that the

technicians did not follow the installation and verification instructions provided in the work order.

The inspectors also questioned the operability of the two fittings discovered during the extent of condition review. Subsequent licensee review of the condition determined that despite failing the manufacturer's "go-no go" gap test, the fittings were sufficiently tight to preclude a similar failure. The licensee also reclassified the fitting failure as a condition adverse to quality and performed an apparent cause determination for the failure.

A review of the safety analysis showed that a failure of the main feedwater isolation valve to close on demand would have very low safety significance since other valves, such as the feedwater regulating valve, would have closed to isolate an affected steam generator. The licensee entered this condition into the corrective action program as CR-WF3-2010-1166 and CR-WF3-2011-7469. Corrective actions included repairing the Swagelok fitting and completing an apparent cause evaluation to determine the nature of the fitting failure and the failure to follow procedure.

Analysis. The failure to follow work order instructions is a performance deficiency. The inspectors determined that this deficiency is reasonable for the licensee to be able to foresee and correct and could have been prevented. This performance deficiency is more than minor because it affects the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspector performed the initial significance determination for the main feedwater isolation valve failure using NRC Inspection Manual 0609, Attachment 0609.04, "Phase 1 – Initial Screening and Characterization of Findings." The finding screened to a Phase 2 significance determination because it involved a potential loss of one train of safety related equipment for longer than the technical specification allowed outage time. A Region IV senior reactor analyst performed a Phase 2 significance determination and used the pre-solved worksheet from the "Risk Informed Inspection Notebook for the Waterford-3 Nuclear Power Plant," Revision 2.01a. However, the main feedwater isolation valves were not included in the pre-solved worksheet and the valves did not appear as components in the Phase 2 significance determination worksheets. The senior reactor analyst performed a Phase 3 significance determination for this issue. The analyst noted that the main feed isolation valves were not a significant contributor to core damage frequency and were not included in the NRC's SPAR model. These valves close to mitigate core overcooling events or to isolate feedwater flow to a ruptured feedwater line inside containment. Over cooling events do not lead to core damage. A ruptured feedwater line could challenge containment integrity, but without core damage there would be no potential for a large early release. If a valve failed to close on demand, the licensee had other means to isolate feedwater flow to a steam generator or into containment. Operators could secure feedwater pumps, close a block valve, or close the main feedwater flow control valves. Accordingly, the contribution to core damage was much less than E-6. As a result, this finding had very low safety significance (Green). This finding does not have a crosscutting aspect since it is not indicative of current plant performance.

Enforcement. Technical specification 6.8.1.a states that written procedures shall be established, implemented, and maintained as recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Regulatory Guide 1.33, Appendix A, Section 9, "Procedures for Performing Maintenance," states, in part, that maintenance that can affect the performance of safety-related equipment should be performed in accordance with procedures on documented instructions. Contrary to the above, in 2005, the licensee failed to comply with the instructions provided in Work Order 61044, for assembly and tightening a Swagelok fitting during the installation of a pressure gauge to the main feedwater isolation valve hydraulic accumulators . This condition existed since the pressure gauge was installed in 2005, until discovery and repair in 2010. This violation was entered into the licensee's corrective action program as CR-WF3-2010-1166 and CR-WF3-2011-7469. Corrective actions included repairing the Swagelok fitting and completing an apparent cause evaluation to determine the nature of the fitting failure and failure to follow procedure. This violation of technical specification 6.8.1.a is being treated as an NRC identified non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy: NCV 05000382/2011005-05, "Failure to Follow Work Order Instructions to Install a Swagelok Fitting on a Main Feedwater Isolation Valve Tube Connection."

4OA3 Event Follow-up (71153)

.1 (Closed) Licensee Event Report (LER) 05000382/2009-006-00, Degraded Hydraulic Fluid Causes Both Main Feedwater Isolation Valves to Fail

On October 22, 2009, both main feedwater isolation valves failed to close in the required time period during the performance of a surveillance test. At the time, the licensee determined that the most probable cause was gelling of the hydraulic fluid due to an introduction of moisture in the lines. As a part of the review for this event, the inspectors identified a non-cited violation 05000382/2011005-01, "Failure to Identify and Correct a Condition Adverse to Quality Associated with the Main Feedwater Isolation Valves." The inspectors documented this violation in Section 1R12 of this report. This licensee event report is closed.

.2 (Closed) Licensee Event Report 05000382/2011-002-00, Main Feedwater Isolation Valve A Failed Surveillance Requirement

On April 7, 2011, the main feedwater isolation valve for train A failed to close in the required time period during the performance of a surveillance test. The cause of the failure was due to varnish deposits on the interior surface of the valve that prevented the valve from stoking close. As a part of the review for this event, the inspectors identified a non-cited violation 05000382/2011005-01, "Failure to Identify and Correct a Condition Adverse to Quality Associated with the Main Feedwater Isolation Valves." The inspectors documented this violation in Section 1R12 of this report. This licensee event report is closed.

.3 (Closed) Licensee Event Report 05000382/2010-002-00, Main Feedwater Isolation Valve B Exceeded Allowed Outage Time Due to Tubing Rupture

On February 23, 2010, the tubing connection on the main feedwater isolation valve failed shortly after performing a calibration test on its nitrogen accumulator pressure switch. The cause of the failure was due to a loose Swagelok fitting. As a part of the review of this event, the inspectors identified a non-cited violation 05000382/2011005-05, "Failure to Follow Work Order Instructions to Install a Swagelok Fitting on a Main Feedwater Isolation Valve Tube Connection." The inspectors documented this violation in Section 4OA2 of this report. This licensee event report is closed.

.4 (Closed) Licensee Event Report 05000382/2011-003-00, Emergency Diesel Generator Output Breaker Failed to Automatically Close

On April 30, 2011, the train A emergency diesel generator output breaker failed to automatically close as expected during the performance of a surveillance test. The cause of the failure was due to an improperly wired time delay relay. As a part of the review of this event, the inspectors identified a non-cited violation 05000382/2011003-03, "Failure to implement written procedures for restoring a time delay relay associated with the train A emergency diesel generator output breaker." The inspectors documented this violation in inspection report 05000382/2011003. This licensee event report is closed.

