UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

July 29, 2015

Mr. Benjamin C. Waldrep
Vice President
Duke Energy Progress, Inc.
Shearon Harris Nuclear Power Plant
P. O. Box 165, Mail Code: Zone 1
New Hill, NC 27562-0165

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT - NRC INTEGRATED INSPECTION REPORT 05000400/2015002

Dear Mr. Waldrep:

On June 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Shearon Harris Nuclear Power Plant, Unit 1. The enclosed inspection report documents the inspection results which were discussed on July 20 2015, with you and other members of your staff.

Three NRC-identified findings of very low safety significance (Green) were identified during this inspection. These findings were determined to involve violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest these NCVs, 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 II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Shearon Harris Nuclear Power Plant, Unit 1.

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 II; and the NRC Resident Inspector at the Shearon Harris facility.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390 of the NRC's "Agency Rules of Practice and Procedure," 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 Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

George T. Hopper, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket No.: 50-400
License No.: NPF-63

Enclosure:
NRC Inspection Report 05000400/2015002
w/Attachment: Supplementary Information

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Letter to B. Waldrep from George T. Hopper dated July 29, 2015.

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT - NRC INTEGRATED INSPECTION REPORT 05000400/2015002

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REGION II

Docket Nos.:	50-400
License Nos.:	NPF-63
Report No.:	05000400/2015002
Licensee:	Duke Energy Progress, Inc.
Facility:	Shearon Harris Nuclear Power Plant, Unit 1
Location:	5413 Shearon Harris Road New Hill, NC 27562
Dates:	April 1, 2015 through June 30, 2015
Inspectors:	J. Austin, Senior Resident Inspector P. Lessard, Resident Inspector M. Riches, Resident Inspector J. Parent, Visiting Inspector (Section 1R18) A. Butcavage, Reactor Inspector (Section 1R08) R. Hamilton, Senior Health Physicist (Sections 2RS2, 4OA1) W. Loo, Senior Health Physicist (Section 2RS5) R. Kellner, Health Physicist (Sections 2RS1, 2RS3, 2RS4, 4OA1) W. Pursley, Health Physicist (Sections 2RS2, 2RS5) A. Sengupta, Reactor Inspector (Section 1R08) R. Williams, Senior Reactor Inspector (Section 1R08)
Approved by:	George T. Hopper, Chief Reactor Projects Branch 4 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000400/2015002; April 1, 2015, through June 30, 2015; Duke Energy Progress, Inc., Shearon Harris Nuclear Power Plant, Unit 1, Operability Determinations and Functionality Assessments, Plant Modifications.

The report covers a three-month period of inspection by resident inspectors, a visiting inspector and regional inspectors. There were three NRC-identified violations documented in this report. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP) dated April 29, 2015. The cross-cutting aspects are determined using IMC 0310, "Aspects within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated February 4, 2015. The NRC's program for overseeing the safe operations of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

Cornerstone: Barrier Integrity

- Green. An NRC-identified Green non-cited violation (NCV) of Technical Specification (TS) 6.8.1, Procedures and Programs, was identified for the licensee's inadequate implementation of procedure OP-173, Control Room Area HVAC System. Specifically, the licensee failed to adequately implement OP-173 Section 8.3, "Placing the Control Room Area HVAC System into Recirculation Manually," and maintain a positive pressure in the main control room (MCR). The licensee entered this issue into the corrective action program (CAP) as action request (AR) 742947, and restored a positive pressure in the MCR. The licensee also revised the associated procedure OWP-RM-01, Control Room OAI [outside air intake] Radiation Monitors, to ensure appropriate actions are taken for the outside air intake supply when radiation monitors are inoperable.

  The failure to maintain positive pressure in the MCR in accordance with OP-173 was a performance deficiency. The performance deficiency was determined to be more than minor in accordance with IMC 0612, Appendix B, since it was associated with the procedure quality attribute of the barrier integrity cornerstone and adversely affected the cornerstone objective and, if left uncorrected, the performance deficiency would have the potential for leading to a more significant safety concern. Specifically, the buildup of carbon dioxide (CO_2) would impair operators' performance and actions. The inspectors evaluated the finding using Inspection Manual Chapter 0609, "Significance Determination Process," Attachment 4 and Appendix G (June 19, 2012), "Shutdown Operations Significance Determination Process." The inspectors determined the finding was associated with the barrier integrity cornerstone and required a detailed risk evaluation because the finding involved control room habitability during both normal and accident conditions. A detailed risk evaluation was completed by a regional SRA using the guidance of NRC IMC 0609 Appendix G and Appendix F, "Fire Protection Significance Determination Process." A bounding analysis was performed considering potential demands on MCR habitability due to radiation and smoke effects. The major analysis assumptions included: an eleven day exposure period, recovery credit for MCR

door closure, shutdown core damage radiation and fuel pool radiation events were considered. The dominant sequence was a fire impacting the MCR with smoke, failure of operators to isolate the MCR resulting in loss of the operators leading to loss of core heat removal. The risk of the performance deficiency was mitigated by the low initiating event probabilities and the recovery likelihood of MCR door closure. The result of the analysis was an increase in core damage frequency of < 1.0E-6/year, a green finding of very low safety significance. The finding had a cross-cutting aspect of Procedure Adherence, as described in the Human Performance cross-cutting area because the licensee failed to comply with OP-173. (H.8) (Section1R15)

- Green. An NRC-identified Green NCV of TS 6.8.1, Procedures and Programs, was identified for the licensee's failure to perform adequate post modification tests (PMTs) on Motor Circuit Protectors (HMCP) breakers for dampers 1CZ-1 and 1CZ-2 as required by procedure AD EG-ALL-1155, Plant Modification Testing. The licensee entered this issue into the CAP as AR 741781. The licensee took immediate corrective action to manually close 1CZ-1 and 1CZ-2 to isolate the MCR boundary. The licensee also changed the setpoint, and revised the PMT to include the direction reversal.

  The licensee's failure to perform adequate PMTs on HMCP breakers for 1CZ-1 and 1CZ-2 as required by procedure AD-EG-ALL-1155 was a performance deficiency. The performance deficiency was more than minor because it was associated with the Procedure Quality Attribute of the Barrier Integrity Cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the licensee failed to test the highest instantaneous current the HMCP breakers would be expected to experience. This would be during the damper's direction reversal, during the PMT. Therefore, the HMCP breakers for 1CZ-1 and 1CZ-2 had the potential to trip open during a control room isolation signal (CRIS), causing unfiltered in-leakage into the MCR envelope in the event of a radiological emergency. Using IMC 0609.04, "Initial Characterization of Findings," issued on June 19, 2012, and IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued on June 19, 2012; the inspectors concluded that a detailed risk evaluation was required since the finding represented a degradation of the barrier function of the control room against smoke and the radiological barrier function provided for the control room. This conclusion was based upon the potential of the HMCP breakers tripping due to a high instantaneous current, during an event that would cause a CRIS such as a high radiation signal at the normal intake or emergency intakes, or smoke detection at the normal intake. A detailed risk evaluation was performed in accordance with the guidance of NRC IMC 0609 Appendix A. A bounding analysis was performed considering potential demands on MCR habitability due to radiation and smoke effects. The major analysis assumptions included: a 94-day exposure period, recovery credit for manual closure of either 1CZ-1 or 1CZ-2, at power core damage probability radiation impact determined from the NRC SPAR model, fuel pool radiation impact from NUREG-1738, and fire risk from IMC 0609 Appendix F. The dominant sequence was a fire impacting the MCR with smoke, failure of operators to isolate the MCR dampers resulting in loss of the operators leading to loss of core heat removal. The risk of the performance deficiency was mitigated by the low initiating event probabilities and the recovery likelihood of MCR damper closure. The result of the analysis was an increase in core damage frequency of < 1.0E-6/year a GREEN finding of very low safety

significance. The finding was assigned to the cross-cutting aspect of Work Management in the Human Performance cross-cutting area because the licensee's work management processes failed to develop and implement a PMT that adequately tested the breakers to their designed performance. (H.5) (Section 1R18)

Cornerstone: Emergency Preparedness

- Green. An NRC-identified Green NCV of 10 CFR 50.54(q)(2) was identified for the licensee's failure to maintain adequate equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition as required by 10 CFR 50.47(b)(9). Specifically, the data logger for the onsite primary meteorological tower (MET) periodically provided inaccurate meteorological information to the Emergency Response Facility Information System (ERFIS) displays in the MCR and the Emergency Operations Facility (EOF).

  The inspectors determined that the failure to maintain emergency assessment capability was a performance deficiency. The finding was more than minor because it adversely affected the Emergency Preparedness Cornerstone objective of ensuring that the licensee was capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, between March 30 and April 28, 2015, the data logger unit on the onsite primary meteorological tower used for dose assessment and dose projections, malfunctioned at least five times. On these occasions, the 15-minute average MET data read by ERFIS was locked and did not update. During these periods, the dose projection process was challenged to provide adequate and timely estimates of radioactive releases, onsite and offsite dose assessment, as well as projected offsite doses. Equipment or systems necessary for dose projection were not functional for longer than 24 hours from the time of discovery and no compensatory measures were implemented until after the inspectors questioned the licensee. The finding was assessed for significance in accordance with NRC IMC 0609, Appendix B, Emergency Preparedness SDP, Attachment 2, and determined to be a very low safety significance finding (Green). The finding has a cross-cutting aspect of evaluation, as described in the area of problem identification and resolution, because the organization did not thoroughly evaluate or address the causes and extent of conditions commensurate with the safety significance of not having accurate MET data for radioactive material releases to the environment or projected offsite doses. (P.2) (Section 1R15)

REPORT DETAILS

Summary of Plant Status

Unit 1: The unit began the period at 100 percent power. On April 2, 2015, the unit was shut down for a planned refueling outage (RFO-19). The unit returned to 100 percent power on May 18, 2015, and remained at or near this power level for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 1 sample)

a. Inspection Scope

Summer Readiness of Offsite and Alternate AC Power System

Since the licensee changed procedures affecting operation of grid alert system, the inspectors reviewed the licensee's procedures for operation and continued availability of offsite and onsite alternate AC power systems. The inspectors also reviewed the communications protocols between the transmission system operator and the licensee to verify that the appropriate information is exchanged when issues arise that could affect the offsite power system. In addition, the inspectors reviewed the material condition of offsite and onsite alternate AC power systems (including switchyard and transformers) by performing a walkdown of the switchyard. Documents reviewed are listed in the Attachment.

