



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

February 6, 2020

Ms. Kim Maza
Site Vice President
Duke Energy Progress, LLC
5413 Shearon Harris Road
Mail Code HNP01
New Hill, NC 27562-9300

SUBJECT: SHEARON HARRIS – INTEGRATED INSPECTION REPORT
05000400/2019004

Dear Ms. Maza:

On December 31, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Shearon Harris. On January 21, 2020, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

No findings or violations of more than minor significance were identified during this inspection.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Louis J. McKown, II, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket No. 05000400
License No. NPF-63

Enclosure:
As stated

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SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT – INTEGRATED INSPECTION
REPORT 05000400/2019004 DATED FEBRUARY 6, 2020

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number: 05000400

License Number: NPF-63

Report Number: 05000400/2019004

Enterprise Identifier: I-2019-004-0073

Licensee: Duke Energy Progress, LLC

Facility: Shearon Harris Nuclear Power Plant

Location: New Hill, NC 27562

Inspection Dates: October 01, 2019 to December 31, 2019

Inspectors: M. Bates, Senior Operations Engineer
R. Carrion, Senior Reactor Inspector
B. Collins, Senior Reactor Inspector
J. Diaz-Velez, Senior Health Physicist
S. Downey, Senior Reactor Inspector
R. Kellner, Senior Health Physicist
W. Loo, Senior Health Physicist
A. Patz, Resident Inspector
W. Pursley, Health Physicist
J. Zeiler, Senior Resident Inspector

Approved By: Louis J. McKown, II, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Shearon Harris Nuclear Power Plant, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information. Findings and violations being considered in the NRC's assessment are summarized in the table below.

List of Findings and Violations

No findings or violations of more than minor significance were identified.

Additional Tracking Items

None.

PLANT STATUS

Unit 1 began the inspection period operating at 93 percent rated thermal power in a coastdown preparing for the start of a refueling outage. On October 11, 2019, the unit was shutdown to begin the refueling outage (RFO-22). The refueling outage was completed on November 18, 2019. The unit returned to 100 percent rated thermal power on November 21, 2019, and remained at essentially full power for the remainder of the inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors performed plant status activities described in IMC 2515, Appendix D, "Plant Status," and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Seasonal Extreme Weather Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated readiness for seasonal extreme weather conditions prior to the onset of seasonal cold temperatures on December 9, 2019

71111.04Q - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) 1&4A and 2&3A spent fuel pool cooling systems while 'B' train spent fuel pool pumps were unavailable during reactor defueling activities on October 19, 2019
- (2) 'A' emergency diesel generator (EDG) while 'B' EDG was out-of-service for refueling outage preventive maintenance on November 3, 2019
- (3) 'A' and 'B' motor driven auxiliary feedwater pumps while the turbine driven auxiliary feedwater (TDAFW) pump was out-of-service for preventive maintenance on December 11-12, 2019
- (4) 'B' containment spray pump while 'A' containment spray pump was out-of-service for preventive maintenance on December 18, 2019

71111.04S - Equipment Alignment

Complete Walkdown Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated system configurations during a complete walkdown of the residual heat removal (RHR) system on November 20, 2019

71111.05Q - Fire Protection

Quarterly Inspection (IP Section 03.01) (5 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Reactor Auxiliary Building (RAB) 190' elevation 'B' RHR and Containment Spray pump room (fire zone 1-A-1-PB) on October 12, 2019
- (2) RAB 236' elevation component cooling water (CCW) pump and auxiliary feedwater pump area (fire zone 1-A-3-PB/1-A-3-TA) on October 19, 2019
- (3) Containment 221', 236', and 261' elevations (fire zones 1-C-1-BAL, 1-C-1-CHFA, 1-C-1-CHFB, 1-C-3-EPA, and 1-C-3-EPB) on October 29, 2019
- (4) RAB 286' elevation 'B' train essential switchgear room, ventilation room, and battery room (fire zones 1-A-SWGRB, 1-A-5-HVB, and 1-A-BATB) on November 9, 2019
- (5) 'B' EDG room and support equipment areas (fire zones 1-D-1-DGB-RM, 1-D-1-DGB-ER, 1-D-1-DGB-ASU, and 1-D-DTB) on December 17, 2019

71111.06 - Flood Protection Measures

Inspection Activities - Underground Cables (IP Section 02.02c.) (1 Sample)

The inspectors evaluated cable submergence protection in:

- (1) Cable vaults M523C-SB, M523D-SB, and M523E-SB, that contain 'B' train safety-related cables located between the EDG building and turbine building on December 11, 2019

71111.07A - Heat Sink Performance

Annual Review (IP Section 02.01) (2 Samples)

The inspectors evaluated readiness and performance of:

- (1) 'B' CCW and 'B' EDG jacket water heat exchangers during licensee inspection and mechanical cleaning on October 19, 2019
- (2) 'A' EDG jacket water heat exchanger and containment cooling AH-2 during licensee inspection and cleaning on October 31, 2019

71111.08P - Inservice Inspection Activities (PWR)

PWR Inservice Inspection Activities Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated pressurized water reactor non-destructive testing by reviewing the following examinations from October 21 - 31, 2019:

- Ultrasonic Examination (UT)
 - Examination of II-PZR-01NTHW-10, Safety Nozzle to Upper Head, 15" diameter nozzle; ASME Class 1 (observed)
 - Examination of II-PZR-01NTHW-11, Safety Nozzle to Upper Head, 15" diameter nozzle; ASME Class 1 (observed)
 - Examination of II-PZR-01NTHW-12, Safety Nozzle to Upper Head, 15" diameter nozzle; ASME Class 1 (observed)
- Penetrant Testing (PT)
 - Examination of II-RHR-01RHRA-STVW-06A,B,C; Skirt to Vessel Weld; ASME Class 2 (reviewed)
- Visual Examination (VE)
 - Examination of Reactor Vessel Bottom-Mounted Instrumentation Penetrations; ASME Class 1 (reviewed)
- Eddy Current Testing (ET)
 - SG 1A - ET for tubes R58C131 & R107C78, ASME Class 1
 - SG 1B - ET for tubes R2C1 & R58C131, ASME Class 1
 - SG 1C - ET for tubes R1C86 & R1C138, ASME Class 1

The Inspectors evaluated the licensee's boric acid corrosion control program performance.

71111.11A - Licensed Operator Regualification Program and Licensed Operator Performance

Regualification Examination Results (IP Section 03.03) (1 Sample)

The licensee completed the annual regualification operating examinations required to be administered to all licensed operators in accordance with Title 10 of the *Code of Federal Regulations* 55.59(a)(2), "Regualification Requirements," of the NRC's "Operator's Licenses." During the week of October 28, 2019, the inspector performed an in-office review of the overall pass/fail results of the individual operating examinations and the crew simulator operating examinations in accordance with IP 71111.11, "Licensed Operator Regualification Program." These results were compared to the thresholds established in Section 3.02, "Regualification Examination Results," of IP 71111.11.

- (1) The inspectors reviewed and evaluated the licensed operator examination failure rates for the regualification annual operating exam completed on June 28, 2019

71111.11Q - Licensed Operator Regualification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (3 Samples)

- (1) The inspectors observed and evaluated licensed operator performance in the Control Room during shutdown for refueling outage H1R22 on October 11, 2019
- (2) The inspectors observed and evaluated licensed operator performance in the Control Room during reactor coolant system (RCS) draindown to lowered inventory level conditions on October 14, 2019
- (3) The inspectors observed and evaluated licensed operator performance in the Control Room during initial reactor criticality following refueling outage H1R22 on November 17, 2019

Licensed Operator Regualification Training/Examinations (IP Section 03.02) (1 Sample)

- (1) The inspectors observed and evaluated a simulator scenario for operator training involving gross failed fuel and plant radiological release event on December 10, 2019

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness Inspection (IP Section 02.01) (2 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

- (1) 'A' essential chilled water system (ESCW) chilled water pump P-4A motor trip on May 15, 2019
- (2) Nuclear instrument source range detector NI-31 failure due to water intrusion into detector assembly on October 15, 2019

Quality Control (IP Section 02.02) (1 Sample)

The inspectors evaluated maintenance and quality control activities associated with the following equipment performance activities:

- (1) 'B' RHR pump motor breaker overcurrent and short circuit trip on November 9, 2019