4OA5 Other Activities

.1 (Closed) NRC Temporary Instruction (TI) 2515/177, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems (NRC Generic Letter 2008-01)"

a. Inspection Scope

The inspectors verified that the onsite documentation, system hardware, and licensee actions were consistent with the information provided in the licensee's response to NRC Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems." Specifically, the inspectors verified that the licensee has implemented or was in the process of implementing the commitments, modifications, and programmatically controlled actions described in the licensee's response to GL 2008-01. The inspection was conducted in accordance with Temporary Instruction 2515/177, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems (NRC Generic Letter 2008-01)," and considered the site-specific supplemental information provided by the Office of Nuclear Reactor Regulations to the inspectors.

b. Inspection Documentation

The selected temporary instruction areas of inspection were licensing basis, design, testing, and corrective actions. In general, the licensee's actions taken in response to GL 2008-01 were adequate to address the potential for the accumulation of

unacceptable gas volumes in emergency core cooling systems pump suction and discharge piping. The inspectors verified that issues identified during the licensee's reviews and walkdowns of emergency core cooling systems were entered in the corrective action program and were being addressed. The inspectors determined that the proposed or implemented corrective actions were adequate to ensure that deficiencies related to emergency core cooling systems gas accumulation were corrected. Specifically, the replacement of all the safety injection tank check valves in an upcoming refueling outage with another type that isn't as susceptible to leaking should resolve, by design, the introduction of gas into the low pressure safety injection system. The documentation of the inspection effort and any resulting observations are below.

Licensing Basis: The inspectors reviewed selected portions of licensing basis documents to verify that they were consistent with the Office of Nuclear Reactor Regulation assessment report and that the licensee properly processed any required changes. The inspectors reviewed selected portions of technical specifications, technical specification bases, and the updated final safety analysis report. The inspectors also verified that applicable documents that described the plant and plant operation, such as calculations, piping and instrumentation diagrams, procedures, and corrective action program documents addressed the areas of concern and were changed, if needed, following plant changes. The inspectors confirmed that the licensee performed surveillance tests at the frequency required by the technical specifications. The inspectors verified that the licensee tracked their commitment to evaluate and implement any changes that will be contained in the technical specification task force traveler.

Design: The inspectors reviewed design documents, performed system walkdowns, and interviewed plant personnel to verify that the licensee addressed design and operating characteristics of the emergency core cooling systems. The inspectors verified that the licensee had identified the applicable gas intrusion mechanisms for their plant.

The inspectors verified that the licensee had established void acceptance criteria consistent with the void acceptance criteria identified by the Office of Nuclear Reactor Regulation. The inspectors also confirmed that the range of flow conditions evaluated by the licensee was consistent with the full range of design basis and expected flow rates for various break sizes and locations.

The inspectors reviewed documents, including calculations, and engineering evaluations with respect to gas accumulation in the emergency core cooling systems, decay heat removal, and containment spray systems. The inspectors verified that these documents addressed venting requirements, aspects where pipes were normally voided such as some containment spray piping inside containment, void control during maintenance activities, and the potential for vortex effects that could ingest gas into the systems during design basis events.

The inspectors conducted a walkdown of selected regions of the safety injection system and containment spray system in sufficient detail to assess the licensee's walkdowns. The inspectors also verified that the information obtained during the licensee's walkdown

was consistent with the items identified during the inspector's independent walkdown. The inspectors completed portions of a full system alignment inspection of the safety injection system in an earlier inspection period. The inspectors documented additional activities that counted towards the completion of this temporary instruction in Section 4OA5 of Inspection Reports 05000382/2011003.

The inspectors verified that piping and instrumentation diagrams and isometric drawings that describe the safety injection system configurations. The review of the selected portions of isometric drawings considered the following:

- High point vents were identified;
- High points without vents were recognizable;
- Other areas where gas could accumulate and potentially impact operability, such as at orifices in horizontal pipes, isolated branch lines, heat exchangers, improperly sloped piping, and under closed valves, were described in the drawings or in referenced documentation;
- Horizontal pipe centerline elevation deviations and pipe slopes in nominally horizontal lines that exceed specified criteria were identified;
- All pipes and fittings were clearly shown; and
- The drawings were up-to-date with respect to recent hardware changes, and that any discrepancies between as-built configurations and the drawings were documented and entered into the corrective action program for resolution.

The inspectors verified that the licensee had completed their walkdowns and selectively verified that the licensee identified discrepant conditions in their corrective action program and appropriately modified affected procedures and training documents.

Testing: The inspectors reviewed selected surveillance, post-modification test, and post-maintenance test procedures and results to verify that the licensee has approved and was using procedures that were adequate to address the issue of gas accumulation and/or intrusion in the subject systems. This review included the verification of procedures used for conducting surveillances and determination of void volumes to ensure that the void criteria was satisfied and will be reasonably ensured to be satisfied until the next scheduled void surveillance. Also, the inspectors reviewed procedures used for filling and venting following conditions which may have introduced voids into the subject systems to verify that the procedures addressed testing for such voids and provided processes for their reduction or elimination. The inspectors also reviewed selected portions of procedures used during the surveillance testing of the low pressure safety injection system. Specifically, the inspectors observed the performance of a fill and vent surveillance on a new equalizing line (Valve SI-4052A/B). SI-4052A/B was installed as a result of a design change to prevent void formation in the low pressure safety injection system during a transition to shutdown cooling. This additional activity

counted towards the completion of this temporary instruction and was documented in Inspection Report 05000382/2011003.

Corrective Actions: The inspectors reviewed the corrective action program documents to assess how effectively the licensee addressed the issues in the corrective action program associated with Generic Letter 2008-01. In addition, the inspectors verified that the licensee implemented appropriate corrective actions for selected corrective actions identified in the nine-month and supplemental responses. The inspectors determined that the licensee had effectively implemented the actions required by Generic Letter 2008-01.

Based on this review, the inspectors concluded that there is reasonable assurance that the licensee will complete all outstanding items and incorporate this information into the design basis and operational practices. This temporary instruction is closed.

c. Findings

No findings were identified.

