



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

November 1, 2016

Mr. Benjamin C. Waldrep  
Site Vice President  
Shearon Harris Nuclear Power Plant  
M/C HNP01  
New Hill, North Carolina 27562-0165

**SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT - NRC INTEGRATED  
INSPECTION REPORT 05000400/2016003**

Dear Mr. Waldrep:

On September 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Shearon Harris Nuclear Power Plant, Unit 1. On October 18, 2016, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

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

If you contest the significance of this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC resident inspector at the Shearon Harris Nuclear Power Plant.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC resident inspector at the Shearon Harris Nuclear Power Plant.

B. Waldrep

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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."

Sincerely,

*/RA/*

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

Docket No.: 05000400  
License No.: NPF-63

Enclosure:  
Inspection Report 05000400/2016003  
w/Attachment: Supplemental Information

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B. Waldrep

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B. Waldrep

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Letter to Benjamin C. Waldrep from Steven D. Rose dated November 1, 2016

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT - NRC INTEGRATED  
INSPECTION REPORT 05000400/2016003

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos.: 50-400

License Nos.: NPF-63

Report No.: 05000400/2016003

Licensee: Duke Energy Progress, Inc.

Facility: Shearon Harris Nuclear Power Plant, Unit 1

Location: 5413 Shearon Harris Road  
New Hill, NC 27562

Dates: July 1, 2016 through September 30, 2016

Inspectors: M. Riches, Acting Senior Resident Inspector  
K. Miller, Resident Inspector, Farley  
J. Zeiler, Senior Resident Inspector, Robinson  
J. Dodson, Senior Project Engineer (Section 4OA2)  
D. Jackson, Project Engineer (Sections 1R05, 4OA1)

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

Enclosure

## SUMMARY

Integrated Inspection Report 05000400/2016003; July 1, 2016, through September 30, 2016; Duke Energy Progress, Inc., Shearon Harris Nuclear Power Plant, Unit 1, Problem Identification and Resolution.

The report covered a three-month period of inspection by resident inspectors, a visiting inspector, a regional senior project engineer and a regional project engineer. There was one NRC-identified violation documented in this report. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP) dated April 29, 2015. The cross-cutting aspects are determined using IMC 0310, "Aspects within the Cross-Cutting Areas, dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated August 1, 2016. The NRC's program for overseeing the safe operations of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

### Other Findings

Green. Inspectors identified a Green non-cited violation (NCV) of 10 CFR 26.27, Written Policy and Procedures, for the failure to conduct and document fatigue assessments for self-declared fatigued contractors, and other contract personnel called in to supplement or support emergent firewatch duties, and emergent foul weather and storm-related issues. Specifically, self-declared, fatigued workers and other personnel were called in to work and no fatigue assessments were conducted and documented as required by procedure AD-SY-ALL-0460, Revision 0, "Managing Fatigue and Work Hour Limits." The licensee entered this into the corrective action program (CAP) as nuclear condition report (NCR) 02053832.

The failure to conduct and document fatigue assessments for self-declared fatigued contractors, and other contract personnel called in to supplement or support emergent firewatch duties, and emergent foul weather and storm-related issues was a performance deficiency. The finding was more than minor because if left uncorrected, the performance deficiency would have the potential to become a more significant safety concern. Specifically, the failure to conduct fatigue assessments on personnel that self-declared fatigue or were called in to perform unscheduled work, could result in performance of work while impaired from fatigue that may affect their abilities to perform safety-related firewatch compensatory duties and support emergent foul weather activities, safely and competently. The inspectors used NRC IMC 0609, Appendix E, Part I, Baseline Security Significance Determination Process, dated October 16, 2015, and it did not meet the criteria for application of the significance screen. Using Figure 6, Access Authorization, the impact area was determined to be the vital area; with Tier II program element 08-02.05(e), of Policy and Procedures, resulting in a total of one point, which is within the significance determination process threshold for a Green finding. The finding had a cross cutting area of Human Performance, with a cross cutting aspect of documentation, because contract supervisors and managers failed to create and maintain complete, accurate and up-to-date documentation related to the FFD program. (H.7) (Section 4OA2.3.1)