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) Elevated (Yellow) risk during refueling outage H1R22 for initial RCS draindown to below reactor vessel flange elevation (i.e., lowered inventory) in preparation for removing the reactor vessel head on October 14, 2019
- (2) Elevated (Yellow) risk during refueling outage H1R22 with single train of RHR and spent fuel pool cooling available while 'B' train essential safety equipment was out-of-service for outage maintenance and defueling operations were ongoing on October 17, 2019
- (3) Elevated (Green) risk during refueling outage H1R22 for RCS draindown to below the reactor vessel flange elevation in preparation for installing the reactor vessel head following completion of refueling on November 10, 2019
- (4) Elevated (Green) risk during planned unavailability of the TDAFW pump for preventive maintenance on December 10-11, 2019

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 02.02) (4 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Emergency airlock door difficult to operate on October 2, 2019 (NCR 02295068)
- (2) 'B' train ESCW chiller as-found refrigerant volume was excessively low during periodic weighing on October 17, 2019 (NCR 02297945)
- (3) Excessive drag force measured during control rod drive latching associated with fuel assembly ZC50 on November 5, 2019 (NCR 02300932)
- (4) Oscillations in RCS loop temperatures causing unexpected automatic control rod motion on November 9, 2019 (NCR 02303771)

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (2 Samples)

The inspectors evaluated the following temporary or permanent modification engineering changes (ECs):

- (1) Temporary Modification EC 0000416637, Removal of RCS Loop 3 From Median Tavg to Rod Control, on November 29, 2019
- (2) Permanent Modification EC 0000294355, Equipment Hatch Body Ring Cutout and Re-weld during Reactor Vessel Head Replacement, on November 15, 2019

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (6 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) OST-1073, 1B-SB Emergency Diesel Generator Operability Test Monthly Interval Modes 1-2-3-4-5-6, and OST-1824, 1B-SB Emergency Diesel Generator Operability Test 18 Month Interval Modes 1 Through 6 and Defueled, following 'B' EDG planned refueling outage maintenance activities on November 5, 2019
- (2) OP-111, Residual Heat Removal System, Section 8.6, for restart of 'B' RHR following emergent pump motor breaker replacement on November 9, 2019
- (3) Framatome procedure 916.43, Channel Strength Test and Direct Pressure Bubble Leak Testing Equipment Hatch Modification Work, following re-weld of containment equipment hatch body ring on November 10, 2019
- (4) MST-10050, Nuclear Instrumentation System Source Range N31 Calibration, following N31 detector replacement on November 15, 2019
- (5) OST-1124, Train B 6.9 KV Emergency Bus Undervoltage Trip Actuating Device Operational Test and Contact Check Modes 1-6, and OST-1411, Auxiliary Feedwater Pump 1X-SAB Operability Test Quarterly Interval Modes 1,2,3, following planned maintenance on the TDAFW on December 11, 2019
- (6) OST-1118, Containment Spray Operability Train A Quarterly Interval Modes 1-4, following 'A' train containment spray pump motor breaker preventive maintenance on December 18, 2019

71111.20 - Refueling and Other Outage Activities

Refueling/Other Outage Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated refueling outage 1H1R22 activities from October 12, 2019 to November 18, 2019

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (2 Samples)

- (1) Operations Periodic Test (OPT)-1519, Containment Visual Inspection for Boron and Evaluation of Containment Sump Inleakage Every Refueling Outage Shutdown Mode 3, on October 12, 2019
- (2) Engineering Surveillance Test (EST)-923, Initial Criticality and Low Power Physics Testing, on November 17, 2019

RCS Leakage Detection Testing (IP Section 03.01) (1 Sample)

- (1) OST-1076, Reactor Coolant System Leakage Evaluation, Computer Calculation, Daily Interval, Modes 1-4, on December 2, 2019

Containment Isolation Valve Testing (IP Section 03.01) (1 Sample)

- (1) EST-212, Type C Local Leak Rate Test, Attachment 1 for Penetration M-7, LLRT for 1CS-7, 8, 9, 10, 11, on November 5, 2019

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

Radiological Hazard Assessment (IP Section 02.01) (1 Sample)

The inspectors evaluated radiological hazards assessments and controls.

- (1) The inspectors reviewed the following:

Radiological Surveys

- RCB 254' Steam Generator Bowl: Survey HNP-M-20191021-1*
- RCB 254' Steam Generator Platform: Survey HNP-M-20191022-2
- RCB 221' RH-40 Valve Packing Removal: Survey HNP-M-20191022-8*
- RAB 236' CSIP Mezzanine: Survey (pre-job survey of 1CS-776) HNM-M-20191020-27
- RAB 236' CSIP Mezzanine: Survey (job coverage of breach) HNP-M-20191021-9*
- RAB 236' 1RC-144 Mechanical Penetration Valve: Survey HNP-M-20191021-29

Risk Significant Radiological Work Activities

- "A" S/G Manway Removal
- "A" S/G Sludge Lancing
- Removal of RH-40 Valve Packing

- RAB 236' 1CS-776 System Breach
- RAB 236' 1RC-144 Mechanical Penetration Valve

Air Sample Survey Records

- See above surveys which also included air samples

Instructions to Workers (IP Section 02.02) (1 Sample)

The inspectors evaluated instructions to workers including radiation work permits used to access high radiation areas.

- (1) The inspectors reviewed the following:

Radiation Work Permits

- RWP 1035, Rev.06, Task #3 - Steam Generator Eddy Current Support (LHRA)
- RWP 1034, Rev. 05 - Steam Generator Secondary Side Equipment Setup and Removal, Sludge Lance, Fosar (HRA)
- RWP 1030, Rev. 01 - Steam Generator Platform Set Up and Demob (HRA)
- RWP 1018, Rev. 02 - Reactor Coolant Pump Seals (HRA)
- RWP 1012, Rev. 08 - Snubber Activities H118R1 (HRA)
- RWP 1005, Rev. 01 - Inspections H118R1 (LHRA/HRA)

Electronic Alarming Dosimeter Alarms

- EID 279010 Alarm dated 08/13/2019
- EID 271500 Alarm dated 03/06/2019
- EID 342966 Alarm dated 04/16/2018

Labeling of Containers

- The inspectors observed multiple labeled containers during walkdowns of the radiological controlled area, including the RCB, and the RAB.

Contamination and Radioactive Material Control (IP Section 02.03) (1 Sample)

The inspectors evaluated licensee processes for monitoring and controlling contamination and radioactive material.

- (1) The inspectors verified the following sealed sources are accounted for and are intact:
- Hopewell Designs, Inc., instrument calibration irradiator containing two Cs-137 sealed sources serial no.: 3269CO and 2730GP
 - J.L. Shepard (Model 89/Sn: 8169), instrument calibration irradiator containing one Cs-137
 - J.L. Shepard (Model 28-5A/Sn: 10144) instrument calibration irradiator containing Cs-137

Radiological Hazards Control and Work Coverage (IP Section 02.04) (1 Sample)

The inspectors evaluated in-plant radiological conditions during facility walkdowns and observation of radiological work activities.

- (1) The inspectors also reviewed the following radiological work package for areas with airborne radioactivity:
- WO 20278632, Task 03 - "B" Steam Generator Install Nozzle Dams*
 - WO 20268362, Task 02 - "A" Steam Generator Sec. Side Inspection, Sludge Lancing and Eddy Current Test
 - WO 20278628, Task 04 - "A" Steam Generator Remove Inspection Port/Handle Covers

*The inspectors observed licensee staff performing work under respirators (RWP 1033)

High Radiation Area and Very High Radiation Area Controls (IP Section 02.05) (1 Sample)

- (1) The inspectors evaluated risk-significant high radiation area and very high radiation area controls

Radiation Worker Performance and Radiation Protection Technician Proficiency (IP Section 02.06) (1 Sample)

- (1) The inspectors evaluated radiation worker performance and radiation protection technician proficiency

71124.02 - Occupational ALARA Planning and Controls

Inspectors evaluated licensee performance with respect to maintaining personnel exposures ALARA by evaluating the licensee's work planning activities and assumptions, and worker ALARA implementation and controls.

Radiological Work Planning (IP Section 02.01) (1 Sample)

The inspectors evaluated the licensee's radiological work planning.

- (1) The inspectors reviewed the following activities:
- ALARA Plan# 2019HNPH1R22-007, Cavity Decon (Medium & High Risk Work) 9/11/2019
 - ALARA Plan# 2019HNPH1R22-009, Refueling Activities (HRRSA), 09/11/2019
 - ALARA Plan# 2019HNPH1R22-004, Primary System Activities, 09/11/2019
 - ALARA Plan# 2019HNPH1R22-000, Reactor Vessel Closure Head (RVCH) Replacement, 08/21/2019

Verification of Dose Estimates and Exposure Tracking Systems (IP Section 02.02) (1 Sample)

The inspectors evaluated dose estimates and exposure tracking.