4OA6 Meetings

Exit Meeting Summary

On November 17, 2011, the inspectors presented the results of the radiation safety inspections to Ms. K. Cook, General Manager, Plant Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On December 9, 2011, the inspector presented the onsite emergency preparedness inspection results to Ms. D. Jacobs, Vice President, Operations, and other members of her staff, who acknowledged the results. The inspector confirmed that proprietary, sensitive, or personal information examined during the inspection had been returned to the identified custodian.

On December 15, 2011, the inspectors presented the preliminary inspection results of the heat sink inspection to Ms. D. Jacobs, Vice President, Operations, and other members of the licensee staff. A final exit meeting was presented to W. Steeleman, Licensing Manager, on January 5, 2012. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

On January 19, 2012, the inspectors presented the inspection results to Mr. K. Nichols, Director, Engineering, and other members of the licensee staff. Mr. Nichols was acting as Site Vice President of Operations. The licensee acknowledged the issues presented. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section 2.3.2 of the NRC Enforcement Policy, for being dispositioned as a non-cited violation.

> Title 10 of CFR 50.54(q) requires, in part, that a holder of a nuclear power reactor operating license shall follow emergency plans which meet the standards in 10 CFR 50.47(b) and 10 CFR 50, Appendix E. Revision 28 of the Waterford 3 Emergency Plan, Section 8.1.1.3, requires that initial and periodic refresher training be provided to various categories of emergency personnel, including those who perform duties on first aid and rescue teams. The Waterford Emergency Plan specifies that periodic refresher training will be provided on an annual basis at a minimum. This requirement is stated in order to implement the requirements of 10 CFR 50.47(b)(15). Contrary to this requirement, the licensee identified that first aid periodic refresher training was being conducted on a two-year cycle, and periodic refresher training for rescue teams were not being provided. The finding was of very low safety significance because it did not result in emergency response personnel not being available to provide continuous coverage (24 hours) for a key Emergency Response Organization function (as defined in NEI 99-02). The finding was entered in the licensee's corrective action program as Condition Report CR-WF3-2010-4468.

SUPPLEMENTAL INFORMATION
KEY POINTS OF CONTACT

Entergy Personnel

D. Jacobs, Vice President, Operations
K. Cook, General Manager, Plant Operations
S. Adams, Director, Nuclear Safety Assurance
C. Alday, Manager, System Engineering
E. Begley, Senior Engineer, Programs and Components
D. Boan, Supervisor, Radiation Protection
E. Brauner, Supervisor, System Engineering
J. Brawley, ALARA Supervisor, Radiation Protection
A. Buford, Engineer II, System Engineering
L. Dauzat, Operations Supervisor, Radiation Protection
C. England, Manager, Radiation Protection
G. Fey, Manager, Emergency Planning
C. Fugate, Assistant Manager, Operations
R. Gilmore, Manager, Engineering
J. Gumnick, Manager, Radiation Protection
J. Hashim, Senior Engineer, Programs and Components
M. Haydel, Supervisor, Programs and Components
J. Hornsby, Manager, Chemistry
J. Houghtaling, Senior Project Manager
B. Lanka, Manager, Design Engineering
B. Lindsey, Manager, Maintenance
M. Mason, Senior Licensing Specialist, Licensing
W. McKinney, Manager, Corrective Action and Assessments
D. Miller, Supervisor, Radwaste and Radioactive Material Control
D. Moor, Fleet Manager, Radiation Protection
K. Nichols, Director, Engineering
R. O'Quinn, Steam Generator Program
R. Perry, Senior Emergency Planner
A. Piluti, Manager, Radiation Protection
R. Putnam, Manager, Programs and Components
T. Qualantone, Manager, Plant Security
W. Steelman, Manager, Licensing
J. Williams, Senior Licensing Specialist, Licensing

NRC Personnel

C. Smith, Project Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000382/2011005-01	NCV	Inoperable Train of Containment Cooling System (Section 1R07)
05000382/2011005-02	NCV	Failure to Identify and Correct a Condition Adverse to Quality Associated with the Main Feedwater Isolation Valves (Section 1R12)
05000382/2011005-03	NCV	Failure to Periodically Update the Updated Final Safety Analysis Report (Section 2RS08)
05000382/2011005-04	NCV	Failure to Translate Tornado Impact on the Ultimate Heat Sink During a Refueling Outage (Section 4OA1.2)
05000382/2011005-05	NCV	Failure to Follow Work Order Instructions to Install a Swagelok Fitting on a Main Feedwater Isolation Valve Tube Connection (Section 4OA2.4)

Closed

05000382/2009-006-00	LER	Degraded Hydraulic Fluid Causes Both Main Feedwater Isolation Valves to Fail (Section 4OA3.1)
05000382/2010-002-00	LER	Main Feedwater Isolation Valve B Exceeded Allowed Outage Time Due to Tubing Rupture (Section 4OA3.3)
05000382/2011-002-00	LER	Main Feedwater Isolation Valve A Failed Surveillance Requirement (Section 4OA3.2)
05000382/2011-003-00	LER	Emergency Diesel Generator Output Breaker Failed to Automatically Close (Section 4OA3.4)
2515/177	TI	Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems (NRC Generic Letter 2008-01) (Section 4OA5)

LISTS OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Procedures/Documents

Number	Title	Revision
OP-006-008	Transformer Operation	301
OP-006-001	Plant Distribution (7kV, 4kV, & SSD) Systems	307
OP-002-001	Auxiliary Component Cooling Water	302

Section 1R05: Fire Protection

Procedures/Documents

Number	Title	Revision
UNT-005-013	Fire Protection Program	11
OP-009-004	Fire Protection	307
MM-007-010	Fire Extinguisher Inspection and Replacement	304
FP-001-015	Fire Protection System Impairments	303
OP-903-060	Fire Hose Station Inspection	8

Section 1R06: Flood Protection

Condition Reports

CR-WF3-2009-3135 CR-WF3-2010-7613

Work Orders

00202986

Procedures/Documents

Number	Title	Revision
EN-DC-346	Cable Reliability Program	2

Section 1R07: Flood Protection Measures

Condition Reports

CR-WF3-2009-03405 CR-WF3-2010-00845 CR-WF3-2011-06925 CR-WF3-2011-08098
CR-WF3-2011-08150 CR-WF3-2011-08166 CR-WF3-2011-08170

Work Orders

000200390-01	00067871-01	00022739-01	00234964-01
00234976-01	00022738-03	52036749-01	52036750-01

