



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION IV  
1600 E. LAMAR BLVD.  
ARLINGTON, TX 76011-4511

January 21, 2016

Mr. Michael R. Chisum  
Site Vice President  
Entergy Operations, Inc.  
17265 River Road  
Killona, LA 70057-0751

**SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 – NRC INTEGRATED  
INSPECTION REPORT 05000382/2015004**

Dear Mr. Chisum:

On December 31, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Waterford Steam Electric Station, Unit 3. On January 14, 2016, the NRC inspectors discussed the results of this inspection with you and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violation or significance of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC resident inspector at the Waterford Steam Electric Station, Unit 3.

M. Chisum

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In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents 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/

Jeffrey R. Sowa, Acting Chief  
Project Branch D  
Division of Reactor Projects

Docket No. 50-382  
License No. NPF-38

Enclosure:  
Inspection Report 05000382/2015-004  
w/ Attachment: Supplemental Information

cc w/ encl: Electronic Distribution

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Sincerely,

/RA/

Jeffrey R. Sowa, Acting Chief  
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Letter to Michael R. Chisum from Jeffrey Sowa dated January 21, 2016

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 – NRC INTEGRATED  
INSPECTION REPORT 05000382/2015004

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket: 0500032  
License: NPF-38  
Report: 05000382/2015004  
Licensee: Entergy Operations, Inc.  
Facility: Waterford Steam Electric Station, Unit 3  
Location: 17265 River Road  
Killona, LA 70057  
Dates: October 1 through December 31, 2015  
Inspectors: F. Ramirez, Senior Resident Inspector  
C. Speer, Acting Senior Resident Inspector  
T. Sullivan, Acting Resident Inspector  
J. Choate, Acting Resident Inspector  
N. Greene, PhD, Health Physicist  
M. Phalen, Senior Health Physicist  
I. Anchondo, Reactor Inspector  
J. Sowa, Senior Resident Inspector  
Approved By: Jeffrey R. Sowa, Acting Chief  
Project Branch D  
Division of Reactor Projects

## SUMMARY

IR 05000382/2015004; 10/01/2015 – 12/31/2015; Waterford Steam Electric Station, Unit 3; Maintenance Effectiveness

The inspection activities described in this report were performed between October 1 and December 31, 2015, by the resident inspectors at Waterford 3 and inspectors from the NRC's Region IV office. One finding of very low safety significance (Green) is documented in this report. This finding involved a violation of NRC requirements. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

### Cornerstone: Initiating Events

- Green. The inspectors reviewed a self-revealing, non-cited violation of Technical Specification 6.8.1.a, associated with the licensee's failure to properly pre-plan and perform maintenance in accordance with EN-DC-153, "Preventative Maintenance Component Classification." The licensee entered this condition into their corrective action program as condition report CR-WF3-2015-06438. The licensee restored compliance by properly classifying the components as High Critical in accordance with EN-DC-153, Revision 2, and by initiating development of appropriate preventative-maintenance for the control element assembly calculators (CEACs). In addition, the licensee initiated work to improve the reliability of the CEACs, including reviewing card refurbishments to ensure circuit card reliability is enhanced.

The performance deficiency was more than minor because it is associated with the Equipment Performance attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, inappropriate preventative maintenance on the circuit cards associated with the CEACs ultimately resulted in a plant trip on October 3, 2015. The inspectors screened the finding in accordance with NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process." Using IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," the inspectors determined that the finding was of very low significance (Green) because the finding did not cause a trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. Because the performance deficiency occurred in 2008, the inspectors concluded that the finding does not reflect current licensee performance and therefore did not assign a cross-cutting aspect. (Section 1R12)

## PLANT STATUS

The Waterford Steam Electric Station, Unit 3, began the inspection period at 100 percent power. On October 4, 2015, an automatic reactor trip occurred due to the failure of core element assembly calculator (CEAC) 2. Following repairs to CEAC 2, the operators restarted the reactor on October 5, 2015, and achieved 100 percent power on October 7, 2015. The licensee initiated a plant shutdown on October 24, 2015, to begin refueling outage 20. On December 15, 2015, operators commenced a reactor startup. On December 21, 2015, the unit achieved full power. The unit remained at full power for the remainder of the inspection period.

## REPORT DETAILS

### 1. REACTOR SAFETY

#### Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R01 Adverse Weather Protection (71111.01)

##### Readiness to Cope with External Flooding

##### a. Inspection Scope

On December 14, 2015, the inspectors completed an inspection of the station's readiness to cope with external flooding. After reviewing the licensee's flooding analysis, the inspectors chose two plant areas that were susceptible to flooding:

- Main Steam Isolation Valve #1 Area
- Main Steam Isolation Valve #2 Area

The inspectors reviewed plant design features and licensee procedures for coping with flooding. The inspectors walked down the selected areas to inspect the design features, including the material condition of seals, drains, and flood barriers. The inspectors evaluated whether credited operator actions could be successfully accomplished.

These activities constituted one sample of readiness to cope with external flooding, as defined in Inspection Procedure 71111.01.

##### b. Findings

No findings were identified.

#### 1R04 Equipment Alignment (71111.04)

##### .1 Partial Walkdown

##### a. Inspection Scope

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

- November 16, 2015, containment spray train B

- November 19, 2015, high pressure safety injection train B
- December 16, 2015, component cooling water train B

The inspectors reviewed the licensee's procedures and system design information to determine the correct lineup for the systems. They visually verified that critical portions of the trains were correctly aligned for the existing plant configuration.

These activities constituted three partial system walk-down samples as defined in Inspection Procedure 71111.04.

b. Findings

No findings were identified.

**1R05 Fire Protection (71111.05)**

Quarterly Inspection

a. Inspection Scope

The inspectors evaluated the licensee's fire protection program for operational status and material condition. The inspectors focused their inspection on four plant areas important to safety:

- November 3, 2015, fire area RCB 1, reactor containment building general area
- November 10, 2015, fire area NS-TB 5, turbine building operating floor +67'
- November 19, 2015, fire area RAB 32, auxiliary component cooling water room
- December 10, 2015, fire area RAB 15, emergency diesel generator B

For each area, the inspectors evaluated the fire plan against defined hazards and defense-in-depth features in the licensee's fire protection program. The inspectors evaluated control of transient combustibles and ignition sources, fire detection and suppression systems, manual firefighting equipment and capability, passive fire protection features, and compensatory measures for degraded conditions.

These activities constituted four quarterly inspection samples, as defined in Inspection Procedure 71111.05.

b. Findings

No findings were identified.

**1R06 Flood Protection Measures (71111.06)**

a. Inspection Scope

On December 8, 2015, the inspectors completed an inspection of underground bunkers susceptible to flooding. The inspectors selected two underground bunkers that contained risk-significant or multiple-train cables whose failure could disable risk-significant equipment:



- Manhole M348-NA
- Manhole M351-NA

The inspectors observed the material condition of the cables and splices contained in the bunkers and looked for evidence of cable degradation due to water intrusion. The inspectors verified that the cables and vaults met design requirements.

These activities constitute completion of one bunker/manhole sample, as defined in Inspection Procedure 71111.06.

b. Findings

No findings were identified.

**1R07 Heat Sink Performance (71111.07)**

a. Inspection Scope

On November 16, 2015, the inspectors completed an inspection of the readiness and availability of risk-significant heat exchangers. The inspectors verified the licensee used the industry standard periodic maintenance method outlined in EPRI NP-7552 for the essential chillers. Additionally, the inspectors walked down all three essential chillers to observe its performance and material condition.

These activities constitute completion of one heat sink performance annual review sample, as defined in Inspection Procedure 71111.07.

b. Findings

No findings were identified.

**1R08 Inservice Inspection Activities (71111.08)**

The activities described in subsections 1 through 5 below constitute completion of one inservice inspection sample, as defined in Inspection Procedure 71111.08.