- (1) The inspectors reviewed the following as low as reasonably achievable planning documents:
- ALARA Plan# 2019HNPH1R22-007, Cavity Decon (Medium & High Risk Work) 9/11/2019

- ALARA Plan# 2019HNPH1R22-009, Refueling Activities (HRRSA), 09/11/2019
- ALARA Plan# 2019HNPH1R22-004, Primary System Activities, 09/11/2019
- ALARA Plan# 2019HNPH1R22-000, Reactor Vessel Closure Head (RVCH) Replacement, 08/21/2019

Additionally, the inspectors reviewed the following radiological outcome evaluations:

- ALARA Critique for ALARA Plan 2018HNPH1R21-006, B RCP Motor Replacement, 05/08/2018
- ALARA Critique for ALARA Plan 2018HNPH1R21-001, Reactor Head Repairs, 06/05/2018
- ALARA Critique for ALARA Plan 2018HNPH1R21-008, Refueling Activities, 05/02/2018

Implementation of ALARA and Radiological Work Controls (IP Section 02.03) (1 Sample)

The inspectors reviewed as low as reasonably achievable practices and radiological work controls.

- (1) The inspectors reviewed the following activities:
- RWP 1010, Refuel Activities
 - RWP 1013, Seal Table Activities, Task 9 Remove and Replace Thimbles
 - RWP 1016, Cavity Decon Activities
 - RWP 1031, S/G Manway Removal/Replacement
 - RWP 1047, RVCH Replacement

Radiation Worker Performance (IP Section 02.04) (1 Sample)

The inspectors evaluated radiation worker and radiation protection technician performance during:

- (1) RVCH replacement, B RCP Seal work, Incore Thimble Removal/Replacement and primary side S/G work including manway removal and Eddy Current testing

71124.03 - In-Plant Airborne Radioactivity Control and Mitigation

Engineering Controls (IP Section 02.01) (1 Sample)

The inspectors evaluated equipment used to mitigate and monitor airborne radioactivity and verified licensee has established trigger points for evaluating airborne alpha and beta emitting radionuclides.

- (1) The inspectors reviewed the following:

Installed Ventilation Systems

- OST-1048, Fuel Handling Building Emergency Exhaust System Operability 18 Month Interval at All Times, Rev. 020, November 11, 2017 and April 27, 2019
- OST-1052, RAB Emergency Exhaust System Operability 18 Month Interval All Modes, Revs. 025 and 026, April 13, 2017 and July 9, 2018, respectively

Temporary Ventilation System Setups

- High Efficiency Particulate Air Filters for “A” Primary Sample Tank Room, Reactor Auxiliary Building 236’, and H1R22 Reactor Coolant Pump Seal Work Activities

Portable or Installed Monitoring Systems

- AMS4, Serial No. 021815, Spent Fuel Pool
- iCam, Serial No. 13217, Reactor Auxiliary Building 236’

Use of Respiratory Protection Devices (IP Section 02.02) (1 Sample)

The inspectors evaluated the licensee’s use and maintenance of respiratory protection equipment. This included review of respirator qualification records and grade D quality supplied air.

- (1) Observing in-field applications; verifying the licensee validated the level of protection provided by the devices; inspecting the material condition of devices, reviewing records and certification of devices issued for use; reviewing the qualifications of workers that use the devices; and observing workers’ donning, doffing and testing devices

TEDE-ALARA evaluations for the use of respiratory protection equipment

- 1RH-40 Breach TEDE-ALARA Evaluation Worksheet, August 6, 2019
- Cavity Decon TEDE-ALARA Evaluation Worksheet, August 6, 2019

Respiratory protection used during work activities

- None were available during this inspection period.

Periodic Inspection records for staged respirators (ready-for-use)

- HPP-630, Attachment 8 – SCOTT AIR-PAK Respiratory Equipment Inspection Records, Rev. 34, Page 53 of 55, August through November, 2019, for staged respirators that were ready-for-use in the Main Control Room (Unit Serial Nos. 1605930 and 2228196), Technical Support Center (Unit Serial Nos. 1219306 and 1196644), and the Operational Support Center (Unit Serial Nos. 1196599 and 2228175)

Self-Contained Breathing Apparatus for Emergency Use (IP Section 02.03) (1 Sample)

The inspectors evaluated the licensee’s storage and maintenance of SCBA for emergency use. This included a review of SCBA qualification records.

- (1) The inspectors reviewed the following:

Status and Surveillance Records for Self-Contained Breathing Apparatus

- HPP-630, Attachment 8 – SCOTT AIR-PAK Respiratory Equipment Inspection Records, Rev. 34, Page 53 of 55, August through November, 2019, for staged

respirators that were ready-for-use in the Main Control Room (Unit Serial No. 2228177), Technical Support Center (Unit Serial No. 1196641), and the Operational Support Center (Unit Serial No. 2228199)

Self-Contained Breathing Apparatus Fit for On-Shift Operators

- Selected On-Shift Unit 1 Reactor Operators and Senior Reactor Operators were reviewed for Self-Contained Breathing Apparatus Fit

Self-Contained Breathing Apparatus Maintenance Check

- Posi3 USB Test Results, Functional Test, Scott Air-Paks: 4.5, Unit ID: 1196641, July 11, 2018 and July 10, 2019; and 75 4500, Unit IDs: 2228177, June 6, 2018 and June 5, 2019, and 2228199, June 6, 2018 and June 5, 2019

71124.04 - Occupational Dose Assessment

The inspectors evaluated the licensee's characterization of the source term and use of scaling factors for the use of hard-to-detect radionuclide activity.

Source Term Categorization (IP Section 02.01) (1 Sample)

- (1) The inspectors evaluated the licensee's characterization of the source term and use of scaling factors for the use of hard-to-detect radionuclide activity

External Dosimetry (IP Section 02.02) (1 Sample)

- (1) The inspectors evaluated the external dosimetry program implementation

Internal Dosimetry (IP Section 02.03) (1 Sample)

The inspectors evaluated the internal dosimetry program implementation, including review of individual intake assessments and internal dose evaluations (as available). No samples can be listed due to Personally Identifiable Information (PII) restrictions.

- (1) The inspectors reviewed the following:

Whole Body Counts

- April 18, 2018, Guide Stud Work Activities, Radiation Protection (RP) No. 210689
- April 20, 2018, "B" Reactor Coolant Pump Housing and Pump Seal Removal, RP No. 280551
- October 29, 2019, Demobilization of "B" Steam Generator Equipment, RP No. 210172

In-Vitro Internal Monitoring

- April 20, 2018, Reactor Head Repair, Multipack Identification (ID) Nos. 4774 and 4791
- February 5, 2019, Spent Fuel Pool Diving, Multipack ID Nos. 4889 and 4890

Dose Assessments Performed Using Air Sampling and Derived Air Concentration-Hour Monitoring

- None were available during this inspection period

Special Dosimetric Situations (IP Section 02.04) (1 Sample)

The inspectors evaluated licensee methods for assessment of special dosimetric situations such as declared pregnant worker, exposure in nonuniform fields, shallow dose equivalent and neutron exposure.

(1) EDEX exposures

- April 20, 2018, Reactor Head Repair, Multipack Identification (ID) Nos. 4774 and 4791
- February 5, 2019, Spent Fuel Pool Diving, Multipack ID Nos. 4889 and 4890

Shallow Dose Equivalent

- None were available during this inspection period

Neutron Dose Assessment

- October 10 and 11, 2019, Reactor Auxiliary Building 286 Equipment Hatch Work Activities, Radiation Protection Nos. 404290 and 910022, respectively

71124.05 - Radiation Monitoring Instrumentation

Walk Downs and Observations (IP Section 02.01) (1 Sample)

The inspectors evaluated radiation monitoring instrumentation during plant walkdowns.

