



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II**

245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

September 7, 2018

Ms. Tanya Hamilton
Site Vice President
Shearon Harris Nuclear Power Plant
M/C HNP01
New Hill, NC 27562-0165

**SUBJECT: ERRATA – SHEARON HARRIS NUCLEAR POWER PLANT – NUCLEAR
REGULATORY COMMISSION INTEGRATED INSPECTION REPORT
05000400/2018002**

Dear Ms. Hamilton:

On August 10, 2018, the U.S. Nuclear Regulatory Commission (NRC) issued the subject inspection report for Shearon Harris Nuclear Power Plant, Agencywide Document and Management System (ADAMS) Accession Number ML18222A165. After the inspection report was issued, the NRC noted that the closure statement for URI 05000400/2017003-02, was inadvertently entered at the end of the violation on page 21 instead of the applicable violation on page 19. Accordingly, we have revised the body of Inspection Report (IR) 05000400/2018002, to document the necessary changes.

This reissued report does not change any NRC position that has been communicated in the previously issued report.

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 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

T. Hamilton

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I apologize for any inconvenience this error may have caused. If you have any questions, please contact me at (404) 997-4609.

Sincerely,

/RA/

Steven D. Rose, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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

Enclosure:
IR 05000400/2018002

cc: Distribution via ListServ

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REGULATORY COMMISSION INTEGRATED INSPECTION REPORT
05000400/2018002 September 7, 2018

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ADAMS Accession No. ML18250A054

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number: 50-400

License Number: NPF-63

Report Number: 05000400/2018002

Enterprise Identifier: I-2018-002-0042

Licensee: Duke Energy Progress, LLC

Facility: Shearon Harris Nuclear Power Plant

Location: 5413 Shearon Harris Road
New Hill, NC 27562

Inspection Dates: April 1, 2018 to June 30, 2018, Unit 1

Inspectors: J. Zeiler, Senior Resident Inspector
A. Patz, Resident Inspector
A. Butcavage, Reactor Inspector (Section 71111.08)
C. Fontana, Emergency Preparedness Inspector (Section 1EP03, 1EP05,
and 71151)
R. Kellner, Senior Health Physicist (Section 71124.01)
J. Panfel, Health Physicist (Section 71124.08)
S. Sanchez, Senior Emergency Preparedness Inspector (Sections
1EP02, 1EP04, and 1EP05)
J. Walker, Emergency Preparedness Inspector (In-Training)
R. Williams, Senior Reactor Inspector (Section 71111.08)

Approved By: S. Rose, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring licensee's performance by conducting a quarterly integrated inspection at Shearon Harris, Unit 1 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. NRC and self-revealed findings, violations, and additional items are summarized in the table below.

List of Findings and Violations

Failure to Promptly Identify and Correct a Condition Adverse to Quality For a Through-Wall Leak in the ESW Screen Wash Piping			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000400/2018002-01 Opened/Closed	P.1 - Identification	71111.04
An NRC-identified Green NCV of Title 10 Code of Federal Regulations (CFR) 50, Appendix B, Criterion XVI, "Corrective Actions," was identified for the licensee's failure to promptly identify and correct a condition adverse to quality involving through-wall leakage in the 'B' train ESW screen wash piping. Specifically, on April 30, 2018, operators failed to initiate a work request or condition report after security personnel reported through-wall leakage in the 'B' train ESW screen wash piping. No further follow-up or corrective actions were taken until May 3, 2018, when NRC inspectors identified the same through-wall piping leakage during a plant walkdown inspection and reported the degraded condition.			

Inadequate Fire Brigade Performance Assessment of Announced Fire Drill			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000400/2018002-02 Opened/Closed	P.6 - Self-Assessment	71111.05AQ
An NRC-identified Green NCV of 10 CFR 50.48(c) and National Fire Protection Association (NFPA) Standard 805, Section 3.4.3, "Training and Drills," was identified for the licensee's failure to adequately assess the fire brigade performance during an announced fire drill conducted March 21, 2018. Specifically, the inspectors identified several fire brigade performance deficiencies, improvement items, and lessons learned that were not identified and documented in the licensee's corrective action program during the fire drill critique as required by the licensee's fire drill administrative control procedure.			

Failure to Adequately Document Changes to the Emergency Plan			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Emergency Preparedness	Severity Level IV NCV 05000400/2018002-03 Opened/Closed	Not Applicable	71114.04 Other Activities

The inspectors identified multiple examples of a Severity Level IV (SL-IV) NCV of 10 CFR 50.54(q)(3), for changes to the licensee's radiological emergency plan (E-Plan) associated with protective action recommendation (PAR) procedures and emergency response equipment that failed to demonstrate that the changes would not reduce the effectiveness of the E-Plan. Specifically, the licensee did not provide an adequate analysis to demonstrate that the removal of the sheltering in-place PARs was not a reduction in effectiveness of the E-Plan. Additionally, the licensee did not perform an analysis demonstrating that the removal of a temporary diesel generator providing a backup source of power to the Technical Support Center (TSC) did not reduce the effectiveness of the E-Plan.

Failure to Implement Adequate Steam Generator Blowdown Demineralizer Control Procedures			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000400/2018002-04 Opened/Closed	H.12 - Avoid Complacency	71152
A self-revealing Green NCV of Technical Specifications (TS) 6.8.1.a, "Procedures and Programs," was identified for licensee's failure to establish and implement adequate steam generator blowdown demineralizer control operating procedures resulting in exceeding secondary water chemistry Action Level 3 criteria for impurities in the steam generators. Specifically, the licensee did not implement adequate isolation valve controls between the demineralizer resin regeneration system and the feedwater system during resin regeneration activities. This open path allowed leakage of sulfates and chlorides into the feedwater system. The level of these impurities exceeded the secondary chemistry Action Level 3 threshold and resulted in an unplanned shutdown.			

Failure to Follow Secondary Water Chemistry Plan for Elevated Levels of Secondary Water Impurities			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000400/2018002-05 Opened/Closed	H.8 - Procedure Adherence	71152
An NRC-identified Green NCV of TS 6.8.4.c, "Secondary Water Chemistry," was identified for the licensee's failure to follow secondary water chemistry control requirements in accordance with procedure CSD-CP-HNP-0002, Harris Secondary Water Chemistry Strategic Plan. . Specifically, the licensee remained at 100% power for approximately 10 hours after entering secondary water chemistry Action Level 3 due to elevated chlorine and sulfates chemical impurity concentrations, which was contrary to the procedure requirements to downpower the unit to below 5% power as quickly as safe plant operation permits. This unit downpower delay allowed additional time for the chemical impurities to adversely affect the steam generators.			

Failure to Implement Viable Compensatory Actions with Seismic Monitoring System Out of Service for Planned Preventive Maintenance			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Emergency Preparedness	Green NCV 05000400/2018002-06 Opened/Closed	H.5 - Work Management	71152
An NRC-identified Green NCV of 10 CFR 50.54(q)(2) was identified for the licensee's failure to follow and maintain the effectiveness of its emergency plan that meets the requirements of the risk-significant emergency planning standard 10 CFR 50.47(b)(4). Specifically, the licensee failed to implement viable compensatory actions while conducting planned preventive maintenance that rendered both seismic monitoring systems unavailable for 53.5 hours resulting in a loss of emergency assessment capability for declaring a Notification of Unusual Event under Emergency Action Level (EAL) HU2.1 for a seismic event.			

Additional Tracking Items

Type	Issue number	Title	Report Section	Status
URI	05000400/2018001-01	Adequacy of Fire Brigade Response During Fire Drill	71111.05AQ	Closed
LER	05000400/2018001-00	Automatic Actuation of Auxiliary Feedwater System	71153	Closed
LER	05000400/2018002-00	Reactor Pressure Vessel Closure Head Penetration Nozzle Indications Attributed to Primary Water Stress Corrosion Cracking	71153	Closed
URI	05000400/2017003-02	Review of Removal of the Technical Support Center (TSC) Temporary Diesel Generator	Other Activities	Closed

PLANT STATUS

The unit began the inspection period at 100 percent rated thermal power. On April 7, 2018, the unit was shutdown to begin the refueling outage (RFO-21). The refueling outage was completed on May 10, 2018. The unit returned to 100 percent rated thermal power on May 13, 2018, 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 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

Summer Readiness (1 Sample)

The inspectors evaluated summer readiness for offsite and alternate alternating current (AC) power systems.

Seasonal Extreme Weather (1 Sample)

The inspectors evaluated readiness for seasonal extreme weather conditions prior to the onset of seasonal hot weather.

71111.04 - Equipment Alignment

Partial Walkdown (4 Samples)

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

- (1) 'A' and 'B' train residual heat removal (RHR) systems during refueling outage on April 7, 2018
- (2) 1&4B and 2&3B spent fuel pool cooling systems during defueling activities on April 13, 2018
- (3) 'A' and 'B' train emergency service water (ESW) systems during preparations for Mode 4 entry on May 3, 2018
- (4) 'B' essential services chilled water system (ESCW) while 'A' ESCW was out of service for preventive maintenance on May 22, 2018

Complete Walkdown (1 Sample)

The inspectors evaluated system configuration during a complete walkdown of the 125V direct current (DC) electrical system on June 28, 2018.

71111.05AQ - Fire Protection Annual/Quarterly

Quarterly Inspection (5 Samples)

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

- (1) 'A' and 'B' emergency diesel generator (EDG) rooms (fire zones 1-D-1-DGA-RM, 1-D-1-DGA-ER, 1-D-1-DGA-ASU, 1-D-1-DGB-RM, 1-D-1-DGB-ER, and 1-D-1-DGB-ASU) on April 4, 2018
- (2) 'A' and 'B' RHR pump rooms (fire zones 1-A-1-PA and 1-A-1-PB) on April 15, 2018
- (3) Containment 221', 236', 261', and 286' elevations (fire zones 1-C-1-RCP-1A, 1-C-1-RCP-1B, 1C-1-RCP-1C, and 1-C-1-BAL) on April 28, 2018
- (4) 'A' and 'B' ESW pump intake structure (fire zones 12-I-ESWPA, 12-I-ESWPA-BAL, 12-I-ESWPB, and 12-I-ESWPB-BAL) on May 3, 2018
- (5) 'A' and 'B' ESCW chillers, volume control tank valve gallery, 'A' and 'B' RHR heat exchanger rooms, and 'A' and 'B' electrical penetration rooms (fire zones 1-A-4-CHLR, 1-A-BAL-E, 1-A-34-RHXA, 1-A-34-RHXB, 1-A-EPA, and 1-A-EPB) on May 22, 2018

Annual Inspection (No Sample)

The inspectors conducted follow-up of URI 05000400/2018001-01 dealing with previously identified fire brigade drill performance issues.