.1 Non-destructive Examination (NDE) Activities and Welding Activities

a. Inspection Scope

The inspectors directly observed the following nondestructive examinations:

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
Safety Injection	14-inch pipe to elbow (Weld No. 21-009)	Ultrasonic Testing (UT)
Safety Injection	45 Deg. Elbow to 14-inch pipe (Weld No. 21-007)	UT

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
Reactor Cooling	Instrument Nozzle Tube to Flange No. 93 (Weld No. 02-T-93X1)	UT

The inspectors reviewed records for the following nondestructive examinations:

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
Safety Injection	Elbow to 14-inch Pipe (Weld No. 21-004)	UT
Reactor Cooling	Instrument Nozzle Tube to Flange No. 94 (Weld No. 02-T-94X1)	UT
Reactor Cooling	Instrument Nozzle Tube to Flange No. 95 (Weld No. 02-T-95X1)	UT

During the review and observation of each examination, the inspectors observed whether activities were performed in accordance with the ASME Code requirements and applicable procedures. The inspectors also reviewed the qualifications of all nondestructive examination technicians performing the inspections to determine whether they were current.

The inspectors reviewed records for the following welding activities:

<u>SYSTEM</u>	<u>WELD IDENTIFICATION</u>	<u>EXAMINATION TYPE</u>
Safety Injection	Spool to SI-512B Valve (Weld No. FW-20)	UT

The inspectors reviewed whether the welding procedure specifications and the welders had been properly qualified in accordance with ASME Code Section IX requirements. The inspectors also determined whether that essential variables were identified, recorded in the procedure qualification record, and formed the bases for qualification of the welding procedure specifications.

b. Findings

No findings were identified.

.2 Vessel Upper Head Penetration Inspection Activities

a. Inspection Scope

During this refueling outage RF20, the vessel upper head penetration inspection activities were not performed. The next bare metal visual inspection will occur during

refueling outage RF21. The next volumetric examination will occur during refueling outage RF24.

b. Findings

No findings were identified.

.3 Boric Acid Corrosion Control (BACC) Inspection Activities

a. Inspection Scope

The inspectors reviewed the licensee's implementation of its boric acid corrosion control program for monitoring degradation of those systems that could be adversely affected by boric acid corrosion. The inspectors reviewed the documentation associated with the licensee's boric acid corrosion control walk-down as specified in procedure EN-DC-319, "Boric Acid Corrosion Control Program (BACCP), Revision 11, and CEP-BAC-001, "Boric Acid Corrosion Control (BACC) Program Plan," Revision 1. The inspectors reviewed whether the visual inspections emphasized locations where boric acid leaks could cause degradation of safety significant components, and whether engineering evaluations used corrosion rates applicable to the affected components and properly assessed the effects of corrosion induced wastage on structural or pressure boundary integrity. The inspectors observed whether corrective actions taken were consistent with the ASME Code and 10 CFR 50, Appendix B requirements.

b. Findings

No findings were identified.

.4 Steam Generator Tube Inspection Activities

a. Inspection Scope

Steam generator inspections were not performed during refueling outage RF20.

b. Findings

No findings were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed 11 condition reports which dealt with inservice inspection activities and found the corrective actions were appropriate. From this review the inspectors concluded that the licensee had an appropriate threshold for entering issues into the corrective action program and had procedures that direct a root cause evaluation when necessary. The inspectors also determined the licensee had an effective program for applying industry operating experience. Specific documents reviewed during this inspection are listed in the attachment.

b. Findings

No findings were identified.

## **1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)**

### **.1 Review of Licensed Operator Requalification**

#### **a. Inspection Scope**

On November 25, 2015, the inspectors observed simulator training for an operating crew. The inspectors assessed the performance of the operators and the evaluators' critique of their performance.

These activities constitute completion of one quarterly licensed operator requalification program sample, as defined in Inspection Procedure 71111.11.

#### **b. Findings**

No findings were identified.

### **.2 Review of Licensed Operator Performance**

#### **a. Inspection Scope**

On October 4, 2015, the inspectors observed the performance of on-shift licensed operators in the plant's main control room. At the time of the observations, the plant was in a period of heightened activity due to responding to a plant trip. The inspectors observed the operators' performance of the following activities:

- Evaluation of technical specifications
- Work prioritization
- Alarm response

In addition, the inspectors assessed the operators' adherence to plant procedures, including conduct of operations and other operations department policies.

These activities constitute completion of one quarterly licensed operator performance sample, as defined in Inspection Procedure 71111.11.

#### **b. Findings**

No findings were identified.

## **1R12 Maintenance Effectiveness (71111.12)**

#### **a. Inspection Scope**

The inspectors reviewed two instances of degraded performance or condition of safety-related structures, systems, and components (SSCs):

- November 16, 2015, startup channel #1

- December 17, 2015, core element assembly calculators

The inspectors reviewed the extent of condition of possible common cause SSC failures and evaluated the adequacy of the licensee's corrective actions. The inspectors reviewed the licensee's work practices to evaluate whether these may have played a role in the degradation of the SSCs. The inspectors assessed the licensee's characterization of the degradation in accordance with 10 CFR 50.65 (the Maintenance Rule), and verified that the licensee was appropriately tracking degraded performance and conditions in accordance with the Maintenance Rule.

These activities constituted completion of two maintenance effectiveness samples, as defined in Inspection Procedure 71111.12.

b. Findings

Introduction. The inspectors reviewed a self-revealing, Green, non-cited violation of Technical Specification 6.8.1.a associated with the licensee's failure to properly pre-plan and perform maintenance in accordance with EN-DC-153, "Preventative Maintenance Component Classification."

Description. The Core Element Assembly Calculators (CEACs) gather information regarding individual core element assembly (CEA) deviations in the core and provide penalty factors to the core protection calculators (CPCs), which calculate the core safety limits related to the departure from nucleate boiling ratio trip and the local power density trip.

At approximately 2200 on Saturday, October 3, 2015, the licensee noted indications of degradation of a circuit card associated with CEAC 2. At 2208, the control room received a CEA-withdrawal-prohibit annunciator and a CEA-channel-C-deviation annunciator. Operators noted on CEAC 2 that the indications were that CEA 50 and CEA 51 were oscillating up and down several inches. Using other parameters, the operators determined that neither CEA 50 nor CEA 51 was moving, and that the CEAC 2 indications were erroneous. The licensee decided to remove CEAC 2 from service, and began doing so. However, at 2307, the oscillations associated with CEAC 2 became large enough to generate a penalty factor transmitted to the CPCs which prompted the CPC to generate trip signals based on local-power density and departure-from-nucleate-boiling ratio, and those trip signals caused the reactor to trip.

During troubleshooting of CEAC 2, the licensee found that a circuit card in slot 5 of CEAC 2 had failed. The failed circuit card was associated with CEAs 50 and 51, and resulted in the CEAC transmitting data to the CPCs indicating large CEA deviations and an associated large penalty factor. As noted above, that penalty factor resulted in the reactor trip.

In their review of the event, the licensee found that as part of a maintenance-optimization program in 2008, they had changed the classification of the CEACs from "High Critical" to "Low Critical." Consequently, the licensee discontinued the preventive-maintenance programs that had previously affected the CEACs, and had begun replacing them only as required.

The inspectors' review of the associated circumstances found no documented basis for changing the classification of the CEACs from High Critical to Low Critical components. Instead, the inspectors noted that because certain failures of CEACs can result in reactor trips, classifying the CEACs as Low Critical was not consistent with certain guidance in licensee procedure EN-DC-153, "Preventative Maintenance Component Classification." Specifically, EN-DC-153 requires the licensee to classify as High Critical those components whose failures can cause reactor trips. Furthermore, for High Critical components, EN-DC-153 step 5.2[6](c)(4) requires the licensee to develop and implement appropriate preventative maintenance activities at appropriate frequencies for the components.

Analysis. The failure to pre-plan and perform preventative maintenance on CEAC components as required by EN-DC-153 step 5.2[6](c)(4) was a performance deficiency which was reasonably within the licensee's ability to foresee and correct. The performance deficiency is more than minor, and therefore is a finding, because it is associated with the Equipment Performance attribute of the Initiating Events Cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, inappropriate preventative maintenance on the circuit cards associated with the CEACs ultimately contributed to a plant trip on October 3, 2015.