The inspectors reviewed the following ARs associated with this area to verify that the licensee identified and implemented appropriate corrective actions:

- AR 745800, Unexpected Alarm in Switchyard
- AR 755137, Move MST-I0189 to Work Week 15W29 Due to Hot Weather Grid Alert

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04 – 4 samples)

a. Inspection Scope

.1 Partial Walkdown

The inspectors verified that critical portions of the selected systems were correctly aligned by performing partial walkdowns. The inspectors selected systems for assessment because they were a redundant or backup system or train, were important

for mitigating risk for the current plant conditions, had been recently realigned, or were a single-train system. The inspectors determined the correct system lineup by reviewing plant procedures and drawings. Documents reviewed are listed in the Attachment.

The inspectors selected the following systems or trains to inspect:

- "A" spent fuel pool cooling system while it was protected following core offload on April 14, 2015
- "B" train of safety related switchgear while the "A" emergency diesel generator (EDG) was inoperable on May 5, 2015
- "A" and "B" diesel fuel oil storage tank piping walkdown for respective EDGs, April 20, 2015

To verify the licensee was identifying and resolving equipment alignment discrepancies, the inspectors reviewed corrective action documents, including condition reports (CRs) and outstanding work orders (WOs). The inspectors also reviewed periodic reports containing information on the status of risk-significant systems, including maintenance rule reports and system health reports. Documents reviewed are listed in the Attachment.

.2 Complete Walkdown

The inspectors verified the alignment of the auxiliary feedwater system. The inspectors selected this system for assessment because it is a risk-significant mitigating system. The inspectors determined the correct system lineup by reviewing plant procedures, drawings, the updated final safety analysis report (UFSAR), and other documents. The inspectors reviewed records related to the system's outstanding design issues, maintenance work requests, and deficiencies. The inspectors verified that the selected system was correctly aligned by performing a complete walkdown of accessible components.

To verify the licensee was identifying and resolving equipment alignment discrepancies, the inspectors reviewed corrective action documents, including CRs and outstanding WOs. The inspectors also reviewed periodic reports containing information on the status of risk-significant systems, including maintenance rule reports and system health reports. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q – 6 samples)

a. Inspection Scope

.1 Quarterly Inspection

The inspectors evaluated the adequacy of selected fire plans by comparing the fire plans to the defined hazards and defense-in-depth features specified in the fire protection program. In evaluating the fire plans, the inspectors assessed the following items:

- control of transient combustibles and ignition sources
- fire detection systems
- water-based fire suppression systems
- gaseous fire suppression systems
- manual firefighting equipment and capability
- passive fire protection features
- compensatory measures and fire watches
- issues related to fire protection contained in the licensee's corrective action program

The inspectors toured the following six fire areas to assess material condition and operational status of fire protection equipment. Documents reviewed are listed in the Attachment.

- Reactor Auxiliary Building (RAB), 216' Elevation, Mechanical Penetration Area
- RAB, 236' Elevation, CCW and AFW Area
- RAB, 236' Elevation, Mechanical Penetration Area
- RAB, 261' Elevation, Alternate Seal Injection and Filter Area
- RAB, 261' Elevation, Water Chiller Area "A" and "B"
- RAB, 261' Elevation, Boric Acid Batching Area

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

a. Inspection Scope

Internal Flooding

The inspectors reviewed related flood analysis documents and walked down the area listed below containing risk-significant structures, systems, and components susceptible to flooding. The inspectors verified that plant design features and plant procedures for flood mitigation were consistent with design requirements and internal flooding analysis assumptions. The inspectors also assessed the condition of flood protection barriers and drain systems. In addition, the inspectors verified the licensee was identifying and

properly addressing issues using the CAP. Documents reviewed are listed in the Attachment.

- RAB 236' Elevation, Mechanical Penetration Area

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07 – 1 sample)

a. Inspection Scope

Annual Review

The inspectors verified the readiness and availability of the "A" component cooling water heat exchanger to perform its design function by verifying the licensee uses the periodic maintenance method outlined in Generic Letter (GL) 89-13, Service Water System Problems Affecting Safety-Related Equipment, verifying critical operating parameters through direct observation, and verifying correct categorization and receipt of maintenance under the Maintenance Rule. Additionally, the inspectors verified that the licensee had entered any significant heat exchanger performance problems into the corrective action program and that the licensee's corrective actions were appropriate. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08 – 1 sample)

a. Inspection Scope

Non-Destructive Examination Activities and Welding Activities

From April 7–17, 2015, the inspectors conducted an onsite review of the implementation of the licensee's in-service inspection (ISI) program for monitoring degradation of the reactor coolant system (RCS) boundary, risk-significant piping and component boundaries, and containment boundaries in Unit 1.

The inspectors either directly observed or reviewed the following non-destructive examinations (NDEs), mandated by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC) (Code of Record: 2001 Edition with 2003 Addenda) to evaluate compliance with the ASME Code, Section XI and Section V requirements, and if any indications or defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code, or an NRC-approved alternative requirement. The inspectors also reviewed the qualifications of the NDE technicians

performing the examinations to determine whether they were current, and in compliance, with the ASME Code requirements.

- WO 13344486, Ultrasonic Testing (UT), 1-RC-3-285N-1, piping off A loop/CL (observed)
- WO 13352682, UT, II-CS-097-RC-CW-A3, pipe to tee weld (reviewed)
- WO 2199334, Penetrant Testing (PT), Welded Attachments, Cont 265' R-50' AZ-290 (reviewed)
- WO 856563-09, PT, 1-SP-941 Valve HL/CL B loop Primary Sampling Line (reviewed)
- WO 13352682, Visual Testing-3 (VT), Rigid Strut Support (reviewed)

The inspectors reviewed the following welding activities, qualification records, and associated documents in order to evaluate compliance with procedures, and the ASME Code, Section XI and Section IX requirements. Specifically, the inspectors reviewed the WOs, repair and replacement plans, weld data sheets, welding procedures, procedure qualification records, welder performance qualification records, and NDE reports.

- WO 856563-09, 1-SP-941 Valve HL/CL B loop Primary Sampling Line, Class 2 (observed)
- WO 2107301-01, Replace Valve, RCS 1RC-903, Class 1(reviewed)
- WO 1846416-01, Replace Valve, 1CS-347, CS Class 2 (reviewed)

During non-destructive surface and volumetric examinations performed since the previous refueling outage, the licensee did not identify any relevant indications that were analytically evaluated and accepted for continued service; therefore, no NRC review was completed for this inspection procedure (IP) attribute.

Pressurized Water Reactor Vessel Upper Head Penetration Inspection Activities

The inspectors verified that for the Unit 1 reactor vessel head, a bare metal visual examination and a volumetric examination were performed during this outage, in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D).

The inspectors observed and reviewed sample results of the NDE activities associated with the UT volumetric examination of the reactor closure head control rod drive penetrations and VT of the reactor vessel upper head outer surface at the penetration numbers listed below. The inspectors used the samples to determine if the activities, including the disposition of indications and defects, were conducted in accordance with the requirements of ASME Code Case N-729-1 as incorporated by reference in 10 CFR 50.55a (g)(6)(ii)(D). Additionally, the inspectors' review of the UT examinations also determined whether essentially 100 percent of the required examination volumes and surfaces were examined, and whether a volumetric or surface leakage path examination was completed. The inspectors also discussed the independent NDE Level III examination on-line review process that was used during the UT examinations for the

control rod drive mechanism (CRDM) penetrations with the Level III examiners, to verify that independence was maintained during the UT examination process.

- UT, Rx Closure Head CRDM Penetration 9, ASME Code Class 1
- UT, Rx Closure Head CRDM Penetration 40, ASME Code Class 1
- VT, Rx Closure Head CRDM Penetration 12, ASME Code Class 1
- VT, Rx Closure Head CRDM Penetration 16, ASME Code Class 1
- VT, Rx Closure Head CRDM Penetration 24, ASME Code Class 1
- VT, Rx Closure Head CRDM Penetration 31, ASME Code Class 1
- VT, Rx Closure Head CRDM Penetration 39, ASME Code Class 1
- VT, Rx Closure Head CRDM Penetration 57, ASME Code Class 1

The Unit 1 reactor vessel closure head contains six previously-repaired CRDM nozzles. As such, additional NDE inspections associated with the previously-repaired CRDM penetrations were also included in the inspection sample documentation review, to verify that the required eddy current (EC) and PT were completed on the repaired CRDM locations listed below.

- PT, EC, Reactor Closure Head CRDM Penetration 5, ASME Code Class 1
- PT, Reactor Closure Head CRDM Penetration 17, ASME Code Class 1
- PT, EC, Reactor Closure Head CRDM Penetration 37, ASME Code Class 1
- PT, EC, Reactor Closure Head CRDM Penetration 38, ASME Code Class 1
- PT, Reactor Closure Head CRDM Penetration 49, ASME Code Class 1
- PT, EC, Reactor Closure Head CRDM Penetration 63, ASME Code Class 1

The inspectors also reviewed a sample of NDE records for the three CRDM penetration weld repairs listed below that were completed during the current 2015 outage, to evaluate if the licensee applied the in-process and pre-service NDEs, and acceptance criteria required by the Harris ASME Code Relief Request 13R-15, Revision 2, were completed, and no recordable indications were identified.

- UT, PT, CRDM Penetration 14, and ASME Code Class 1
- UT, CRDM Penetration 18, and ASME Code Class 1
- UT, CRDM Penetration 23, and ASME Code Class 1

Boric Acid Corrosion Control Inspection Activities

The inspectors reviewed the licensee's Boric Acid Corrosion Control (BACC) Program activities, to determine if the activities were implemented in accordance with the commitments made in response to NRC GL 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants, and applicable industry guidance documents. Specifically, the inspectors performed an onsite records review of procedures, and the results of the licensee's containment walkdown inspections performed during the current refueling outage. The inspectors also interviewed the BACC program owner, conducted an independent walkdown of containment to evaluate compliance with licensee's BACC Program requirements, and verified that degraded or

non-conforming conditions such as boric acid leaks were properly identified, and corrected in accordance with the licensee's BACC Program and CAPs. The inspectors also performed a sample inspection of the reactor vessel upper head area in the vicinity of the CRDM latch housing, for indications of RCS leakage from seal welds associated with the CRDM assemblies.

The inspectors reviewed the following engineering evaluations completed for evidence of boric acid leakage, to determine if the licensee properly applied applicable corrosion rates to the affected components, and properly assessed the effects of corrosion induced wastage on structural or pressure boundary integrity, in accordance with the licensee procedures.

- AR 651198, 1 IC-E14 C seal table connector
- AR 655864, 1 CS-549 Pump B discharge isolation valve
- AR 686449, 1CT-99, 0.5 dpm leak past closed seat
- AR 670365, 1 SP-952 has indication in stuffing box
- AR 693062, 1SI-333, boron accumulation on PIP
- AR 705859, 3SF-E004, 2 & 3 B SFP heat exchanger inspection
- AR 719163, 1SP-1756 degassifier tank volume potential isolation valve
- AR 720196, PDT-01 CS-7264 BS seal water injection filter

The inspectors reviewed the following CRs and associated corrective actions related to evidence of boric acid leakage, to evaluate if the corrective actions completed were consistent with the requirements of the ASME Code and 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action.