## REPORT DETAILS

### Summary of Plant Status

Unit 1: The unit began the period at 100 percent rated thermal power (RTP). The unit ended the inspection period at 94 percent RTP coasting down to the refueling outage.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R04 Equipment Alignment (71111.04 – 4 samples)

##### a. Inspection Scope

##### .1 Partial Walkdown

The inspectors verified that critical portions of the selected systems were correctly aligned by performing partial walkdowns. The inspectors selected systems for assessment because they were a redundant or backup system or train, were important for mitigating risk for the current plant conditions, had been recently realigned, or were a single-train system. The inspectors determined the correct system lineup by reviewing plant procedures and drawings. Documents reviewed are listed in the Attachment.

The inspectors selected the following systems or trains to inspect:

- “B” essential services chilled water (ESCW) chiller following trip of “A” ESCW chiller on July 22, 2016
- “B” emergency diesel generator (EDG) while the “A” EDG was out of service for scheduled maintenance on July 26-27, 2016
- “B” emergency service water (ESW) train while the “A” ESW train was out of service for scheduled maintenance on July 26, 2016

##### b. Findings

No findings were identified.

##### .2 Complete Walkdown

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

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

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q – 7 samples)

a. Inspection Scope

Quarterly Inspection

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

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

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

- "A" and "B" EDG buildings, fire areas 1-D-DGA, 1-D-DTA, 1-D-DGB, and 1-D-DTB
- "A" and "B" ESW buildings, fire areas 12-I-ESWPA and 12-I-ESWPB
- Residual heat removal and containment spray rooms, 190 elevation, fire area 1 A-BAL-A
- Floor and equipment drain tank rooms, 190 elevation, fire area 1-A-BAL-A
- Reactor auxiliary building (RAB) 305-foot elevation - rod control cabinet room, fire zone 12-A-6-RCC1
- RAB 305-foot elevation - auxiliary relay panel room, fire zone 12-A-6-ARP1
- RAB 305-foot elevation - computer room, fire zone 12-A-CR

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 2 samples)

a. Inspection Scope

.1 Internal Flooding

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

- Diesel Fuel Oil Storage Transfer Building

.2 Underground Cables

The inspectors reviewed related flood analysis documents and inspected the areas listed below containing cables whose failure could disable risk-significant equipment. The inspectors observed maintenance personnel conducting manual cable vault dewatering and reviewed the engineering assessments of the as-found quantity of water in the associated vaults to ensure that cables were not being subjected to submergence and potential degradation. In addition, the inspectors verified the licensee was identifying and properly addressing cable vault issues using the CAP. Documents reviewed are listed in the Attachment.

- Vaults 70A, 70B, 70C, and 70D (located at Manhole 70 south of the refueling water storage tank)
- Vaults 73A, 73B, 73C, and 73D (located at Manhole 73 north of the ESW intake structure)
- Vaults 516A, 516B, and 516C (located at Manhole 516 east of the ESW intake structure)

b. Findings

No findings were identified.

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

a. Inspection Scope

.1 Resident Inspector Quarterly Review of Licensed Operator Regualification

No simulator sessions, either training or evaluated, were scheduled this quarter. The resident inspectors observed just-in-time (JIT) training in support of implementation of license amendment 153, "Temporary Change to Technical Specifications for the "A" Emergency Service Water (ESW) Pump Replacement." The JIT training focused on the

field actions that selected operators were expected to perform if a loss of offsite power (LOOP) event occurred while the "A" ESW pump was out of service for an extended period of time (up to 14 days). On September 19, 2016, the inspectors observed an in-plant training session conducted in a walkdown setting of the proceduralized recovery actions designed to put the plant in a safe configuration.

The inspectors assessed the following:

- lesson plan objectives
- thoroughness of topics covered
- level of engagement and interaction between the students and the instructor

Documents reviewed are listed in the Attachment.

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

The inspectors observed licensed operator performance in the main control room during the infrequently performed evolution involving the end-of-life (EOL) moderator temperature coefficient measurement on July 29, 2016.