71111.06 - Flood Protection Measures

Cables (1 Sample)

The inspectors evaluated cable submergence protection in:

- (1) Cable vaults M523A, M523B, and M523G, that contain 'A' train safety-related cables between the emergency diesel generator building and the turbine building on May 22, 2018.

71111.07 - Heat Sink Performance

Heat Sink (2 Samples)

The inspectors evaluated the 'A' and 'B' train component cooling water (CCW) heat exchanger performance on April 16, 2018.

71111.08 - Inservice Inspection Activities (1 Sample)

The inspectors evaluated pressurized water reactor non-destructive testing by reviewing the following examinations from April 8 to April 16, 2018:

- (1) Ultrasonic Examination (UT):
- a) Phased Array (PA)-UT of DMW-01NSEN-18WOL, Nozzle-to-Safe End weld, ASME Class 1 (Observed)
 - b) PA-UT of DMW-01NSEN-19WOL, Nozzle-to-Safe End weld, ASME Class 1 (Observed)
 - c) PA-UT of SMW-1-RC-FW-329WOL, Safe End-to-Pipe weld, ASME Class 1 (Observed)
 - d) PA-UT of SMW-1-RC-FW-334WOL, Safe End-to-Pipe weld, ASME Class 1 (Observed)
 - e) UT of control rod drive mechanism (CRDM) penetration to reactor vessel head weld, Penetrations No's. 2, 11, 57, 61, 65, ASME Class 1 (Observed)
 - f) UT of CRDM penetration to reactor vessel head weld, Penetration No. 33, ASME Class 1 (Reviewed)
- (2) Liquid Penetrant Examination (PT):
- a) PT of 2SW10-37SA-1, 3/4" socket to pipe weld, ASME Class 2 - This review included a pressure boundary welding activity (Reviewed)
 - b) PT of reactor vessel head Penetration 33, ASME Code Class 1 (Observed)
 - c) PT of reactor vessel head CRDM Penetration 63, ASME Code Class 1, Previous Repaired Penetration (Observed)
- (3) Visual Examination (VT):
- a) VT-3 of the containment liner elevation 236' (Observed)
 - b) VT-2 of reactor vessel head CRDM Penetrations 3, 7, 8, 27, 33 and 47, ASME Code Class 1 (Observed)
- (4) Eddy Current Examination (ET):
- a) ET of previously repaired reactor vessel head penetrations (Observed)

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

71111.11 - Licensed Operator Regualification Program and Licensed Operator Performance

Operator Regualification (1 Sample)

The inspectors observed and evaluated an operator regualification simulator training scenario involving a complete station blackout on June 7, 2018.

Operator Performance (1 Sample)

The inspectors observed and evaluated actual control room operator performance during the following activities:

- (1) Reactor shutdown for the refueling outage on April 8, 2018
- (2) Reactor startup following the refueling outage on May 9, 2018

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness (2 Samples)

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

- (1) Local leak rate test failure of nitrogen supply containment isolation valve 1SI-287 to accumulator and pressurizer power operated relief valve on June 4, 2018
- (2) Degraded secondary demineralizer system cation tank backwash inlet valve 1CE-663 resulting in secondary chemical excursion event on June 25, 2018

71111.13 - Maintenance Risk Assessments and Emergent Work Control (5 Samples)

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

- (1) Elevated (Yellow) risk for decay heat removal key safety functional area during refueling outage H1R21 when the steam generators first became unavailable for a heat sink and subsequent reactor coolant system (RCS) draindown in preparation for removing the reactor vessel head on April 9, 2018
- (2) Elevated (Yellow) risk for decay heat removal and spent fuel pool cooling key safety functional areas due to a single train of RHR and spent fuel pool cooling available while the 'A' train essential power bus was out of service and defueling operations were ongoing on April 13, 2018
- (3) Elevated (Green) risk during RCS draindown following reactor vessel refueling and preparation for re-installing the reactor vessel head on April 28, 2018
- (4) Elevated (Green) risk during planned unavailability of the 'A' ESCW for preventive maintenance on May 15, 2018
- (5) Elevated (Green) risk during planned unavailability of the 'B' EDG for preventive maintenance on June 4-6, 2018

71111.15 - Operability Determinations and Functionality Assessments (4 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Unacceptable scaffolding configuration erected over the 'A' EDG (Nuclear Condition Report (NCR) 02196061)
- (2) Through wall leak in 'B' ESW screen wash piping (NCR 02203536)
- (3) 'A' EDG engine jacket water outlet temperature lowered to alarm setpoint due to failure of jacket water heater electrical breaker (NCR 02206204)
- (4) Lowering auxiliary reservoir water level due to back leakage past valve 1SW-3, the 'A' train emergency service water supply from the main reservoir (NCR 02207610)

71111.18 - Plant Modifications (1 Sample)

The inspectors evaluated the following modification:

- (1) EC 284243, Harris Nuclear Plant Turbine Control System Upgrade – Integration, on June 28, 2018

71111.19 - Post Maintenance Testing (6 Samples)

The inspectors evaluated the following post maintenance tests (PMTs):

- (1) OP-111, Residual Removal System; Section 5.2, Starting a Standby RHR Loop for RCS Cooling, following scheduled refueling outage work activities on the 'B' RHR pump, on April 13, 2018
- (2) Operations Surveillance Test (OST)-1411, Auxiliary Feedwater Pump 1X-SAB Operability Test Quarterly Interval Mode 1, 2, 3, following overhaul of the turbine on the turbine-driven auxiliary feedwater pump, on May 7, 2018
- (3) EST-850, Turbine Control System Integration Power Ascension Test following modification of the turbine control system, on May 10, 2018
- (4) Work Order 20253445 instructions for cycling 'A' EDG jacket water heater electrical breaker and verifying proper jacket water temperatures following replacement of breaker starter contactor and auxiliary contacts following breaker failure, on May 15, 2018
- (5) Operations Procedure Testing (OPT)-1512, Essential Chilled Water Turbopak Units Quarterly Inspection/Checks Modes 1-6, following preventive maintenance on the 'A' ESCW system, on May 22, 2018
- (6) OST-1073, 1B-SB Emergency Diesel Generator Operability Test Monthly Interval Modes 1-2-3-4-5-6, following preventive maintenance on the 'B' EDG, on June 6, 2018

71111.20 - Refueling and Other Outage Activities (1 Sample)

The inspectors evaluated refueling outage H1R21 activities from April 7 to May 10, 2018.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (3 Samples)

- (1) OST-1824, 1BSB Emergency Diesel Generator Operability Test 18-Month Interval Modes 1 Through 6 and Defueled, on April 28, 2018
- (2) OST-1826, Safety Injection: ESF Response Time, Train B 18-Month Interval on a Staggered Test Basis Modes 5-6, on April 29, 2018
- (3) OST-1803, Containment Sump Visual Inspection 18 Month Interval Mode 5, on May 2, 2018

In-service (1 Sample)

- (1) OST-1087, Motor Driven Auxiliary Feedwater Pumps Full Flow Test Quarterly Interval Mode 1, on April 6, 2018

Containment Isolation Valve (1 Sample)

- (1) Engineering Surveillance Test (EST)-212, Type C Local Leak Rate Test, (Attachment 26 for Penetration M-76A, LLRT for 1SI-179 and 1SI-182), on April 28, 2018

EMERGENCY PREPAREDNESS

71114.02 - Alert and Notification System Testing (1 Sample)

The inspectors evaluated the maintenance and testing of the alert and notification system on March 26, 2018 through March 30, 2018.

71114.03 - Emergency Response Organization Staffing and Augmentation System (1 Sample)

The inspectors evaluated the readiness Emergency Response Organization on March 26, 2018 through March 30, 2018.

71114.04 - Emergency Action Level and Emergency Plan Changes (1 Sample)

The inspectors evaluated submitted EAL and Emergency Plan changes on March 26, 2018 through March 30, 2018. This evaluation does not constitute NRC approval.

71114.05 - Maintenance of Emergency Preparedness (1 Sample)

The inspectors evaluated the maintenance of the emergency preparedness program on March 26, 2018 through March 30, 2018.

71114.06 - Drill Evaluation

Drill/Training Evolution (1 Sample)

The inspectors evaluated a drill on a station blackout event on June 7, 2018.

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

Radiological Hazard Assessment (1 Sample)

The inspectors evaluated radiological hazards assessments and controls.

Instructions to Workers (1 Sample)

The inspectors evaluated worker instructions.

Contamination and Radioactive Material Control (1 Sample)

The inspectors evaluated contamination and radioactive material controls.

Radiological Hazards Control and Work Coverage (1 Sample)

The inspectors evaluated radiological hazards control and work coverage.

High Radiation Area and Very High Radiation Area Controls (1 Sample)

The inspectors evaluated risk-significant high radiation area and very high radiation area controls.

Radiation Worker Performance and Radiation Protection Technician Proficiency (1 Sample)

The inspectors evaluated radiation worker performance and radiation protection technician proficiency.

71124.08 - Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

Radioactive Material Storage (1 Sample)

The inspectors evaluated the licensee's radioactive material storage.

Radioactive Waste System Walk-down (1 Sample)

The inspectors evaluated the licensee's radioactive waste processing facility during plant walkdowns.

Waste Characterization and Classification (1 Sample)

The inspectors evaluated the licensee's radioactive waste characterization and classification.

Shipment Preparations (1 Sample)

The inspectors evaluated the licensee's radioactive material shipment preparation processes.

Shipment Records (1 Sample)

The inspectors evaluated the licensee's non-excepted package shipment records.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification (6 Samples)

The inspectors verified licensee performance indicators submittals listed below for the period from April 2017 through March 2018 for items 1 - 3, and January 2017 through December 2017 for items 4 - 6.

- (1) MS05: Safety system functional failures on May 17, 2018
- (2) BI01: Reactor coolant system specific activity on June 25, 2018
- (3) BI02: Reactor coolant system leak rate on June 7, 2018
- (4) EP01: Drill & exercise performance
- (5) EP02: Emergency response organization drill participation
- (6) EP03: Alert & notification system reliability

71152 - Problem Identification and Resolution

Semiannual Trend Review (1 Sample)

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

Annual Follow-up of Selected Issues (2 Samples)

The inspectors reviewed the licensee's implementation of its CAP related to the following issues:

- (1) Elevated levels of sulfates and chlorides in the feedwater system due to leakage from the cation regeneration tank (NCR 02177014)
- (2) Failure to Implement Viable Compensatory Actions During Planned Maintenance on the Seismic Monitoring System (NCR 02202061)

71153 - Follow-up of Events and Notices of Enforcement Discretion

Events (1 Sample)

The inspectors evaluated the unexpected automatic actuation of the 'A' and 'B' motor driven auxiliary feedwater pumps and licensee's response on April 7, 2018.