- AR 652557, 1CS-230 Pipe cap Downstream Has Active Boric Acid Leak
- AR 663497, 1CS-424, Pipe Cap Has Wet Boron on 221 RCB
- AR 663498, 1CS-427/428 CAPS Have Wet Boron on Cap
- AR 724893, 1CT-33 Has Dry White Boric Acid on packing
- AR 741547, 1CS-499 Boric Acid Leak
- AR 743135, OE Assignment Failed to Identify an Adverse Condition

Steam Generator Tube Inspection Activities

The inspectors reviewed the EC examination activities performed in Unit 1 steam generators (SGs) A, B, and C, during this current refueling outage to verify compliance with the licensee's TSs, ASME BPVC Section XI, and Nuclear Energy Institute 97-06, "Steam Generator Program Guidelines."

The inspectors reviewed the scope of the EC examinations, and the implementation of scope expansion criteria, to verify these were consistent with the Electric Power Research Institute (EPRI) Pressurized Water Reactor Steam Generator Examination Guidelines, Revision 7. The inspectors reviewed documentation for a sample of EC data analysts, probes, and testers to verify that personnel and equipment were qualified to detect the applicable degradation mechanisms, in accordance with the EPRI

Examination Guidelines. This review included a sample of site-specific Examination Technique Specification Sheets (ETSSs) to verify that their qualification and site-specific implementation were consistent with Appendix H of the EPRI Examination Guidelines. The inspectors also reviewed a sample of EC data for SG tubes A-R64C114, A-R36C61, A-R36C63, C-R85C30, and C-R85C24, with a qualified data analyst, to confirm that data analysis and equipment configuration were performed in accordance with the applicable ETSSs, and site-specific analysis guidelines. The inspectors verified that recordable indications were detected and sized in accordance with vendor procedures.

The inspectors selected a sample of degradation mechanisms from the Unit 1 Degradation Assessment report (i.e., mechanical wear due to foreign objects and anti-vibration bar wear), and verified that their respective in-situ pressure testing criteria were determined in accordance with the EPRI Steam Generator Integrity Assessment Guidelines, Revision 3. Additionally, the inspectors reviewed EC indication reports to determine whether tubes with relevant indications were appropriately screened for in-situ pressure testing. The inspectors also compared the latest EC examination results with the last Condition Monitoring and Operational Assessment Report for Unit 1, to assess the licensee's prediction capability for maximum tube degradation and number of tubes with indications. The inspectors verified that the licensee's evaluation was conservative, and that current examination results were bound by the operational assessment projections.

The inspectors assessed the latest EC examination results to verify that new degradation mechanisms, if any, were identified and evaluated before plant startup. The review of EC examination results included the disposition of potential loose part indications on the SG secondary side to verify that corrective actions for evaluating and retrieving loose parts were consistent with the EPRI Guidelines. The inspectors also reviewed a sample of primary-to-secondary leakage data for Unit 1 to confirm that operational leakage in each SG remained below the detection or action level threshold during the previous operating cycle.

The inspectors' review included the implementation of tube repair criteria and repair methods, to verify they were consistent with plant TSs and industry guidelines. The inspectors verified that the licensee had selected the appropriate tubes, if any, for plugging based on the required plugging criteria.

Furthermore, the inspectors interviewed licensee staff and reviewed a sample of inspection results for the inspections conducted in the secondary side internals of SGs A, B, and C, to verify that potential areas of degradation based on site-specific operating experience (OE) were inspected, and appropriate corrective actions were taken to address degradation indications.

Identification and Resolution of Problems

The inspectors reviewed a sample of ISI-related issues entered into the CAP to determine if the licensee had appropriately described the scope of the problem, and had initiated corrective actions. The review also included the licensee's consideration and

assessment of OE events applicable to the plant. The inspectors performed this review to ensure compliance with 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, requirements.

Specifically, the inspectors reviewed the licensee response to industry OE concerning CRDM seismic support inspections. The OE documented a failure to perform visual inspection of the CRDM, ASME Class 1, seismic support components, as required by the ASME Section XI Code, Table IWF-2500-1, Item F1.40. Following discussions with the inspectors, the licensee initiated a corrective action (AR 743135) to add the required visual, VT-3 Inspection report to the Harris ISI Program. The licensee also performed an as-left visual (VT-3) inspection of the CRDM seismic support components prior to plant startup from the current refueling outage.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11 – 2 samples)

a. Inspection Scope

.1 Resident Inspector Quarterly Review of Licensed Operator Requalification

On June 11, 2015, the inspectors observed a simulator scenario administered to an operating crew as part of the licensee's accredited requalification training program. The scenario evaluated the crew's ability to respond to a faulted steam generator (two failed main steam safety valves) concurrent with the rupture of a tube within the same steam generator allowing a release path of reactor coolant to the environment.

The inspectors assessed the following:

- licensed operator performance
- the ability of the licensee to administer the scenario and evaluate the operators
- the quality of the post-scenario critique
- simulator performance

Documents reviewed are listed in the Attachment.

.2 Resident Inspector Quarterly Review of Licensed Operator Performance in the Actual Plant/Main Control Room

The inspectors observed licensed operator performance in the main control room during plant startup from the refueling outage on May 15, 2015.

The inspectors assessed the following:

- use of plant procedures
- control board manipulations
- communications between crew members
- use and interpretation of instruments, indications, and alarms
- use of human error prevention techniques
- documentation of activities
- management and supervision

Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 3 samples)

a. Inspection Scope

The inspectors assessed the licensee's treatment of the issues listed below to verify the licensee appropriately addressed equipment problems within the scope of the maintenance rule (10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"). The inspectors reviewed procedures and records to evaluate the licensee's identification, assessment, and characterization of the problems as well as their corrective actions for returning the equipment to a satisfactory condition. Documents reviewed are listed in the Attachment.

- 1B31-SB-11B, Supply Breaker to Valve 1CS-423 Seal Water Injection to RCP "C", Breaker Failed to Trip During Testing
- Motor for 1SW-39 SA, Normal Service Water Supply to Train "A" Containment Coolers was not EQ qualified
- AH-13-1B, Lost Indication of the Breaker Status

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 5 samples)

a. Inspection Scope

The inspectors reviewed the maintenance activities listed below to verify that the licensee assessed and managed plant risk as required by 10 CFR 50.65(a)(4) and licensee procedures. The inspectors assessed the adequacy of the licensee's risk assessments and implementation of risk management actions. The inspectors also

verified that the licensee was identifying and resolving problems with assessing and managing maintenance-related risk using the CAP. Additionally, for maintenance resulting from unforeseen situations, the inspectors assessed the effectiveness of the licensee's planning and control of emergent work activities. Documents reviewed are listed in the Attachment.

- June 30, 2015, Qualitative Yellow Risk during Performance of MST-I0145 with "A" Feedwater Regulating Valve in Manual
- May 14, 2015, Yellow Risk during Reactor Startup, Low Power Physics Testing, and Power Ascension
- May 18, 2015, Yellow Risk during "A" Start-up Transformer Out of Service for Planned Maintenance
- June 02, 2015, Yellow Risk during "C" Main Feed Regulating Valve in Manual for MST-I0031
- June 13, 2015, Review of Emergent Risk Assessment for Failure of the Moisture Separator/Recombiner Controller

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 7 samples)

a. Inspection Scope

.1 Operability and Functionality Review

The inspectors selected the operability determinations or functionality evaluations listed below for review based on the risk-significance of the associated components and systems. The inspectors reviewed the technical adequacy of the determinations to ensure that TS operability was properly justified and the components or systems remained capable of performing their design functions. To verify whether components or systems were operable, the inspectors compared the operability and design criteria in the appropriate sections of the UFSAR to the licensee's evaluations. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. Additionally, the inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment.

- "B" EDG Jacket Water Leak, AR 755047
- "B" Chilled Water Inboard Bearing Oil Leak, AR 755136
- Control Room Habitability Concerns, ARs 742947, 742421
- Loss of "A" Emergency Service Water (ESW) Flow and Pressure, AR 747036
- "A" Fuel Oil Transfer Pump Reduced Capacity, AR 756226

- Analysis for Environmental Quality for Reactor Auxiliary Building Elevation 261 is Needed, AR 754721
- Met Tower Inoperable due to Data Freezing, AR 741720

b. Findings

1. Introduction: An NRC-identified Green NCV of 10 CFR 50.54(q)(2) was identified for the licensee's failure to maintain adequate equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition as required by 10 CFR 50.47(b)(9). Specifically, the data logger for the onsite primary MET periodically provided inaccurate meteorological information to the ERFIS displays in the main control room and the EOF.

Description: Between March 30 and April 28, 2015, the data logger for the onsite primary meteorological tower malfunctioned at least five times. On these occasions, the 15-minute average MET data read by ERFIS locked and would not update (i.e., displayed old MET data). The NRC inspectors questioned the operability and functionality of the onsite meteorological tower after observing that multiple ARs were submitted involving discrepancies in MET data displayed in the main control room.

ERFIS data as read by the main control room, the EOF, and the NRC, was not immediately identifiable as erroneous when old data was displayed. Erroneous ERFIS data would have challenged the licensee's ability to make technically adequate and timely estimates of radioactive material releases to the environment or projected offsite doses during an emergency. The inspectors concluded that the licensee could have reasonably identified methods to determine if the MET data was locked-up, such as data trending by the operators or by an offsite contractor. In periods when old data was displayed, backup sources such as the National Weather Service, would not have been used per procedures until the MET data was recognized as erroneous.

Analysis: The inspectors determined that failing to maintain emergency assessment capability as required by 10 CFR 50.47(b)(9) was a performance deficiency. The finding was more than minor because it adversely affected the Emergency Preparedness Cornerstone objective of ensuring that the licensee was capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, between March 30 and April 28, 2015, the data logger unit on the onsite primary meteorological tower used for dose assessment and dose projections malfunctioned at least five times. On these occasions, the 15-minute average MET data read by ERFIS was locked-up and not updating. During these periods, the dose projection process was challenged to provide adequate and timely estimates of radioactive releases, onsite and offsite dose assessment, as well as projected offsite doses. Equipment or systems necessary for dose projection were not functional for longer than 24 hours from the time of discovery and no compensatory measures were implemented until after the inspectors questioned the licensee. The finding was assessed for significance in accordance with NRC IMC 0609, Appendix B Emergency Preparedness SDP, Attachment 2 and determined to be a low safety significance finding (Green). The finding has a cross-cutting aspect of evaluation,

as described in the area of problem identification and resolution, because the organization did not thoroughly evaluate or address the causes and extent of conditions commensurate with the safety significance of not having accurate MET data for radioactive material releases to the environment or projected offsite doses. (P.2)

Enforcement: Section 50.54(q)(2) of 10 CFR requires, in part, a licensee to follow and maintain the effectiveness of an emergency plan that meets the requirements in Appendix E to this part and, for nuclear power reactor licensee, the planning standards of 10 CFR 50.47(b). Section 50.47(b)(9) of 10 CFR requires, in part, the use of adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency. The Harris Nuclear Plant Radiological Emergency Plan, Section 3.1, Revision 63, states, in part, that special provisions have been made to assure that ample space and proper equipment are available to effectively respond to a full range of possible emergencies.