The inspectors assessed the following:

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

Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 6 samples)

a. Inspection Scope

The inspectors reviewed the maintenance activities listed below to verify that the licensee assessed and managed plant risk as required by 10 CFR 50.65(a)(4) and licensee procedures. The inspectors assessed the adequacy of the licensee's risk assessments and implementation of risk management actions. The inspectors also verified that the licensee was identifying and resolving problems with assessing and managing maintenance-related risk using the CAP. Additionally, for maintenance resulting from unforeseen situations, the inspectors assessed the effectiveness of the licensee's planning and control of emergent work activities. Documents reviewed are listed in the Attachment.

- July 22, 2016, emergent risk assessment following a trip of “A” ESCW chiller due to oil leak (GREEN risk)
- September 15, 2016, “B” moisture separator reheater lift from turbine building 261’ elevation to 314’ elevation (qualitative YELLOW risk)
- September 19, 2016, emergent risk assessment for replacement of “A” ESW pump online (GREEN risk)
- August 4, 2016, emergent risk assessment following loss of automatic steam generator (SG) level control on “A” and “C” SGs (YELLOW risk)
- August 18, 2016, emergent risk assessment for replacement of “A” EDG jacket water keep warm pump/motor following motor degradation (GREEN risk)
- August 30, 2016, Replacement of FIS-114, reactor makeup water flow indicating switch (YELLOW risk)

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 6 samples)

a. Inspection Scope

.1 Operability and Functionality Review

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

- Prompt Determination of Operability (PDO) for action request (AR) 2038785, Question Regarding Reactor Vessel Head Repair Issue
- Immediate Determination of Operability (IDO) for AR 2043878, Water Intrusion into the Diesel Fuel Oil Storage Transfer Building
- IDO for AR 2052833, Oil Level Below Minimum in Turbine Driven Auxiliary Feedwater Pump Turbine
- PDO for AR 2050623, “A” ESW Pump Vibration
- PDO for AR 2062139, Effect of Thermally-Induced Current on the Operability of Containment High-Range Radiation Monitor

.2 Operator Work-Around Review

The inspectors performed a detailed review of the licensee's operator work-around, operator burden, and control room deficiency lists for the station in effect on August 18, 2016, to verify that the licensee identified operator workarounds at an appropriate threshold and entered them in the CAP. The inspectors verified that the licensee identified the full extent of issues, performed appropriate evaluations, and planned appropriate corrective actions. The inspectors also reviewed compensatory actions and their cumulative effects on plant operation. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)

a. Inspection Scope

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

- Engineering Change 0000404325, Temporary Mod/Controls Required to Meet NRC License Conditions for "A" ESW Pump Online Replacement

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 7 samples)

a. Inspection Scope

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

- Work Orders (WOs) 20035513, 20091023, and 20095485, Conduct mechanical and electrical preventive maintenance activities on the "A" EDG, July 27, 2016

- WO 13421553, Perform Operations Periodic Test (OPT) -1512, ESCW Quarterly Inspection, following second trip on low lube oil pressure, August 3, 2016
- WO 20102682, Replace "A" EDG jacket water keepwarm pump/motor, August 18, 2016
- WO 20106415, Perform OPT-1512, ESCW Quarterly Inspection, following replacement of control power breaker, August 27, 2016
- WO 13511770, Perform LP-F-0014, Total Reactor Makeup Water System, to verify proper operation following replacement of flow indicating switch, FIS-114, August 30, 2016
- WO 20111379, Perform Operating Surveillance Test (OST) -1411, Auxiliary Feedwater Pump 1X-SAB, Quarterly Operability Test, following adjustment of lube oil relief valve 1LO-140, September 19, 2016
- WO 13530023, Perform OST-1214, "A" ESW Pump Performance and Vibration Testing, EPT-441, "A" ESW Pump Curve Determination, and OPT-1082, "A" ESW Flow Balance, following online replacement of "A" ESW Pump, September 27, 2016

The inspectors evaluated these activities for the following:

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

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

b. Findings

Introduction: The inspectors opened a URI to facilitate prompt tracking, documentation, and closure of inspection, verification, and resolution activities, associated with the "A" ESCW chiller failures.