Procedures

Number	Title	Revision
CE-002-313	Maintaining Essential Chill Water Chemistry	303
CE-002-019	Maintaining Diesel Generator Jacket Water Cooling Water Chemistry	301
CE-002-007	Maintaining Component Cooling Water Chemistry	304
EN-DC-159	System Monitoring Program	6
MM-003-041	Six Year Emergency Diesel Engine Inspection	8
OP-903-037	Containment Cooling Fan Operability Verification	5
OP-008-003	Containment Cooling System	6

Calculations

Number	Title	Revision
EC-S96-015, DRN 05-1043	Containment Cooler Performance Analysis	C
9C2-5Y	Chiller Heat Rejection	1
MNQ 9-65	Component Cooling Water Temperature Evaluation	2
MNQ 9-65, EC-738	Component Cooling Water Temperature Evaluation	2
EC-S05-013	Ultimate Heat Sink Containment Heat Loads	0
MNQ 9-2, EC 22850	Component Cooling Water System	1

Drawings

Number	Title	Revision
B430, Sheet V21	Instrument Installation Details	8
B424, Sheet 1134S	Containment Fan Coolers Sys A Valves	22
B424, Sheet 1132	Containment Fan Cooler AH-1 (3A-SA)	21
B424, Sheet 1133	Containment Fan Cooler AH-1 (3C-SA)	19

Engineering Requests

Number	Title	Revision
ER-W3-2001-1125-000	CCW Monitoring Plan	0

Section 1R11: Licensed Operator Requalification Program

Procedures/Documents

Number	Title	Revision / Date
OP-901-212	Rapid Plant Power Reduction	3
OP-901-110	Pressurizer Level Control Malfunction	5
OP-902-000	Standard Post Trip Actions	11
OP-902-007	Steam Generator Tube Rupture Recovery Procedure	13
O-HITEVAL1	Simulator Scenario	11/12/2005

Section 1R12: Maintenance Effectiveness

Condition Reports

CR-WF3-2011-2005 CR-WF3-2009-5587 CR-WF3-2011-6951

Work Orders

00292841 00292877

Procedures/Documents

Number	Title	Revision
EN-DC-203	Maintenance Rule Program	1
EN-DC-204	Maintenance Rule Scope and Basis	2
EN-DC-205	Maintenance Rule Monitoring	2
SD-FW	Feedwater System	5

Section 1R13: Maintenance Risk Assessment and Emergent Work Controls

Procedures/Documents

Number	Title	Revision
EN-WM-101	On-line Work Management Process	6

OI-037-000	Operations' Risk Assessment Guideline	2

Section 1R15: Operability Evaluations

Condition Reports

CR-WF3-2011-6801

Procedures/Documents

Number	Title	Revision
EN-OP-104	Operability Determination Process	4
EN-WM-101	On-Line Work Management Process	6
OI-037-000	Operations Risk Management Guideline	300
OP-100-010	Equipment Out of Service	303
W2.502	Configuration Risk Management Program Implementation	0

Section 1R19: Post Maintenance Testing

Condition Reports

CR-WF3-2011-7429	CR-WF3-2011-7432	CR-WF3-2011-7477	CR-WF3-2011-0679
CR-WF3-2011-6473			

Work Orders

291717	290316	264679	52210873

Procedures/Documents

Number	Title	Revision
OP-002-004	Chilled Water System	306
Dwg. B424, Sh. 749	Control Wiring Diagram – Dry Tower A Isolation Valve	14
OP-903-118	Primary Auxiliaries Quarterly IST Valve Tests	23
MI-005-565	Dry Cooling Tower Fan Logic Test Train A or B	302

Section 1R22: Surveillance Testing

Work Orders

00292841 00258279

Documents/Procedures

Number	Title	Revision
OP-903-118	Primary Quarterly IST Valve Test	23

Section 1EP1: Exercise Evaluation

Condition Reports

CR-WF3-2007-1683	CR-WF3-2009-0533	CR-WF3-2009-1583	CR-WF3-2009-3256
CR-WF3-2009-5215	CR-WF3-2010-0698	CR-WF3-2010-1271	CR-WF3-2010-2296
CR-WF3-2010-2563	CR-WF3-2010-3295	CR-WF3-2010-3994	CR-WF3-2010-4060
CR-WF3-2010-4468	CR-WF3-2011-1639	CR-WF3-2011-1780	CR-WF3-2011-3701
CR-WF3-2011-5587			

Documents/Procedures

Number	Title	Revision
EP-003-040	Emergency Equipment Inventory	305
EP-003-070	Emergency Communications Systems Routine Testing	303
EP-002-101	Operational Support Center (OSC) Activation, Operation, and Deactivation	303
EP-002-090	Core Damage Assessment	302
EP-002-091	Emergency Chemistry	304
EP-002-100	Technical Support Center (TSC) Activation, Operation, and Deactivation	38
EP-002-071	Site Protective Measures	302
EP-002-081	Search and Rescue	009
EP-002-130	Emergency Team Assignments	023
EP-002-140	Reentry	301
EP-002-170	Recovery	302
EP-002-102	Emergency Operations Facility (EOF) Activation, Operation and Deactivation	303

EP-003-040	Emergency Equipment Inventory	305
EP-003-070	Emergency Communications Systems Routine Testing	303
EP-003-030	Emergency Program Review, Updating and Modification	301
EP-002-150	Emergency Plan Implementing Records	015
EP-002-190	Personnel Accountability	018
EP-002-061	Emergency Environmental Monitoring	301
EP-001-001	Recognition and Classification of Emergency Conditions	29
EP-001-020	Alert	306
EP-001-030	Site Area Emergency	305
EP-001-040	General Emergency	305
EP-002-010	Notifications and Communications	308
EP-002-033	Administration of Iodine Blocking Agents	303
EP-002-050	Offsite Dose Assessment	304
EP-002-052	Protective Action Guidelines	23
EP-002-061	Emergency Environmental Monitoring	301
EP-003-020	Emergency Preparedness Drills and Exercises	301
EP-003-030	Emergency Program Review, Updating, and Modification	301
EN-LI-114	Performance Indicator Process	4
EN-FAP-EP-005	Emergency Preparedness Performance Indicators	0
EN-IS-102	Confined Space Program	8