(1) The inspectors reviewed the following:

Portable Survey Instrument Calibration Records

- Ludlum Model 3002 (alpha/beta) Frisker: S/N 25011668 (EnRad ID: 13123), 02/07/2019 and 08/08/2018
- Ludlum Model 19 MicroR Meter: S/N 296342 (EnRad ID: 07224), 01/04/2018 and 02/21/2019; S/N 218210 (EnRad ID: 02681), 04/18/2017 and 02/21/2019
- Ludlum Model 12-4 (REMBALL): S/N 315070 (EnRad ID: 12681), 10/30/2017 and 02/04/2019; S/N 252006 (EnRad ID: 03140), 06/09/2016 and 10/22/2018
- Ludlum Model 9-3 Ion Chamber Meter: S/N 273801 (EnRad ID: 10422), 03/07/2018 and 03/06/2019; S/N 288680 (EnRad ID: 11382), 08/07/2017 and 11/02/2018
- Ludlum Model 3030P Scaler: S/N 275335 (EnRad ID: 03527), 08/07/2018 and 09/23/2019; S/N 322976 (EnRad ID: 07824), 01/04/2017 and 03/27/2019
- Mirion TelePole Survey Meter: S/N 6601-001 (EnRad ID: 02702), 10/12/2018 and 08/15/2019; S/N 0914-151 (EnRad ID: 02702), 01/26/2018 and 10/08/2019
- Goose Neck (Low Volume Air Sampler: S/N 5835 (EnRad ID: 10378), 05/21/2018 and 05/15/2019; S/N 5352 (EnRad ID: 12546), 09/06/2017 and 05/15/2019
- Mirion RDS-31iTxGM (high range underwater detector): S/N 711777 (EnRad ID: 13237), 04/02/2019; S/N 711798 (EnRad ID: 13043), 03/27/2019

Source Check Demonstration

- Ludlum Model 9-3 Ion Chamber Meter
- Mirion TelePole Survey Meter
- Ludlum Model 3030P Scaler

Area Radiation Monitors and Continuous Air Monitors

- Eberline AMS-4 (CAM): S/N 2131 (EnRad ID: 02815), 03/21/2017 and 04/26/2019; and S/N 2509, (EnRad ID: 10368), 03/01/2017 and 10/07/2019
- Mirion iCAM (CAM): S/N 6050, (EnRad ID: 13217), 02/08/2019; and S/N 5732, (EnRad ID: 07894), 08/07/2017

Personnel Contamination Monitors, Portal Monitors and Small Article Monitors

- Canberra Argo-5 AB: S/N 1111-166 (EnRad ID: 10244), 09/05/2018 and 07/24/2019; S/N 1612-301 (EnRad ID: 07855), 01/28/2018 and 01/29/2019; S/N 1502-033 (EnRad ID: 12268), 02/01/2018 and 01/28/2019
- Canberra GEM-5 (portal monitor): S/N 0711-103 (EnRad ID: 10737), 09/04/2018 and 08/29/2019; S/N 1409-171 (EnRad ID: 12564), 01/30/2018 and 01/29/2019; S/N 1409-170 (EnRad ID: 12537), 09/05/2018 and 08/29/2019
- Canberra Cronos 4 (small article monitor): S/N 1312-311 (EnRad ID: 12552), 01/30/2018 and 01/30/2019; S/N 0912-138 (EnRad ID: 10214), 01/11/2018 and 01/28/2019

Calibration and Testing Program (IP Section 02.02) (1 Sample)

The inspectors evaluated the calibration and testing program implementation.

- (1) The inspectors reviewed the following:

Alarm Setpoint and Calibration Method Check of Personnel Contamination Monitors, Portal Monitors and Small Article Monitors

- Canberra Argo-5 AB: S/N 1111-166, and S/N 1502-033
- Canberra GEM-5: S/N 0711-103, S/N 1409-171, and S/N 1409-170
- Canberra Cronos 4: S/N 1312-311, and S/N 0912-138

Failure to Meet Calibration or Source Check Acceptance Criteria

- No examples of instruments that failed to meet calibration or source check acceptance criteria were available for review during this inspection

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

MS08: Heat Removal Systems (IP Section 02.07) (1 Sample)

- (1) Unit 1 (October 1, 2018 – September 30, 2019)

MS10: Cooling Water Support Systems (IP Section 02.09) (1 Sample)

- (1) Unit 1 (October 1, 2018 - September 30, 2019)

OR01: Occupational Exposure Control Effectiveness Sample (IP Section 02.15) (1 Sample)

- (1) 10/31/2018 - 09/30/2019 - Electronic Dosimeter (ED) Dose and Dose Rate Alarm Logs, Monthly Performance Indicator Data for the Occupational Radiation Safety Cornerstone

PR01: Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual
Radiological Effluent Occurrences (RETS/ODCM) Radiological Effluent Occurrences Sample
(IP Section 02.16) (1 Sample)

- (1) 10/31/2018 - 09/30/2019 - Gaseous, Particulate, and Liquid Effluent Release Permit Dose calculation results, date(s) as applicable and Monthly Performance Indicator Data for the for the Public Radiation Safety Cornerstone

71152 - Problem Identification and Resolution

Semiannual Trend Review (IP Section 02.02) (1 Sample)

- (1) The inspectors reviewed the licensee's corrective action program for potential adverse trends that might be indicative of a more significant safety issue

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

71007 - Reactor Vessel Head Replacement Inspection

Reactor Vessel Head Replacement Inspection (7 Samples)

- (1) The inspectors reviewed certified material test reports (CMTRs) the following items to verify that the chemistry, heat treatment, and mechanical properties of the materials used to construct the replacement reactor vessel head (RRVH) were as identified in the design specification and in accordance with the requirements of ASME Section II and ASME Section III:
- RRVH forging
 - RRVH penetration nozzle adapters for the Integrated Latch Housings (ILHs), Core Exit Thermocouple Nozzle Assemblies (CETNAs), and Reactor Vessel Level Indication System (RVLIS) nozzle assembly
 - RRVH penetration nozzle tubes
 - RVLIS piping subassembly
 - Rod travel housings
 - RRVH lifting lugs
 - Welding materials
- (2) The inspectors reviewed radiation protection program controls, planning, and preparation in the following areas utilizing applicable portions of baseline inspection procedures 71124.01, 71124.02, 71124.03, 71124.04, and 71124.06 as guidance:

- ALARA planning
- Dose estimates and dose tracking
- Exposure controls including temporary shielding
- Airborne and contamination controls
- Radioactive material controls and management
- Radiological work plans and controls
- Emergency contingencies
- Project staffing and training plans
- Airborne radioactivity effluent controls
- Evaluation of radiological source term including presence of hard-to-detect radionuclides including transuranics

The inspected areas are listed in the radiation safety sections of the report.

- (3) The inspectors reviewed RRVH activities including: review of RRVH lifting and rigging procedures, preparations, heavy load lift paths; required crane and rigging inspections; crane and rigging testing and inspections; and review of personnel training and qualification requirements

The inspectors conducted the following inspections activities throughout the vessel head removal and reinstallation process as appropriate:

- Establishment of operating conditions including defueling, reactor coolant system drain down, refueling, and vessel head detensioning/tensioning
- Inspected controls for excluding foreign materials in the reactor vessel
- Implementation of radiation protection controls
- Verification that reinstalled (used) components were suitable for use
- Installation of, use, and removal of temporary services directly related to RV head replacement activities

The inspectors conducted RRVH post-installation verifications and testing inspections including the following areas:

- Review of post-installation and verification program and its implementation
- Review of containment testing and inspections, as applicable
- Equipment hatch body sleeve ring reweld inspections and leak testing
- Review of RCS leakage testing and test results

- (4) The inspectors reviewed the weld records, weld procedure specifications, and procedure qualification records, associated with the RRVH welds identified below to verify that welding activities were performed in accordance with the requirements of ASME Section III and ASME Section IX. As documented in IR 99901379/2019-201, a sample of the associated welder performance qualification records were reviewed during the onsite vendor inspection at Equipos Nucleares S.A. (ENSA).