Contrary to the above, between March 30 and April 28, 2015, on at least five occasions, the site dose projection process would have been challenged to assess and monitor actual or potential offsite consequences of a radiological emergency while the MET data logger was locked and did not update. Immediate corrective actions were that the licensee established a compensatory action to plot the data to enable prompt identification of locked MET data. The licensee entered this issue into their CAP as AR 741757. Because the licensee entered the issue into the CAP and the finding was of very low safety significance (Green), this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC's Enforcement Policy: NCV 05000400/2015002-01: Failure to Maintain Emergency Assessment Capability.

2. Introduction: An NRC-identified Green NCV of TS 6.8.1, Procedures and Programs, was identified for the licensee's inadequate implementation of procedure OP-173, Control Room Area HVAC System. Specifically, the licensee failed to adequately implement OP-173 Section 8.3, "Placing the Control Room Area HVAC System into Recirculation Manually," and maintain a positive pressure in the MCR.

Description: On April 9, 2015, NRC inspectors questioned the operability of the control room envelope (CRE) upon finding an MCR door propped open to ventilate the CRE and reduce CO_2 levels. While in Mode 6, the "A" 6.9kV bus was de-energized for maintenance and therefore was not providing power to the CRIS radiation monitors (RMs). The loss of power to the "B" CRIS RMs shut the "B" damper in each of the three outside intake supply paths resulting in no outside air supply. In accordance with procedure OWP-RM-01, operators isolated the "A" air intakes and exhausts due to the inoperable RMs. In recirculation mode, the MCR did not have an intake of fresh air because both the "A" and "B" intake supply paths were isolated. This caused the CO_2 levels to rise. When CO_2 levels approached the administrative limit, the operators ceased core alterations and irradiated fuel movements, propped the MCR door open, and vented the MCR. This resulted in the inability to maintain the CRE at a positive pressure. The licensee's decision to not reestablish supply air to the MCR using the emergency outside air intake supply resulted in elevated levels of CO_2 and the need to breach the CRE by opening multiple CRE doors, to reduce the levels of CO_2.

Analysis: The inspectors determined that licensee's failure to maintain a positive pressure in the MCR in accordance with procedure OP-173 was a performance deficiency. Specifically, the licensee failed to adequately implement OP-173 Section 8.3, "Placing the Control Room Area HVAC System into Recirculation Manually," to maintain a positive pressure in the MCR. The performance deficiency was determined to be more than minor in accordance with IMC 0612, Appendix B, since it was associated with the procedure quality attribute of the barrier integrity cornerstone and adversely affected the cornerstone objective, and if left uncorrected, the performance deficiency would have the potential for leading to a more significant safety concern. Specifically, the buildup of CO_2 would impair operators' performance and actions. The inspectors evaluated the finding using Inspection Manual Chapter 0609, "Significance Determination Process," Attachment 4 and Appendix G (June 19, 2012), "Shutdown Operations Significance Determination Process." The inspectors determined the finding was associated with the barrier integrity cornerstone and required a detailed risk evaluation because the finding involved control room habitability during both normal and accident conditions. A detailed risk evaluation was completed by a regional SRA using the guidance of NRC IMC 0609 Appendix G and Appendix F, "Fire Protection Significance Determination Process." A bounding analysis was performed considering potential demands on MCR habitability due to radiation and smoke effects. The major analysis assumptions included: an eleven day exposure period, recovery credit for MCR door closure, shutdown core damage radiation and fuel pool radiation events were considered. The dominant sequence was a fire impacting the MCR with smoke, failure of operators to isolate the MCR resulting in loss of the operators leading to loss of core heat removal. The risk of the performance deficiency was mitigated by the low initiating event probabilities and the recovery likelihood of MCR door closure. The result of the analysis was an increase in core damage frequency of < 1.0E-6/year, a green finding of very low safety significance. The finding had a cross-cutting aspect of Procedure Adherence, as described in the Human Performance cross-cutting area because the licensee failed to comply with OP-173. (H.8)

Enforcement: TS 6.8.1, Procedures and Programs, requires, in part, that written procedures be implemented covering activities referenced in Regulatory Guide 1.33, Revision 2, dated February 1978, including safety-related activities carried out during operation of the reactor plant, specifically Section 3.p, Procedures for Control Room Heating and Ventilation. Procedure OP-173, Control Room Area HVAC System, Section 8.3, "Placing the Control Room Area HVAC System into Recirculation Manually," step 12, directs the operators to pressurize the MCR following an expected CRIS.

Contrary to this requirement, from April 7-17, 2015, the licensee did not maintain a positive pressure in the MCR, as required by procedure OP-173. The licensee took corrective actions to restore a positive pressure to the MCR. The licensee also revised the associated procedure OWP-RM-01, Control Room OAI Radiation Monitors, to ensure appropriate actions are taken for the outside air intake supply when radiation monitors are inoperable. This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. The violation was entered into the licensee's CAP as AR 742947 and is designated as NCV 05000400/2015002-02, Failure to Adequately Implement the Control Room Area HVAC System Procedure.

1R18 Plant Modifications (71111.18 – 1 sample)

a. Inspection Scope

The inspectors verified that the plant modifications listed below did not affect the safety functions of important safety systems. The inspectors confirmed the modifications did not degrade the design bases, licensing bases, and performance capability of risk significant structures, systems and components. The inspectors also verified modifications performed during plant configurations involving increased risk did not place the plant in an unsafe condition. Additionally, the inspectors evaluated whether system operability and availability, configuration control, post-installation test activities, and changes to documents, such as drawings, procedures, and operator training materials, complied with licensee standards and NRC requirements. In addition, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with modifications. Documents reviewed are listed in the Attachment.

- Engineering Change 84170, 480V Motor Control Center Bucket Replacement

b. Findings

Introduction: An NRC-identified Green NCV of TS 6.8.1, Procedures and Programs, was identified for the licensee's failure to perform adequate PMTs on HMCP breakers for dampers 1CZ-1 and 1CZ-2 as required by procedure AD-EG-ALL-1155, Plant Modification Testing.

Description: On January 7 and 21, 2015, HMCP breakers for 1CZ-2 and 1CZ-1 (respectively) were installed per Engineering Change 84170, 480V Motor Control Center Bucket Replacement. This modification was being performed to replace the original designed breakers, ITE/Gould type EF3. PMTs were performed on both HMCP breakers for 1CZ-2 and 1CZ-1 on January 8 and 23, 2015, respectively.

On April 4, 2015, licensee was performing a remote shutdown operability test per procedure, OST-1857, Remote Shutdown System Operability: Accumulator Isolation Valve and Letdown Isolation Valve Testing 18 Month Interval Modes 5, 6 or Defueled, which involved transferring control (using transfer switch) of the HVAC system for the MCR envelope from the main control board to the auxiliary control point and back. During this testing, 1CZ-1 and 1CZ-2 failed partially open due to the recently installed breakers for 1CZ-1 and 1CZ-2, tripping open due to high instantaneous current. The high instantaneous current occurred when the motor actuator for the dampers attempted to reverse direction immediately following an open signal. With both breakers tripped and both dampers partially open, a failure of the associated safety function occurred. The normal air intake was not isolated, and would not isolate automatically on receipt of a CRIS. To isolate the MCR boundary for TS, operators performed section 8.3 of OP-173, Control Room Area HVAC System, and placed the MCR in recirculation by using the hand wheel associated with 1CZ-1 and 1CZ-2 to shut the dampers.

The inspectors performed an analysis of the event and determined that the PMTs performed on both of the HMCP breakers did not test for the effects of instantaneous high current upon the breakers and verify the trip settings on the breaker were adequate. The licensee's procedure, AD-EG-ALL-1155, provides direction on the development and implementation of PMTs. Section 5.1.2.c of AD-EG-ALL-1155, states, in part, that SSC testing shall be performed at the highest system level and as close to design basis conditions as practical, which would support the need to have tested for the effects of an instantaneous high current on the HMCP breakers.

Analysis: The licensee's failure to perform adequate PMTs on HMCP breakers for 1CZ-1 and 1CZ-2 as required by procedure AD-EG-ALL-1155 was a performance deficiency. The performance deficiency was more than minor because it was associated with the procedure quality attribute of the barrier integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, the licensee failed to test the highest instantaneous current the HMCP breakers would be expected to experience. This would be during the damper's direction reversal, during the PMT. Therefore, the HMCP breakers for 1CZ-1 and 1CZ-2 had the potential to trip open during a CRIS, causing unfiltered in-leakage into the MCR envelope in the event of a radiological emergency. Using IMC 0609.04, "Initial Characterization of Findings," issued on 6/19/2012 and IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued on June 19, 2012; the inspectors concluded that a detailed risk evaluation was required since the finding represented a degradation of the barrier function of the control room against smoke and the radiological barrier function provided for the control room. This conclusion was based upon the potential of the HMCP breakers tripping due to a high instantaneous current, during an event that would cause a CRIS such as high radiation signal at the normal intake or emergency intakes, or smoke detection at the normal intake. A regional Senior Reactor Analyst completed the detailed risk evaluation under the SDP. A detailed risk evaluation was performed in accordance with the guidance of NRC IMC 0609 Appendix A. A bounding analysis was performed considering potential demands on MCR habitability due to radiation and smoke effects. The major analysis assumptions included: a 94-day exposure period, recovery credit for manual closure of either 1CZ-1 or 1CZ-2, at power core damage probability radiation impact determined from the NRC SPAR model, fuel pool radiation impact from NUREG-1738, and fire risk from IMC 0609 Appendix F. The dominant sequence was a fire impacting the MCR with smoke, failure of operators to isolate the MCR dampers resulting in loss of the operators leading to loss of core heat removal. The risk of the performance deficiency was mitigated by the low initiating event probabilities and the recovery likelihood of MCR damper closure. The result of the analysis was an increase in core damage frequency of < 1.0E-6/year, a Green finding of very low safety significance. The finding was assigned to the cross-cutting aspect of Work Management in the Human Performance cross-cutting area because the licensee's work management processes failed to develop and implement a PMT that adequately tested the breakers to their designed performance. (H.5)

Enforcement: TS 6.8.1, Procedures and Programs, requires, in part, that written procedures be implemented covering activities referenced in Regulatory Guide 1.33, Revision 2, dated February 1978, including safety-related activities carried out during operation of the reactor plant, specifically Section 9.c, Procedures for Repair and Replacement of Equipment. Step 5.1.2.c of procedure AD-EG-ALL-1155 states, SSC testing shall be performed at the highest system level and as close to design basis conditions as practical.