The inspectors initially screened the finding in accordance with NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," issued April 29, 2015. Using IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued June 19, 2012, the inspectors determined that the finding was of very low significance (Green) because the finding did not cause a trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. Specifically, following the plant trip, all mitigation equipment relied upon to transition the plant to a stable shutdown condition responded as designed.

Because the performance deficiency occurred in 2008, the inspectors concluded that the finding does not reflect current licensee performance and therefore did not assign a cross-cutting aspect.

Enforcement. Technical Specification 6.8.1.a, requires, in part, that procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2. Section 9.a of Appendix A to Regulatory Guide 1.33, Revision 2, requires, in part, that "maintenance that can affect the performance of safety-related equipment be properly pre-planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances." The licensee established procedure EN-DC-153, "Preventative Maintenance Component Classification," Revisions 2-12, to satisfy the Regulatory Guide 1.33 requirement. Step 5.2[6](c)(4) of EN-DC-153 requires the licensee to develop and implement appropriate preventive maintenance strategies for High Critical components.

Contrary to the above, from 2008 to October 3, 2015, the licensee failed to develop and implement appropriate preventive maintenance strategies for High Critical components. Specifically, the licensee did not pre-plan and perform maintenance that could affect the performance of the safety-related circuit cards associated with the CEACs, and the

failure of one of those cards consequently caused a reactor trip. The licensee entered this condition into their corrective action program as condition report CR-WF3-2015-06438. The licensee restored compliance by properly classifying the components as High Critical in accordance with EN-DC-153, Revision 12, and by initiating development of appropriate preventative-maintenance for the CEACs. In addition, the licensee initiated work to improve the reliability of the CEACs, including reviewing card refurbishments to ensure circuit card reliability is enhanced.

Because this violation was of very low safety significance and the licensee entered the issue into their corrective action program, this violation is treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy: NCV 05000382/2015004-01, "Failure to Properly Pre-Plan and Perform Maintenance on the Core Element Assembly Calculators."

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

#### **a. Inspection Scope**

The inspectors reviewed two risk assessments performed by the licensee prior to changes in plant configuration and the risk management actions taken by the licensee in response to elevated risk:

- October 16, 2015, risk assessment associated with repairs performed on startup transformer
- November 2, 2015, risk assessment associated with lowered inventory operations

The inspectors verified that these risk assessment were performed timely and in accordance with the requirements of 10 CFR 50.65 (the Maintenance Rule) and plant procedures. The inspectors reviewed the accuracy and completeness of the licensee's risk assessments and verified that the licensee implemented appropriate risk management actions based on the result of the assessments.

The inspectors also observed portions of two emergent work activities that had the potential to affect the functional capability of mitigating systems:

- October 5, 2015, emergent work associated with charging pump B
- November 14, 2015, emergent work associated with safety train B under voltage relays

The inspectors verified that the licensee appropriately developed and followed a work plan for these activities. The inspectors verified that the licensee took precautions to minimize the impact of the work activities on unaffected SSCs.

These activities constitute completion of four maintenance risk assessments and emergent work control inspection samples, as defined in Inspection Procedure 71111.13.

#### **b. Findings**

No findings were identified.

## **1R15 Operability Determinations and Functionality Assessments (71111.15)**

### a. Inspection Scope

The inspectors reviewed one operability determination that the licensee performed for degraded or nonconforming SSCs:

- November 6, 2015, motor control center 315B

The inspectors also reviewed operator actions taken or planned to compensate for degraded or nonconforming conditions. The inspectors verified that the licensee effectively managed these operator workarounds to prevent adverse effects on the function of mitigating systems and to minimize their impact on the operators' ability to implement abnormal and emergency operating procedures.

These activities constitute completion of two operability and functionality review samples, which included one operator work-around sample, as defined in Inspection Procedure 71111.15.

### b. Findings

No findings were identified.

## **1R18 Plant Modifications (71111.18)**

### a. Inspection Scope

On November 13, 2015, the inspectors reviewed a permanent plant modification of emergency diesel generator B electronic governor replacement that affected risk-significant SSCs.

The inspectors reviewed the design and implementation of the modification. The inspectors verified that work activities involved in implementing the modification did not adversely impact operator actions that may be required in response to an emergency or other unplanned event. The inspectors verified that post-modification testing was adequate to establish the operability of the SSC as modified.

These activities constitute completion of one samples of permanent modifications, as defined in Inspection Procedure 71111.18.

### b. Findings

No findings were identified.

## **1R19 Post-Maintenance Testing (71111.19)**

### a. Inspection Scope

The inspectors reviewed six post-maintenance testing activities that affected risk-significant SSCs:

- October 8, 2015, startup channel #1



- October 21, 2015, reactor drain tank outlet inside containment isolation valve BM-109
- November 4, 2015, emergency feedwater header B to steam generator 2 backup flow control valve EFW-223B
- November 11, 2015, startup transformer B
- November 14, 2015, emergency diesel generator B
- November 23, 2015, startup transformer A

The inspectors reviewed licensing- and design-basis documents for the SSCs and the maintenance and post-maintenance test procedures. The inspectors observed the performance of the post-maintenance tests to verify that the licensee performed the tests in accordance with approved procedures, satisfied the established acceptance criteria, and restored the operability of the affected SSCs.

These activities constitute completion of six post-maintenance testing inspection samples, as defined in Inspection Procedure 71111.19.

b. Findings

No findings were identified.

**1R20 Refueling and Other Outage Activities (71111.20)**

.1 Refueling Outage 20

a. Inspection Scope

During the station's refueling outage that concluded on December 15, 2015, the inspectors evaluated the licensee's outage activities. The inspectors verified that the licensee considered risk in developing and implementing the outage plan, appropriately managed personnel fatigue, and developed mitigation strategies for losses of key safety functions. This verification included the following:

- Review of the licensee's outage plan prior to the outage
- Review and verification of the licensee's fatigue management activities
- Monitoring of shut-down and cool-down activities
- Verification that the licensee maintained defense-in-depth during outage activities
- Observation and review of reduced-inventory and mid-loop activities
- Observation and review of fuel handling activities
- Walkdown of containment prior to startup
- Monitoring of heat-up and startup activities

These activities constitute completion of one refueling outage sample as defined in Inspection Procedure 71111.20.

b. Findings

No findings were identified.

## **1R22 Surveillance Testing (71111.22)**

### a. Inspection Scope

The inspectors observed three risk-significant surveillance tests and reviewed test results to verify that these tests adequately demonstrated that the SSCs were capable of performing their safety functions:

In-service tests:

- October 15, 2015, charging pump A

Containment isolation valve surveillance tests:

- November 6, 2015, containment atmosphere radiation monitor suction header inside containment isolation valve ARM-109
- November 23, 2015, reactor coolant loop 2 shutdown cooling suction inside containment isolation valve SI-405A

The inspectors verified that these tests met technical specification requirements, that the licensee performed the tests in accordance with their procedures, and that the results of the test satisfied appropriate acceptance criteria. The inspectors verified that the licensee restored the operability of the affected SSCs following testing.

These activities constitute completion of three surveillance testing inspection samples, as defined in Inspection Procedure 71111.22.

### b. Findings

No findings were identified.

## **2. Cornerstone: Emergency Preparedness**

### **1EP6 Drill Evaluation (71114.06)**

#### **.1 Emergency Preparedness Drill Observation**

##### a. Inspection Scope

The inspectors observed an emergency preparedness drill on December 16, 2015, to verify the adequacy and capability of the licensee's assessment of drill performance. The inspectors reviewed the drill scenario, observed the drill from the emergency operations facility, and attended the post-drill critique. The inspectors verified that the licensee's emergency classifications, off-site notifications, and protective action recommendations were appropriate and timely. The inspectors verified that any emergency preparedness weaknesses were appropriately identified by the licensee in the post-drill critique and entered into the corrective action program for resolution.

These activities constitute completion of one emergency preparedness drill observation sample, as defined in Inspection Procedure 71114.06.

b. Findings

No findings were identified.