- Partial penetration (J-groove) welds and associated buttering welds for the following CRDM penetrations (by ID#): 2, 12, 25, 55, 62
- Dissimilar metal butt welds between the CRDM nozzle and the Integrated Latch Housing for the following CRDM penetrations (by ID#): 2, 12, 25, 55, 62
- Thermal sleeve flange welds for the following CRDM penetrations: 2, 12, 25, 55, 62
- RRVH general and mating face cladding welds (SC-10.01, SC-10.03)

- (5) The inspectors reviewed the following sample of nondestructive examinations and tests performed during fabrication of the RRVH to verify that they were performed in accordance with the design specification and as required by ASME Section III:
- Eddy Current Examination
 - Partial penetration (J-groove) welds in the following CRDM penetrations (by ID#): 2, 12, 25, 55, 62
 - Liquid Penetrant Examination
 - CETNAs after final machining
 - Partial penetration (J-groove) welds and associated buttering welds for the following CRDM penetrations (by ID#): 2, 3, 6, 9, 12, 13, 24, 25, 41, 55, 58, 62
 - RRVH forging prior to cladding
 - RVLIS nozzle assembly after final machining
 - Weld IW-14.01, RRVH vent line to coupling weld
 - Magnetic Particle Examination
 - RRVH forging after final machining for inner and mating surfaces at Japan Steel Works
 - RRVH forging prior to shipping from Japan Steel Works to ENSA
 - RRVH forging prior to cladding at ENSA
 - RRVH lifting lug base material and welds
 - Radiographic Examination
 - Weld IW-12.01.49, CETNA dissimilar metal weld
 - Weld IW-12.01.53, CETNA dissimilar metal weld
 - Weld IW-13.01.18, RVLIS nozzle assembly dissimilar metal weld
 - RRVH Hydrostatic Pressure Test
 - Ultrasonic Examination
 - RRVH forging after final machining for inner and end portions following quenching and tempering (JSW)
 - RRVH forging prior to shipping (JSW)
 - Weld IW-12.01.49, CETNA dissimilar metal weld
 - Weld IW-12.01.53, CETNA dissimilar metal weld
 - Weld IW-13.01.18, RVLIS nozzle assembly dissimilar metal weld
- (6) The inspectors verified that all required preservice examinations were complete as required by ASME Section XI and Code Case N-729-4. The inspectors also reviewed the following sample of RRVH preservice examinations to verify that they were performed in accordance with the design specification and as required by ASME Section XI and 10 CFR 50.55a:
- Ultrasonic Examination
 - Nozzles and partial penetration (J-groove) welds in the following RRVH penetrations (by number): 2, 3, 6, 9, 12, 13, 24, 25, 41, 55, 58, 62
 - CRDM/ILH nozzle assembly dissimilar metal welds for the following RRVH penetrations (by number): 42-46, 48, 50, 52, 54-65
 - CETNA dissimilar metal welds in the following RRVH penetrations (by number): 47, 49, 51, 53
 - Visual Examination
 - Bare metal visual of the RRVH

- (7) The inspectors reviewed quality assurance (QA) records to verify that the licensee had adequate oversight over activities affecting the quality of the RRVH that were performed by contractors and vendors. This included a review of the procurement specification, certificates of conformance with purchase order requirements, and the receipt inspection record for the RRVH. The inspectors also reviewed a sample of surveillance reports prepared by the licensee's Oversight Resident at vendor facilities to assess the thoroughness of the audits and the impact of audit findings on the fabrication of the RRVH. In addition, the inspectors reviewed records related to the identification and disposition of nonconformances to verify that all deviations from design drawings and deviations from the design specification had been appropriately dispositioned.

INSPECTION RESULTS

| | |
|---|-------|
| Assessment | 71007 |
| <p>The inspection of the Harris reactor vessel head replacement was completed in accordance with the NRC's inspection plan and NRC IP 71007. Additional inspection samples and applicable results are documented in the following inspection reports:</p> <ul style="list-style-type: none"> • IR 05000400/2018010 (ML18345A116) dated Nov. 30, 2018 • IR 05000400/2019412 (ML19192A342) dated July 10, 2019 • IR 05000400/2019002 (ML19217A077) dated Aug. 5, 2019 • IR 05000400/2019003 (ML19301A516) dated Oct. 24, 2019 | |

| | |
|--|-------|
| Observation: Semi-Annual Trend Review | 71152 |
| <p>The inspectors reviewed issues entered in the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, but also considered the results of inspector daily condition report screenings, licensee trending efforts, and licensee human performance results. The review nominally considered the 6-month period of July 2019 through December 2019, 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.</p> <p>The inspectors noted a continued negative trend in equipment performance challenges associated with the following plant equipment:</p> <ul style="list-style-type: none"> • essential services chilled water (ESCW) system, and • 'C' plant (instrument) air compressor <p>A negative equipment performance trend due to numerous problems and issues with the ESCW chillers was previously documented in NRC Inspection report 05000400/2017004, dated January 23, 2018. The inspectors identified continued equipment performance issues with the ESCW chillers that were documented in the following recent licensee NCRs:</p> <ul style="list-style-type: none"> • NCR 02272647, 'A' ESCW chiller chill water pump P-4A motor breaker tripped due to malfunction of the breaker mechanical latch potentially caused by component wear and/or hardened grease on May 15, 2019 | |

- NCR 02278242, 'B' ESCW chiller operated with surging conditions on June 20, 2019
- NCR 02281819, 'B' ESCW chiller was operating with surge conditions and tripped on high compressor oil/refrigerant temperature due to a refrigerant leak, lower than normal compressor oil level, and excessive service water fouling of the condenser tubes on July 14, 2019
- NCR 02291122, 'B' ESCW chiller found operating with low refrigerant level on August 24, 2019
- NCR 02297945, 'B' ESCW chiller refrigerant charge based on physical weighing found at 42.2 percent of total nominal capacity due to excessive leakage on October 20, 2019
- NCR 02300842, 'B' ESCW chiller tripped repeatedly during post-maintenance testing following outage maintenance on November 3-5, 2019
- NCR 02308559, 'B' ESCW chiller declared inoperable due to excessive cycling of pre-rotation vanes and hot gas bypass valve caused by a faulty hot gas bypass valve actuator motor potentiometer on December 26, 2019

A negative equipment performance trend due to numerous problems and issues with the plant (instrument) air compressors were previously documented in NRC Inspection report 05000400/2019002, dated August 5, 2019. The inspectors identified continued equipment performance issues with the 'C' plant air compressor that were documented in the following recent licensee NCRs:

- NCR 02288535, air header pressure oscillations due to 'C' air compressor third stage blow-off valve cycling causing elevated stage 3 inlet high temperature on August 24, 2019
- NCR 02294209, 'C' air compressor trouble due to uninterrupted power supply (UPS) fault condition alarm on September 27, 2019
- NCR 02294739, 'C' air compressor trouble due to UPS fault condition alarm on October 1, 2019
- NCR 02294876, 'C' air compressor shutdown unexpectedly during reset of UPS fault alarm on October 1, 2019
- NCR 02299196, 'C' air compressor tripped on stage 3 high vibrations resulting in entry into abnormal operating procedure (AOP)-017 for loss of instrument air on October 25, 2019
- NCR 02303100, Elevated instrument air demands due to leaking solenoid valves on November 18, 2019
- NCR 02303375, 'C' air compressor alarm due to stage 3 inlet high temperature on November 19, 2019

The licensee acknowledged the existence of continued equipment reliability issues associated with both the ESCW chillers and 'C' plant air compressor and initiated NCR 02311938 to address the adverse trend and to establish formal equipment reliability recovery actions.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On January 21, 2020, the inspectors presented the integrated inspection results to Kim Maza, Site Vice President and other members of the licensee staff.

- On November 21, 2019, the inspectors presented the Radiation Protection Occupational Safety inspection results to John Dills, Plant Manager and other members of the licensee staff.
- On November 8, 2019, the inspectors presented the Joint Exit Meeting for the ISI Inspection (IP 71111.08) and the Reactor Vessel Head Replacement Inspection (IP 71007) inspection results to Tanya Hamilton, Site Vice President and other members of the licensee staff.