Miscellaneous Documents

Number	Title	Revision/Date
	Waterford 3 SES Orange Team Tabletop	October 18, 2011
	Emergency Preparedness Dress Rehearsal	October 25, 2011
	Waterford 3 Exercise	December 5, 2007

	Waterford 3 SES Biennial Exercise	June 24, 2009
	Waterford 3 Steam Electric Station Drill 2011-04 Emergency Preparedness Exercise	December 7, 2011
WCBT-EP-OSR	OSC Search and Rescue	October 27, 2010
	HTE Contractor's Invoice 11851	August 18, 2011
WRREPEAL	Required Reading Revision 5 EALs	
WLPLORHIT EP02	Emergency Plan Training for Control Room Personnel, Training Personnel and Operations Coordinators	
	2001 Siren Pole Testing Report	
	2006 Siren Pole Testing Report	
	2011 Siren Pole Testing Report	
	Waterford 3 Siren System Profile, Attachment 5.1	
	Waterford 3 Steam Electric Station Emergency Plan	41
2009-04	2009 Orange Team Hostile Action Drill	October 23, 2009
2010-02	2010 Red Team Site Drill	June 24, 2010
2010-03	2010 Orange Team Site Drill	September 25, 2010
2010-04	2010 Blue Team Site Drill	November 22, 2010
2011-01	2011 Red Team Site Drill	March 31, 2011
2011-02	2011 Green Team Site Drill	August 11, 2011
2011-03	2011 Orange Team Site Drill	November 25, 2011
TEAR W3-2011-1430	Item from 12/7/2011 NRC E Plan Drill	December 8, 2011
	2011 Exercise Major Findings	December 8, 2011

Drawings

Number	Title	Revision
B288, Sheet 4	Cable and Conduit List Installation Notes	18

Section 1EP4:Emergency Action Level and Emergency Plan Changes

Documents/Procedures

Number	Title	Revision
	Waterford 3 Emergency Plan	41
	Waterford 3 Emergency Plan	42
EP-001-001	Recognition and Classification of Emergencies	29
EP-001-001	Recognition and Classification of Emergencies	28

Section 1EP6: Drill Evaluation

Procedures/Documents

Number	Title	Revision
EP-001-001	Recognition and Classification of Emergencies	25
EP-002-010	Notifications and Communications	304
EP-002-052	Protective Action Guidelines	21

Section 2RS06: Radioactive Gaseous and Liquid Effluent Treatment

Condition Reports

CR-WF3-2009-01489	CR-WF3-2009-02733	CR-WF3-2009-03056	CR-WF3-2009-03149
CR-WF3-2009-03637	CR-WF3-2009-03765	CR-WF3-2009-03955	CR-WF3-2009-05403
CR-WF3-2009-05524	CR-WF3-2010-06420	CR-WF3-2010-02443	CR-WF3-2010-03687
CR-WF3-2010-03955			

Procedures/Documents

Number	Title	Revision
12.1.1	Laboratory Quality Assurance	17
12.4.21	The Sampling and Determination of Tritium	24
16.11.1	Monthly Grab Gas Samples	10

16.11.3	Primary Containment Purge Sampling Analysis	14
16.12.5	Preparation of Radioactive Effluent Release Reports	7
CE-003-512	Liquid Radioactive Waste Release Permit (Manual)	2
CE-003-513	Gaseous Radioactive Waste Release Permit (Manual)	303
CE-003-514	Liquid Radioactive Waste Release Permit (Computer)	301
CE-003-515	Gaseous Radioactive Waste Release Permit (Computer)	302
CE-003-516	Calculation and Adjustment of Radiation Monitor Setpoints	302
CI-9.3	Waste Water Management Plan Development	3
MSP-SGT-B103	Standby Gas Treatment Filtration System-Unit A	8
SWP-CHE-01	Groundwater Protection Program	2
EN-RP-113	Response to Contaminated Spills/Leaks	5
EN-CY-102	Laboratory Analytical Quality Control	3
EN-CY-111	Radiological Ground Water Monitoring Program	1
MM-003-046	Controlled Ventilation Area System Surveillance	301

Audits, Self Assessments, and Surveillances

Number	Title	Date
189062	Energy Northwest Self-Assessment Report	September 6, 2010
AU-CH-10	Chemistry Environmental and Effluents Program	October 14, 2010
LO-WLO-2011-042	Assessment on RADEAS Effluent Software	August 16, 2011
QS-2010-W3-003	QA Follow up Surveillance Chemistry/Environmental	April 7, 2010
QA-2-3-2011-W3-1	Audit Report Combined Chemistry, Effluents, Environmental Monitoring	September 13, 2011

10 CFR 50.75(g) Condition Reports

CR-WF3-2009-01021 CR-WF3-2009-06489 CR-WF3-2009-06711

Release Permits

Primary Containment Purge Sampling Analysis

10/16/10	10/17/10	04/01/11	04/04/11

Gaseous Waste Batch Release

10/20/09	11/02/09	04/10/11

In-Place Filter Testing Records

Unit	System	Train	Test	Date
2	Standby Gas Treatment	MSP-SGT-B104	Charcoal Adsorber	December 13, 2010
2	Standby Gas Treatment	MSP-SGT-B102	HEPA Filter Unit-B	June 18, 2010
2	Standby Gas Treatment	MSP-SGT-B101	HEPA Filter Unit-A	November 13, 2009
2	Standby Gas Treatment	MSP-SGT-B103	Charcoal Adsorber	October 21, 2009

Miscellaneous Documents

Number	Title	Date
	2009 Annual Radiological Effluent Release Report	April 19, 2010
	2010 Annual Radiological Effluent Release Report	April 17, 2011
	Intra-Laboratory Comparison Results	2009
	Intra-Laboratory Comparison Results	2010