Contrary to the above requirement, the licensee did not perform the breaker testing as close to design basis conditions as practical. The PMTs on the HMCP breakers for 1CZ-1 and 1CZ-2, which were performed on January 8 and January 23, 2015, respectively, failed to test for the occurrence of 1CZ-1 and 1CZ-2 having a direction reversal which would have caused a high instantaneous current, which can be expected during normal operation. Tripping of the HMCP breakers for 1CZ-1 and 1CZ-2 has the potential of causing unfiltered in-leakage into the MCR envelop in the event of a radiological emergency. The licensee took immediate corrective actions by manually closing 1CZ-1 and 1CZ-2 to isolate the MCR boundary for TSs. The licensee also changed the setpoint, and revised the PMT to include the direction reversal. This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. This violation was entered into the licensee's the corrective action program as AR 741781 and AR 757503 and is designated as NCV 05000400/2015002-03, Inadequate Post Modification Testing of 1CZ-1 and 1CZ-2 HMCP Breakers.

1R19 Post-Maintenance Testing (71111.19 – 6 samples)

a. Inspection Scope

The inspectors either observed post-maintenance testing or reviewed the test results for the maintenance activities listed below to verify the work performed was completed correctly and the test activities were adequate to verify system operability and functional capability.

- WO 13513467, "A" Chiller Replace Compressor Mechanical Seal, May 2, 2015
- WO 13468424, "A" EDG Lube Oil Cooler has a lube oil leak, May 3, 2015
- WO 13314231, Perform missed PMT on Alternate Seal Injection system, May 14, 2015
- WO 02228277, MP-EC84170, MCC 1A21-5A-12C Bucket Replacement, May 20, 2015
- WO 02224607, Perform partial OPT-1080, EDG 1A-SA Starting Air Compressor and Air Dryer, May 26, 2015
- WO 13534885, Replace the Primary and Secondary Met Tower Data Loggers, June 29, 2015

The inspectors evaluated these activities for the following:

- Acceptance criteria were clear and demonstrated operational readiness.
- Effects of testing on the plant were adequately addressed.
- Test instrumentation was appropriate.
- Tests were performed in accordance with approved procedures.
- Equipment was returned to its operational status following testing.
- Test documentation was properly evaluated.

Additionally, the inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with post-maintenance testing. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

a. Inspection Scope

For the refueling outage that began on April 2, 2015, and ended on May 15, 2015, the inspectors evaluated the following outage activities:

- outage planning
- shutdown, cooldown, refueling, heatup, and startup
- RCS instrumentation and electrical power configuration
- reactivity and inventory control
- decay heat removal and spent fuel pool cooling system operation
- containment closure

The inspectors verified that the licensee:

- considered risk in developing the outage schedule
- controlled plant configuration in accordance with administrative risk reduction methodologies
- developed work schedules to manage fatigue
- developed mitigation strategies for loss of key safety functions
- adhered to operating license and TS requirements

Inspectors verified that safety-related and risk-significant structures, systems, and components not accessible during power operations were maintained in an operable condition. The inspectors also reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with outage activities. Documents reviewed are listed in the Attachment.

Review of Outage Plan

Prior to the outage, the inspectors reviewed the outage risk control plan to verify that the licensee had performed adequate risk assessments, and had implemented appropriate risk-management strategies when required by 10 CFR 50.65(a)(4).

Monitoring of Shutdown Activities

The inspectors observed portions of the cooldown process to verify that TS cooldown restrictions were followed. The inspectors reviewed the following AR associated with this area to verify that the licensee identified and implemented appropriate corrective actions:

- AR 741637, LT-01FW0485IIW, Drifted High During R19 Cooldown

Licensee Control of Outage Activities

During the outage, the inspectors observed the items or activities described below to verify that the licensee maintained defense-in-depth commensurate with the outage risk-control plan for key safety functions and applicable TS when taking equipment out of service.

- Clearance Activities
- Reactor Coolant System Instrumentation
- Electrical Power
- Decay Heat Removal
- Spent Fuel Pool Cooling
- Inventory Control
- Reactivity Control
- Containment Closure

The inspectors also reviewed responses to emergent work and unexpected conditions to verify that resulting configuration changes were controlled in accordance with the outage risk control plan, and to verify that control room operators were kept cognizant of the plant configuration. The inspectors reviewed the following ARs associated with this area to verify that the licensee identified and implemented appropriate corrective actions:

- AR 745635, 1CS-7 Failed to Fully Open Based on Control Switch Indication
- AR 745506, Rub Concern – Scaffold and “B” EDG Day Tank
- AR 745737, Process Issues with Controlling Breakers During MOV Testing

Reduced-Inventory Conditions

The inspectors reviewed commitments from Generic Letter 88-17, “Loss of Decay Heat Removal,” and confirmed by sampling, that those commitments are still in place and adequate. Periodically, during the lower inventory conditions, the inspectors reviewed

system lineups to verify that the configuration of the plant systems are in accordance with those commitments. During lower inventory operations, the inspectors observed operator activities to verify that unexpected conditions or emergent activities did not degrade the operators' ability to maintain required reactor vessel level. The inspectors reviewed the following ARs associated with this area to verify that the licensee identified and implemented appropriate corrective actions:

- AR 742053, MST-I0322 RVLIS Calibration Unsatisfactory

Refueling Activities

The inspectors observed fuel handling operations (removal, inspection, and insertion) and other ongoing activities to verify that those operations and activities were being performed in accordance with technical specifications and approved procedures. Also, the inspectors observed refueling activities to verify that the location of the fuel assemblies, including new fuel, was tracked from core offload through core reload. The inspectors reviewed the following ARs associated with this area to verify that the licensee identified and implemented appropriate corrective actions:

- AR 742089, NOS QC Identified Foreign Material During Upper Cavity Cleanliness Inspection
- AR 745462, NI-32 Readings Impacted by Welding
- AR 742831, Fuel Movement LHRA Barrier Issues

Monitoring of Heatup and Startup Activities

Prior to mode changes and on a sampling basis, the inspectors reviewed system lineups and/or control board indications to verify that TS, license conditions, and other requirements, commitments, and administrative procedure prerequisites for mode changes were met prior to changing modes or plant configurations. Also, the inspectors periodically reviewed RCS boundary leakage data, and observed the setting of containment integrity to verify that the RCS and containment boundaries were in place and had integrity when necessary. Prior to reactor startup, the inspectors walked down containment to verify that debris had not been left which could affect performance of the containment sumps. The inspectors reviewed reactor physics testing results to verify that core operating limit parameters were consistent with the design.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 6 samples)

a. Inspection Scope

The inspectors reviewed the surveillance tests listed below and either observed the test or reviewed test results to verify testing adequately demonstrated equipment operability

and met TS and licensee procedural requirements. The inspectors evaluated the test activities to assess for preconditioning of equipment, procedure adherence, and equipment alignment following completion of the surveillance. Additionally, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with surveillance testing. Documents reviewed are listed in the Attachment.

Routine Surveillance Tests

- OST-1036, Shutdown Margin Calculation Modes 1 – 5
- OST-1116, Administrative Controls to Prevent Dilution During Refueling Monthly Interval Mode 6
- MST-M0006, Emergency Diesel Generator Fuel Oil Tank Inspection
- OST-1044, ESFAS Train "A" Slave Relay Test Quarterly Interval Modes 1 – 4

Containment Isolation Valve

- EST-219, Personnel Air Lock Door Seals Local Leak Rate

Reactor Coolant System Leak Detection

- OST-1026, Reactor Coolant System Leakage Evaluation, Computer Calculation, Daily Interval, Modes 1-2-3-4

b. Findings

No findings were identified.

2. RADIATION SAFETY

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01 - 1 sample)

a. Inspection Scope

Hazard Assessment and Instructions to Workers: During facility tours, the inspectors directly observed labeling of radioactive material and postings for radiation areas, high radiation areas (HRAs), and airborne radioactivity areas established within the radiologically controlled area (RCA) of the RAB, Reactor Containment Building (RCB), and radioactive waste (radwaste) processing and storage locations. The inspectors independently measure radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCA areas. The inspectors reviewed survey records for several plant areas including surveys for alpha emitters, discrete radioactive particles, airborne radioactivity, gamma surveys with a range of dose rate gradients, and pre-job surveys for upcoming tasks. The inspectors also discussed changes to plant operations that could contribute to changing radiological conditions since the last inspection. For selected outage jobs, the inspectors attended pre-job briefings and reviewed radiation

work permit (RWP) details to assess communication of radiological control requirements and current radiological conditions to workers.

Hazard Control and Work Practices: The inspectors evaluated access barrier effectiveness for selected Locked High Radiation Area (LHRA) locations. Changes to procedural guidance for LHRA and Very High Radiation Area (VHRA) controls were discussed with health physics (HP) supervisors. Controls and their implementation for storage of irradiated material within the spent fuel pool (SFP) were reviewed and discussed. Established radiological controls (including airborne controls) were evaluated for selected RFO19 tasks including Residual Heat Removal (RHR) pump replacement, reactor vessel head work, and reactor lower internals removal. In addition, licensee controls for areas where dose rates could change significantly as a result of plant shutdown and refueling operations were reviewed and discussed.

Occupational workers' adherence to selected RWPs and HP technician (HPT) proficiency in providing job coverage were evaluated through direct observations and interviews with licensee staff. Electronic dosimeter (ED) alarm set points and worker stay times were evaluated against area radiation survey results for selected work activities. The use of personnel dosimetry (ED alarms, extremity dosimetry, multi-badging in high dose rate gradients, etc.) was reviewed as part of IP 71124.04. Worker response to dose and dose rate alarms during selected work activities was also evaluated.

Control of Radioactive Material: The inspectors observed surveys of material and personnel being released from the RCA using small article monitor, personnel contamination monitor and portal monitor instruments. As part of IP 71124.05, the inspectors reviewed the last two calibration records for selected release point survey instruments and discussed equipment sensitivity, alarm setpoints, and release program guidance with licensee staff. The inspectors compared recent 10 Code of Federal Regulations (CFR) Part 61 results for the Dry Active Waste (DAW) radioactive waste stream with radionuclides used in calibration sources to evaluate the appropriateness and accuracy of release survey instrumentation. The inspectors also reviewed records of leak tests on selected sealed sources and discussed nationally tracked source transactions with licensee staff.