Licensee Event Reports (2 Samples)

The inspectors evaluated the following licensee event reports (LERs) which can be accessed at <https://lersearch.inl.gov/LERSearchCriteria.aspx>:

- (1) LER 05000400/2018001-00, Automatic Actuation of Auxiliary Feedwater System
- (2) LER 05000400/2018002-00, Reactor Pressure Vessel Closure Head Penetration Nozzle Indications Attributed to Primary Water Stress Corrosion Cracking

Unresolved Item Closeout

URI 05000400/2017003-02, Review of Removal of the Technical Support Center (TSC) Temporary Diesel Generator.

INSPECTION RESULTS

Failure to Promptly Identify and Correct a Condition Adverse to Quality For a Through-Wall Leak in the ESW Screen Wash Piping			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000400/2018002-01 Opened/Closed	P.1 - Identification	71111.04
<p>An NRC-identified Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," was identified for the licensee's failure to promptly identify and correct a condition adverse to quality involving through-wall leakage in the 'B' train ESW screen wash piping. Specifically, on April 30, 2018, operators failed to initiate a work request or condition report after security personnel reported through-wall leakage in the 'B' train ESW screen wash piping. No further follow-up or corrective actions were taken until May 3, 2018, when NRC inspectors identified the same through-wall piping leakage during a plant walkdown inspection and reported the degraded condition.</p>			
<p><u>Description:</u> On May 3, 2018, with the unit in Mode 5 and Mode 4 entry projected on May 4, 2018, the inspectors identified through-wall leakage in the 'B' train ESW screen wash piping for the traveling screens from the main reservoir. The leakage was upstream of a 2-inch isolation valve, 1SC-30, adjacent to the valve weld, and was estimated to be 20 drops per minute (dpm). The inspectors reported the degraded condition to the licensee and immediate actions were taken to address the operability of 'B' train ESW by conducting ultrasonic examination of the piping area to determine if the through-wall leak could challenge the structural integrity of the piping. The results of this testing showed that the through-wall leakage was a localized pin hole and would not have challenged the structural integrity of the screen wash piping, therefore, the licensee determined that the 'B' train ESW was operable, but degraded due to the leakage. A compensatory action was established to monitor the leakage twice per shift for further degradation until the piping was repaired.</p> <p>The inspectors subsequently learned that a security officer had observed the same piping leak on April 30, 2018, and had reported the condition to the control room supervisor (CRS). The CRS had dispatched an auxiliary operator (AO) to investigate the leakage which was confirmed to be 8 dpm. No work request or NCR was initiated for the identified piping leakage. As a result, no further licensee actions were taken to address the issue until May 3, 2018, when the NRC identified the leakage and reported it to licensee personnel. The inspectors determined that the through-wall leakage in the ESW piping represented a condition adverse to quality and should have been reported in the licensee's CAP via the initiation of a work request and NCR on April 30, 2018.</p> <p>Corrective Actions: The licensee's immediate corrective actions to address the through-wall leakage included the performance of ultrasonic examinations of the affected piping. The 'B' ESW screen wash piping in the vicinity of the affected area was subsequently replaced prior to the unit entering Mode 4 on May 6, 2018. Coaching was provided to the CRS and AO involved on the requirements to address conditions adverse to quality in the CAP and lessons learned were shared with all other operators.</p> <p>Corrective Action References: NCR 02203536 and NCR 02203840</p> <p><u>Performance Assessment:</u></p>			

Performance Deficiency: The licensee's failure to identify a condition adverse to quality involving through-wall leakage in the 'B' train ESW screen wash piping that required being entered into the CAP was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the ESW screen wash system is a safety-related support system that is required for operability of the ESW, and the failure to identify and correct the through-wall leakage or perform an appropriate operability evaluation of the continued structural integrity of the screen wash piping resulted in continued degradation and leakage, that could have called into question the operability of the 'B' train ESW system had the through-wall leakage continued.

Significance: The inspectors assessed the significance of the finding using IMC 0609, Appendix A, "SDP for Findings at-Power," dated June 9, 2012. The finding was determined to be of very low safety significance (Green) since subsequent ultrasonic examinations of the affected screen wash piping determined there was no loss of structural integrity, therefore, the 'B' train ESW remained capable of performing its intended safety function.

Cross-cutting Aspect: The finding has a cross-cutting aspect in the identification component of the problem identification and resolution cross-cutting area (P.1), because the organization failed to implement a corrective action program with a low threshold for identifying issues. Specifically, operations personnel failed to enter the degraded condition associated with through-wall leakage in the ESW screen wash piping into the work management process or condition reporting system in a timely manner in accordance with the CAP.

Enforcement:

Violation: 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected.

Contrary to the above, from April 30, 2018, through May 3, 2018, the licensee failed to promptly identify and correct a condition adverse to quality involving through-wall leakage in the 'B' train ESW screen wash piping, a safety-related support system. Specifically, on April 30, 2018, operators failed to initiate a work request or condition report after security personnel reported through-wall leakage in the 'B' train ESW screen wash piping. No further follow-up or corrective actions were taken until May 3, 2018, when the NRC inspectors identified the same through-wall piping leakage during a plant walkdown inspection and reported the degraded condition, at which time, appropriate actions were implemented to address the issue.

Disposition: This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy.

Inadequate Fire Brigade Performance Assessment of Announced Fire Drill			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000400/2018002-02 Opened/Closed	P.6 - Self-Assessment	71111.05AQ
<p>An NRC-identified Green NCV of 10 CFR 50.48(c) and National Fire Protection Association (NFPA) Standard 805, Section 3.4.3, "Training and Drills," was identified for the licensee's failure to adequately assess the fire brigade performance during an announced fire drill conducted March 21, 2018. Specifically, the inspectors identified several fire brigade performance deficiencies, improvement items, and lessons learned that were not identified and documented in the licensee's corrective action program during the fire drill critique as required by the licensee's fire drill administrative control procedure.</p>			
<p>Description: On March 21, 2018, the inspectors observed an announced fire drill. The inspectors noted several performance deficiencies and weaknesses during the drill that were not identified and addressed by the licensee's drill critique process. These issues were associated with fire brigade leader command and control performance and the proper selection, placement, and use of equipment and fire-fighting strategies, including the following:</p> <ul style="list-style-type: none"> • The fire brigade leader directed three fire brigade members to enter the fire hot zone to fight the fire as the attack team. Since there is only a 5-person fire brigade, this leaves the two remaining fire brigade members, one of which is the fire brigade leader (who also serves as the site incident commander), to be part of the designated 2-out rescue team that is required when fighting internal building fires. The 2-out rescue team is responsible, if necessary, for providing assistance or rescue for any or all of the attack team members. The inspectors were concerned that this fire brigade strategy could result in challenges with fire brigade leader command and control, and with the effectiveness of conducting rescues. Specifically, the fire brigade leader could be hampered in his primary role of directing a site fire response while serving as a rescue team member. Adding to this complication, in locations where radio communication use is prohibited, it would be difficult for the fire brigade leader to communicate and coordinate with the Control Room or others during a rescue situation. Regarding the actual rescue activity itself, its effectiveness could be challenged since a 2-person rescue team would be faced with potentially assisting/removing three attack members out of the hot zone versus two. Based on discussions with licensee fire brigade training personnel following the drill, the inspectors learned that this 3-in, 2-out deployment strategy was the current manner in which all internal building firefighting strategies and fire training was based upon. • The fire brigade leader allowed the 3-man attack team to enter the fire hot zone with permission to commence firefighting prior to the 2-man rescue team arriving at the fire scene's pre-established incident command post. The inspectors later learned that the rescue team, including the fire brigade leader, had arrived at the incident command post approximately five minutes after the attack team had entered the fire area. This delay involved the fire brigade leader completing his thermal protective clothing dress-out in the locker room. The inspectors were concerned that under actual circumstances, if the 2-man rescue team were not ready and prepared to fulfill their rescue responsibilities upon entry of the attack team into the fire hot zone, the effectiveness of the rescue team could be challenged. 			

- The inspectors observed that no fire hose or other form of fire suppression was pulled or readily available for the 2-man rescue team to take with them should they have needed to enter the hot zone to rescue the attack team. When the fire brigade leader and drill controllers were questioned about this, the inspectors were told that on the same fire hose that the attack team was using, a 1-1/2 inch gated wye valve had been connected, and the rescue team could have connected another 50 foot, 1-1/2 inch fire hose to it and used that hose as a rescue hose. The inspectors determined this to be inadequate since the rescue team would have been forced to enter the fire hot zone without any suppression support in order reach the fire hose connection.

Corrective Actions: The licensee's immediate corrective actions included implementing an Operator Standing Instruction #18-009, "Fire Brigade 2-Out Response," directing the following specific fire brigade required actions:

- The brigade attack team will consist of 2 fire members to ensure the fire brigade incident commander is not normally utilized as one of the 2-out rescue members. If a runner is needed based on the fire area, the incident commander may serve as a 2-out member, but this should be the exception.
- The 2-out members will establish a ready method of suppression that is accessible outside the fire zone. This should be the identified backup hose in the fire pre-plan. This hose does not need to be charged by should be flaked out and ready for use.
- The attack team will not enter the fire area, except when search and rescue is necessary, until the 2-out team is in the area with the suppression method ready for use.

Corrective Action Reference: NCR 02194468

Performance Assessment:

Performance Deficiency: The inspectors determined that the failure to adequately assess the fire brigade performance during an announced fire drill was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the protection against external events (fire) attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems, such as the fire brigade, that respond to initiating events to prevent undesirable consequences. Specifically, the failure to identify and correct fire brigade deficiencies could negatively affect the fire brigade's capability to combat an actual fire.

Significance: The inspectors assessed the significance of the finding using IMC 0609, Appendix A, "SDP for Findings at-Power" dated June 19, 2012. The finding was determined to be of very low safety significance (Green) in accordance with D.1 of IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," because the fire brigade demonstrated the ability to meet the required time for fire extinguishment during the drill and the finding did not significantly affect the ability of the fire brigade to respond to an actual fire.

Cross-cutting Aspect: This finding has a cross-cutting aspect in the self-assessment component of the problem identification and resolution cross-cutting area, P.6, because the organization failed to conduct self-critical and objective assessments of its programs and practices associated with a fire drill.

Enforcement:

Violation: Harris Nuclear Power Plant, Unit 1 Renewed Facility Operating License Condition 2.F, "Fire Protection Program," requires, in part, that the licensee implement and maintain in effect all provisions of the approved Fire Protection Program that comply with 10 CFR 50.48(c) and the NFPA Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition, as specified in the NRC safety evaluation report dated June 28, 2010. Implementation and administrative controls for the NFPA 805 fire brigade program, including the conduct of fire drill training for fire brigade members, which are contained in administrative procedure AD-OP-ALL-0207, "Fire Brigade and HAZMAT Team Administrative Controls." AD-OP-ALL-0207, Section 5.5, "Fire Drill Administration," requires, in part, that a fire drill critique and evaluation of fire brigade performance be conducted to identify deficiencies, improvements, lessons learned, and to ensure implementation of adequate corrective actions to address performance issues.