DOCUMENTS REVIEWED

| Inspection Procedure | Type | Designation | Description or Title | Revision (Rev.) or Date |
|----------------------|---|------------------------------|--|-------------------------|
| 71007 | Corrective Action Documents Resulting from Inspection | NCR 02300921 | NRC Observation on ENSA Weld Record | 11/05/2019 |
| | Engineering Changes | 294345 | RRVH and Insulation Design and Installation | Rev. 0 |
| | | 294346 | CRDM and DRPI Cable Design and Installation | Rev. 0 |
| | | 294347 | Outage Oversight for ORVH/RRVH Transport and Haul Path | Rev. 0 |
| | | 294348 | ORVH and RRVH Rigging and Transport | Rev. 0 |
| | | 294355 | Equipment Hatch and Interference Removal | Rev. 0 |
| | Miscellaneous | | Shearon Harris RRVH Weekly Oversight Report | 06/27/2016 |
| | | | Shearon Harris RRVH Weekly Oversight Report | 07/04/2016 |
| | | | Shearon Harris RRVH Weekly Oversight Report | 07/11/2016 |
| | | | Shearon Harris RRVH Weekly Oversight Report | 08/21/2016 |
| | | | Shearon Harris RRVH Oversight Inspection Detail Report | 04/08/2017 |
| | | 1JT1FIP001-1.120-SW-1 | Duke Energy Vendor Quality Observation Report - Weld of Lifting Lug to Vessel Head | 06/09/2017 |
| | | 23-9251746-001 | Quality Assurance Data Package for Shearon Harris Replacement Reactor Vessel Head | 09/06/2019 |
| | | HNP-G-0009 | Procurement Specification for the Replacement Reactor Vessel Head | Rev. 7 |
| | Procedures | AD-HS-ALL-0101 | Industrial Safety | Rev. 11 |
| | | AD-MN-ALL-0005 | Nuclear Planning | Rev. 21 |
| | | AD-MN-ALL-0009 | Nuclear Rigging, Lifting, and Material Handling | Rev. 6 |
| | | PD-MN-ALL-0009 | Duke Energy Nuclear Rigger's Handbook | Rev. 7 |
| | | PD-MN-ALL-0011 | Material Handling | Rev. 5 |
| | Work Orders | 20264004 | EC 294347, Outage Oversight for ORVH/RRVH Transport and Haul Path | Rev. 0 |
| 71111.01 | Corrective Action Documents | Action Request (AR) 02295316 | 2019 Winter Readiness | 10/03/2019 |
| | | AR 02249778 | 2018 Winter Performance | 12/20/2018 |
| | | NCR 02305058 | EUH-88 cycling heating element on and off repeatedly | 11/30/2019 |

| Inspection Procedure | Type | Designation | Description or Title | Revision (Rev.) or Date |
|----------------------|-----------------------------|---|--|-------------------------|
| | Procedures | AD-EG-ALL-1523 | Temporary Ignition Source Control | Rev. 1 |
| | | AD-WC-ALL-0230 | Seasonal Readiness | Rev. 0 |
| | | AP-301 | Seasonal Weather Preparations and Monitoring | Rev. 85 |
| | | OP-161.01 | Operations Freeze Protection and Temperature Maintenance Systems | Rev. 48 |
| | | ORT-1415 | Electric Unit Heater Check Monthly Interval - September Through March Mode: ALL | Rev. 14 |
| 71111.04Q | Procedures | OP-112 | Containment Spray System | Rev. 46 |
| | | OP-116 | Fuel Pool Cooling System | Rev. 45 |
| | | OP-137 | Auxiliary Feedwater System | Rev. 46 |
| | | OP-155 | Diesel Generator Emergency Power System | Rev. 89 |
| 71111.05Q | Fire Plans | CSD-HNP-PFP-CNMT | Containment Building Pre-Fire Plan | Rev. 0 |
| | | CSD-HNP-PFP-DGB | Diesel Generator Building Pre-Fire Plan | Rev. 1 |
| | | CSD-HNP-PFP-RAB-190-216 | Reactor Auxiliary Building Elevations 190 and 216 Pre-Fire Plan | Rev. 1 |
| | | CSD-HNP-PFP-RAB-236 | Reactor Auxiliary Building Elevation 236 Pre-Fire Plan | Rev. 2 |
| | | CSD-HNP-PFP-RAB-286 | Reactor Auxiliary Building Elevation 286 Pre-Fire Plan | Rev. 1 |
| | Miscellaneous | | Fire Protection Permit and Impairment Log Entries | |
| | Procedures | AD-EG-ALL-1520 | Transient Combustible Control | Rev. 12 |
| | | FPP-001 | Fire Protection Program Manual | Rev. 44 |
| | | FPP-013 | Fire Protection - Minimum Requirements, Mitigating Actions and Surveillance Requirements | Rev. 101 |
| 71111.06 | Procedures | AP-046 | Control of Environmental Protective Features | Rev. 6 |
| | Work Orders | 20208141-02, 20208141-03, and 20208141-04 | Inspect 'B' Train Manholes and Associated Cables | 12/11/2019 |
| 71111.07A | Corrective Action Documents | NCR 02301003 | A EDG JW Heat Exchanger Tube Blockage | 11/06/2019 |
| | Procedures | AD-EG-ALL-1312 | Raw Water Program Implementation | Rev. 0 |

| Inspection Procedure | Type | Designation | Description or Title | Revision (Rev.) or Date |
|----------------------|-----------------------------|---|--|-------------------------|
| | | EPT-163 | Generic Letter 89-13 Inspection (Raw Water Systems and Local Area Air Handler Inspection and Documentation) | Rev. 18 |
| | | MPT-M0091 | Heat Exchanger Opening/Closure for NRC Generic Letter 89-13 Inspections | Rev. 18 |
| | Work Orders | 20268979 and 20268530 | Inspect, clean, and perform eddy current inspection of the 'B' CCW heat exchanger | 10/20/2019 |
| | | 20269100 and 20268555 | Inspect, clean, and perform eddy current testing on 'B' EDG jacket water heat exchangers | 10/22/2019 |
| 71111.08P | Calibration Records | | Certificate of Calibration for Infrared Thermometer, serial number 32610661WS | 07/01/2019 |
| | | | Certificate of Calibration for Infrared Thermometer, serial number 31420250WS | 07/02/2019 |
| | | L-19-018 | Ultrasonic Instrument Linearity | 10/15/2019 |
| | Corrective Action Documents | 3SF-FPRP2B requires boric acid corrosion evaluation | 3SF-FPRP2B requires boric acid corrosion evaluation | |
| | | NCR 02222982 | Weepage from ESW Piping <1dpm Pinhole Leak | |
| | | NCR 02231579 | Incorrect Coverage Claimed on CASS Welds | |
| | | NCR 02237623 | B-SB Emergency Diesel Generator - Broken Bolts | |
| | | NCR 02242606 | B MSR North Relief Wisping Steam | |
| | | NCR 02244032 | 1CS-340 Has Additional Boric Acid Buildup | |
| | | NCR 02268780 | AISI Relief Requests Not Submitted for CC N-770 Exams | |
| | | NCR 02270068 | 1SP-217, 'A' SG Sampling, Failed to Open | |
| | | NCR 02270264 | Pinhole Leak on the Service Water Piping to B-SB CSIP Cooler | |
| | | NCR 02287589 | Active Boric Acid Leak on 2&3A SFCP | |
| | Engineering Evaluations | AR 02272087 | Leakage Is Coming from the Flange of 1SF-32 | |
| | | AR 02280487 | Excessive but Controlled Boric Acid Leakage in Proximity of the Mechanical Seals of SFP Cooling Pump 2&3B (3SF-E012) | |
| | | AR 02287589 | 2SF-37 Pump Casing to Pipe Vent | |
| | | NCR 02271662 | Component Tag # 1SF-1 (SFP Supply to "A" Train Isolation) | |
| | | NCR 02296763 | 1SI-181 Dry White Leakage (initially identified as wet) | |

| Inspection Procedure | Type | Designation | Description or Title | Revision (Rev.) or Date |
|----------------------|---------------|---|---|-------------------------|
| | Miscellaneous | | Welder Process Qualification Report for J. Weatherford | |
| | | | Magnaflux Ultragel II Certificate of Certification, Batch #19H060 | 08/21/2019 |
| | | | Magnaflux Spotcheck Remover SKC-S Certificate of Certification, Batch #15F15K | 06/24/2015 |
| | | | Magnaflux Spotcheck Developer SKD-S2 Certificate of Certification, Batch #18A06K | 01/12/2018 |
| | | | Magnaflux Spotcheck Penetrant SKL-SP2 Certificate of Certification, Batch #18C01K | 03/02/2018 |
| | | | Welder Continuity Logs for J. Weatherford | |
| | | | NDE Personnel Certification Records for P. Jensen, R. Healey, M. Hill, D. King, and R. Koster | |
| | | | Weld Record for Weld 1-CS-651-FW-109; Weld Doc. No. 190485 | |
| | | HNP-PM4-002 | Fourth Interval Inservice Inspection Plan and Third Interval Containment Inservice Inspection Plan | Rev. 1 |
| | | Procedure Qualification Record L-109 | SMAW Manual | Rev. 1 |
| | | Procedure Qualification Record L-128A | GTAW Manual | Rev. 1 |
| | | Welding Procedure Specification GTSM0808-01 | GTAW or SMAW or Combination | Rev. 11 |
| | NDE Reports | Report Number PT-19-001 | Liquid Penetrant Examination of II-RHR-01RHRA-STVW-06A,B,C; Skirt to Vessel Weld – ASME Class 2 | 10/17/2019 |
| | | Report Number VE-19-003 | Ultrasonic Examination of II-PZR-01NTHW-10, Safety Nozzle to Upper Head, 15" diameter nozzle – ASME Class 1 | 10/25/2019 |
| | | Report Number VE-19-004 | Ultrasonic Examination of II-PZR-01NTHW-11, Safety Nozzle to Upper Head, 15" diameter nozzle – ASME Class 1 | 10/25/2019 |
| | | Report Number | Ultrasonic Examination of II-PZR-01NTHW-12, Safety Nozzle | 10/31/2019 |