**3. RADIATION SAFETY**

**Cornerstones: Public Radiation Safety and Occupational Radiation Safety**

**2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)**

a. Inspection Scope

The inspectors assessed the licensee's performance in assessing the radiological hazards in the workplace associated with licensed activities. The inspectors assessed the licensee's implementation of appropriate radiation monitoring and exposure control measures for both individual and collective exposures. The inspectors walked down various portions of the plant and performed independent radiation dose rate measurements. The inspectors interviewed the radiation protection manager, radiation protection supervisors, and radiation workers. The inspectors reviewed licensee performance in the following areas:

- The hazard assessment program, including a review of the licensee's evaluations of changes in plant operations and radiological surveys to detect dose rates, airborne radioactivity, and surface contamination levels
- Instructions and notices to workers, including labeling or marking containers of radioactive material, radiation work permits, actions for electronic dosimeter alarms, and changes to radiological conditions
- Programs and processes for control of sealed sources and release of potentially contaminated material from the radiologically controlled area, including survey performance, instrument sensitivity, release criteria, procedural guidance, and sealed source accountability
- Radiological hazards control and work coverage, including the adequacy of surveys, radiation protection job coverage and contamination controls, the use of electronic dosimeters in high noise areas, dosimetry placement, airborne radioactivity monitoring, controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools, posting and physical controls for high radiation areas and very high radiation areas
- Radiation worker and radiation protection technician performance with respect to radiation protection work requirements
- Audits, self-assessments, and corrective action documents related to radiological hazard assessment and exposure controls since the last inspection

These activities constitute completion of one sample of radiological hazard assessment and exposure controls as defined in Inspection Procedure 71124.01.

b. Findings

No findings were identified.

**2RS2 Occupational ALARA Planning and Controls (71124.02)**

a. Inspection Scope

The inspectors assessed licensee performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). During the inspection, the inspectors interviewed licensee personnel and reviewed licensee performance in the following areas:

- Site-specific ALARA procedures and collective exposure history, including the current 3-year rolling average, site-specific trends in collective exposures, and source-term measurements
- ALARA work activity evaluations/postjob reviews, exposure estimates, and exposure mitigation requirements
- The methodology for estimating work activity exposures, the intended dose outcome, the accuracy of dose rate and man-hour estimates, and intended versus actual work activity doses and the reasons for any inconsistencies
- Records detailing the historical trends and current status of tracked plant source terms and contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry
- Radiation worker and radiation protection technician performance during work activities in radiation areas, airborne radioactivity areas, or high radiation areas
- Audits, self-assessments, and corrective action documents related to ALARA planning and controls since the last inspection

These activities constitute completion of one sample of occupational ALARA planning and controls as defined in Inspection Procedure 71124.02.

b. Findings

No findings were identified.

#### 4. OTHER ACTIVITIES

##### **Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness, Public Radiation Safety, Occupational Radiation Safety, and Security**

#### 4OA1 Performance Indicator Verification (71151)

##### .1 Reactor Coolant System Specific Activity (BI01)

###### a. Inspection Scope

The inspectors reviewed the licensee's reactor coolant system chemistry sample analyses for the period of October 2014 through September 2015 to verify the accuracy and completeness of the reported data. The inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample on December 22, 2015. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the reactor coolant system specific activity performance indicator Waterford Steam Electric Station, Unit 3, as defined in Inspection Procedure 71151.

###### b. Findings

No findings were identified.

##### .2 Reactor Coolant System Total Leakage (BI02)

###### a. Inspection Scope

The inspectors reviewed the licensee's records of reactor coolant system or total leakage for the period of October 2014 through September 2015 to verify the accuracy and completeness of the reported data. The inspectors observed the performance of OP-903-024, "Reactor Coolant System Water Inventory Balance," Revision 22 on December 21, 2015. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the reactor coolant system leakage performance indicator Waterford Steam Electric Station, Unit 3, as defined in Inspection Procedure 71151.

###### b. Findings

No findings were identified.

##### .3 Occupational Exposure Control Effectiveness (OR01)

###### a. Inspection Scope

The inspectors verified that there were no unplanned exposures or losses of radiological control over locked high radiation areas and very high radiation areas during the period of April 1, 2014 to September 30, 2015. The inspectors reviewed a sample of radiologically controlled area exit transactions showing exposures greater than 100 mrem. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the occupational exposure control effectiveness performance indicator as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

.4 Radiological Effluent Technical Specifications (RETS)/Offsite Dose Calculation Manual (ODCM) Radiological Effluent Occurrences (PR01)

a. Inspection Scope

The inspectors reviewed corrective action program records for liquid or gaseous effluent releases that occurred between April 1, 2014 and September 30, 2015, and were reported to the NRC to verify the performance indicator data. The inspectors used definitions and guidance contained in Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, to determine the accuracy of the reported data.

These activities constituted verification of the radiological effluent technical specifications (RETS)/offsite dose calculation manual (ODCM) radiological effluent occurrences performance indicator as defined in Inspection Procedure 71151.

b. Findings

No findings were identified.

**40A2 Problem Identification and Resolution (71152)**

.1 Routine Review

a. Inspection Scope

Throughout the inspection period, the inspectors performed daily reviews of items entered into the licensee's corrective action program and periodically attended the licensee's condition report screening meetings. The inspectors verified that licensee personnel were identifying problems at an appropriate threshold and entering these problems into the corrective action program for resolution. The inspectors verified that the licensee developed and implemented corrective actions commensurate with the significance of the problems identified. The inspectors also reviewed the licensee's problem identification and resolution activities during the performance of the other inspection activities documented in this report.

b. Findings

No findings were identified.

.2 Semiannual Trend Review

a. Inspection Scope

The inspectors reviewed the licensee's corrective action program, performance indicators, system health reports, and other documentation to identify trends that might indicate the existence of a more significant safety issue. The inspectors verified that the licensee was taking corrective actions to address identified adverse trends.

These activities constitute completion of one semiannual trend review sample, as defined in Inspection Procedure 71152.

b. Observations and Assessments

On November 28, 2015, during preparations for plant startup, the licensee started the auxiliary feedwater pump. On November 30, 2015, personnel in the area reported smoke coming from the outboard mechanical seal of the pump and noted sparking from the seal area. The pump was secured and the licensee undertook troubleshooting activities and made repairs to the pump. The pump was returned to service on December 8, 2015.

On December 3, 2015, during preparations for plant startup, the licensee started condensate pump A. Approximately one minute after the pump started, operators in the area noted sparks coming from the stationary gland plate and rotating gland seal ring. The pump was secured and the licensee undertook troubleshooting. Repairs were made and the pump was returned to service on December 19, 2015.

On December 7, 2015, during preparations for plant startup, the licensee started condensate pump B. Within seconds of the pump starting, the pump tripped. Operators in the area noted smoke coming from the pump motor. The licensee subsequently undertook troubleshooting. Repairs were made and the pump was returned to service on December 15, 2015.

The inspectors questioned the licensee regarding potential common trends and causes regarding the failures of the three pumps. The licensee found that the motor-to-pump alignment was not performed on the condensate pumps following maintenance performed during the outage. However, the licensee indicated that no common or adverse trends had been noted regarding the condensate pump failures and the auxiliary feedwater pump failure.

In their review of the events, the inspectors found that on December 4, 2015, CR-WF3-2015-09094 documented foreign material left in the internals of condensate pump A and B subsequent to maintenance performed during refueling outage 20. Further, the inspectors found that on December 5, 2015, following the auxiliary feedwater pump failure, foreign material was found in the pump and documented in CR-WF3-2015-09385.

The inspectors presented the information to the licensee and asked if any evaluation was done or planned for the apparent adverse trend of foreign material intrusion into the pumps or associated workmanship issues. The licensee initiated condition report CR-WF3-2015-9528 to evaluate the potential adverse trend related to foreign materials and workmanship. As a result of their review of CR WF3-2015-9528, the licensee later concluded that an adverse trend exists.

c. Findings

No findings were identified.