Description: On July 15, 2016, the "A" ESCW chiller tripped on low oil pressure. Licensee investigation identified that oil was leaking from the threaded portion of a brass fitting located between a pressure switch and needle valve associated with PDS-01CY-9428ASA-HI. Upon removal, it was observed that significant radial cracking occurred in the threaded portion of the brass fitting. A like-for-like replacement was installed and the "A" ESCW chiller was returned to service. One week later, on July 22, 2016, the "A" ESCW chiller tripped again on low oil pressure. The investigation revealed that the same brass fitting had failed and the "A" ESCW chiller could not meet its mission time of 30 days of continuous operation in the event of a loss of cooling accident. During this 7-day period, the "B" ESCW chiller was inoperable for a period of time, which means the ESCW system would not have been able to meet its safety function. The licensee's investigation into the cause of the subsequent failure is ongoing. A URI is being opened to determine whether the subsequent failure of the brass fitting was reasonably within the licensee's ability to predict and therefore a performance deficiency. This issue is

being tracked as URI 05000400/2016003-01, Subsequent Loss of Safety-Related Chilled Water System Results in a Loss of Safety Function.

1R22 Surveillance Testing (71111.22 – 4 samples)

a. Inspection Scope

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

Routine Surveillance Tests

- Engineering Surveillance Test (EST)-702, Moderator Temperature Coefficient –EOL

In-Service Tests

- OST-1191, Steam Generator [Power Operated Relief Valve (PORV)] and Block Valve Operability Test Quarterly Inspection
- OST-1080, Auxiliary Feedwater Pump 1X-SAB Full Flow Test Quarterly Interval Mode 1, 3

Reactor Coolant System Leak Detection

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

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 – 1 sample)

a. Inspection Scope

The inspectors observed the emergency preparedness drill conducted on July 19, 2016. The inspectors observed licensee activities in the simulator and the technical support center to evaluate implementation of the emergency plan, including event classification, notification, and protective action recommendations. The inspectors evaluated the licensee's performance against criteria established in the licensee's procedures. Additionally, the inspectors attended the post-exercise critique to assess the licensee's effectiveness in identifying emergency preparedness weaknesses and verified the

identified weaknesses were entered in the CAP. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 – 3 samples)

a. Inspection Scope

The inspectors reviewed a sample of the performance indicator (PI) data, submitted by the licensee, for the Unit 1 PIs listed below. The inspectors reviewed plant records compiled between July 2015 and June 2016 to verify the accuracy and completeness of the data reported for the station. The inspectors verified that the PI data complied with guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," and licensee procedures. The inspectors verified the accuracy of reported data that were used to calculate the value of each PI. In addition, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with PI data. Documents reviewed are listed in the Attachment.

Cornerstone: Mitigating Systems

- residual heat removal system
- high pressure injection system
- emergency AC power system

b. Findings

No findings were identified.

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

.1 Routine Review

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

.2 Annual Follow-up of Selected Issues

a. Inspection Scope

The inspectors conducted a detailed review of the apparent cause evaluation for the following condition report:

- AR 2043878, Diesel Fuel Oil Storage Building Water Intrusion

The inspectors evaluated the following attributes of the licensee's actions:

- complete and accurate identification of the problem in a timely manner
- evaluation and disposition of operability and reportability issues
- consideration of extent of condition, generic implications, common cause, and previous occurrences
- classification and prioritization of the problem
- identification of root and contributing causes of the problem
- identification of any additional condition reports
- completion of corrective actions in a timely manner

Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.3 Safety Conscious Work Environment

a. Inspection Scope

NRC inspectors conducted an assessment of the Safety Conscious Work Environment (SCWE) for three onsite contract companies using both a written survey and interviews with contract staff, contract supervisors, contract managers and the Duke Contract oversight manager. During the inspection, inspectors were sensitive to areas and issues that would represent challenges to the free flow of information, such as areas where employees may be reluctant to raise concerns or report issues in the corrective action program. Interviewing these contractors allowed inspectors to assess the SCWE of the contract groups. Additionally, interviews were conducted with fire watch personnel, team leads, and supervisors.