Problem Identification and Resolution: Nuclear Condition Reports (NCRs) associated with radiological hazard assessment and control were reviewed and assessed. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure AD-PI-ALL-0100, CAP, Rev. 2. The inspectors also reviewed recent self-assessment results.

Radiation protection activities were evaluated against the guidance and requirements of UFSAR Section 12; TS Section 6; 10 CFR Parts 19 and 20; Regulatory Guide (RG) 8.38, "Control of Access to High and Very High Radiation Areas in Nuclear Power Plants"; and approved licensee procedures. Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR Part 20 and IE

Circular 81-07, “Control of Radioactively Contaminated Material”. Procedures and documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2RS2 As Low As Reasonably Achievable (ALARA) (71124.02 - 1 sample)

a. Inspection Scope

Work Planning and Exposure Tracking: The inspectors reviewed planned work activities and their collective exposure estimates for the previous RFO 18 and current RFO 19 outages. ALARA planning packages were reviewed for the following tasks: Shielding, Valve Repair, Snubber Inspection, Testing and Replacement, Refueling Activities, Reactor Head Inspection and Repairs, Steam Generator Manway Removal, Sludge Lancing and Eddy Current Testing. For the selected tasks, the inspectors reviewed established dose goals and discussed assumptions regarding the bases for the current estimates with responsible ALARA planners. The inspectors evaluated the incorporation of exposure reduction initiatives and operating experience, including historical post-job reviews, into RWP requirements. Day-to-day collective dose data for the selected tasks were compared with established dose estimates and evaluated against procedural criteria (trigger points) for additional ALARA review. Where applicable, changes to established estimates were discussed with ALARA planners and evaluated against work scope changes or unanticipated elevated dose rates.

Source Term Reduction and Control: The inspectors reviewed the collective exposure three-year rolling average from 2010-2013. The inspectors reviewed the historical dose data and contrasted it to the current and projected future dose values. The inspectors reviewed dose reduction activities that were being pursued in the current outage and those that are being contemplated that current plant conditions preclude implementation. It was noted that cobalt-58 rather than cobalt-60 is the primary dose contributor and that current dose reduction efforts are moving toward controlling Nickel deposited on the fuel such as ultrasonic fuel cleaning and macroporus resin overlays.

Radiation Worker Performance: Radiation worker performance was observed and evaluated as part of IP 71124.01 and is documented in section 2RS1. While observing job tasks, the inspectors evaluated the use of remote technologies to reduce dose including teledosimetry and remote visual monitoring.

Problem Identification and Resolution: The inspectors reviewed and discussed selected CAP documents associated with ALARA program implementation. The inspectors evaluated the licensee’s ability to identify and resolve the issues in accordance with licensee procedure AD-PI-ALL-0100, CAP, Rev. 2. The inspectors also evaluated the scope and frequency of the licensee’s self-assessment program and reviewed recent assessment results.

ALARA program activities were evaluated against the requirements of FSAR Section 12, TS Sections 6.8, Procedures and Programs, and 6.11, Radiation Protection Program; 10 CFR Part 20; and approved licensee procedures. Records reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03 - 1 sample)

a. Inspection Scope

Engineering Controls: The inspectors reviewed the use of temporary and permanent engineering controls to mitigate airborne radioactivity during the RFO 19 refueling outage. The inspectors observed the use of portable air filtration units for work in contaminated areas of the RCB and reviewed filtration unit testing certificates. The inspectors evaluated the effectiveness of continuous air monitors and air samplers placed in work area "breathing zones" to provide indication of increasing airborne levels.

Respiratory Protection Equipment: The inspectors reviewed the use of respiratory protection devices to limit the intake of radioactive material. This included review of devices used for routine tasks and devices stored for use in emergency situations. As part of IP 71124.02, the inspectors reviewed ALARA evaluations for the use of respiratory protection devices during work underneath the reactor vessel head. Selected Self-Contained Breathing Apparatus (SCBA) units and negative pressure respirators (NPRs) staged for routine and emergency use in the MCR and other locations were inspected for material condition, SCBA bottle air pressure, number of units, and number of spare masks and air bottles available. The inspectors discussed SCBA repair and maintenance with licensee staff and reviewed maintenance records for selected SCBA units for the past two years. The inspectors evaluated SCBA and NPR compliance with National Institute for Occupational Safety and Health certification requirements. The inspectors also reviewed records of air quality testing for supplied-air devices and SCBA bottles.

The inspectors discussed training for various types of respiratory protection devices with HP staff and interviewed radiation workers and control room operators on use of the devices including SCBA bottle change-out and use of corrective lens inserts. Respirator qualification records (including medical qualifications) were reviewed for several MCR operators and emergency responder personnel in the Maintenance and HP departments.

Problem Identification and Resolution: NCRs associated with airborne radioactivity mitigation and respiratory protection were reviewed and assessed. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure AD-PI-ALL-0100, CAP, Rev. 2. The inspectors also reviewed recent self-assessment results.

Licensee activities associated with the use of engineering controls and respiratory protection equipment were reviewed against UFSAR Section 12; TS Section 6; 10 CFR Part 20; RG 8.15, "Acceptable Programs for Respiratory Protection"; and applicable licensee procedures. Procedures, documents, and records reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04 - 1 sample)

a. Inspection Scope

External Dosimetry: The inspectors reviewed National Voluntary Laboratory Accreditation Program (NVLAP) certification data (including Thermoluminescent Dosimeter (TLD) testing for neutron, gamma, and beta exposures) and discussed program guidance for storage, processing, and results for active and passive personnel dosimeters currently in use. Licensee procedures for shallow and deep dose assessments for workers with identified skin contaminations were reviewed and discussed. Comparisons of ED and personnel dosimeter data were reviewed and discussed in detail. In addition, inspectors evaluated the use of extremity dosimetry, multi-badging, and re-positioning of whole body dosimetry during RFO 19 maintenance activities.

Internal Dosimetry: Program guidance (including Derived Air Concentration (DAC)-hr tracking), instrument detection capabilities, and assessment results for internally deposited radionuclides were reviewed in detail. The inspectors reviewed selected routine *in vivo* (Whole Body Count) analyses from May 2012 to April 2015. In addition, capabilities for collection and analysis of special bioassay samples were evaluated and discussed with licensee staff.

Special Dosimetric Situations: The inspectors evaluated the licensee's use of multi-badging extremity dosimetry, and dosimeter relocation within non-uniform dose rate fields and discussed worker monitoring in neutron areas with licensee staff. The inspectors also reviewed the licensee's use of Effective Dose Equivalent from External Exposure (EDEX) to calculate total effective dose equivalent (TEDE) for individuals performing repair activities under the reactor head during RFO 19 and monitoring records for declared pregnant workers (DPW) from May 2012 to current. In addition, the adequacy of shallow dose assessments for selected Personnel Contamination Events (PCEs) occurring between January 2012 and April 2015 were reviewed and discussed.

Problem Identification and Resolution: The inspectors reviewed and discussed selected CAP documents associated with occupational dose assessment. The inspectors evaluated the licensee's ability to identify and resolve the identified issues in accordance with procedure AD-PI-ALL-0100, CAP, Rev. 2. The inspectors also discussed the scope of the licensee's internal audit program and reviewed recent assessment results.

Occupational dose assessment program activities were evaluated against the requirements of UFSAR Section 12; TS Sections 6.8, Procedures and Programs and 6.11, Radiation Protection Program; 10 CFR Parts 19 and 20; RG 8.40, Methods for Measuring Effective Dose Equivalent from External Exposure; and approved licensee procedures. Procedures, documents, and records reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation (71124.05 - 1 sample)

a. Inspection Scope

Walkdowns and Observations: During tours of selected areas located at the plant, the inspectors observed and evaluated material condition of installed radiation detection equipment including area radiation monitor (ARM), continuous air monitor (CAM), personnel contamination monitor (PCM), portal monitor (PM), and small article monitor (SAM) equipment types. In addition, selected effluent monitoring equipment monitoring RAB and Turbine Building effluent release pathways were observed for material condition and evaluated for operability.

Selected portable instrumentation types staged for, or in, use were evaluated for current calibration status. Proficiency of health physics technician staff in conducting operability checks and using select portable instrumentation was evaluated during field observations. Licensee actions and records for portable instrumentation found out-of-tolerance were reviewed and discussed. In addition, PCM and SAM equipment responses to a low-level plant-mix radionuclide source were evaluated.

Calibration and Testing Programs: The inspectors reviewed and discussed recent calibration and/or functional test results for selected ARM, process, and effluent monitors. The inspectors reviewed and evaluated traceability of current calibration sources to the original primary calibrations and National Institute of Standards and Technology and National Bureau of Standards certifications. The most recent 10 CFR Part 61 analysis for dry active waste was reviewed to determine if calibration and check sources are representative of the plant source term. In addition, establishment of alarm set-point values for selected process and effluent monitoring instrumentation were reviewed and discussed with responsible licensee representatives.

Calibration documentation was reviewed for selected ARM, CAM, PCM, PM and whole body counter (WBC) equipment. In addition, calibration activities for selected portable instrumentation and use of the onsite instrument calibrator were discussed with responsible licensee staff. For the WBC system, the inspectors reviewed selected calibration and laboratory inter-comparison records, quality control check records, and discussed operability and availability issues.

Quality assurance data for selected gamma spectroscopy systems were reviewed and discussed with cognizant counting room and chemistry staff. The capabilities of gamma spectroscopy instrumentation used for analysis of routine and post-accident liquid samples were reviewed and evaluated. Capabilities to obtain and analyze highly radioactive samples of reactor coolant for classifying fuel damage were discussed in detail.

Effectiveness and reliability of selected radiation detection instruments were reviewed against details documented in the following: 10 CFR Part 20; NUREG-0737, Clarification of TMI Action Plan Requirements; TS Sections 3/4.3.3, Radiation Monitoring for Plant Operations, 6.8, Procedure and Programs, 6.11, Radiation Protection Program, and 6.14 Offsite Dose Calculation Manual; UFSAR Chapter 11; and applicable licensee procedures. Documents reviewed during the inspection are listed in the Attachment.