| Inspection Procedure | Type | Designation | Description or Title | Revision (Rev.) or Date |
|----------------------|---------------|---|--|-------------------------|
| | | VE-19-005 | to Upper Head, 15" diameter nozzle – ASME Class 1 | |
| | | Report Number VT-19-052-001-RV-BMI (1-50) | Visual Examination of Reactor Vessel Bottom Mounted Instrumentation Penetrations - ASME Class 1 | 10/23/2019 |
| | Procedures | NDE-NE-ALL-4101 | Liquid Penetrant Examination | Rev. 2 |
| | | NDE-NE-ALL-6212 | Utilization of PDI-UT-12 Procedure for Manual Phased Array Ultrasonic Examination of Reactor Pressure Vessel Welds | Rev. 2 |
| | | NDE-NE-ALL-6213 | Utilization of PDI-UT-13 Procedure for Manual Phased Array Ultrasonic Examination of Reactor Pressure Vessel Nozzle to Shell Welds and Nozzle Inner Radius Regions | Rev. 2 |
| | | NDE-NE-ALL-7203 | Visual Examination of PWR Reactor Pressure Vessel Bottom Mounted Instrument Penetrations | Rev. 2 |
| | | PDI-UT-012 | Procedure for Manual Phased Array Ultrasonic Examination of Reactor Pressure Vessel Welds | Rev. E |
| | | PDI-UT-013 | Procedure for Manual Phased Array Ultrasonic Examination of Reactor Pressure Vessel Nozzle to Shell Welds and Nozzle Inner Radius Regions | Rev. H |
| | Work Orders | Work Order 20277214 | M,1CS-748, Replace Valve | |
| 71111.11Q | Miscellaneous | Reactivity Manipulation Plan | H1C22 Shutdown to Support RFO22 | Rev. 0 |
| | | Reactivity Manipulation Plan | H1C23 Initial Power Escallation | Rev. 0 |
| | Procedures | AD-OP-ALL-1000 | Conduct of Operations | Rev. 15 |
| | | AOP-032 | High RCS Activity | Rev. 22 |
| | | AOP-035 | Main Transformer Trouble | Rev. 23 |
| | | AOP-038 | Rapid Downpower | Rev. 47 |
| | | EOP-E-0 | Reactor Trip or Safety Injection | Rev. 15 |
| | | GP-004 | Reactor Startup (Mode 3 to Mode 2) | Rev. 66 |
| | | GP-006 | Normal Plant Shutdown From Power Operation to Hot Standby (Mode 1 to Mode 3) | Rev. 90 |
| | | GP-008 | Draining the Reactor Coolant System | Rev. 48 |

| Inspection Procedure | Type | Designation | Description or Title | Revision (Rev.) or Date |
|----------------------|---|----------------------|--|-------------------------|
| | | OMM-001 | Operations Administrative Requirements | Rev. 117 |
| 71111.12 | Corrective Action Documents | NCR 02272647 | A ESCW chill water pump P-4A motor trip | 05/29/2019 |
| | | NCR 02297036 | Source range nuclear instrument NI-31 failure due to water intrusion | 10/15/2019 |
| | | NCR 02301522 | B RHR Pump Breaker Overcurrent/Short Circuit | 11/09/2019 |
| | Miscellaneous | Vendor Manual VM-OJZ | Circuit Breakers and Switchgear (for Siemens 480 volt RLN-1600 breakers) | Rev. 26 |
| | Work Orders | 20158230 | Troubleshooting and replacement of B RHR pump breaker | 11/09/2019 |
| | | 20363347 | B RHR pump motor breaker replacement following overcurrent/short circuit trip | 11/09/2019 |
| 71111.13 | Calculations | HNP-F/PSA-0119 | Online Phoenix PRA Model | Rev. 1 |
| | Corrective Action Documents Resulting from Inspection | NCR 02298160 | HNP site risk procedure needs clarification | 10/21/2019 |
| | Procedures | AD-NF-ALL-0501 | Electronic Risk Assessment Tool (ERAT) | Rev. 4 |
| | | AD-WC-ALL-0200 | On-Line Work Management | Revs. 14 and 15 |
| | | AD-WC-ALL-0240 | On-Line Risk Management Process | Rev. 1 |
| | | AD-WC-ALL-0410 | Work Activity Integrated Risk Management | Revs. 8 and 9 |
| | | AD-WC-HNP-0420 | HNP Shutdown Risk Management | Revs. 4 and 5 |
| 71111.15 | Corrective Action Documents | NCR 02297036 | Failure of source range instrument NI-31 due to water intrusion into detector assembly | 10/15/2019 |
| | Corrective Action Documents Resulting from Inspection | PRR 02295506 | Revise AP-545 to incorporate 29 CFR 1910 requirements | 10/04/2019 |
| | Procedures | AD-OP-ALL-0105 | Operability Determinations and Functionality Assessments | Revs. 4 and 5 |
| | | EST-209 | Type B Local Leak Rate Tests | Rev. 19 |
| | | OWP-AL | Containment Air Locks | Rev. 0 |

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| 71111.18 | Calculations | HNEI-0400-0021 | Engineering Instruction Supporting EC 416637 | Rev. 0 |
| | Engineering Evaluations | Action Request 02304345 | Evaluate Removal of Loop 3 from Median RCS Tavg | 11/24/2019 |
| 71111.19 | Procedures | PLP-400 | Post Maintenance Testing | Rev. 64 |
| | | PM-E0044 | 480 VAC Siemens Type RLN(F) Load Center Breaker and Cubicle P.M. | Rev. 23 |
| | Work Orders | 13469924 | 480 VAC Breaker PM for 1A-SA Containment Spray Pump Motor | 12/18/2019 |
| | | 20318026 and 20326794 | TDAFW speed instrumentation and governor control system calibration | 12/10/2019 |
| | | 20363347 | B RHR pump motor breaker replacement | 11/09/2019 |
| 71111.20 | Calculations | HNEI-0400-0006 | Harris FHP-014 Shuffle Sequence Preparation Requirements | 04/30/2019 |
| | | HNP-F/NFSA-0328 | Determination of the Bounding Decay Heat of the Shearon Harris Reactor Core and Spent Fuel Pool | 05/15/2019 |
| | Miscellaneous | HNEI-0400-0012 | Harris Cycle 22 Core Operating Limits Report (COLR) | Rev. 0 |
| | | HNEI-0400-0016 | Harris Cycle 23 Core Operating Limits Report (COLR) | Revs. 0, 1, and 2 |
| | Procedures | AP-545 | Containment Entries | Rev. 61 |
| | | EM-217 | Temporary Power Feed to Spent Fuel Pool Cooling Pump 1&4B-SB | Rev. 10 |
| | | FHP-010 | Core Loading Verification | Rev. 21 |
| | | FHP-014 | Fuel and Insert Shuffle Sequence | Rev. 65 |
| | | GP-001 | Reactor Coolant System Fill and Vent Mode 5 | Rev. 43 |
| | | GP-002 | Normal Plant Heatup from Cold Solid to Hot Subcritical Mode 5 to Mode 3 | Rev. 72 |
| | | GP-004 | Reactor Startup (Mode 3 to Mode 2) | Rev. 66 |
| | | GP-005 | Power Operation (Mode 2 to Mode 1) | Rev. 107 |
| | | GP-006 | Normal Plant Shutdown from Power Operation to Hot Standby (Mode 1 to Mode 3) | Rev. 90 |
| | | GP-007 | Normal Plant Cooldown Mode 3 to Mode 5 | Rev. 70 |
| | | GP-008 | Draining the Reactor Coolant System | Rev. 48 |
| | | GP-009 | Refueling Cavity Fill, Refueling and Drain of the Refueling Cavity Modes 5-6-5 | Rev. 68 |