NRC inspectors also conducted a review of available NCRs, FFD documentation, procedures, guidelines, instructions, and training material for SCWE and FFD. Documents reviewed are listed in the Attachment to this report.

b. Assessment

The inspectors surveyed and interviewed a sample of contract personnel including those assigned to fire watch duties. The results were as follows:

The inspectors discussed the SCWE and FFD training received by all personnel and related individuals' jobs/tasks to SCWE as it related to reporting nuclear safety concerns and FFD requirements. Personnel were aware of the training and associated requirements. Some of the personnel interviewed were not comfortable using the CAP due to lack of knowledge of the system. Some used the CAP process, some did not know how to use the CAP system, and some had not used the system. Additionally, some individuals stated that they would tell their supervisors and assume the supervisor entered the issue into the CAP process.

Staff, supervisors, and management from two of the three contract companies knew the SCWE and FFD processes, and stated that they follow processes for all tasks. They also provided examples of how they followed the processes. Inspectors determined that there were no SCWE issues related to those two contract groups. During interviews and reviews of available documentation related to the third contract company, the inspectors identified underlying factors that would produce a “chilling” effect or reluctance to report safety issues. Personnel stated that they were aware of retaliation and because of that, realistically they would not raise safety or regulatory issues for fear of direct retaliation. They further stated that if it were a serious issue they would notify the Duke employee concerns program or the NRC.

Based on inspection insights obtained from interviews, written survey results, and available documentation, the inspectors concluded that the conditions in the third contract company responsible for fire watches, housekeeping, decontamination, and other support services were not conducive to a healthy SCWE. The effectiveness of the corrective actions specified by the licensee will be evaluated during a future inspection.

c. Findings

- .1 Introduction: Inspectors identified a Green NCV of 10 CFR 26.27(c), Procedures, for the failure to conduct and document fatigue assessments for self-declared fatigued contractors, and other contract personnel called in to supplement or support emergent firewatch duties, and emergent foul weather and storm-related issues. Specifically, self-declared fatigued workers and other personnel were called in to work and no fatigue assessments were conducted and documented as required by procedure AD-SY-ALL-0460, Revision 0, “Managing Fatigue and Work Hour Limits.”

Description: During the week of July 11, 2016, inspectors interviewed contract personnel, reviewed training related to FFD, and requested documentation of fatigue assessments and waivers for onsite contractors. Inspectors requested this documentation for the period October 2015 through June 2016. Inspectors also requested the documentation forms for contractor unscheduled work call outs and the fatigue assessment forms for the same time period. The licensee could not produce any fatigue assessment forms for the contractors.

During interviews and documentation reviewed, inspectors determined that decontamination, firewatch, and housekeeping personnel were called in to supplement or support emergent firewatch duties, and emergent foul weather and storm-related issues. Personnel who declared they were fatigued were directed to report to the site, and others that were called in for non-scheduled and/or off hours work, had no documentation of any fatigue assessments being performed.

Contract supervisors and managers did not maintain any logs or records of personnel call outs/ins. Additionally, no records could be found of time off between call outs/ins, fatigue declarations, or fatigue assessments.

The inspectors concluded that there were no FFD records, documentation, or fatigue assessments conducted by this contract company as required by procedure AD-SY-ALL-0460, Revision 0, “Managing Fatigue and Work Hour Limits.” Section 5.19, further states in part that self-declaration of fatigue should be encouraged; and to document self-declarations on Attachment 2.

Analysis: The failure to conduct and document fatigue assessments for self-declared fatigued contractors, and other contract personnel called in to supplement or support emergent firewatch duties, and emergent foul weather and storm-related issues was a performance deficiency. The finding was more than minor because if left uncorrected, the performance deficiency would have the potential to become a more significant safety concern. Specifically, the failure to conduct fatigue assessments on personnel that self-declared fatigue or were called in to perform unscheduled work, could result in performance of work while impaired from fatigue, which may affect their abilities to perform safety-related firewatch compensatory duties and support emergent foul weather activities, safely and competently. The inspectors used NRC IMC 0609, Appendix E, Part I, Baseline Safety Significance Determination Process, dated October 16, 2015, and it did not meet the criteria for application of the significance screen. Using Figure 6, Access Authorization, the impact area was determined to be the vital area; with Tier II program element 08-02.05(e), of Policy and Procedures, resulting in a total of one point, which is within the significance determination process threshold for a Green finding. The finding had a cross cutting area of Human Performance, with a cross cutting aspect of documentation, because contract supervisors and managers failed to create and maintain complete, accurate and up-to-date documentation related to the FFD program. (H.7)