**40A3 Follow-up of Events and Notices of Enforcement Discretion (71153)**

(Closed) Licensee Event Report (LER) 05000382/2015-008-00, Automatic Reactor Trip Due to Failed Circuit Card in Control Element Assembly Calculator 2

At approximately 2200 on Saturday, October 3, 2015, the licensee noted indications of degradation of a circuit card associated with CEAC 2. At 2208, the control room received a CEA-withdrawal-prohibit annunciator and a CEA-channel-C-deviation annunciator. Operators noted on CEAC 2, the indications were that CEA 50 and CEA 51 were oscillating up and down several inches. Using other parameters, the operators determined that neither CEA 50 nor CEA 51 was moving, and that the CEAC 2 indications were erroneous. At 2307, the oscillations associated with CEAC 2 became large enough to generate a penalty factor transmitted to the CPCs which prompted the CPC to generate trip signals based on local-power density and departure-from-nucleate-boiling ratio, and those trip signals caused the reactor to trip. In their review of the event, the inspectors documented finding NCV 05000382/2015004-01 in section 1R12 of this report. This licensee event report is closed.

These activities constitute completion of one event follow-up sample, as defined in Inspection Procedure 71153.

**40A6 Meetings, Including Exit**

Exit Meeting Summary

On October 29, 2015, the inspectors presented the radiation safety inspection results to Mr. M. Chisum, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On November 13, 2015, the inspectors presented the inspection results to Mr. M. Chisum, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

On January 14, 2016, the inspectors presented the inspection results to Mr. M. Chisum, Site Vice President, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.



## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

M. Chisum, Site Vice President, Operations  
M. Richey, General Manager, Plant Operations  
M. Briley, NDE Outage Supervisor  
J. Clavelle, Manager, Systems and Components  
R. Gilmore, Acting Director, Regulatory & Performance Improvement  
M. Haydel, Manager, Design & Program Engineering  
B. Hienlen, NDE Level III  
J. Jarrell, Manager, Regulatory Assurance  
B. Lanka, Director, Engineering  
N. Lawless Manager, Chemistry  
B. Lindsey, Senior Manager, Operations  
R. McGeha, NDE Level III  
S. Meiklejohn, Senior Licensing Specialist  
L. Milster, Licensing Engineer, Regulatory Assurance  
N. Petit, Supervisor, Design Engineering  
J. Sarrell, Regulatory Affair Manager  
J. Signorelli, Simulator Supervisor  
R. Simpson, Superintendent, Operator Training  
J. Swan, Inservice Inspection Program Owner  
M. Zamber, Sr. Licensing Specialist

#### **NRC Personnel**

F. Ramirez, Senior Resident Inspector  
C. Speer, Acting Senior Resident Inspector  
T. Sullivan, Acting Resident Inspector  
J. Choate, Acting Resident Inspector  
N. Greene, PhD, Health Physicist  
M. Phalen, Senior Health Physicist  
I. Anchondo, Reactor Inspector  
J. Sowa, Senior Resident Inspector

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### **Opened and Closed**

05000382-2015004-01	NCV	Failure to Properly Pre-Plan and Perform Maintenance on the Core Element Assembly Calculators (Section 1R12)
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Closed

05000382/2015004-008-00 LER Automatic Reactor Trip Due to Failed circuit Card in Control Element Assembly Calculator 2 (Section 4OA3)

**LIST OF DOCUMENTS REVIEWED**

**Section 1R01: Adverse Weather Protection**

Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EC 54335	Provide Operability Input For CR-WF3-2014-5529 / CR-WF3-2014-6149 Potential for Ponding Water Around EDG Feed Tank Vent Lines	0
ECM13-001	MSIV Area Flooding Analysis	0

Condition Reports

CR-WF3-2015-04366

**Section 1R04: Equipment Alignment**

Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OP-002-003	Component Cooling Water	316
OP-009-001	Containment Spray System	306
OP-009-008	Safety Injection System	038

Condition Reports

CR-WF3-2015-08043

## Section 1R05: Fire Protection

### Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
NS-TB-005	Waterford-3 S.E.S. Prefire Strategy	1
RAB-15-001	Waterford-3 S.E.S. Prefire Strategy	8
RAB-32-001	Waterford-3 S.E.S. Prefire Strategy	9
RCB-001	Waterford-3 S.E.S. Prefire Strategy	10

### Condition Reports

CR-2015-07708

## Section 1R06: Flood Protection Measures

### Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
SEP-UIP-WF3	Underground Components Inspection Plan	1

### Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
G-439	Yard Duct Runs and Outdoor Lighting	20
G-492	Plant Area Grading & Drainage	23

### Condition Reports

CR-WF3-2015-09206

## Section 1R07: Heat Sink Performance

### Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
EPRI NP-7552	Heat Exchanger Monitoring Guidelines	December 1991
SEP-HX-WF3-001	Generic Letter 89-13 heat Exchanger Test Basis	0

## Section 1R08: Inservice Inspection Activities

### Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
CEP-NDE-0423	Manual Ultrasonic Examination of Austenitic Piping Welds	7
SEP-BAC-WF3-001	Waterford 3 Boric Acid Corrosion Control Program	1
EN-DC-319	Boric Acid Corrosion Control Program	10
CEP-BAC-001	Boric Acid Corrosion Control Program Plan	1
EN-MA-133	Control of Scaffolding	12
CEP-WP-002	Welding Procedure Specification	0
SEP-ISI-104	Program Section for ASME Section XI, Division 1, Inservice Inspection Program	2

### Condition Reports

CR-WF3-2014-03325	CR-WF3-2014-04150	CR-WF3-2014-05715	CR-WF3-2014-05717
CR-WF3-2015-00087	CR-WF3-2015-00988	CR-WF3-2015-02500	CR-WF3-2015-03063
CR-WF3-2015-03622	CR-WF3-2015-04752	CR-WF3-2015-05018	

### Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
D-WC-11102-040	ICI Nozzle to Quick/Lock Flange Adapter Calibration Block	4
5817-13776	Layout THD4	0
5817-13772	Layout Sheet 1	0
WTR-1-1300	Reactor Vessel Closure Head	0

### Work Orders

387674	55752	387631
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## Section 1R11: Licensed Operator Requalification Program and Licensed Operator Performance

### Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
	10/3/2015 Post Trip Review Report	0

Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
NE-002-030	Initial Criticality	305
O-JITDIL	Dilution Startup JITT, O-JITDIL	6
OP-010-003	Plant Startup	337
OP-903-027	Containment Closeout Inspection	304

**Section 1R12: Maintenance Effectiveness**

Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EC 61217	RF20 Startup Channel #1 Engineering Input	0
EN-DC-153	Preventative Maintenance Component Classification	12
EN-DC-153	Preventative Maintenance Component Classification	2
EN-DC-159	System and Component Monitoring	8
EN-DC-175	Single Point Failure Review Process	5
EN-DC-335	PM Basis Template	6

Condition Reports

CR-WF3-2015-07528 CR-WF3-2015-07417 CR-WF3-2015-06438

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EC 60429	Engineering Input for CR-WF3-2015-06448	0
EC 60438	Revised Engineering Input for CR-WF3-2015-06448	0
EC 60453	Repair the Two (2) "C" Phase 230KV – 1780KCM Cables Connected to GOB A and SUT A by Installing Jumpers Around the Existing Degraded Cables	0
EN-WM-104	On Line risk Assessment	9
OI-037-000	Operations' Risk Assessment Guideline	306

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
B424-E375-1	Charging Pump B	11
B424-E375-2	Charging Pump B	6
B424	Charging Pump B	20

Condition Reports

CR-WF3-2015-06448 CR-WF3-2015-06617

Work Orders

WO 00426061

**Section 1R15: Operability Determinations and Functionality Assessments**

Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
	Waterford Operations Report Book Dates Sep 2014 – Sep 2015	
EC 61343	Operability Input for MCC315-B Due to Corrosion and Water Intrusion	0
EN-FAP-OP-006	Operational Aggregate Impact Index Performance Indicator	2
EN-OP-111	Operational Decision Making Issue Process	11
EN-OP-117	Operations Assessment Resources	9
OP-901-220	Loss of Condenser Vacuum	301