Contrary to the above, during the announced fire drill conducted on March 21, 2018, the fire brigade critique and evaluation failed to identify deficiencies, improvements, and lessons learned in the fire brigade performance. Specifically, the inspectors identified several deficiencies in fire brigade leader command and control performance and the selection, placement, and use of equipment and fire-fighting strategies that were not identified by the fire brigade critique and evaluation.

Disposition: This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy.

This finding closes URI 05000400/2018001-01.

Failure to Adequately Document Changes to the Emergency Plan			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Emergency Preparedness	Severity Level IV NCV 05000400/2018002-03 Opened/Closed	Not Applicable	71114.04 Other Activities
The inspectors identified multiple examples of a SL-IV NCV of 10 CFR 50.54(q)(3), for changes to the licensee's radiological E-Plan associated with PAR procedures and emergency response equipment that failed to demonstrate that the changes would not reduce the effectiveness of the E-Plan. Specifically, the licensee did not provide an adequate analysis to demonstrate that the removal of the sheltering in-place PARs was not a reduction in effectiveness of the E-Plan. Additionally, the licensee did not perform an analysis demonstrating that the removal of a temporary diesel generator providing a backup source of power to the Technical Support Center (TSC) did not reduce the effectiveness of the E-Plan.			
<u>Description:</u> The inspectors identified the following two examples where the licensee failed to conduct adequate analysis demonstrating that changes to emergency implementing procedures or emergency response equipment did not reduce the effectiveness of the E-Plan.			
Example 1: While performing a detailed review of a change to the Shearon Harris' E-Plan and the associated PAR procedure PEP-110, "Emergency Classification and Protective Action Recommendations," the inspectors identified that the analysis for removal of the sheltering in-place PARs under certain accident scenarios was inadequate to demonstrate			

that the change was not a reduction in effectiveness of the E-Plan. The analysis, as documented in the licensee's 50.54(q) evaluation, did not adequately address the applicability of NUREG-0654, Supplement 3, for the removal of the sheltering-in-place PARs under certain accident conditions. Nor did the evaluation include a comparison of the Safety Evaluation approved E-Plan with the proposed changes to the Plan and PAR procedure to ensure continued compliance with the affected regulatory requirements and would have been the basis for concluding whether or not a reduction in effectiveness existed by making the changes. Instead, the analysis relied on an agreement between the licensee, the State, and the affected Counties, that removal of these PARs was acceptable. Subsequent to the inspectors questioning whether or not the changes were a reduction in effectiveness of the E-Plan, the licensee completed an analysis of the E-plan changes. After review of the licensee's analysis, including a review of other NRC publications that address removal of sheltering-in-place PARs under certain accident conditions, the inspectors determined that the licensee had documented a sufficient basis to make the E-Plan and procedure revisions in the subsequent analysis. However, the licensee had failed to adequately describe the basis for not having to submit this change to the NRC for review and approval in the original 50.54(q) documentation provided.

Example 2: As documented in URI 05000400/2017003-02, "Review of Removal of the TSC Temporary Diesel Generator," the inspectors determined that the TSC temporary diesel generator was removed from the site on July 17, 2017, without conducting a 10 CFR 50.54(q)(3) evaluation of the impact to the facility. This temporary diesel generator was previously installed in 2012 to provide reliable backup power to the TSC in the event of a Loss of Offsite Power (LOOP) coincident with a Loss of Coolant Accident (LOCA) event. At that time, it was recognized that a complete loss of both normal offsite power sources to the TSC could result in long-term TSC operational concerns. The temporary diesel generator was originally intended to be installed until a reliable backup power source could be installed under a permanent modification; however, the permanent modification was subsequently cancelled. While a 10 CFR 50.54(q)(3) evaluation was completed when the temporary diesel generator was originally installed, the licensee failed to perform a 10 CFR 50.54(q)(3) evaluation before its removal on July 17, 2017. The inspectors determined that the failure to perform an analysis demonstrating that the removal of a temporary diesel generator did not reduce the effectiveness of the E-Plan was a violation of 10 CFR 50.54(q)(3).

Corrective Actions: For the issue associated with Example 1, the licensee entered the issue into the corrective action program and revised the 50.54(q) evaluation to demonstrate that the change was not a reduction in effectiveness.

For the issue associated with Example 2, the licensee staged another temporary diesel generator onsite to provide backup power to the TSC in the event of a LOOP and initiated multiple NCRs.

Corrective Action Reference: NCR 02195252, NCR 02194997, NCR 02195154, NCR 02195156, and NCR 02195161.

Performance Assessment:

Performance Deficiency: The licensee's failure to demonstrate that changes to the emergency plan implementing procedures and emergency response equipment was not a reduction in the effectiveness of the E-Plan was determined to be a performance deficiency within the licensee's ability to foresee and correct.

Screening: The inspectors determined the performance deficiencies were more than minor because it adversely affected the procedure quality attribute of the Emergency Preparedness cornerstone objective. Specifically, the licensee's ability to ensure that adequate measures are taken to protect the health and safety of the public is degraded if the licensee does not perform or performs inadequate analyses of the effects of changes to the emergency plan.

Significance: This finding is a violation of NRC requirements, and because it has the potential for impacting the NRC's ability to perform its regulatory function, traditional enforcement is applicable in accordance with IMC 0612, Appendix B, Figure 2. This finding is determined to be a SL-IV violation in accordance with Section 6.6.d.1 of the Enforcement Policy because it involves the licensee's ability to meet or implement a regulatory requirement not related to assessment or notification such that the effectiveness of the emergency plan is reduced.

Cross-Cutting Aspect: Not applicable for Traditional Enforcement issues.

Enforcement:

Violation: 10 CFR 50.54(q)(3) states, in part, that a licensee may make changes to emergency plans without NRC approval only if the changes do not reduce the effectiveness of the plans and the plans, as changed, continue to meet the standards of 50.47(b) and the requirements of Appendix E.

Contrary to the above,

(Example 1) on January 4, 2018, the licensee failed to demonstrate that a change to their E-Plan and associated PAR procedure did not reduce the effectiveness of the plan.

Specifically, the licensee did not provide an adequate basis for removing sheltering in-place PARs under certain accident scenarios, and that change had the potential to reduce the effectiveness of the approved E-Plan. After the violation was identified by the inspectors, the licensee completed a revised 50.54(q) evaluation and the inspectors concluded, that the changes were not a reduction in effectiveness.

(Example 2) on July 17, 2017, the licensee failed to demonstrate that a change to their E-Plan to remove a temporary diesel generator installed to provide reliable backup power to the TSC did not reduce the effectiveness of the plan. Specifically, the licensee failed to perform an analysis of the TSC operational impact without the temporary diesel generator during an event involving a LOOP coincident with a LOCA. Additionally, although the changes made to the TSC that did not comply with the E-Plan, the facility remained functional since both normal offsite power supplies were maintained during the absence of the temporary diesel generator, and there was no loss of a planning standard function.

Disposition: This violation is being treated as a Non-Cited SL-IV Violation, consistent with Section 2.3.2 of the Enforcement Policy.

This finding closes URI 05000400/2017003-02.

Failure to Implement Adequate Steam Generator Blowdown Demineralizer Control Procedures

Cornerstone	Significance	Cross-cutting Aspect	Report Section
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Initiating Events	Green NCV 05000400/2018002-04 Opened/Closed	H.12 - Avoid Complacency	71152
<p>A self-revealing Green NCV of TS 6.8.1.a, "Procedures and Programs," was identified for licensee's failure to establish and implement adequate steam generator blowdown demineralizer control operating procedures resulting in exceeding secondary water chemistry Action Level 3 criteria for impurities in the steam generators. Specifically, the licensee did not implement adequate isolation valve controls between the demineralizer resin regeneration system and the feedwater system during resin regeneration activities. This open path allowed leakage of sulfates and chlorides into the feedwater system. The level of these impurities exceeded the secondary chemistry Action Level 3 threshold and resulted in an unplanned shutdown.</p> <p><u>Description:</u> On January 12, 2018 while the unit was at 100% power, operators began renewing a batch of cation resin in the cation regeneration tank by soaking the resin in a sulfuric acid solution. During this soak, the acid solution migrated from the regeneration tank through 1CE-663, a single closed diaphragm valve that had degraded, and into the feedwater system. On January 13, 2018 at 3:20 a.m., the licensee found indications of elevated sulfate and chloride levels in the steam generators and entered Action Level 3 at 5:42 a.m. The licensee took actions to improve plant chemistry and ultimately started the plant shutdown at 3:34 p.m. on January 13, 2018. The unit entered Mode 5, cold shutdown, on January 14, 2018 at 10:19 p.m.</p> <p>Inspectors determined the primary cause of the chemical leakage was an inadequate barrier between the cation regeneration tank and the feedwater system. OP-127, "Steam Generator Blowdown," provides the procedure for resin regeneration. At the time of this event, this procedure only utilized one closed isolation valve between the cation regeneration tank and the feedwater system. In order to address this vulnerability, OP-127 was modified to change a second isolation valve between the cation regeneration tank and the feedwater system, 1CE-1221, from open during this procedure to shut. This change provided a second barrier between the cation regeneration tank and the feedwater system and will prevent a chemical excursion if one of the valves fails.</p> <p>Inspectors also determined that the chemical excursion could have been prevented by properly maintaining functionality of the single closed isolation valve, 1CE-663, between the cation regeneration tank and the feedwater system. This barrier is a single isolation valve that was classified as "run-to-maintenance" which means the risk and consequences of failure are acceptable as described by licensee procedure AD-EG-ALL-1202, "Preventive Maintenance and Surveillance Testing Administration." In contrast to this classification, the failure of 1CE-663 resulted in an unacceptable level of impurities in the steam generators and a subsequent unplanned shutdown.</p> <p>Corrective Actions: The licensee implemented procedural changes to eliminate the single barrier vulnerability and performed maintenance on the regeneration system isolation valves to restore their functionality. OP-127 was revised to provide a second isolation valve to be shut to act as a second barrier between the cation regeneration tank and the feedwater system. Additionally, 1CE-663 and similar valves have been reclassified from run-to-maintenance to non-critical and preventive maintenance will be regularly performed. Periodic sampling of the leakage path will also be implemented to ensure degraded valve conditions can be found before conditions worsen.</p> <p>Corrective Action Reference(s): NCR 02177014</p>			

Performance Assessment:

Performance Deficiency: The inspectors determined the licensee failure to implement adequate steam generator blowdown demineralizer procedure controls to maintain a functional barrier between the cation regeneration tank and the feedwater system was a performance deficiency.