Enforcement: 10 CFR 26.27(c), Procedures, states in part, each licensee and other entity shall prepare, implement, and maintain written procedures that describe the methods to be used in implementing the FFD policy and the requirements of this part. 10 CFR 26.27(c)(3) states in part, the procedures must describe the process that the licensee or other entity will use to ensure that individuals who are called in to perform an unscheduled working tour are fit for duty. Licensee procedure AD-SY-ALL-0460, Revision 0, "Managing Fatigue and Work Hour Limits," is used to implement the requirements to ensure that individuals who are called in to perform an unscheduled working tour are fit for duty.

Contrary to the above, from October 2015 through June 2016, there were multiple occasions when the licensee failed to implement the procedure required to conduct and document fatigue assessments for self-declared fatigued contractors, and other contract personnel called in to supplement or support emergent firewatch duties, and emergent foul weather and storm-related issues. The licensee entered NCR 02053832 into the CAP and implemented actions to reinforce with the contract organizations that the FFD program is to address fatigue issues as well drugs and alcohol. Since the issue was addressed by the CAP and the violation was of very low safety significance, consistent with Section 2.3.2.a of the NRC's Enforcement Policy, this violation is being treated as an NCV: NCV 05000400/2016003-02, Failure to Conduct and Document Fatigue Assessments for Contract Personnel.

#### 4OA3 Follow-up of Events (71153 – 1 sample)

##### .1 (Closed) Licensee Event Report 05000400/2015-001-00, Safety Valve Settings Outside Technical Specification Tolerance

###### a. Inspection Scope

On May 11, 2015, the licensee submitted a licensee event report (LER) documenting that surveillance testing had identified five main steam (MS) safety valves (SV) and one pressurizer SV that were outside of the TS allowed tolerance of one percent for their respective lifting settings. The licensee's corrective actions to prevent recurrence involved replacing the pressurizer SV and to submit a license amendment request (LAR) to expand the allowed tolerance for the lift settings from one percent to three percent on the MSSVs, which is consistent with the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code. The LAR also lowered the value for the limiting safety system setting and the limiting condition for operation for pressurizer level to a maximum of 87 percent and 75 percent, respectively. A safety evaluation of the proposed changes to the licensee's TS was performed. On July 25, 2016, license amendment number 151 was approved by the NRC, granting the licensee the TS changes described above. This LER is closed.

###### b. Findings

No findings were identified during the review of this LER. This LER is closed.

#### 4OA6 Meetings, Including Exit

On October 18, 2016, the resident inspectors presented the inspection results to Mr. Ben Waldrep and other members of the licensee's staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee personnel

J. Caves, (Acting) Manager, Regulatory Affairs  
M. Denny, Director, Engineering  
L. Faulk, Director, Plant Security  
D. Griffith, Manager, Training  
T. Hamilton, Plant Manager  
B. Jones, Director, Organizational Effectiveness  
J. Keltner, Manager, Chemistry  
B. McCabe, Manager, Nuclear Oversight  
S. McDaniels, Engineer, Regulatory Affairs  
I. Norby, Senior Engineer, Regulatory Affairs  
S. O'Connor, General Manager, Engineering  
J. O'Keefe, Assistant Operations Manager, Support  
M. Parker, Manager, Radiation Protection  
J. Scott, Operations Manager  
J. Sharlow, Senior Emergency Preparedness Specialist  
G. Simmons, Manager, Emergency Planning  
T. Stephens, Regulatory Affairs  
D. Stih, Emergency Preparedness Specialist  
R. Vandenberg, Assistant Operations Manager, Shift  
B. Waldrep, Site Vice President  
C. Yarley, Engineer, Regulatory Affairs

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

#### Open

05000400/2016003-01	URI	Subsequent Loss of Safety-Related Chilled Water System Results in a Loss of Safety Function (Section 1R19)
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#### Opened and Closed

05000400/2016003-02	NCV	Failure to Conduct and Document Fatigue Assessments for Contract Personnel (Section 4OA2.3.1)
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#### Closed