Condition Reports

CR-WF3-2015-00150 CR-WF3-2015-03053 CR-WF3-2015-06169 CR-WF3-2015-03635  
CR-WF3-2015-02125 CR-WF3-2015-04076 CR-WF3-2015-05580 CR-WF3-2015-03563  
CR-WF3-2014-06485 CR-WF3-2014-05149 CR-WF3-2014-05995 CR-WF3-2014-06003  
CR-WF3-2014-02872 CR-WF3-2014-03400 CR-WF3-2014-05092 CR-WF3-2013-00445  
CR-WF3-2014-07994 CR-WF3-2009-06234 CR-WF3-2015-07977 CR-WF3-2015-06702  
CR-WF3-2015-06585

## Section 1R18: Plant Modifications

### Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EC 45396	Replace EDG B Hydraulic Governor	0
NEI 96-07	Guidelines for 10 CFR 50.59 Evaluations	1

### Condition Reports

CR-WF3-2015-08197 CR-WF3-2015-08215 CR-WF3-2015-08236

### Work Orders

WO 00409465

## Section 1R19: Post-Maintenance Testing

### Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
ME-003-300	6.9 kV Overcurrent Proactive Device Functional Test	9
ME-003-315	Molded Case Circuit Breakers	306
ME-004-331	Reactor Coolant Pump Motor Maintenance	302
MI-003-115	Startup and Control Channel Drawer Calibration Channel 1 or 2	303
OP-006-009	Electrical Bus Outages	11
OP-903-120	Containment and Miscellaneous Systems Quarterly IST Valve Tests	21
TD-C490.0405	Combustion Engineering Ex-Core Neutron Flux Monitoring System Operation and Maintenance Manual	0
TD-C490.0425	Combustion Engineering Ex-Core Neutron Flux Monitoring System Startup and Control Channel Operation and Maintenance Manual	1

### Condition Reports

CR-WF3-2015-06437 CR-WF3-2015-06467 CR-WF3-2015-08065 CR-WF3-2015-08256  
CR-WF3-2015-08160 CR-WF3-2015-04739 CR-WF3-2015-06986 CR-WF3-2015-08665  
CR-WF3-2015-08671 CR-WF3-2015-08300 CR-WF3-2015-08656 CR-WF3-2015-08572  
CR-WF3-2015-08610

Work Orders

WO 00426846	WO 52539181	WO 52588411	WO 00398449
WO 00407717	WO 52506719	WO 00335505	WO 00405671
WO 52586076			

**Section 1R20: Refueling and Other Outage Activities**

Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EC 61343	Operability Input For CR-WF3-2015-07977	0
OP-010-003	Plant Startup	336
OP-010-004	Power Operations	324
OP-010-005	Plant Shutdown	326
OP-903-027	Inspection of Containment	304
SEP-BAC-WF3-001	Waterford 3 Boric Acid Corrosion Control Program (BACCP)	1

Condition Reports

CR-WF3-2015-06513	CR-WF3-2015-06471	CR-WF3-2015-07042	CR-WF3-2015-07040
CR-WF3-2015-03603	CR-WF3-2015-07008	CR-WF3-2015-09093	CR-WF3-2015-09272
CR-WF3-2015-09194			

**Section 1R22: Surveillance Testing**

Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-OP-104	Operability Determination Procedure	9
OP-100-010	Equipment Out of Service	311
OP-100-014	Technical Specification and Technical Requirements Compliance	4
OP-100-014	Technical Specification and Technical Requirements Compliance	5
OP-100-014	Technical Specification and Technical Requirements Compliance	330
OP-903-003	Charging Pump Operability Check	306



Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
SEP-APJ-005	Waterford 3 Primary Containment Leakage Rate Testing (Appendix J) Program	5
STA-001-004	Local Leak Rate Test (LLRT)	312
STA-001-006	Leak Rate Testing	301

Condition Reports

CR-WF3-2015-06448 CR-WF3-2015-08443 CR-WF3-2015-07025 CR-WF3-2015-07376  
CR-WF3-2015-08114 CR-WF3-2015-07380

Work Orders

WO 52637359 WO 00520404 WO 00405671 WO 52576902

**Section 1EP6: Drill Evaluation**

Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EP-001-001	Recognition & Classification of Emergency Conditions	31
EP-001-020	Alert	308
EP-001-030	Site Area Emergency	307
EP-001-040	General Emergency	308
EP-002-010	Notifications and Communications	313
EP-002-102	Emergency Operations Facility (EOF) Activation, Operation, and Deactivation	306

**Section 2RS1: Radiological Hazard Assessment and Exposure Controls**

Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-RE-220	PWR Control of Miscellaneous Material in the Spent Fuel Pool	03
EN-RP-101	Access Control for Radiologically Controlled Areas	11
EN-RP-102	Radiological Control	04
EN-RP-105	Radiation Work Permits	14
EN-RP-108	Radiation Protection Posting	15

Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-RP-121	Radioactive Material Control	11
EN-RP-122	Alpha Monitoring	09
EN-RP-123	Radiological Controls for Highly Radioactive Objects	01
EN-RP-131	Air Sampling	14
EN-RP-141	Job Coverage	05
EN-RP-141-01	Job Coverage Using Remote Monitoring Technology	04
EN-RP-142	Failed Fuel Response	02
EN-RP-143	Source Control	11
EN-RP-152	Conduct of Radiation Protection	00
EN-RP-153	Radiation Protection Fundamentals Program	00
EN-RP-201	Dosimetry Administration	04
EN-RP-204	Special Monitoring Requirements	08
EN-RP-308	Operation and Calibration of Gamma Scintillation Tool Monitors	08
EN-RP-317-03	Operation and Calibration of Sources and Laboratory Standard Instruments	00

Condition Reports

CR-WF3-2015-00209 CR-WF3-2015-06081 CR-WF3-2014-03346 CR-WF3-2014-02076  
CR-WF3-2015-02527 CR-WF3-2015-00772 CR-WF3-2014-03915

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Waterford 3 Dry Fuel Storage Neutron Study	October 29, 2015
	Waterford 3 Containment Neutron Study	October 29, 2015
	Personnel Contamination Events Log	2014 and 2015 YTD
	Selected Air Sample Records	2014 and 2015 YTD
	Selected Radiological Survey Records	2014 and 2015 YTD

<u>Number</u>	<u>Title</u>	<u>Date</u>
52602677	Semi-Annual Source Inventory	June 23, 2015
LO-WLO-2014-0038	Pre-NRC Focused Assessment	September 09, 2014
LO-WLO-2015-0025	Pre-NRC Inspection FSA	April 28, 2015

## **Section 2RS2: Occupational ALARA Planning and Controls**

### Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-RP-105	Radiological Work Permits	14
EN-RP-110	ALARA Program	13
EN-RP-110-01	ALARA Initiative Deferrals	1
EN-RP-110-03	Collective Radiation Exposure (CRE) Reduction Guidelines	4
EN-RP-110-05	ALARA Planning and Controls	2
EN-RP-110-06	Outage Dose Estimating and Tracking	1
HP-001-114	Control of Temporary Shielding	15

### Audits, Self-Assessments, and Surveillances

#### Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Date</u>
LO-WLO-2015-00025	Pre-NRC Inspection FSA: Radiation Protection	April 28, 2015
LO-WLO-2015-00029	Radiation Protection Repetitive Work Task Tracking	August 2, 2015

### Radiological Work Permits and ALARA Packages

<u>Number</u>	<u>Title</u>
20140702	RF19 Disassembly of Reactor Head and All Associated Work Activities
20140705	Reassembly of Reactor Head and Associated Work Activities
20150507	Remove/Replace RCP 2B Seals
20150606	RF20 "Bulk Work" Perform Minor Maintenance Activities, Walkdowns, Surveillance, and Inspections Inside RCB
20150727	Fuel Handling Machine Upgrade/Installation Project

<u>Number</u>	<u>Title</u>
20150805	RF20 Tours and Inspections in All Radiologically Controlled Areas EXCEPT HRAs, LHRAs, VHRAs, and the Reactor

Condition Reports

CR-WF3-2014-02633	CR-WF3-2014-06343	CR-WF3-2015-01180	CR-WF3-2015-02231
CR-WF3-2015-02392	CR-WF3-2015-03104	CR-WF3-2015-04683	CR-WF3-2015-05960
CR-HQN-2015-00687			