Screening: The performance deficiency is more than minor because it adversely affected the procedure quality attribute of the Initiating Events cornerstone and the cornerstone objective to limit the likelihood of events that upset plant stability and challenge the critical safety functions during power operations. Specifically, the licensee failed to implement appropriate procedure controls to ensure proper isolation of the cation regeneration system from the feedwater system or perform preventative maintenance on diaphragm valves used for single isolation which allowed leakage of sulfates and chlorides into the feedwater system. The level of these impurities exceeded the Action Level 3 threshold and resulted in an unplanned shutdown.

Significance: The inspectors assessed the significance of the finding using IMC 0609, Appendix A, "SDP for Findings at-Power," dated June 19, 2012. The finding was screened by Exhibit 1, "Initiating Events Screening Questions," under Section B, "Transient Initiators." Though this performance deficiency resulted in an unplanned shutdown, it did not result in a reactor trip nor a loss of mitigation equipment. Therefore, the finding was screened to Green.

Cross-cutting Aspect: The finding has a cross-cutting aspect in the avoid complacency component of the human performance cross-cutting area (H.12), because licensee personnel failed to recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Specifically, personnel failed to recognize the risk of allowing a single barrier to degrade over time without implementing appropriate demineralizer system operating procedures that contained provisions for double isolation or other mitigating actions in case of failure.

Enforcement:

Violation: TS 6.8.1.a, "Programs and Procedures," requires, in part, that written procedures shall be established, implemented, and maintained covering the activities described in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Section 9.d of Regulatory Guide 1.33 requires procedures for demineralizer resin regeneration. The licensee's implementing procedure for demineralizer resin regeneration is OP-127, "Steam Generator Blowdown."

Contrary to the above, as of January 12, 2018, the licensee failed to establish, implement, and maintain an adequate procedure for conducting steam generator demineralizer resin regeneration activities. Specifically, OP-127 did not provide adequate valve isolation controls between the demineralizer resin regeneration piping and the feedwater system during resin regeneration activities. This open path allowed leakage of sulfates and chlorides into the feedwater system causing the level of these impurities to exceed the secondary chemistry Action Level 3 threshold and resulted in an unplanned shutdown.

Disposition: This violation is being treated as a NCV, consistent with Section 2.3.2.a of the Enforcement Policy.

Failure to Follow Secondary Water Chemistry Plan for Elevated Levels of Secondary Water Impurities			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Initiating Events	Green NCV 05000400/2018002-05 Opened/Closed	H.8 - Procedure Adherence	71152
<p>An NRC-identified Green NCV of TS 6.8.4.c, "Secondary Water Chemistry," was identified for the licensee's failure to follow secondary water chemistry control requirements in accordance with procedure CSD-CP-HNP-0002, "Harris Secondary Water Chemistry Strategic Plan." Specifically, the licensee remained at 100% power for approximately 10 hours after entering secondary water chemistry Action Level 3 due to elevated chlorine and sulfates chemical impurity concentrations, which was contrary to the procedure requirements to downpower the unit to below 5% power as quickly as safe plant operation permits. This unit downpower delay allowed additional time for the chemical impurities to adversely affect the steam generators.</p>			
<p><u>Description:</u> On January 13, 2018 at 3:20 a.m., the licensee identified via secondary sample results that the concentrations of chlorides and sulfates had exceeded Action Level 3 limits in the secondary side of the steam generators. After confirming the impurities were above the Action Level 3 threshold with a confirmatory sample at 5:00 a.m., operations entered AOP-033, "Chemistry Out of Tolerance," and declared Action Level 3 was met at 5:42 a.m. In response to meeting Action Level 3, AOP-033 directed the initiation of a rapid plant shutdown as quickly as safe plant operation permits to less than 5% power using procedure AOP-038, "Rapid Downpower." However, the licensee delayed implementation of a unit downpower due to indications of improving secondary chemistry impurity conditions and the possibility that a chemistry deviation might be allowed. At 6:28 a.m., new steam generator sample results indicated the chloride and sulfate impurities were below the Action Level 3 threshold and the licensee exited Action Level 3 and entered Action Level 2. Since the lower action level did not require an immediate rapid shutdown, the licensee decided not to initiate a unit downpower. Later in the afternoon and after further discussions with Duke Fleet and industry subject matter experts, the licensee determined that a unit shutdown and cleanup was the appropriate course of action. On January 13, 2018 at 3:34 p.m., the licensee initiated a rapid shutdown from 100% using AOP-038. The unit entered Mode 5, cold shutdown, on January 14, 2018 at 10:19 p.m.</p>			
<p>During the follow-up to this event, the inspectors reviewed the licensee's secondary water chemistry program procedure, CSD-CP-HNP-0002, which implements TS 6.8.4.c requirements for a secondary water chemistry program. Section 6.2.3 of CSD-CP-HNP-0002 states that "Regardless of the duration of the excursion into Action Level 3, the plant shall be taken to <5% power as quickly as safe plant operation permits." The inspectors found no procedure allowance justifying the use of deviations from Action Level 3 conditions in CSD-CP-HNP-0002. Further, environmental and radiochemistry procedure (ERC)-008, "Chemistry Action Level Response Program," only allows deviations from secondary action levels when technical justification supports the deviation and a written Technical Report is completed prior to exceeding the allotted action level time. The inspectors determined that an adequate technical justification was not supported for this incident and the licensee had failed to initiate the required Technical Report prior to exceeding the allotted action level time which required immediate implementation of actions to initiate a downpower. Specific to whether there was any rationale supporting a technical justification for deviating from the Action Level 3, the</p>			

inspectors noted that the procedural basis for the rapid downpower was that secondary plant chemistry above the Action Level 3 threshold is expected to result in rapid corrosion of a significant secondary side component, such as an upper steam generator tube support plate, during continued operation. Once the chlorine and sulfates have migrated to the steam generator, they will concentrate and remain in steam generator crevices in a phenomenon known as “hideout” and will not quickly release into the bulk fluid until heat flux is reduced (i.e., unit downpower) or temperatures are reduced (i.e., unit cooldown), depending on the type of impurity. The inspectors determined that the licensee had failed to follow the requirements of CSD-CP-HNP-0002, as well as ERC-008, by delaying the initiation of the required downpower from 5:42 a.m. on January 13, 2018, when confirmatory sample results showed that Action Level 3 limits were exceeded until 3:54 p.m., when actions to commence the downpower were initiated.

Corrective Actions: The licensee revised AOP-033 and ERC-008 to ensure that any deviations from secondary, as well as primary chemistry action requirements, are conducted in accordance with the existing Duke Fleet administrative procedure AD-EG-ALL-1912, “Materials Degradation Management Program Implementation.” As with CSD-CP-HNP-0002, administrative procedure AD-EG-ALL-1912 would not have allowed deviations from secondary chemistry Action Level 3 action requirements since it would be contrary to committed industry steam generator water chemistry guidelines. As part of the licensee’s evaluation of the adverse impacts from chemical excursion, the licensee performed a limited physical inspection of the steam generators during the Spring 2018 refueling outage and planned to perform an in-depth condition monitoring and operational assessment of the steam generators during the Fall 2019 outage to evaluate whether any further long term steam generator health concerns exist.

Corrective Action References: NCR 02177014

Performance Assessment:

Performance Deficiency: The inspectors determined the licensee’s failure to implement the requirements of CSD-CP-HNP-0002 to initiate actions to shutdown to <5% power when Action Level 3 secondary water chemistry conditions were confirmed was a performance deficiency.

Screening: The performance deficiency was more than minor because it adversely affected the procedure quality attribute of the initiating events cornerstone and the cornerstone objective to limit the likelihood of events that upset plant stability and challenge the critical safety functions during power operations, such as a steam generator tube rupture. Specifically, the delay in reducing power allowed an elevated level of impurities to remain in the steam generators for approximately 10 additional hours at levels at which the licensee considers rapid corrosion of a significant secondary side component will occur over the short term or adversely affect the structural integrity of the steam generator tubes due to intergranular attack or pitting over the long term.

Significance: The inspectors assessed the significance of the finding using IMC 0609, Appendix A, “SDP for Findings at-Power,” dated June 9, 2012. The finding was screened by Exhibit 1 “Initiating Events Screening Questions,” under Section D, “Steam Generator Tube Rupture.” Based on a licensee analysis and limited inspection during the Spring 2018 outage, the steam generator tubes appear to not have reduced structural integrity. However, corrosion is a time dependent process and therefore the effect would not be seen immediately. The licensee will perform a more in-depth inspection of the steam generators in

the next outage in Fall 2019. Based on available information, the inspectors expect the steam generators to maintain integrity under normal, full power, steady state operation, as well as design basis accident conditions. Therefore, the finding was screened to Green.

Cross-cutting Aspect: The finding had a cross-cutting aspect in the procedure adherence component of the human performance cross-cutting area (H.8), because licensee personnel failed to follow processes, procedures, and work instructions. Specifically, by delaying the shutdown, the licensee failed to adhere to CSD-CP-HNP-0002.

Enforcement:

Violation: TS 6.8.4.c, "Secondary Water Chemistry," requires, in part, that a program shall be established, implemented, and maintained for monitoring secondary water chemistry to inhibit steam generator tube degradation, which includes procedures defining corrective actions for all off-control point chemistry conditions. This program was described, in part, by CSD-CP-HNP-0002, "Harris Secondary Water Chemistry Strategic Plan." Section 6.2.3 of this document applies to exceeding Action Level 3 limits and required that, regardless of the duration of the excursion into Action Level 3, the plant shall be taken to <5% power as quickly as safe plant operation permits.

Contrary to the above, on January 13, 2018, the licensee failed to implement the secondary water chemistry program as required by TS 6.8.4.c in accordance with CSD-CP-HNP-0002 when the secondary chemistry exceeded Action Level 3 limits. Specifically, the licensee did not initiate a shutdown to <5% power as quickly as safe plant operation permits in accordance with CSD-CP-HNP-0002, but remained at 100% power for approximately 10 hours after entering Action Level 3, from 5:42 a.m. to 3:34 p.m. on January 13, 2018.

Disposition: This violation is being treated as a NCV, consistent with Section 2.3.2.a of the Enforcement Policy.