Problem Identification and Resolution: The inspectors reviewed and discussed selected CAP documents associated with radiation monitoring instrumentation. The reviewed items included condition reports, self-assessment, and quality assurance audit documents. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve identified issues in accordance with procedure AD-PI-ALL-0100, CAP, Rev. 2. Procedures, documents, and records reviewed are listed in the Attachment.

b. Findings:

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 – 5 samples)

a. Inspection Scope

The inspectors reviewed a sample of the performance indicator (PI) data, submitted by the licensee, for the Unit 1 PIs listed below. The inspectors reviewed plant records compiled between April 2014 and March 2015 to verify the accuracy and completeness of the data reported for the station. The inspectors verified that the PI data complied with guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," and licensee procedures. The inspectors verified the accuracy of reported data that were used to calculate the value of each PI. In addition, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with PI data. Documents reviewed are listed in the Attachment.

Cornerstone: Mitigating Systems

- Safety system functional failures

Cornerstone: Barrier Integrity

- RCS leak rate
- RCS specific activity

Cornerstone: Occupational Radiation Safety

The inspectors reviewed the Occupational Exposure Control Effectiveness PI results for the Occupational Radiation Safety Cornerstone from August 2014 through February 2015. For the assessment period, the inspectors reviewed ED alarm logs and selected NCRs related to controls for exposure significant areas. The inspectors also reviewed licensee procedural guidance for collecting and documenting PI data. Documents reviewed are listed in the Attachment.

Cornerstone: Public Radiation Safety

The inspectors reviewed the Radiological Control Effluent Release Occurrences PI results for the Public Radiation Safety Cornerstone from August 2014 through February 2015. For the assessment period, the inspectors reviewed cumulative and projected doses to the public contained in liquid and gaseous release permits and NCRs related to Radiological Effluent TSs/ODCM issues. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 - 1 sample)

.1 Routine Review

The inspectors screened items entered into the licensee's CAP to identify repetitive equipment failures or specific human performance issues for follow-up. The inspectors reviewed CRs, attended screening meetings, or accessed the licensee's computerized corrective action database.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors reviewed issues entered in the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on issues with functionality assessments, but also considered the results of inspector daily condition report screenings, licensee trending efforts, and licensee human performance results. The review nominally

considered the 6-month period of January 2015 through June 2015, although some examples extended beyond those dates when the scope of the trend warranted. The inspectors compared their results with the licensee's analysis of trends. Additionally, the inspectors reviewed the adequacy of corrective actions associated with a sample of the issues identified in the licensee's trend reports. The inspectors also reviewed corrective action documents that were processed by the licensee to identify potential adverse trends in the condition of structures, systems, and/or components as evidenced by acceptance of long-standing non-conforming or degraded conditions. Documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings were identified.

The inspectors identified that an adverse trend exists associated with the licensee's ability to perform timely and adequate functional assessments. The following are examples of this trend:

- AR 742947, Control Room Habitability Concerns
- AR 741720, Met Tower Inoperable Due to Data Freezing
- AR 754721, Analysis for Environmental Quality for RAB 216' Is Needed
- AR 690371, SRO Risk Recognition / Decision-making Process
- AR 696331, EDG Building Sump Pumps

4OA3 Follow-up of Events (71153 – 3 samples)

(Closed) Licensee Event Report (LER) 05000400/2014-003-00; Diesel Fuel Oil Storage Building Moderate Energy Line Break Design Deficiency

On October 8, 2014, the licensee determined the internal flooding calculation for the diesel fuel oil storage building was invalid during an extent of condition evaluation. This issue is discussed in more detail with an associated finding in NRC Integrated Inspection Report 05000400/2014005, Section 1R15. The inspectors reviewed the LER for accuracy and appropriateness of corrective actions. This LER is closed.

(Closed) LER 05000400/2015-002-00; Breakers to the "A" and "B" Train Control Room Normal Intake Isolation Damper Motor Actuators Tripped Open

On April 4, 2015, the licensee performed a remote shutdown operability test which caused a high instantaneous current to trip open the breakers for dampers 1CZ-1 and 1CZ-2, which left the dampers in a partially open position, not allowing them to perform their safety function. This issue is discussed in more detail with an associated finding in Section 1R18 of this report. The inspectors reviewed the LER for accuracy and appropriateness of corrective actions. This LER is closed.

(Closed) LER 05000400/2015-003-00; Reactor Pressure Vessel Head Penetration Nozzle Indications Requiring Repair Attributed to Primary Water Stress Corrosion Cracking

On April 7, 2015, with the unit shutdown, the reactor vessel head penetration nozzles were examined during a scheduled refueling outage. Ultrasonic examinations identified indications that required repairs to three head penetration nozzles (nozzles 14, 18, and 23). This issue is discussed in more detail in Section 1R08 of this report. The inspectors reviewed the LER for accuracy and appropriateness of corrective actions. This LER is closed.

4OA6 Meetings, Including Exit

On July 20, 2015, the resident inspectors presented the inspection results to Mr. Ben Waldrep, Site Vice-President and other members of the licensee's staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee personnel
J. Caves, (Acting) Manager, Nuclear Regulatory Affairs
R. Chezem, Boric Acid Program Owner
D. Corlett, Manager, Nuclear Regulatory Affairs
J. Dufner, Plant Manager
L. Faulk, Director, Nuclear Plant Security
E. Fonteneau, Steam Generator Program Owner (RNP/HNP)
D. Griffith, Manager, Nuclear Training
C. Hartweg, Snubber Program Owner
J. Jankens, Supervisor, Radiation Protection
J. Keltner, Manager, Nuclear Chemistry
B. McCabe, Manager, Nuclear Oversight
I. Nordby, Regulatory Affairs
S. O'Connor, General Manager, Nuclear Engineering
M. Parker, Manager, Nuclear Radiation Protection
G. Simmons, Manager, Emergency Preparedness
A. Staller, ISI Program Owner
T. Thulien, NDE Principal Level III, ET
S. Volk, RPV Head Exams
J. Warner, Manager, Work Management
B. Waldrep, Site Vice President
A. Zimandy, Site Welding Engineer

NRC personnel
G. Hopper, Chief, Reactor Projects Branch 4, Division of Reactor Projects, Region II

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000400/2015002-01	NCV	Failure to Maintain Emergency Assessment Capability (Section 1R15)
05000400/2015002-02	NCV	Failure to Adequately Implement the Control Room Area HVAC System Procedure (Section 1R15)
05000400/2015002-03	NCV	Inadequate Post Modification Testing of 1CZ-1 and 1CZ-2 HMCP Breakers (Section 1R18)

Closed

05000400/2014-003-00	LER	Diesel Fuel Oil Storage Building Moderate Energy Line Break Design Deficiency (Section 4OA3)
05000400/2015-002-00	LER	Breakers to the “A” and “B” Train Control Room Normal Intake Isolation Damper Motor Actuators Tripped Open (Section 4OA3)
05000400/2015-003-00	LER	Reactor Pressure Vessel Head Penetration Nozzle Indications Requiring Repair Attributed to Primary Water Stress Corrosion Cracking(Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures
AP-300, Severe Weather
AP-301, Seasonal Weather Preparations and Monitoring
AD-PI-ALL-0300, Self-Assessment and Benchmark Programs

Work Orders
WO 13396479, AP-301 O&S Online Supervisor Ensure Hot Weather Preps Done

AR 756739, Perform AP-301 Hot Weather Operations
AR 745800, Unexpected Alarm in Switchyard
AR 755137, Move MST-I0189 to Work Week 15W29 Due to Hot Weather Grid Alert

Section 1R04: Equipment Alignment

Partial System Walkdown
Spent Fuel Pool Cooling system:
Procedure OP-116 Fuel Pool Cooling System,
Drawing 2165-S-0805, Simplified Flow Diagram Fuel Pool Cooling System
UFSAR 9.1.3 Fuel Pool Cooling

B Train Electrical Switchgear:
Procedure OP-156.02, AC Electrical Distribution,
Drawing CAR 2166-G-0030, 480 Volt Auxiliary One Line Wiring Diagram

Diesel Fuel Oil Storage Tank:
Procedure OP-156.02, AC Electrical Distribution,
Drawing 2165-S-0563, Fuel Oil System
UFSAR 9.5.4, Diesel Generator Fuel Oil Storage and Transfer

Complete System Walkdown
Auxiliary Feedwater System:
OP-137, Auxiliary Feedwater System
Design Basis Document-114, Auxiliary Feedwater System
Drawing 2165-S-0544, Simplified Flow Diagram Feedwater System
UFSAR section 10.4.9, Auxiliary Feedwater System

Section 1R05: Fire Protection

FPP-001 Fire Protection Program Manual
FPP-013, Fire Protection – Minimum Requirements, Mitigating Actions and Surveillance Requirements
FPP-012-02-RAB261, RAB Elevation 261 Fire Pre-Plan

FPP-012-02-RAB 236, RAB Elevation 236 Fire Pre-Plan
FPP-012-02-190-216, RAB Elevations 190 and 216 Fire Pre-Plan

Section 1R06: Flood Protection Measures

AR 742470, Splash Guards Installed on RAB Floor Drains
Calculation PRA-F/E-5, RAB Unit 1 Elevation 236 Compartment Flood Analysis

UFSAR Sections
2.4.10, Flooding Protection Requirements
3.6A.6, Flooding Analysis

Procedures
AOP-022, Loss of Service Water
OP-139, Service Water System

Section 1R07: Heat Sink Performance

Procedures
EPT-163, GL 89-13 Inspections (Raw Water Systems and Local Area Air Handler Inspection and Documentation)
MPT-M0091, Heat Exchanger Opening/Closure for NRC GL 89-13 Inspections
WO 13300533, MPT-M0091 and EPT-163 for "A" CCW Heat Exchanger
PLP- 620, Service Water Program (GL 89-13)

Section 1R08: Inservice Inspection Activities

Procedures:
AD-EG-ALL-1702, ASME Section XI ISI Administration, Rev. 0
AD-PI-ALL-0100, Corrective Actions Program, Rev. 2
AD-PI-ALL-0300, Self-Assessment and Benchmark Programs, Rev. 1
AD-PI-ALL-0400, Operating Experience Program, Rev. 1
AD-EG-ALL-1610, Flow Accelerated Corrosion Implementation, Rev. 1
AD-EG-HNP-1618, Snubber program Plan, Rev. 1
AD-EG-PWR-1611, Boric Acid Corrosion Control Program Implementation, Rev. 0
AD-MN-ALL-0006, Fluid Leak Management, Rev. 0
CM-M-0072, Integrated Reactor Vessel Head (IRVH) Seismic Tie Rod Installation/Removal, Rev. 16
EGR-NGGC-0351, Condition Monitoring of Structures, Rev. 22
EGR-NGGC-0201, ASME Section XI ISI Examination Program/Plan Administration, Rev. 3
EST-227, ASME Section XI Class 1 System Pressure Test, Rev. 13
NDEP-201, PT Testing, Rev. 34NDEP-408, Ultrasonic Thickness Measurement (A-scan), Rev. 14
NDEP-425, Ultrasonic Examination of Austenitic Pipe Weld, PDI Temp. Rev. B, Rev. 13
NDEP-620, VT-1 and VT-3 Visual Examination of ASME Section XI, IWE and IWL Containment of Nuclear Power Plant, Rev. 7
NW-05, Welding Procedure, Rev. 9