Section 2RS07: Radiological Environmental Monitoring Program

CONDITION REPORTS

CR-WF3-2009-03318 CR-WF3-2009-04132 CR-WF3-2010-03108 CR-WF3-2010-05645

CR-WF3-2011-04458 CR-WF3-2011-06874

PROCEDURES

NUMBER	TITLE	REVISION
CE-003-522	Meteorological Data Collection and Processing	3
CE-003-523	Meteorological Monitoring Program	1
CE-003-526	Collection and Preparation of REMP Liquid Samples	302
CE-003-528	Collection of Sediment Samples	1
CE-003-529	Collection of Vegetation Samples	1
CE-003-531	Collection and Preparation of REMP Air Samples	1
CE-003-532	Preparation and Distribution of REMP Thermoluminescent Dosimeters	301
CE-003-534	Land Use Census	1
ESP-8-069	Radiological Environmental Analytical Services	00
UNT-005-014	Offsite Dose Calculation Manual	303

Audits, Self Assessments and Surveillances

Number	Title	Date
QA-2-6-2011-W3-1	Combined Chemistry, Effluents, and Environmental Monitoring	September 22, 2011
O2C-WF3-2009-0216	Meteorological Monitoring Program	August 13, 2009

Calibration and Maintenance Records

Number	Title	Date
ENV-FT-016	Rockwell Municipmr-5 Flow Totalizer	September 29, 2011
ENV-FT-018	Rockwell Municipmr-5 Flow Totalizer	September 29, 2011

ENV-FT-019	Rockwell Municipmr-5 Flow Totalizer	September 29, 2011
ENV-FT-020	Rockwell Municipmr-5 Flow Totalizer	September 29, 2011
ENV-FT-021	Rockwell Municipmr-5 Flow Totalizer	September 29, 2011

Miscellaneous Documents

Number	Title	Revision
	Annual Environmental Operating Report	2009
	Annual Environmental Operating Report	2010
	Annual Radioactive Effluent Release Report	2009
	Annual Radioactive Effluent Release Report	2010

Section 2RS08: Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

Condition Reports

CR-HQN-2009-00400	CR-HQN-2011-01116	CR-WF3-2009-03792	CR-WF3-2009-04899
CR-WF3-2009-04918	CR-WF3-2009-05288	CR-WF3-2009-05396	CR-WF3-2009-06220
CR-WF3-2009-07556	CR-WF3-2010-02524	CR-WF3-2010-05458	CR-WF3-2011-00958
CR-WF3-2011-01060	CR-WF3-2011-01188	CR-WF3-2011-06451	CR-WF3-2011-06769
CR-WF3-2011-07366	CR-WF3-2011-07482		

Procedures

Number	Title	Revision
EN-RW-101	Radioactive Waste Management	2
EN-RW-102	Radioactive Shipping Procedure	8
EN-RW-104	Scaling Factors	8
EN-RW-105	Process Control Program	1

EN-RW-106	Integrated Transportation Security Plan	2
EN-RW-108	Radioactive Shipment Accident Response	0
HP-002-224	Spent Resin Operations	7
RW-002-200	Collection and Packaging of Solid Radioactive Waste	302

Audits, Self Assessments and Surveillances

Number	Title	Date
LO-WLO-2010-00147	Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation	September 16, 2011
QA-14/15-2009-W3-1	Quality Assurance Audit Report: Radiation Protection/Radwaste	September 28, 2009
QS-2010-W3-04	QA Follow-up Surveillance of Radiation Protection/Radwaste QA 14/15-2009-W3-1	March 31, 2010
QS-2010-W3-012	Roll-up of Training Review Group Meeting Observations	June 23, 2010

Radioactive Material Shipments

Number	Title	Date
09-1005	Bead Resin (Type B, UN2916, Yellow III)	June 9, 2009
09-1010	Outage Dry Active Waste (LSA-II, UN3321)	November 11, 2009
10-1008	Outage Dry Active Waste and Radwaste Materials (LSA-II, UN3321)	June 24, 2010
10-1012	Low Level Waste Materials (LSA-II, UN3321)	July 22, 2010
10-3063	Reactor Coolant Pump Motor 1A (Excepted-Limited Quantity, UN2910)	August 10, 2010
11-1003	Outage Dry Active Waste (LSA-I, UN2912)	April 14, 2011
11-1014	Dewatered Bead Resin (LSA-II, UN3321)	October 17, 2011

11-3088	HEPA Units (LSA-II, UN3321)	November 15, 2011

Miscellaneous Documents

Number	Title	Date
	2009 Annual Radioactive Effluent Release Report	April 19, 2010
	2010 Annual Radioactive Effluent Release Report	April 17, 2011
	Waterford-3 Steam Electric Station Updated final safety analysis report: Chapters 11 and 12	December 2008
LDCR-95-0059	Survey WF3-1110-0316	June 14, 1995
HP-CALC-94-006	Waterford-3 Low Level Radwaste Facility Shielding Calculation	October 27, 1994
Survey WF3-1110-0316	Waterford-3 Low Level Radwaste Facility	November 16, 2011

Section 4OA1: Performance Indicator

Condition Reports

CR-WF3-2011-7493 CR-WF3-2011-6480

Work Orders

232168 52208380

Procedures/Documents

Number	Title	Revision
NEI 99-02	Regulatory Assessment Performance Indicator Guideline	6
EN-LI-114	Performance Indicator Process	4

EN-EP-201	Performance Indicators	9, 10
EP-001-001	Recognition and Classification of Emergency Conditions	24, 25
EP-002-010	Notifications and Communications	303, 304
EP-002-052	Protective Action Guidelines	20, 21
EP-001-001	Waterford3 Steam Electric Station Emergency Plan	38, 39
OI-040-000	Reactor Coolant System Leakage Monitoring	11
OP-903-024	Reactor Coolant System Water Inventory Balance	19
EC-24830	Provide RF17 Full Core Offload Analysis With Guidance in ECM98-067	0
OP-901-510	Component Cooling Water Malfunction	301
OP-901-513	Spent Fuel Pool Cooling Malfunction	6
OP-010-006	Outage Operations	315
ECM98-067	Limiting Single Failure Thermal-Hydraulic Analysis of Waterford 3 Spent Fuel Pool	1
ECM95-009	Ultimate Heat Sink Fan Requirements Under Various Ambient Conditions	1

Section 4OA2: Problem Identification and Resolution

Condition Reports

CR-WF3-2011-7469 CR-WF3-2010-1166 CR-WF3-2010-1208 CR-WF3-2010-1209

Work Orders

61044 61043

Procedures/Documents

Number	Title	Revision
EN-LI-102	Corrective Action Process	15
SD-FW	Feedwater System	5
ER-W3-2005-0032	Install Pressure Gauges on MFIV White Light Pressure Switches	