Temporary Shielding Requests

Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Date</u>
2015-030	-4 RCB, Scaffold Wall Around Cavity Drain Valves	October 26, 2015
2015-032	Three Free Standing Shields for the RCP Seal Injection Filters on +21 Elevation of RCB	October 25, 2015
2015-033	Using an Overhead Rigging Support, RCP Seal Injection Filter on +21 Elevation of RCB	October 25, 2015

Miscellaneous Documents

Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Date</u>
	RF20 Daily Outage Status Report	October 26-29, 2015
	Waterford 3 Source Term Reduction	2015
	Refuel 19 Outage ALARA Report	2015

## Section 4OA1: Performance Indicator Verification

### Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-RP-202	Personnel Monitoring	09
EN-RP-104	Personnel Contamination Events	07
EN-RP-203	Dose Assessment	07
EN-RP-303-01	Automated Contamination Monitor Performance Testing	00
EN-RP-314	Passive Monitor Sensitivity Testing	00
OP-903-024	Reactor Coolant System Water Inventory Balance	22
W3F1-2015-0008	NRC Performance Indicator (PI) Date – 4 <sup>th</sup> Quarter 2014	0
W3F1-2015-0029	NRC Performance Indicator (PI) Date – 2015 Quarter 1 <sup>st</sup>	0
W3F1-2015-0055	NRC Performance Indicator (PI) Date – 2015 Quarter 2 <sup>nd</sup> Quarter	0
W3F1-2015-0083	NRC Performance Indicator (PI) Date – 2015 Quarter 3 <sup>rd</sup> Quarter	0

### Condition Reports

CR-WF3-2014-01425 CR-WF3-2014-01426

## Section 4OA2: Problem Identification and Resolution

### Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-LI-102	Corrective Action Process	21

### Condition Reports

CR-WF3-2015-09194 CR-WF3-2015-09094 CR-WF3-2015-09287 CR-WF3-2015-09528

### **Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion**

#### Documents/Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
OP-902-000	Standard Post Trip Actions	15
OP-902-001	Reactor Trip Recovery	15

#### Condition Reports

CR-WF3-2015-06438

## PAPERWORK REDUCTION ACT STATEMENT

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.

**Information Request**  
**September 10, 2015**  
**Notification of Inspection and Request for Information**  
**Waterford Steam Electric Station, Unit 3**  
**NRC Inspection Report 05000382/2015005**

On November 9<sup>th</sup>, 2015, reactor inspectors from the Nuclear Regulatory Commission's (NRC) Region IV office will perform the baseline inservice inspection at Waterford, Unit 3, using NRC Inspection Procedure 71111.08, "Inservice Inspection Activities." Experience has shown that this inspection is a resource intensive inspection both for the NRC inspectors and your staff. In order to minimize the impact to your onsite resources and to ensure a productive inspection, we have enclosed a request for documents needed for this inspection. These documents have been divided into two groups. The first group (Section A of the enclosure) identified information to be provided prior to the inspection to ensure that the inspectors are adequately prepared. The second group (Section B of the enclosure) identifies the information the inspectors will need upon arrival at the site. It is important that all of these documents are up to date and complete in order to minimize the number of additional documents requested during the preparation and/or the onsite portions of the inspection.

We have discussed the schedule for these inspection activities with your staff and understand that our regulatory contact for this inspection will be Ms. Maria Zamber of your licensing organization. The tentative inspection schedule is as follows:

Preparation week: November 2-6, 2015  
Onsite week: November 9 -13, 2015

Our inspection dates are subject to change based on your updated schedule of outage activities. If there have any questions about this inspection or the material requested, please contact the lead inspector Isaac Anchondo at (817) 200-1152 ([isaac.anchondo@nrc.gov](mailto:isaac.anchondo@nrc.gov)).

A. Information Requested for the In-Office Preparation Week

The following information should be sent to the Region IV office in hard copy or electronic format ([ims.certrec.com](http://ims.certrec.com) preferred), in care of Isaac Anchondo, by October 26<sup>th</sup>, 2015, to facilitate the selection of specific items that will be reviewed during the onsite inspection week. The inspector will select specific items from the information requested below and then request from your staff additional documents needed during the onsite inspection week (Section B of this enclosure). We ask that the specific items selected from the lists be available and ready for review on the first day of inspection. Please provide requested documentation electronically if possible. If requested documents are large and only hard copy formats are available, please inform the

inspector(s), and provide subject documentation during the first day of the onsite inspection. If you have any questions regarding this information request, please call the inspector as soon as possible.

A.1 ISI/Welding Programs and Schedule Information

- a) A detailed schedule (including preliminary dates) of:
- i. Nondestructive examinations planned for ASME Code Class Components including containment, performed as part of your ASME Section XI, risk informed (if applicable), and augmented inservice inspection programs during the upcoming outage.
  - ii. Examinations planned for Alloy 82/182/600 components that are not included in the Section XI scope (if applicable).
  - iii. Examinations planned as part of your boric acid corrosion control program (mode 3 walk downs, bolted connection walk downs, etc.).
  - iv. Welding activities that are scheduled to be completed during the upcoming outage (ASME Class 1, 2, or 3 structures, systems, or components). Include the weld identification number, description of weld, category, class, type of exam and procedure number, and date of examination.
- b) A copy of ASME Section XI, Code Relief Requests and associated NRC safety evaluations applicable to the examinations identified above. This would include the NRC approved relief request for implementing a risk informed ISI program (if applicable).
- i. A list of ASME Code Cases currently being used to include the system and/or component the Code Case is being applied to.
- c) A list of nondestructive examination reports which have identified relevant indications on any ASME Code Class components since the beginning of the last refueling outage.
- d) A list including a brief description (e.g., system, code class, weld category, nondestructive examination performed) associated with the repair/replacement activities of any ASME Code Class components since the beginning of the last outage and/or planned this refueling outage.
- e) If reactor vessel weld examinations required by the ASME Code are scheduled to occur during the upcoming outage, provide a detailed description of the welds to be examined and the extent of the planned examination. Please also provide reference numbers for applicable procedures that will be used to conduct these examinations.



- f) Copy of any 10 CFR Part 21 reports applicable to structures, systems, or components within the scope of Section XI of the ASME Code that have been identified since the beginning of the last refueling outage.
- g) A list of any temporary noncode repairs in service (e.g., pinhole leaks).
- h) Please provide copies of the most recent self-assessments for the inservice inspection, welding, and Alloy 600 programs.
- i) List with description of ISI related issues such as piping damage (e.g., cracks, wall thinning, wear, MIC) or errors identified during piping examinations that have been entered into your corrective action system since the beginning of the last refueling outage. Also, include a list of corrective action records associated with foreign material introduced/identified in the reactor vessel, primary coolant system, steam generator, or feed systems since the beginning of the last refueling outage.

#### A.2 Reactor Pressure Vessel Head

- a) Provide a detailed scope of the planned bare metal visual examinations (e.g., volume coverage, limitations, etc.) of the vessel upper head penetrations and/or any nonvisual nondestructive examination of the reactor vessel head including the examination procedures to be used.
  - i. Provide the records recording the extent of inspection for each penetration nozzle including documents which resolved interference or masking issues that confirm that the extent of examination meets 10 CFR 50.55a(g)(6)(ii)(D).
  - ii. Provide records that demonstrate that a volumetric or surface leakage path examination assessment was performed.
- b) Copy of current calculations for EDY, and RIY as defined in Code Case N-729-1 that establish the volumetric and visual inspection frequency for the reactor vessel head and J-groove welds.

#### A.3 Boric Acid Corrosion Control Program

- a) Copy of the procedures that govern the scope, equipment and implementation of the inspections required to identify boric acid leakage and the procedures for boric acid leakage/corrosion evaluation.
- b) Please provide a list of leaks (including code class of the components) that have been identified since the last refueling outage and associated corrective action documentation. If during the last cycle, the unit was shut down, please provide documentation of containment walk down inspections performed as part of the boric acid corrosion control program.