05000400/2015-001-00	LER	Safety Valve Settings Outside Technical Specification Tolerance (Section 4OA3)
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## LIST OF DOCUMENTS REVIEWED

### **Section 1R04: Equipment Alignment**

OMM-001, Operations Administrative Requirements, Attachment 16, Protected Train Equipment

#### Partial Walkdowns

OP-155, Diesel Generator Emergency Power System

OP-139, Service Water System

OP-148, Essential Services Chilled Water System

#### Complete Walkdown

OP-137, Auxiliary Feedwater System

Drawing CPL-2165-S-0544, Simplified Flow Diagram Feedwater System Unit 1

Clearance Order OPS-1-16-3065-TDAFWPUMP-0739

AR 2052833 K,1AF-E001 Oil Sightglasses Below Minimum

### **Section 1R05: Fire Protection**

FPP-001, Fire Protection Program Manual

FPP-002, Fire Emergency

FPP-013, Fire Protection – Minimum Requirements, Mitigating Actions and Surveillance Requirements

AD-EG-ALL-1520, Transient Combustible Control

FPP-012-04-DGB, Diesel Generator Building Fire Pre-Plan

FPP-012-08-SEC, Out Building Fire Pre-Plan

FPP-012-02-RAB190-216, Reactor Auxiliary Building Elevations 190 and 216 Fire Pre-Plan

Dwg 2165-S-0902 sh 2, Simplified Flow Diagram Fire Protection Control Valve Details RAB, WPB, and FHB

### **Section 1R06: Flood Protection Measures**

#### Internal Flooding

PRA-F-E-0010, Diesel Fuel Oil Storage Transfer Building Internal Flooding Evaluation

UFSAR, Section 2.4.2, Table 2.4.2-4, Plant Area Water Accumulation for Design PMP Conditions

ESOMS narrative logs 7/8/2016 to 7/10/2016 Operations

#### Underground Cables

WO 20062344, Dewater underground cable vaults

PM-M0129, Cable Vault Sump Pump Skid Maintenance

OP-124, Secondary Drains and Oily Waste Collection and Separation System

Flow Diagram 5-G-0185-S04, Yard Ductbank Sumps Drainage System

### **Section 1R11: Licensed Operator Requalification Program**

#### Resident Inspector Quarterly Review of Licensed Operator Requalification

AD-OP-ALL-1000, Fleet Conduct of Operations

Operations Management Manual, OMM-001, Operations Administrative Requirements

OMM-002, Shift Turnover Package

AD-TQ-ALL-1000, Conduct of Training

TE-OP-HNP-0001, Temporary Event Response Guide for Loss of Offsite Power or Loss of All Service Water during 'A' ESW Pump Replacement, Rev. 0

JIT-LP-17.5, Just in Time Training on Auxiliary Operator Actions for TE-OP-HNP-0001, Rev. 0

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

EST-702, Moderator Temperature Coefficient – EOL

AD-OP-ALL-0106, Conduct of Infrequently Performed Tests or Evolutions

AD-OP-ALL-0203, Reactivity Management

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

AD-WC-ALL-0200, On-Line Work Management

AD-NF-ALL-0501, Electronic Risk Assessment Tool

WCM-001, On-line Risk Management, Attachment 2, Emergent Work Risk Assessment, (completed for 'A' ESCW chiller inoperable on 7/22/2016)

Plant Risk Profile for August 3, 2016

AD-WC-ALL-0410, Work Activity Integrated Risk Management, Attachment 9, Critical Activity Plan, (completed for 'B' MSR lift)

Temporary Load Release 16-014, Lift of 'B' MSR to Turbine Building 314' Elevation, Rev. 2 Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment No. 153 to Renewed Facility Operating License No. NPF-63 Duke Energy Progress, LLC Shearon Harris Nuclear Power Plant, Unit 1, Docket No. 50-400

EC 405325, Temporary Mod/Controls Required to Meet NRC License Conditions (8 & 14) for 'A' ESW Pump Online Replacement