EP-001-001	Recognition and Classification of Emergency Conditions	29
EP-002-010	Notifications and Communications	308
EP-002-052	Protective Action Guidelines	23
EN-LI-114	Performance Indicator Process	4
EN-FAP-EP-005	Emergency Preparedness Performance Indicators	0

Section 4OA5: Other Activities

Condition Reports

CR-WF3-2011-07673	CR-WF3-2011-03495	CR-WF3-2011-03622	CR-WF3-2009-04155
CR-WF3-2011-05046	CR-WF3-2011-07184	CR-WF3-2009-01824	CR-WF3-2009-03507
CR-WF3-2009-04093	CR-WF3-2008-05681	CR-WF3-2009-04464	CR-WF3-2011-00122
CR-WF3-2009-05296	CR-WF3-2010-06947	CR-WF3-2011-05011	CR-WF3-2010-07057
CR-WF3-2011-00554	CR-WF3-2010-02257	CR-WF3-2011-01722	CR-WF3-2011-00786

Procedures/Documents

Number	Title	Revision
OP-903-026	Emergency Core Cooling System Valve Lineup Verification	019
OP-009-008	Safety Injection System	031
OP-009-005	Shutdown Cooling	028
OP-009-001	Containment Spray	303
EN-DC-219	Gas Accumulation Management	0

Drawings

Number	Title	Revision
G1114	Shutdown Cooling Flowpath Through LPSI (Elevation)	91
G167 Sht. 4	Safety Injection System	017
G167 Sht. 3	Flow Diagram: Safety Injection System	020
G167 Sht. 2	Safety Injection System	052
G167 Sht. 1	Safety Injection System	049
G163	Flow Diagram: Containment Spray and Refueling Water Storage Pool	042

4305-1879	Safety Injection ISO IC102	011
8469-28	Safety Injection ISO IC1122	008
4305-3	Containment Spray ISO IC24	012
E-3029-LW3-SI-29	Safety Injection ISO IC29	011
E-2803-IC-27	Containment Spray ISO IC-27	007
4305-6	Containment Spray ISO IC-28	010
4305-2	Containment Spray ISO IC-15	006
4305-4696	Safety Injection ISO IC-636	004
4305-1861	Safety Injection ISO IC-64	011
SK-C-M-531	Elevation Schematic Containment Spray System Train A	00
SK-C-M-532	Elevation Schematic Containment Spray System Train B	00
SK-D-M-573	HPSI Piping Elevations	00

Calculations

Number	Title	Revision
ECM03-003	Shutdown Cooling Operation with Suction Piping Air Intrusion	0
ECM07-001	NPSH Analysis of Safety Injection and Containment Spray Pumps	001
ECP02-004	Water Hammer Analysis – LPSI A	0
WCAP-17271-NP	Air Water Transport in Large Diameter Piping Systems: Analysis and Evaluation of Large Diameter Testing Performed at Purdue University	August 2010
ECM95-012	Minimum Pipe Submergence to Prevent Vortexing in the RWSP	0
ECP03-003	Determination of Permissible Void Size in Containment Spray Piping	0
EC0000025944	SDC Gas Void Analysis	0

Miscellaneous Documents

Number	Title	Revision / Date
W3-DBD-001	Safety Injection System Design Basis Document	003
W3-DBD-013	Containment Spray System Design Basis Document	301

WF3-SE-08-00001	Summary of Activities Associated with the Resolution of GL 2008-01	002
Item 19	Copies of trends of period venting results	0
W3F1-2008-0068	Nine-Month Response to NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems"	0
LO-WLO-2011-00099	Waterford-3 Self Assessment: NRC GL 2008-01 Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems	September 15, 2011

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150-0011.

The following items are requested for the

Public Radiation Safety Team Inspection

at Waterford-3 Nuclear Generating Station

November 14 - 18, 2011

Integrated Inspection Report 2011005

Inspection areas are Radioactive Gaseous and Liquid Effluent Treatment (71124.06), Radiological Environmental Monitoring Program (71124.07), and Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation (71124.08).

NOTE: The information requested for **an in-office review** may be provided in either electronic or paper media or a combination of these. Information provided in electronic media may be in the form of IMS-CERTREC, e-mail attachments, or CD. The agency's text editing software is MS Word; however, we have document viewing capability for Adobe Acrobat (.pdf) text files. Information requested to be **reviewed on-site** during the inspection week should be paper media.

Please arrange to have this information available for an in-office review no later than October 28, 2011.

After the entrance meeting on **November 14, 2011,** for each inspection area below, please provide any additional corrective documents written between the date of the initial request up to the date of the entrance meeting. **Thank you for your support.**

If you have any questions or comments, please contact Louis Carson at (817)860-8221, or email Louis.Carson@nrc.gov, or contact Larry Ricketson at (817)860-8165 or email at Larry.Ricketson@nrc.gov, or contact Natasha Greene at (817)860-8154 or email at Natasha.Greene@nrc.gov.

1. Radioactive Gaseous and Liquid Effluent Treatment (71124.06) – Louis Carson

NOTE: Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for the above inspector should be in a file/folder titled 1-A, Applicable organization charts in file/folder 1-B, etc.

Please provide the requested information in Sections C, D, E, F, and G for Regional Inspector review by October 28, 2011. Please provide the remainder of the information by November 14, 2011.

A. List of contacts and telephone numbers for the following areas:

1. Radiological effluent control

2. Engineered safety feature air cleaning systems

B. Applicable organization charts

C. Audits, self assessments, surveillances, vendor or NUPIC audits of contractor support, and LERs written since March 6, 2009, related to:

1. Radioactive effluents

2. Engineered Safety Feature Air cleaning systems

D. Procedure indexes for the following areas:

1. Radioactive effluents

2. Engineered Safety Feature Air cleaning systems

E. Please provide specific procedures related to the following areas below. Additional specific procedures will be requested by number after the inspector reviews the procedure indexes provided.