Failure to Implement Viable Compensatory Actions with Seismic Monitoring System Out of Service for Planned Preventive Maintenance

Cornerstone	Significance	Cross-cutting Aspect	Report Section
Emergency Preparedness	Green NCV 05000400/2018002-06 Opened/Closed	H.5 - Work Management	71152
An NRC-Identified Green NCV of 10 CFR 50.54(q)(2) was identified for the licensee's failure to follow and maintain the effectiveness of its emergency plan that meets the requirements of the risk-significant emergency planning standard 10 CFR 50.47(b)(4). Specifically, the licensee failed to implement viable compensatory actions while conducting planned preventive maintenance that rendered both seismic monitoring systems unavailable for 53.5 hours resulting in a loss of emergency assessment capability for declaring a Notification of Unusual Event under EAL HU2.1 for a seismic event.			
<u>Description:</u> On April 18, 2018, the licensee removed the Kinemetrics Seismic Switch from service to conduct 18-month frequency preventive maintenance (PM) work activities. Subsequently, on April 23, 2018, while this instrument was still out of service, the licensee removed the EngDahl Seismic Response Spectrum Analyzer from service in order to conduct similar 18-month frequency PMs. These two independent seismic monitoring instruments are credited in the emergency plan for responding to a seismic event and provide the only			

equipment for declaring a Notification of Unusual Event under EAL HU2.1, involving a seismic event exceeding the Operational Basis Earthquake vibration setpoint of 0.075g. On April 24, 2018, the inspectors questioned the licensee's rationale for removing both seismic instruments from service at the same time and whether any compensatory actions had been implemented to address the equipment unavailability. The inspectors learned that the PMs were originally planned to be performed in series during the ongoing refueling outage and not in parallel. The decision to conduct them in parallel on April 23, 2018, was a result of the vendor, who provides maintenance support in conducting the PMs, arriving at the plant a week earlier than expected. While the licensee implemented actions to return at least one of the seismic instruments to service within 72-hours, no formal compensatory actions were implemented while both instruments were out of service. When the inspectors discussed the specific concern that no formal compensatory actions had been implemented with the on-duty operations shift manager, the shift manager stated that he believed guidance contained in the existing abnormal operating procedure for a seismic disturbance would help in making the emergency classification. However, when AOP-021, "Seismic Disturbances," was reviewed, the inspectors identified that the second step in the procedure directed the procedure to be exited if all seismic instrumentation is non-functional. The inspectors determined that the licensee had failed to implement adequate (viable) compensatory actions during the period of April 23, 2018, through April 25, 2018, when both seismic instruments were removed from service for planned maintenance.

Corrective Actions: The licensee's immediate corrective actions included the return of both seismic instruments to service on April 25, 2018. The total time that both seismic instruments were out of service at the same time without viable compensatory actions in place was 53.5 hours. The licensee subsequently reported the incident to the NRC in accordance with 10 CFR 50.72(b)(3)(xiii) for an event that resulted in a major loss of emergency assessment capability. The licensee revised procedure PLP-717, "Equipment Important to Emergency Response," to add requirements for implementing viable compensatory actions when the seismic monitors are out of service for planned maintenance. Additionally, the licensee revised AOP-021 to prevent exiting the procedure when all seismic instrumentation was non-functional.

Corrective Action References: NCR 02201526 and NCR 02202061

Performance Assessment:

Performance Deficiency: The inspectors determined that the failure to implement viable compensatory measures while conducting planned preventive maintenance that rendered both seismic monitoring systems unavailable for 53.5 hours was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it adversely affected the emergency response organization attribute of the Emergency Preparedness Cornerstone for ensuring that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency.

Significance: The inspectors assessed the significance of the finding using IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," dated September 22, 2015. The inspectors determined the finding to be of very low safety significance because it did not result in the loss or degradation of a risk significant planning standard. Specifically, only one initiating event condition involving a Notification of Unusual

Event EAL would have been rendered ineffective such that a seismic event would not have been declared or would have been declared in a degraded manner.

Cross-cutting Aspect: This finding has a cross-cutting aspect in the work management component of the human performance cross-cutting area, H.5, because the organization failed to implement a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. Specifically, the licensee's work control process failed to ensure that viable compensatory measures were implemented before allowing preventive maintenance activities that rendered both seismic monitoring systems non-functional at the same time.

Enforcement:

Violation: 10 CFR 50.54(q)(2), "Emergency Plans," requires that the licensee shall follow and maintain the effectiveness of an emergency plan that meets the requirements in 10 CFR 50, Appendix E, "Emergency Facilities and Equipment," and the emergency planning standards of 10 CFR 50.47(b). Emergency planning standard 10 CFR 50.47(b)(4), states: "A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures."

Contrary to the above, from April 23, 2018, until April 25, 2018, the licensee failed to follow and maintain in effect an emergency plan that used a standard emergency classification and action level scheme because adequate emergency equipment to support emergency response was not maintained. Specifically, the licensee failed to implement viable compensatory actions while performing maintenance that rendered both seismic monitoring systems non-functional, which resulted in the failure to have methods or equipment in place necessary for classifying a Notification of Unusual Event in accordance with EAL HU2.1 of the licensee's emergency plan.

Disposition: This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy.

Minor Violation	71153
<p>Minor Violation: A minor, self-revealing violation of TS 6.8.1.a, "Procedures and Programs," was identified for failure to follow procedure AD-OP-ALL-0200, "Clearance and Tagging."</p> <p>On April 7, 2018, while the plant was in Mode 3 at 0 percent power, the licensee isolated breaker DP-1A-1 circuit 28 in accordance with clearance OPS-1-18-5015-DEH MODS-0093. Isolating this breaker caused an unexpected auto start signal for both motor driven auxiliary feedwater (MDAFW) pumps for a loss of last running main feed pump despite the 1B main feedwater pump still being in operation. Both MDAFWs started and operators manually secured the 1B main feedwater pump to maintain proper feedwater flow to the steam generators.</p> <p>TS 6.8.1.a, 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. Procedure AD-OP-ALL-</p>	

0200, Section 5.5, step 4, states "Clearance impacts must be evaluated to ensure that effects on systems and components outside of the boundary are identified and are acceptable, or properly dispositioned." Contrary to this requirement, the licensee did not identify that the isolation of breaker DP-1A-1 circuit 28 would cause the MDAFWs to auto start in Mode 3 when developing clearance OPS-1-18-5015-DEH MODS-0093.

Screening: The violation is minor because the impact to the plant was minimal; the unit was in Mode 3 throughout the event, the reactor remained subcritical, and feedwater flow to the steam generators was not lost.

Enforcement: Because the performance deficiency is minor, it will not be subject to enforcement action in accordance with the NRC's Enforcement Policy. The licensee entered this issue into their CAP as NCR 02196873. The associated LER is closed.

Observation	71152
<p><u>Semi-Annual Trend Review: Adverse Trend in Emergency Preparedness Performance</u></p> <p>The inspectors performed a trend analysis on the licensee's CAP in order to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on human performance trends, 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 2018 through June 2018, 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 negative human performance trend for the last six months where the licensee was challenged by gaps in performance associated with implementation of an effective emergency preparedness (EP) program that were identified during NRC inspections. Specifically, the inspectors noted issues involving deficiencies in conducting maintenance on important EP equipment used in EAL declarations, conducting adequate reviews of changes to EP program procedures, and understanding limitations in the operation of the siren public alert notification system. The specific NCRs documenting these issues are listed below:</p> <ul style="list-style-type: none"> • NCR 02178472, Siren W33 inadvertent activation • NCR 02194024, Failure to perform 10 CFR 50.54(q) evaluations for changes to EP plan • NCR 02195252, Apparent NRC SL-IV violation for inadequate documentation of EP changes • NCR 02201526, Seismic monitoring system unavailable for planned maintenance without adequate compensatory actions <p>The inspectors discussed this negative trend with the licensee and the weaknesses were acknowledged by the licensee. Prior to this discussion, the licensee's Nuclear Oversight group had already initiated NCR 02202784 to address the adverse trend in the EP area. The inspectors reviewed the NCR and determined that the licensee was adequately addressing</p>	

the adverse trend. The inspectors will continue to monitor the licensee's actions to address this negative trend.

Observation	71152
<u>Annual Follow-Up of Selected Issues: Elevated Levels of Sulfates and Chlorides in the Feedwater System</u>	
<p>The inspectors conducted a detailed review of NCR 02177014, initiated on January 13, 2018, regarding the elevated levels of sulfates and chlorides in the feedwater system due to leakage of sulfuric acid solution from the cation regeneration tank into the feedwater system. The inspectors chose this sample because the chemical excursion resulted in elevated levels of corrosive chemicals in the steam generators and an unplanned shutdown and forced outage to address the adverse impact on the steam generator tubes. The licensee completed a formal root cause evaluation to address the circumstances associated with this event. The inspectors determined that the licensee's corrective actions developed as a result of the event were reasonably commensurate with the safety significance of the event. Two Green NCVs (05000400/2018002-04 and 05000400/2018002-05), that are detailed in this report, were identified by the inspectors to address licensee performance deficiencies associated with the event.</p>	
Observation	71152
<u>Annual Follow-Up of Selected Issues: Failure to Implement Viable Compensatory Actions During Planned Maintenance on the Seismic Monitoring System</u>	
<p>The inspectors conducted a detailed review of NCR 02202061, dealing with the failure to implement viable compensatory actions during planned maintenance on the seismic monitoring system. The inspectors chose this sample because of the importance of properly controlling important equipment used for emergency preparedness response in a state of readiness. The licensee completed a Prompt Investigation Response Team investigation in accordance with CAP procedure AD-PI-ALL-0104, "Prompt Investigation Response Team," to address the underlying cause of the incident, implement corrective actions, and establish timely lessons learned for the rest of the Duke Fleet. The inspectors determined that the licensee's evaluation and corrective actions developed were reasonably commensurate with the safety significance of the event. An NRC-identified Green NCV (05000400/2018002-06) that is detailed in this report was identified by the inspectors to address licensee performance deficiencies associated with the event.</p>	

EXIT MEETINGS AND DEBRIEFS

The inspectors confirmed that proprietary information was controlled to protect from public disclosure.

- On July 19, 2018, the inspectors presented the quarterly resident inspector inspection results to Ms. Tanya Hamilton, Site Vice President, and other members of the licensee staff.
- On August 8, 2018, the inspectors conducted a re-exit of the quarterly resident inspector inspection results to Mr. John Dills, Plant Manager, and other members of the licensee staff.

THIRD PARTY REVIEWS

The inspectors reviewed World Association of Nuclear Operations (WANO) interim peer review report issued during the period.