OPT-1519, Containment Visual Inspection for Boron and Evaluation of Containment Sump Leak in leakage Every Refueling Outage S/D Mode 3, Rev. 10
PLP-605, ASME Boiler and Pressure Vessel Code Section XI Repair/Replacement Activity Program, Rev. 27
TMM-133, SI Thermal Stratification Monitoring Program Rev. 7
8-QPP-761, Multi Frequency Eddy Current Examination of Steam Generator Tubing, Rev. 3
54-ISI-490-008, Multi Frequency Eddy Current Blade Probe Examination of the inside diameter surface of Nozzles, 3/17/2015
54-ISI-244-013, Nondestructive Examination Procedure, Liquid Penetrant Examination of Reactor Vessel Head Penetrations from the Inside Surface, 2/3/2011
AD-EG-ALL-1603, Oversight of Complex Vendor Performed Nondestructive Examinations, 9/16/2013
AD-EG-ALL-1604, NDE Level III Oversight for Large Scope examinations, 9/16/2013

Calculations:
Westinghouse LTR-PAFM-15-31, Rev. 0, Shearon Harris-Development of Acceptance Criteria for Minimum Wall Thickness at Select Class 1 Auxiliary Line Piping Location for RFO19, dated 4/2/2015
HPN-M/MECH-1091, Effective Degradation Years for Reactor Vessel Head, 4/26/2012

NRC-Identified Corrective Action Reports:
AR 744062, RFO18 Snubber Functional Failure, No Engineering Evaluation
AR 743647, Containment ISI Program Plan Incorrectly Item Numbers
AR 743884, Temperature Stick Not Used to Monitor Interpass Temperature
AR 744207, NRC Inspector Observations on Snubber Program
AR 744156, NDE Level II Inspector Unclear on Procedure Used
1166667812, 1ED-110 Boron Accumulation at Valve Packing
AR 742854, Area of Interest observed near CRDM Canopy Seal
AR 743067, Observation of Reactor Head Insulation
AR 743132, NRC Event Notification Clarity
AR 743135, OE Assessment Failed to Identify an Adverse Condition
AR 751246, RVCH Nozzle Post Repair PT Exam Report Clarification

Corrective Action Reports:
AR 652557, 1CS-230 Pipe cap Downstream Has Active Boric Acid Leak
AR 663497, 1CS-424, Pipe Cap Has Wet Boron on 221 RCB
AR 663498, 1CS-427/428 CAPS Have Wet Boron on Cap
AR 724893, 1CT-33 has Dry White Boric Acid on packing
AR 741547, 1CS-499 Boric Acid Leak
AR 663449, AF13 QHSA 648852 R18 Post Outage Assessment – Engineering
AR 743055, Snubber MS-H-0228 Chip in Piston
AR 647333, Scope Expansion Testing for Failed MS-H-0213B
AR 743376, Snubber MS-H0227 Failed Functional Test Due to Lockup
AR 742081, Snubber MS-H-0121 Failed Visual Examination
AR 742620, Snubber MS-H-1283 Locked Up
AR 742419, Bound Spherical Bearing
AR 742422, Snubber SP-H-0886 has a bound Spherical Bearing

AR 622084, Snubber Program Code Transition Deficiencies
AR 742046, Safety Padding on Snubber prior to Engineering Evaluation
AR 741955, CCV cannot be performed on several Snubbers
AR 742582, CCV cannot be performed on Hangers with Alpha and Bravo Snubbers
AR 742398, CCV cannot be performed on Hangers
AR 629418, QC Identified Adverse Condition on Snubber CS-H-1414
AR 647648, TV-2 Life Bolt Holes are not properly aligned
AR 629414, QC Identified Adverse Condition on Snubber SI-H-1282
AR 648256, Snubber MS-H-0030A Cold Set out of Specification in Visual Examination
AR 648252, Snubber CC-H-2149A Cold Set Out of Specification in Visual Examination
AR 647936, CSAT Weld Repair rejected by Radiography
AR 638830, Pipe Associated with ISI-188 does not meet ASME Code Allowables
AR 647171, Post NDE Inspection on piping revealed Indication
AR 646928, PT Indication on welded attachment identified during ISI examination
AR 647849, RPV Support Inclusion in ISI Program
AR 745198, Overbore of RVCH Nozzle 23 during Repair, 4/23/2015

Drawings:
1-ISI-CS-94, Rev. 2, Chemical and Volume Control System (Loop A Inside Containment)
1-ISI-CS-102, Chemical and Volume Control System (Loop B Inside Containment)
A-I-305-I-MS-H-121, Rev. A, Main Steam Snubber
G-105, Rev. 26, Simplified Flow Diagram Radiation Monitor and Hydrogen Analysis System, Unit 1
PD88421, Rev. A, 8.00 Bore XA Stroke Snubber Assembly Rod Expansion
S-0605, Rev. 13, Simplified Flow Diagram Radiation Monitor and Hydrogen Analysis System, Unit 1
Shearon Harris Unit-1, Reactor Vessel Head Penetration Map R-19 (Sketch), Rev. 0

NDE Examiner Quals:
Record of Welder Performance Qualification Tests
Visual Acuity Exam Records
Certificate of Qualification for Examiners
I.D. H9017, Certification of Personnel Qualification, UT-III-PDI, Expires 8/11/2016
I.D. K2915, Certification of Personnel Qualification, UT-III, Expires 8/15/2016
I.D. E2448, Certification of Personnel Qualification, ET-III-QDA, Expires 8/6/2019
I.D. C2231, Certification of Personnel Qualification, Code Case N-722 & N729, Expires 2/7/2016
I.D. B2396, Certification of Personnel Qualification, Bare Head Visual, VT-2, Expires 2/7/2016

Work Orders:
WO 13387013, 1CT-99, 0.5 dpm leak past closed seat
WO 13318331, 1 SP-952 has indication in stuffing box
WO 13402314, 1SI-333, boron accumulation on PIP
WO 13206178, 3SF-E004, 2 & 3 B SFP Hx Inspection
WO 856563-09, 1-SP-941 Valve HL/CL B loop Primary Sampling Line, Class 2
WO 2107301-01, Replace Valve, RCS 1RC-903, Class 1
WO 1846416-01, Replace Valve, 1CS-347, CS Class 2
WO 13344486, Ultrasonic Testing (UT), 1-RC-3-285N-1, piping off A loop/CL

WO 13352682, UT, I-CS-097-RC-CW-A3, pipe to tee weld
WO 2199334, Penetrant Testing, Welded Attachments, Cont 265' R-50' AZ-290
WO 2080382-01, ASME Section XI Class 1 System Pressure Test, RFO18
WO 2156640-01, RT of 1CT-CSAT Tank
WO 1833261-01, ASME System Pressure Test for the RVH Flange Leak-off Lines, 11/15/2013
WO 2156640-02, UT Thickness Report, 1CT-CSAT
WO 2122419-01, Spent Fuel Pool Piping Leak 3SF12-176SB-1-4 Repair through Wall
WO 2122419-03, UT Thickness Report Elbow above 1SF-71
WO 2166533-01, UT Thickness Report 1-S-4-2-VW-3 and 1-SF-4-2-VW-81 Leak
WO 13435176-04, Pin Hole Leak in Valve 1-SW-139-IAW
WO 208042501, Remove Reactor Vessel Head (RVH)
WO 13300970, Post R18 Forced Outage Boric Acid Walkdown (OPT-1591)
WO 134351176-01, -14, Implement 3SW1-269SB-1/1SW-139
WO 13440780-13, Implement EC98288 for B ESW Screen
WO 13440780-5, Implement Line 3SC4-8SB-1
WO 13488325-04, Pin Hole Leak in 3 SW2-166SB-1
WO 13488325-5, 6, UT Thickness 1SW-142, 150, 164, 170, 166SB1
WO 2199334, N-722-1 Reactor Vessel BMI Penetrations VT Examinations
WO 2079704-01, 1SP-204 Clean Boric Acid Accumulation
WO 12201106-01, Pipe Tail Piece Demonstration of 1SP-204
WO 626701-01, CM-M0072, Remove/ Install RVH Seismic Tie Rod

Miscellaneous Documents:
FAC Manager Evaluation, RFO19, line 2FW16-69 SN-1, FW to SG1C-SN, Component FW131-002
ISI Self-Assessment, dated 2/2015
Welding Self-Assessment, Structural Integrity Report No. 1301629.401.R0, dated 3/2015
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AR 00673461
AR 00715033
AR 00746168
Quick Hitter Self-Assessment Report, Self-Assessment No. 00714030, Self-Assessment Title: IP 71124.05, Radiation Monitoring Instrumentation, 03/18/15

Section 4OA1: Performance Indicator Verification

NEI 99-02, Regulatory Assessment Performance Indicator Guideline
Calculation HNP-F/PSA-0068, NRC Mitigating System Performance Index Basis Document for Harris Nuclear Plant

Procedures
REG-NGGC-0009, NRC Performance Indicators and Monthly Operating Report Data, Rev. 14
AD-PI-ALL-0100, CAP, Rev. 2

Records and Data Reviewed
Performance Indicator Submittals August 2014 through February 2015 for Occupational Radiation Protection Performance Indicator and for RETS/ODCM Radiological Effluent Occurrence Indicator
Gaseous Effluent Release Permit G-2014-0234 Post-Release Data
Gaseous Effluent Release Permit G-2015-0037 Post-Release Data
Liquid Effluent Release Permit L-2014-0049 Post-Release Data
Liquid Effluent Release Permit L-2015-0008 Post-Release Data

Corrective Action Documents
N3R 00707574
NCR 00715033
NCR 00725657
NCR 00727785
NCR 00735856
NCR 00728161
NCR 00709489
NCR 00728161

Section 4OA2: Identification and Resolution of Problems

AD-PI-ALL-0100, CAP
AD-PI-ALL-0101, Root Cause Evaluation
AD-PI-ALL-0102, Apparent Cause Evaluation
AD-PI-ALL-0103, Quick Cause Evaluation
AD-PI-ALL-0104, Prompt Investigation Response Team
AD-PI-ALL-0105, Effectiveness Reviews
AR 742947, Control Room Habitability Concerns
AR 741720, Met Tower Inoperable Due to Data Freezing
AR 754721, Analysis for Environmental Quality for RAB 216' Is Needed
AR 690371, SRO Risk Recognition / Decision-making Process
AR 696331, EDG Building Sump Pumps