1. Sampling of radioactive effluents

2. Sample analysis

3. Generating radioactive effluent release permits

4. Laboratory instrumentation quality control

5. In-place testing of HEPA filters and charcoal adsorbers

7. New or applicable procedures for effluent programs (e.g., including ground water monitoring programs)

F. List of corrective action documents (including corporate and subtiered systems) written since March 6, 2009, associated with:

1. Radioactive effluents

2. Effluent radiation monitors

3. Engineered Safety Feature Air cleaning systems

4. Groundwater items

NOTE: The lists should indicate the significance level of each issue and the search criteria used.

G. 2009 and 2010 Annual Radioactive Effluent Release Report

H. Current copy of the Offsite Dose Calculation Manual (ODCM) and change history in the ODCM for the last three years

I. Copy of the 2009 and 2010 interlaboratory comparison results for laboratory quality control performance of effluent sample analysis

J. Effluent sampling schedule for the week of the inspection

K. New entries into 10 CFR 50.75(g) files since March 6, 2009

L. Operations Dept (or other responsible department) log records for effluent monitors removed from service or out of service since March 2009

M. Listing or log of liquid and gaseous release permits since March 6, 2009

N. For technical specification-required air cleaning systems, the most recent surveillance test results of in-place filter testing (of HEPA filters and charcoal adsorbers) and laboratory testing (of charcoal efficiency)

O. Additional Items of Interest (please contact Larry for any clarification needed):

1. Listing of changes to effluent and/or radwaste treatment systems (*physically or via engineering design*)
2. List of systems abandoned "in place"
3. List of work orders since March 2009 for effluent instrumentation and systems
4. Engineering calculations or test results used to determine plate-out or deposition losses in iodine and particulate effluent sample lines. Identify where the sample line losses are used in dose calculations.

2. Radiological Environmental Monitoring Program (71124.07) – Larry Ricketson

NOTE: In an effort to keep the requested information organized, please submit this information to us using the same lettering system below. For example, all contacts and phone numbers for the above inspector should be in a file/folder titled 2-A, Applicable organization charts in file/folder 2-B, etc.

Please provide the requested information in Sections C, D, E, F, H and I for Regional Inspector review by October 28, 2011. Please provide the remainder of the information by November 14, 2011.

List of contacts and telephone numbers for the following areas:

1. Radiological environmental monitoring
2. Meteorological monitoring
3. Control, survey, and release of materials for unrestricted use

B. Applicable organization charts

C. Copies of QA audits, self-assessments, surveillances, and LERs written since March 6, 2009, related to the following areas:

1. Radiological environmental monitoring program (including contractor environmental laboratory audits, if used to perform environmental program functions)
2. Environmental TLD processing facility
3. Meteorological monitoring program

D. Procedure index for the following areas:

1. Radiological environmental monitoring program
2. Meteorological monitoring program

E. Please provide specific procedures related to the following areas. Additional specific procedures will be requested by number after the inspector reviews the procedure indexes.

1. Environmental Program description
2. Sampling, collection, and preparation of environmental samples
4. Sample analysis (if applicable)
5. Laboratory instrumentation quality control
6. Procedures associated with the Offsite Dose Calculation Manual
7. Appropriate QA Audit and Surveillance program procedures, and/or sections of the station's QA manual (which pertain to the REMP)

F. A summary list of corrective action documents (including corporate and subtiered systems) written since March 6, 2009, related to the following programs:

1. Radiological environmental monitoring
2. Meteorological monitoring

NOTE: The lists should indicate the significance level of each issue and the search criteria used.

G. Wind Rose data and evaluations used for establishing environmental sampling locations

H. Copies of the 2 most recent calibration packages for the meteorological tower instruments

I. Copy of the 2009 and 2010 Annual Radiological Environmental Operating Report and Land Use Census, and current revision of the Offsite Dose Calculation Manual

J. Scheduled time to observe environmental sampling activities in the field and visit selected environmental sample location.

K. Scheduled time to meet with the meteorological tower system engineer and/or meteorologist to visit/observe the meteorological tower and associated equipment

L. Copy of the environmental laboratory's interlaboratory comparison program results for 2009 and 2010

M. Data from the environmental laboratory documenting the analytical detection sensitivities for the various environmental sample media (i.e., air, water, soil, vegetation, and milk)

N. Quality Assurance audits (e.g., NUPIC) for contracted services

O. Current NEI Groundwater Initiative Plan and status

3. Radioactive Solid Waste Processing, and Radioactive Material Handling, Storage, and Transportation (71124.08) – Natasha Greene

4.

NOTE: In an effort to keep the requested information organized, please submit this information to us using the same lettering system below. For example, all contacts and phone numbers for the above inspector should be in a file/folder titled 3-A, Applicable organization charts in file/folder 3-B, etc.

Please provide the requested information in Sections C, D, E, and F for Regional Inspector review by October 28, 2011. Please provide the remainder of the information by November 14, 2011.

A. List of contacts and telephone numbers for the following areas:

1. Solid Radioactive waste processing

2. Transportation of radioactive material/waste

B. Applicable organization charts (and list of personnel involved in solid radwaste processing, transferring, and transportation of radioactive waste/materials)

C. Copies of audits, surveillances, department self-assessments, and LERs written since March 6, 2009, related to:

1. Solid radioactive waste management

2. Radioactive material/waste transportation program

D. Procedure index for the following areas:

1. Solid radioactive waste management

2. Radioactive material/waste transportation

E. Please provide specific procedures related to the following areas. Additional specific procedures will be requested by number after the inspector reviews the procedure indexes.

1. Process control program

2. Solid and liquid radioactive waste processing

3. Radioactive material/waste shipping

4. Methodology used for waste concentration averaging, if applicable

5. Waste stream sampling and analysis

F. A summary list of corrective action documents (including corporate and subtiered systems) written since March 6, 2009, related to:

1. Solid radioactive waste

2. Transportation of radioactive material/waste

NOTE: The lists should indicate the significance level of each issue and the search criteria used.

G. Copies of training lesson plans for 49 CFR 172 subpart H, for radwaste processing, packaging, and shipping.

.H. A summary of radioactive material and radioactive waste shipments made from March 6, 2009 to present

I. Waste stream sample analyses results and resulting scaling factors for 2009 and 2010

J. Waste classification reports, if performed by vendors (such as for irradiated hardware)

Although it is not necessary to compile the following information, the inspector will also review:

K. Training and qualification records of personnel responsible for the conduct of radioactive waste processing, package preparation, and shipping