DOCUMENTS REVIEWED

Section 71111.01: Adverse Weather Protection

Summer Readiness

NGGM-IA-0003, Transmission Interface Agreement for Operation, Maintenance, and Engineering Activities at Nuclear Plants, Rev. 11
IA-EG-ALL-0002, Plant Side Distribution Interface Agreement, Rev. 0
AD-WC-ALL-0101, Nuclear Generation Department Generation Planning and Communications, Rev. 2
AD-WC-ALL-0260, Nuclear Generation Response to High or Low Grid System Load, Rev. 1
AOP-028, Grid Stability, Rev. 37
OP-156.02, AC Electrical Distribution, Rev. 158
AR 02146213, Harris training review for new switchyard interface changes
NCR 02130094, Site response to failed switchyard control power cable
NCR 02154591, Breaker disconnect corona identified during routine walkdown of Switchyard
NCR 02155011, Routine thermography identified plant side disconnect not fully seated for breaker 52-7
NCR 02180912, Erosion control issues identified in switchyard
NCR 02206567, POT on north switchyard bus leaking oil

Seasonal Extreme Weather

AP-301, Seasonal Weather Preparations and Monitoring, Rev. 84
AD-WC-ALL-0230, Seasonal Readiness, Rev. 0
Action Request (AR) 02153888, 2017 Post-Summer Hot Weather Assessment
AR 02184550, 2018 Summer Readiness Assessment
AR 02152691, Improvements to procedure AP-301 to address hot weather issues
AR 02152694, Updates to operating procedure OP-148 to address guidance on essential chilled water system chiller surging during hot weather
AR 02153888, 2017 post-summer hot weather assessment
NCR 02134007, NRC identified errors in AP-301 seasonal weather preparations

Section 71111.04: Equipment Alignment

Partial Walkdown

OP-111, Residual Heat Removal System, Rev. 62
OP-116, Fuel Pool Cooling System, Rev. 42
OP-139, Service Water System, Rev. 134
OP-148, Essential Services Chilled Water System, Rev. 76

Complete Walkdown

OP-156.01, DC Electrical Distribution, Rev. 39
NCR 02100415, 1B31-SB-3CL, Repair damaged insulation
NCR 02124713, 1A-SA 125VDC Battery bank needs water
WO 20264026, 1EE-E358, Spare cell for 1A-SA, corrosion on terminals

Section 71111.05: Fire Protection Annual/Quarterly

Quarterly Inspection

FPP-001, Fire Protection Program Manual, Rev. 42
FPP-013, Fire Protection – Minimum Requirements, Mitigating Actions and Surveillance Requirements, Rev. 98
AD-EG-ALL-1520, Transient Combustible Control, Rev. 8

AD-OP-ALL-1000, Conduct of Operations, Rev. 11
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-CNMT, Containment Building Pre-Fire Plan, Rev. 0
CSD-HNP-PFP-SEC, Out Building Pre-Fire Plan, Rev. 2
CSD-HNP-PFP-RAB-261, Reactor Auxiliary Building Elevation 261 Pre-Fire Plan, Rev. 1
CSD-HNP-PFP-RAB-236, Reactor Auxiliary Building Elevation 236 Pre-Fire Plan, Rev. 2

Section 71111.06 - Flood Protection Measures

Cables

WO 20119880, Inspect listed 'A' train manholes & associated cables
AD-EG-ALL-1615, Cable Aging Management Program – Implementation
WO 11771919, M523A-SA & M523B-SA, Degraded cable protectors in manhole

Section 71111.07: Heat Sink Performance

Heat Sink

EPT-163, Generic Letter 89-13 Inspections (Raw Water Systems and Local Area Air Handler Inspection and Documentation), Rev. 17
PLP-620, Service Water Program (Generic Letter 89-13), Rev. 18
MPT-M0091, Heat Exchanger Opening/Closing for NRC Generic Letter 89-13 Inspections, Rev. 17
WO 20131501, Perform EPT-163 inspection and cleaning of 'A' train CCW heat exchanger during refueling outage H1R21
WO 13506167, Perform EPT-163 inspection and cleaning of 'B' train CCW heat exchanger on October 16, 2016
WO 13300533, Perform EPT-163 inspection and cleaning of 'A' train CCW heat exchanger on April 17, 2015

Section 71111.08: Inservice Inspection Activities

Procedures

54-ISI-244-014, Liquid Penetrant Examination of the Reactor Vessel Head Penetrations from the Inside Surface, 2/25/15
54-ISI-367-015, Non-Destructive Examination Procedure (NDE) Visual Examination for Leakage of Reactor Head Penetrations, 1/22/18
54-ISI-460-006, NDE Procedure, Multi-Frequency Eddy Current Orthogonal Coil Array
54-ISI-490-010, NDE Procedure, Multi-Frequency Eddy Current TR ET Blade Probe Examination of the Inside Diameter Surface Of Nozzles, 4/3/18
54-ISI-494-002 NDE Procedure, Multi-Frequency Eddy Current Array ID Probe Examination of Vent Line and RVLIS Nozzle Bores, 4/3/18
54-ISI-604-014, NDE Procedure Automated Ultrasonic Examination of Open tube Reactor Pressure Vessel (RPV) Closure Head Penetrations, 9/12/17
54-ISI-603-009, Automated Ultrasonic Examination of RPV Closure Head Penetrations Containing Thermal Sleeves, 9/12/17
AD-EG-PWR-1611, Boric Acid Corrosion Control Program – Implementation, Rev. 2
AD-MN-ALL-0006, Fluid Leak Management, Rev. 1
AD-NE-ALL-1103, Calibration and Control of NDE Examination Equipment, Rev. 0
NDE-NE-ALL-6302, Utilization of EPRI-WOL-PA-1, Procedure for Manual Phased Array Ultrasonic Examination of Weld Overlaid Similar and Dissimilar Metal Welds, Rev. 0

OPT-1519, Containment Visual Inspection for Boron and Evaluation of Containment Sump Inleakage Every Refueling Outage Shutdown Mode 3, Rev. 11
Probe Examination of Nozzle Welds and Regions, 4/3/18

Calculations

8000-1, Evaluation of Weld Defect Removal Near Node 17, Rev. 7

Drawings:

02-8053812B, Shearon Harris Unit-1, Reactor Vessel Closure Head (RVCH) Penetration Map, Rev 6
02-8053813D, Shearon Harris Unit-1, RVCH Nozzle, Ultrasonic Technology (UT) Coverage, Rev. 6
02-8053814D, Sheet 1 and 2, Shearon Harris Unit-1, RVCH Nozzle, UT Scan Plan, Rev. 6

Other Documents

180-9263397-001, NDE Services Final Report, Shearon Harris 1R20 Bare Metal Visual Examination Final Report, 12/15/16
180-9284789-000, Reactor Vessel Closure Head Bare Metal Visual Examination, 4/16/18
180-9284790-000, Duke Energy Harris RPHV Penetration Examination Report R21, RPHV Penetration Ultrasonic Examination Report, UT Data Signature Log, 4/23/18
51-9131378-002, Technical Justification for Detection of Leak Path Indications in Reactor Pressure Vessel Upper Head Penetrations, Rev. 2
51-9284357-002, Reactor Pressure Vessel Head Penetration Inspection Plan and Coverage Assessment for Shearon Harris Unit-1-Spring 2018, 4/11/18
Certificate of Calibration for PDI Calibration Block: PZR-WOL-8-AX-01, PZR-WOL-8-CIRC-01
Certificate of Certification for Magnaflux Ultragel II Batch #: 14M076, 15B080
Certificate of Conformity for ultrasonic transducer SN: 15K00WAD-1, 1500WAE-1, 15K00WAD-2, 1500WAE-2
Certificate of Instrument Certification for Infrared Thermometer MCNDE40135
Certificate of Qualification for four Examiners
Duke Energy, Shearon Harris Unit-1, NDE Report No. CRDM Nozzle-63-PT-1801, 5/15/18
EC406415, Branch Connection to Resolve Service Water Pinhole Leak, Rev. 1
Harris 1RFO19 April 2015 SG Degradation Assessment, Rev. 0
PD-EG-PWR-1611, Boric Acid Corrosion Control Program, Rev. 1
S000134-TECR-000001, Harris RF019 Steam Generator Condition Monitoring and Operational Assessment, Rev. 1
VE-18-001, Ultrasonic Examination Record, 04-12-18
VE-18-002, Ultrasonic Examination Record, 04-12-18
VE-18-003, Ultrasonic Examination Record, 04-12-18
VE-18-004, Ultrasonic Examination Record, 04-12-18
Welder Qualification Records: G14, WS0004
Welding Procedure Qualification Records: PQR-1, PQR-5, PQR-193A, PQR-193B
WPS 01 3 04, Welding Procedure Specification, Rev. 1

Condition Reports

NCR 02088792, 1SI-329 is leaking and has boron deposits on the valve and pipe insulation
NCR 02095851, Identified boric acid on orifice flange between 1RH-37 and 1RH-38
NCR 02177097, 1RH-40 has a steady stream leaking from the packing gland approximately 0.5 gallons per minute
NCR 02177225, Dried white boric acid deposits that had sprayed out from the insulation box around 1SI-83

CR-2918-5193, Framatome Corrective Action Process, NRC Identified that Leak Path Technical Justification 51-9131378-002 References N-729-1, 5/30/18

Action Requests:

AR 00742854, Area of Interest Observed Near CRDM Canopy Seal, 4/9/15
AR 02198613, Reactor Vessel Nozzle Inspection Probe File Issues, 4/14/18
AR 02199929, Procedure Implementation Error Results in Rework, 4/19/18

Work Orders (WO)/Work Requests (WR)

20121639-01, Through-wall Leak on SW from AH-2 2SW10-37SA-1

Section 71111.11: Licensed Operator Requalification Program and Licensed Operator Performance

Operator Requalification

AOP-018, Reactor Coolant Pump Abnormal Conditions, Rev. 49
AOP-022, Loss of Service Water, Rev. 38
AOP-025, Loss of One Emergency AC Bus (6.9kV) or One Emergency DC Bus (125V), Rev. 42
EOP-E-0, Reactor Trip or Safety Injection, Rev. 11
EOP-ECA-0.0, Loss of All AC Power, Rev. 9
AD-TQ-ALL-0420, Conduct of Simulator Training and Evaluation, Rev. 12

Operator Performance

AD-OP-ALL-1000, Conduct of Operations, Rev. 9
AP-002, Plant Conduct of Operations, Rev. 66
AD-NF-ALL-0201, Reactivity Manipulation Plan, Rev. 1 (for reactor shutdown and startup following refueling outage)
OMM-001, Operations Administrative Requirements, Rev. 112
GP-006, Normal Plant Shutdown from Power Operation to Hot Standby (Mode 1 to Mode 3), Rev. 84
GP-004, Reactor Startup (Mode 3 to Mode 2), Rev. 65

Section 71111.12: Maintenance Effectiveness

Routine Maintenance Effectiveness

10 CFR 50.65, Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, dated July 10, 1991
NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Rev. 4A
Regulatory Guide 1.160, Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Rev. 3
AD-EG-ALL-1210, Maintenance Rule Program, Rev. 1