A.4 Additional Information Related to all Inservice Inspection Activities

- a) A list with a brief description of inservice inspection, and boric acid corrosion control program related issues (e.g., condition reports) entered into your corrective action program since the beginning of the last refueling outage. For example, a list based upon data base searches using key words related to piping or steam generator tube degradation such as: inservice inspection, ASME Code, Section XI, NDE, cracks, wear, thinning, leakage, rust, corrosion, boric acid, or errors in piping examinations.
- b) Provide training (e.g. Scaffolding, Fall Protection, FME, Confined Space) if they are required for the activities described in A.1 through A.4.
- c) Please provide names and phone numbers for the following program leads:

- Inservice inspection (examination, planning)
- Containment exams
- Reactor pressure vessel head exams
- Snubbers and supports
- Repair and replacement program
- Licensing
- Site welding engineer
- Boric acid corrosion control program
- Steam generator inspection activities (site lead and vendor contact)

B. Information to be Provided Onsite to the Inspector(s) at the Entrance Meeting (November 9<sup>th</sup>, 2015):

B.1 Inservice Inspection / Welding Programs and Schedule Information

- a) Updated schedules for inservice inspection/nondestructive examination activities, including planned welding activities, and schedule showing contingency repair plans, if available.
- b) For ASME Code Class welds selected by the inspector from the lists provided from section A of this enclosure, please provide copies of the following documentation for each subject weld:
  - i. Weld data sheet (traveler).
  - ii. Weld configuration and system location.
  - iii. Applicable Code Edition and Addenda for weldment.
  - iv. Applicable Code Edition and Addenda for welding procedures.
  - v. Applicable welding procedures used to fabricate the welds.

- vi. Copies of procedure qualification records (PQRs) supporting the weld procedures from B.1.b.v.
  - vii. Copies of welder's performance qualification records (WPQ).
  - viii. Copies of the nonconformance reports for the selected welds (If applicable).
  - ix. Radiographs of the selected welds and access to equipment to allow viewing radiographs (if radiographic testing was performed).
- c) For the inservice inspection related corrective action issues selected by the inspectors from section A of this enclosure, provide a copy of the corrective actions and supporting documentation.
  - d) For the nondestructive examination reports with relevant conditions on ASME Code Class components selected by the inspectors from Section A above, provide a copy of the examination records, examiner qualification records, and associated corrective action documents.
  - e) A copy of (or ready access to) most current revision of the inservice inspection program manual and plan for the current interval.
  - f) For the nondestructive examinations selected by the inspectors from section A of this enclosure, provide a copy of the nondestructive examination procedures used to perform the examinations (including calibration and flaw characterization/sizing procedures). For ultrasonic examination procedures qualified in accordance with ASME Code, Section XI, Appendix VIII, provide documentation supporting the procedure qualification (e.g. the EPRI performance demonstration qualification summary sheets). Also, include qualification documentation of the specific equipment to be used (e.g., ultrasonic unit, cables, and transducers including serial numbers) and nondestructive examination personnel qualification records.

## B.2 Reactor Pressure Vessel Head (RPVH)

- a) Provide drawings showing the following (if performing any RPVH inspection activities):
  - i. RPVH and control rod drive mechanism nozzle configurations.
  - ii. RPVH insulation configuration.

Note: The drawings listed above should include fabrication drawings for the nozzle attachment welds as applicable.

- b) Copy of the documents which demonstrate that the procedures to be used for volumetric examination of the reactor vessel head penetration J-groove welds were qualified by a blind demonstration test in accordance with 10 CFR 50.55a(g)(6)(ii)(D).

- c) Copy of volumetric, surface and visual examination records for the prior inspection of the reactor vessel head and head penetration J-groove welds.

### B.3 Boric Acid Corrosion Control Program

- a) Please provide boric acid walk down inspection results, an updated list of boric acid leaks identified so far this outage, associated corrective action documentation, and overall status of planned boric acid inspections.
- b) Please provide any engineering evaluations completed for boric acid leaks identified since the end of the last refueling outage. Please include a status of corrective actions to repair and/or clean these boric acid leaks. Please identify specifically which known leaks, if any, have remained in service or will remain in service as active leaks.

### B.4 Codes and Standards

- a) Copy of the performance demonstration initiative (PDI) generic procedures with the latest applicable revisions that support site qualified ultrasonic examinations of piping welds and components (e.g., PDI-UT-1, PDI-UT-2, PDI-UT-3, PDI-UT-10, etc.).
- b) Boric Acid Corrosion Guidebook Revision 1 – EPRI Technical Report 1000975.

**The following items are requested for the  
Occupational Radiation Safety Inspection  
at Waterford-3  
(October 26 - 30, 2015)  
Integrated Report 2015004**

Inspection areas are listed in the attachments below.

Please provide the requested information on or before **October 13, 2015**.

Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.01 should be in a file/folder titled "1- A," applicable organization charts in file/folder "1- B," etc.

If information is placed on *ims.certrec.com*, please ensure the inspection exit date entered is at least 30 days later than the onsite inspection dates, so the inspectors will have access to the information while writing the report.

In addition to the corrective action document lists provided for each inspection procedure listed below, please provide updated lists of corrective action documents at the entrance meeting. The dates for these lists should range from the end dates of the original lists to the day of the entrance meeting.

If more than one inspection procedure is to be conducted and the information requests appear to be redundant, there is no need to provide duplicate copies. Enter a note explaining in which file the information can be found.

If you have any questions or comments, please contact the lead inspector, Natasha Greene, at (817)200-1154 or [Natasha.Greene@nrc.gov](mailto:Natasha.Greene@nrc.gov).

Currently, the other inspector will be Marty Phalen [(817)860-8100 or [Marty.Phalen@nrc.gov](mailto:Marty.Phalen@nrc.gov)].

**PAPERWORK REDUCTION ACT STATEMENT**

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.

**1. Radiological Hazard Assessment and Exposure Controls (71124.01)**

Date of Last Inspection: April 21, 2014

- A. List of contacts (with official title) and telephone numbers for the Radiation Protection Organization Staff and Technicians
  - B. Applicable organization charts
  - C. Audits, self assessments, and LERs written since date of last inspection, related to this inspection area
  - D. Procedure indexes for the radiation protection procedures
  - E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.
    - 1. Radiation Protection Program Description
    - 2. Radiation Protection Conduct of Operations
    - 3. Personnel Dosimetry Program
    - 4. Posting of Radiological Areas
    - 5. High Radiation Area Controls
    - 6. RCA Access Controls and Radworker Instructions
    - 7. Conduct of Radiological Surveys
    - 8. Radioactive Source Inventory and Control
    - 9. Declared Pregnant Worker Program
  - F. List of corrective action documents (including corporate and subtiered systems) since date of last inspection
    - a. Initiated by the radiation protection organization
    - b. Assigned to the radiation protection organization
    - c. Identify any CRs that are potentially related to a performance indicator event
- NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide documents which are "searchable" so that the inspector can perform word searches.
- If not covered above, a summary of corrective action documents since date of last inspection involving unmonitored releases, unplanned releases, or releases in which any dose limit or administrative dose limit was exceeded (for Public Radiation Safety Performance Indicator verification in accordance with IP 71151)
- G. List of radiologically significant work activities scheduled to be conducted during the inspection period (If the inspection is scheduled during an outage, please also include a list of work activities greater than 1 rem, scheduled during the outage with the dose estimate for the work activity.)
  - H. List of active radiation work permits
  - I. Radioactive source inventory list

**2. Occupational ALARA Planning and Controls (71124.02)**

Date of Last Inspection: November 17, 2014

- A. List of contacts (with official title) and telephone numbers for ALARA program personnel
- B. Applicable organization charts
- C. Copies of audits, self-assessments, and LERs, written since date of last inspection, focusing on ALARA
- D. Procedure index for ALARA Program
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.
  - 1. ALARA Program
  - 2. ALARA Committee
  - 3. Radiation Work Permit Preparation
- F. A summary list of corrective action documents (including corporate and subtiered systems) written since date of last inspection, related to the ALARA program. In addition to ALARA, the summary should also address Radiation Work Permit violations, Electronic Dosimeter Alarms, and RWP Dose Estimates.

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide documents which are “searchable.”

- G. List of work activities greater than 1 rem, since date of last inspection. Include original dose estimate and actual dose.
- H. Site dose totals and 3-year rolling averages for the past 3 years (based on dose of record)
- I. Outline of source term reduction strategy