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|----------------------|-----------------------------|--|--|-------------------------|
| | | OST-1081 | Containment Visual Inspection When Containment Integrity is Required Mode 5 | Rev. 21 |
| 71111.22 | Procedures | ISI-114 | General Use of Local Leak Rate Testing Equipment | Rev. 8 |
| 71124.01 | Corrective Action Documents | AR 02170854 | Waste Gas leaks required posting ARA due to Noble Gas | |
| | | AR 02188379 | WANO AFI, RP.1, Alpha Monitoring Program Implementation | |
| | | AR 02196003 | Hopewell Calibration Source Door Hinge Degradation | |
| | | AR 02199037 | Unanticipated Dose Rate Alarm on Self-Brief RWP | |
| | | AR 02200205 | Attempted LHRA Entry without Permission | |
| | | AR 02202081 | HRA Entry on Wrong RWP Task | |
| | | AR 02261334 | Received Unexpected SRD dose rate alarm | |
| | | AR 02286795 | Unanticipated Dose Rate Alarm in Mechanical Penetration Room | |
| | Miscellaneous | Fuel Handling Building Underwater Material Storage Log | Fuel Handling Building Underwater Material Storage Log | |
| | | Semi-Annual Source Inventory | Semi-Annual Source Inventory | 05/15/2019 |
| | Procedures | AD-RP-ALL-0002 | Radiation and Contamination Surveys | Rev. 2 |
| | | AD-RP-ALL-0004 | Radiological Posting and Labeling | Rev. 4 |
| | | AD-RP-ALL-0005 | Access Controls for High and Locked High Radiation Areas | Rev. 1 |
| | | AD-RP-ALL-0007 | Control of Radioactive Material | Rev. 0 |
| | | AD-RP-ALL-2002 | SRD Alarms | Rev. 3 |
| | | AD-RP-ALL-2011 | Radiation Protection Briefings | Rev. 4 |
| | | AD-RP-ALL-2014 | Work in Alpha Environments | Rev. 7 |
| | | AD-RP-ALL-2017 | Access Controls to Very High Radiation Areas and Supplemental Access Controls for HRA and LHRA | Rev. 7 |
| | | AD-RP-ALL-3002 | Unconditional Release of Material | Rev. 1 |
| | | HPP-800 | Handling Radioactive Material | Rev. 64 |
| | | PD-RP-ALL-0001 | Radiation Worker Responsibilities | Rev. 11 |
| | | TE-RP-ALL-4005 | Investigation of Unusual Dosimetry Occurrence or Possible | Rev. 1 |

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|----------------------|-------------------|-------------------|---|-------------------------|
| | Radiation Surveys | | Overexposure | |
| | | HNP-M-20180416-14 | RCB 236' Top of Heath Exchanger Room | 04/16/2018 |
| | | HNP-M-20180429-16 | Incore Sump Down Post Survey | 04/29/2018 |
| | | HNP-M-20180502-5 | 1-WPB 261 FUEL TRANSFER TUBE PIT DOWNPOSTING FROM VHRA TO HRA | 05/02/2018 |
| | | HNP-M-20190306-8 | CVCS Demins Bypassed / Monthly Survey | 03/06/2019 |
| | | HNP-M-20190514-3 | RCB 286 Equipment Hatch Lead Testing | 05/14/2019 |
| | | HNP-M-20190806-7 | Radiography Walk Down | 08/06/2019 |
| | | HNP-M-20190813-5 | Scaffold in RAB 236' Pen. Mech. & Follow Up Investigation | 08/13/2019 |
| | | HNP-M-20191016-24 | RCB 261' Secondary Side SG "A" | 10/16/2019 |
| | | HNP-M-20191022-40 | CHG Pump Mezzanine Cutout 1CS748 | 10/22/2019 |
| | | HNP-M-20191023-17 | RCB 261'RCP C Seal Replacement | 10/23/2019 |
| | | HNP-M-20191023-9 | RCB 254' "B" Steam Generator Bowl Manway Removal | 10/23/2019 |
| 71124.03 | Procedures | AD-RP-ALL, 0008 | Use and Control of HEPA Filtration and Vacuum Equipment | Rev. 0 |
| | | AD-RP-ALL, 2015 | Alpha Radiation Characterization | Rev. 3 |
| | | AD-RP-ALL, 2019 | TEDE-ALARA Evaluations and DAC-Hour Tracking | Rev. 3 |
| | | AP-512 | Use of Respiratory Equipment | Rev. 48 |
| 71124.04 | Procedures | AD-RP-ALL-0006 | Personnel Contamination Monitoring | Rev. 1 |
| | | AD-RP-ALL-4010 | Internal Dose Assessment | Rev. 2 |
| | | AD-RP-ALL-4011 | In Vitro Bioassay | Rev. 2 |
| | | AD-RP-ALL-4015 | Dosimetry in Gradient Radiation Fields | Rev. 0 |
| | | TE-RP-ALL-4001 | Declared Pregnant Worker | Rev. 3 |
| | | TE-RP-ALL-4005 | Investigation of Unusual Dosimetry Occurrence or Possible | Rev. 1 |

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|----------------------|-----------------------------|--|---|-------------------------|
| 71124.05 | Calibration Records | | Overexposure | |
| | | TP-RP-ALL-2007 | Neutron Dose Tracking | Rev. 3 |
| | | EnRad 10480, SN 1111-2988 | Verification of the Calibration of the Hopewell BX3 Calibrator at Harris Nuclear Plant | 03/28/2018 |
| | | EnRad 10480, SN 1111-2988 | Verification of the Calibration of the Hopewell BX3 Calibrator at Harris Nuclear Plant | 03/28/2019 |
| | | ENRAD 10790, SN 10144 | Annual Verification of the J.L Shepherd Model 28 Open Air Calibration Range Irradiator at Harris Nuclear Plant | 03/28/2019 |
| | | FASTSCAN1 | 2017 RECALIBRATION OF THE CANBERRA APEX-INVIVO "FASTSCAN1" FASTSCAN COUNTING SYSTEM AT THE DUKE ENERGY SHEARON HARRIS NUCLEAR PLANT | 11/29/2017 |
| | | FASTSCAN1 | 2018 RECALIBRATION OF THE CANBERRA APEX-INVIVO "FASTSCAN1" FASTSCAN COUNTING SYSTEM AT THE DUKE ENERGY SHEARON HARRIS NUCLEAR PLANT | 11/13/2018 |
| | Corrective Action Documents | ARs 02257046, 02244746, 02246597, and 02257570 | Various Corrective Action Reports | Various |
| | | Self-Assessment Number: 02271575-07 | Harris Instrument Program | 09/26/2019 |
| | Miscellaneous | S/N 105500 | Eckert & Ziegler Standard Reference Source Certificate of Calibration (Cs-137 Source) | 03/22/2017 |
| | | S/N 034 | Model RT-11 High Range Radiation Monitor Calibrator Calibration Report | 01/26/1985 |
| | | S/N 105499 | Eckert & Ziegler Standard Reference Source Certificate of Calibration (Am-241 Source) | 03/22/2017 |
| | Work Orders | 13507419 | Containment Pre-Entry Purge Radiation Monitor REM-01LT-3502B Calibration | 10/4/2016 |
| | | 13512317 | Containment High Range Radiation Monitor RM-01CR-3589SA Calibration | 10/17/2016 |

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| | | 20130782 | Containment Pre-Entry Purge Radiation Monitor REM-01LT-3502B Calibration | 04/17/2018 |
| | | 20131381 | Containment High Range Radiation Monitor RM-01CR-3589SA Calibration | 04/26/2018 |
| | | 20296635 | Perform SPP-0050 and MST-10415 for Transfer Calibration on REM-01 L T-35028 (Containment Pre-Entry Purge Radiation Monitor) | 10/23/2014 |
| 71151 | Calculations | HNP-F/PSA-0068 | NRC Mitigating System Performance Index (MSPI) PRA Input Document | Rev. 11 |
| | | HNP-M/MECH-1231 | Mitigating System Performance Index Basis Document | Rev. 2 |
| | Miscellaneous | | Selected operator logs, tagouts, WOs, and NCRs related to heat removal and cooling water systems | |
| | Procedures | AD-EG-ALL-1217 | Mitigating System Performance Index (MSPI) | Rev. 0 |
| | | AD-PI-ALL-0700 | Performance Indicators | Rev. 2 |