Section 71111.13: Maintenance Risk Assessments and Emergent Work Control

AD-WC-ALL-0200, On-Line Work Management, Rev. 10
AD-WC-ALL-0410 Work Activity Integrated Risk Management, Rev. 6
AD-WC-ALL-0430, Outage Risk Review, Rev. 4
AD-NF-ALL-0501, Electronic Risk Assessment Tool (ERAT), Rev. 1
AD-OP-ALL-1000 Conduct of Operations, Rev. 9
AD-OP-ALL-0201, Protected Equipment, Rev. 4
OMM-001, Conduct of Operations, Rev. 112
WCM-001, On-Line Maintenance Risk Management, Rev. 28

Section 71111.15: Operability Determinations and Functionality Assessments

AD-OP-ALL-0105, Operability Determinations and Functionality Assessments, Rev. 4

ODP Reference Guide, Rev. 5

AD-OP-ALL-0202, Aggregate Operator Impact Assessment, Rev. 2

Section 71111.18: Plant Modifications

NEI 96-07, Guidelines for 10CFR50.59 Evaluations Endorsed by Regulatory Guide 1.187, Rev. 1

Regulatory Guide 1.187, Guidance for Implementation of 10CFR50.59, dated November 2000

AD-EG-ALL-1110, Design Review Requirements, Rev. 5

AD-EG-ALL-1130, Activation of Engineering Changes, Rev. 2

AD-EG-ALL-1132, Preparation and Control of Design Change Engineering Changes, Rev. 9

AD-LS-ALL-0008, 10 CFR 50.59 Review Process, Rev. 0

AD-EG-ALL-1155, Post Modification Testing, Rev. 3

EC 402153, Low Pressure Turbine Steam Path Replacement

HNP-D-0044, System Requirements Specification – Main Turbine Control System, Rev. 3

NCR 02205669, AOP-015 Secondary Load Rejection

NCR 02206582, Reactor power may have exceeded fuel ramp rate restriction

Section 71111.19: Post Maintenance Testing

AD-OP-ALL-0106, Conduct of Infrequently Performed Tests, Rev. 4

PLP-400, Post Maintenance Testing, Rev. 64

EPT-850, Turbine Control System Integration Power Ascension Test, Rev. 0

GP-006, Power Operation (Mode 2 to Mode 1), Rev. 105

Section 71111.20: Refueling and Other Outage Activities

GP-006, Normal Plant Shutdown from Power Operation to Hot Standby (Mode 1 to Mode 3), Rev. 84

GP-007, Normal Plant Cooldown Mode 3 to Mode 5, Rev. 69

GP-008, Draining the Reactor Coolant System, Rev. 46

GP-009, Refueling Cavity Fill, Refueling and Drain of the Refueling Cavity Modes 5-6-5, Rev. 66

GP-001, Reactor Coolant System Fill and Vent Mode 5, Rev. 42

GP-002, Normal Plant Heatup from Cold Solid to Hot Subcritical Mode 5 to Mode 3, Rev. 69 and 70

GP-004, Reactor Startup (Mode 3 to Mode 2), Rev. 65

GP-005, Power Operation (Mode 2 to Mode 1), Rev. 105

FHP-010, Core Loading Verification, Rev. 21

FHP-014, Fuel and Insert Shuffle Sequence, Rev. 61

FHP-401, Manipulator Crane Operation, Rev. 9

PLP-106, Technical Specification Equipment List Program and Core Operating Limits Report, Rev. 67

AD-OP-ALL-0203, Reactivity Management, Rev. 7

AP-545, Containment Entries, Rev. 58

OMM-031, Implementation of Containment Closure, Rev. 9

OST-1081, Containment Visual Inspection When Containment Integrity is Required Mode 5, Rev. 21

Calculation HNP-F/NFSA-0288, HNP Cycle Curvebook, Rev. 0

Calculation HNP-F/NFSA-0317, Harris Cycle 22 Final Core Load Map, Rev. 0

HNEI-0400-0008, H1C22 Loading Pattern & Feed Batch Information, Rev. 0

71114.02: Alert and Notification System Evaluation

Procedures

EPM-400, Public Notification and Alerting System, Rev. 21
PEP-310, Notifications & Communications, Rev. 39
PLP-201, Emergency Plan, Rev. 69

Records and Data

Weekly Silent Tests, April 2016 – February 2018
Quarterly Growl Tests, April 2016 – February 2018
2016 & 2017 Annual Siren Full Volume Tests
FEMA Approval Letter, dated 6/3/14
Duke Letter (to FEMA), dated 1/30/18
Whelen WPS-2900 Series Operating and Troubleshooting Manual

Corrective Action Program Documents

NCR 02029591, Siren W33 intrusion alarm
NCR 02059460, Wake County siren (W35) RTU communication alarm
NCR 02069551, Siren C20 RTU communication alarm
NCR 02070439, Siren C30 partial activation
NCR 02077164, Siren C20 failure – annual full volume test
NCR 02077283, Siren W17 & C11 partial activation

71114.03: Emergency Response Organization Staffing and Augmentation System

Procedures

AD-EP-ALL-0100, Emergency Response Organization (ERO), Rev. 1
PEP-230, Control Room Operations, Rev. 30
PEP-310, Notifications & Communications, Rev. 39
PLP-201, Emergency Plan, Rev. 69

Records and Data

Development of Evacuation Time Estimates Final Report Rev. 0, dated 10/26/16
Selected qualification records for key position ERO personnel

Corrective Action Program Documents

NCR 02078342, Radiation Control Director missed morning muster call

71114.04: Emergency Action Level and Emergency Plan Changes

Procedures

AD-EP-ALL-0602, Emergency Plan Change Screening & Effectiveness Evaluations 10 CFR 50.54(q), Rev. 4
PEP-110, Emergency Classification & Protective Action Recommendations, Rev. 27 & 28
PLP-201, Emergency Plan, Rev. 66, 67, 68, & 69

Change Packages

10 CFR 50.54(q) Screening Evaluation Form for PLP-201 Rev. 67, dated 5/22/17
10 CFR 50.54(q) Screening Evaluation Form for PLP-201 Rev. 68, dated 11/14/17
10 CFR 50.54(q) Screening Evaluation Form for PLP-201 Rev. 69, dated 1/4/18
10 CFR 50.54(q) Effectiveness Evaluation Form for PLP-201 Rev. 69, dated 1/4/18
10 CFR 50.54(q) Screening Evaluation Form for PEP-110 Rev. 28, dated 1/3/18
10 CFR 50.54(q) Effectiveness Evaluation Form for PEP-110 Rev. 28, dated 1/3/18

Corrective Action Program Documents

NCR 02195252, Apparent SL-IV traditional enforcement violation of 50.54(q) (NRC-identified)

71114.05: Maintenance of Emergency Preparedness

Procedures

AD-EP-ALL-0105, Activation & Operation of TSC, Rev. 1
AD-EP-ALL-0502, Emergency Preparedness 10 CFR 50.54(q) Training Requirements, Rev. 1
AD-EP-ALL-0602, E-Plan Screening & Effectiveness Evaluations 10 CFR 50.54(q), Rev. 4
AD-EP-ALL-0803, Evaluation and Critique of Drills and Exercises, Rev. 1
AD-EP-HNP-0105, Rev. 0 – HNP Site Specific TSC Support
AD-PI-ALL-0100, Corrective Action Program, Rev. 15
AD-RP-ALL-6005, Powered Air Purifying Respirator
EP-EAL, Emergency Action Level, Rev. 17
EP-EALCALC-HNP-1401, Radiological Effluent EAL Values, Rev. 2
EPM-100, Emergency Program Administration, Rev's. 10 and 11
EPM-210, Emergency Program (EP) Maintenance, EP Drill and Exercise Program, Rev. 19
OMM-002, Procedure for Respirator Verification, Rev. 67
PEP-110, Emergency Classification and Protective Action Recommendations, Rev. 28
PLP-201, Emergency Plan, Rev. 69
PLP-201, Annex A, Letters of Agreement, Rev. 69, p. 108 of 144 and supporting documentation

Records and Data

2017 Harris Nuclear Plant Graded Exercise Report, 4/26/17
Development of Evacuation Time Estimates, Rev. 0, dated 10/26/16
Drill critique report for ERO drill 16-07, dated 7/19/16
Drill critique report for ERO drill 16-12, dated 12/6/16
Drill critique report for ERO drill 17-02, dated 2/7/17
Drill critique report for ERO drill 17-10, dated 11/15/17
Harris Nuclear Plant Drill 17-12 Augmentation Drill (A) Critique report, dated 1/16/17
Various maintenance records for 2017
Maintenance Surveillance Test, MST-I0378, Plant Vent Stack Accident Monitor RM-21AV-3509-1SA Operational Test, dated 12/5/17
Work Order (WO) 20175281, Plant Vent Stack Accident Monitor test, dated 6/17/17
WO 13543335-01, Plant Vent Stack Accident Monitor Channel Calculation, dated 2/28/17
Nuclear Oversight Audit Harris Emergency Preparedness Performance Review 2015-HNP-EP-01, conducted from 11/6/17 to 11/16/17, dated 12/4/2017
Focused Self-Assessment Report, AD-PI-ALL-0300, Rev. 3, Attachment 2, Assignment number 02083931-03, dated 1/20/17
Self-Assessment Report, AD-PI-ALL-0300, Rev. 4, Assignment number 02172389-05, dated 1/19/18

Corrective Action Documents

NCR 02029783, AP-EP-ALL-803 Enhancements
NCR 02032133, AD-EP-ALL-803 Attachment 2 missing information
NCR 02034217, Duke implementation of actions to address IN-97-45
NCR 02048254, NRC EP program inspection revisions
NCR 02059701, DEMNET problems
NCR 02063370, NOS identified actions from INPO AFI not completed properly
NCR 02068617, Notice of Unusual Event log keeping
NCR 02074259, ERFIS inoperable
NCR 02076600, ERO tasks needed adding to ERO qualification

NCR 02078390, Missed ERO muster call
NCR 02081251, Cell phone use inside power block
NCR 0208224, 16-12 ERO Drill, TSC missing 2 satellite phones
NCR 02084191, OSC facility does not meet needs
NCR 02084686, Drill objective opportunity for improvement ERO drill 16-12
NCR 02120212, HNP EP Exercise inspection minor violation
NCR 02170936, Augmentation Drill positions no shows
NCR 02179739, QHSA 2172389-05 drill report not completed

Section 71114.06: Drill Evaluation

Drill/Training Evolution

AD-TQ-ALL-0420, Conduct of Simulator Training and Evaluation, Rev. 12
AD-OP-ALL-1000, Conduct of Operations, Rev. 12
EP-EAL, Emergency Action Levels, Rev. 17
PLP-201, Emergency Plan, Rev. 69
PEP-110, Emergency Classification and Protective Action Requirements, Rev. 28

Section 71124.01: Radiological Hazard Assessment and Exposure Controls

Procedures, Guidance Documents, and Manuals

AD-RP-ALL-0001, Portable Survey Instruments, Rev. 0
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