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

AD-OP-ALL-0105, Operability Determinations

DWG 1364-46365, MCC-1-4B13

Seismic Operability Review 16-033

Reportability Evaluation Worksheet (REW) for AR 2043878

ESOMS narrative log 7/8/2016 Operations

AR 2044553, Breakdown in Planning for Penetration Seal Breach

DWG 1364-098778, Shearon Harris CRDM ID Temper Bead Weld Repair

September 18, 2015 Letter from NRC to Mr. Benjamin C. Waldrep, SUBJECT: Shearon Harris Nuclear Power Plant, Unit 1 Relief Request I3R-15 for Reactor Vessel Closure Head Penetration Nozzle Repair Technique, In-service Inspection Program – Third 10-Year Interval and Enclosed Safety Evaluation

June 8, 2016, Letter from AREVA to Samuel Volk, Project Manager, Reactor Vessel, AREVA Notification of CR2016-1221, "Stresses Above the Roll Transition Region of a CRDM IDTB Repair Are Higher Than Expected"

AR 2026253, Reactor Vessel Head Half-Nozzle Repair Analysis Issue

Shearon Harris Nuclear Power Plant, Unit 1 – Completion of Office of Nuclear Reactor Regulation Support to Region II Regarding an Operability Determination for the Repair of the Control Rod Drive Mechanism Nozzle Penetrations

Electric Power Research Institute (EPRI) topical report MRP-335, "Materials Reliability Program: Topical Report for Primary Water Stress Corrosion Cracking Mitigation by Surface Stress Improvement, Rev. 3

**Section 1R18: Plant Modifications**

AD-LS-ALL-0008, 10 CFR 50.59 Review Process

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

NEI 96-07, Guidelines for 10 CFR 50.59 Evaluations

EC 404325, Temporary Mod / Controls Required to Meet NRC License Conditions for 'A' ESW Pump Online Replacement

**Section 1R19: Post Maintenance Testing**

PLP-400, Post Maintenance Testing

OST-1013, 1A-SA Emergency Diesel Generator Operability Test Monthly Interval Modes 1-2-3-4-5-6

OP-155, Diesel Generator Emergency Power System

OPT-1512, Essential Services Chilled Water Turbopak Units Quarterly Inspection / Checks Modes 1-6

EC 405116, PDS-01CY-99428AS-HI Fitting Failure Evaluation for 1CH-E005

AR 2046128

AR 2047870

LP-F-0014, Total Reactor Makeup Water System

**Section 1R22: Surveillance Testing**

OMM-007, Operations Surveillance, Periodic and Reliability Tests

EST-702, Moderator Temperature Coefficient – EOL

OST-1191, Steam Generator PORV and Block Valve Operability Test Quarterly Inspection

OST-1080, Auxiliary Feedwater Pump 1X-SAB Full Flow Test Quarterly Interval Mode 1, 3

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

**Section 1EP6: Drill Evaluation**

PLP-201, Emergency Plan

PLP-117, equipment Important to Emergency Response

Emergency Response Organization Integrated Drill 16-07

AR 2046949

AR 2046950

AR 2046954

AR 2046955

AR 2046975

AR 2046983

**Section 4OA1: Performance Indicator Verification**

NEI 99-02, Regulatory Assessment Performance Indicator Guideline

Calculation HNP-F/PSA-0068, NRC Mitigating System Performance Index Basis Document for Harris Nuclear Plant

**Section 4OA2: Problem Identification and Resolution**

AD-OP-ALL-0202, Aggregate Operator Impact Assessment

AD-PI-ALL-0100, Corrective Action Program

AD-PI-ALL-0101, Root Cause Evaluation

AD-PI-ALL-0102, Apparent Cause Evaluation

AD-PI-ALL-0103, Quick Cause Evaluation

AD-PI-ALL-0104, Prompt Investigation Response Team

AD-PI-ALL-0105, Effectiveness Reviews

**Procedures and Guidance Documents**

AD-PI-ALL-0100, Corrective Action Program

AD-EG-ALL-1520,

AD-EG-ALL-1522,

AD-SY-ALL-0460, Managing Fatigue and Work Hour Limits, Revision 0

FPP-005. Duties of a Fire Watch, Revision 21

Condition Reports / Action Requests

AR 01970851  
AR 01986547  
AR 01997483  
AR 02001763  
AR 02005607  
AR 02025493  
AR 02033691  
AR 02033778

Work Orders/Requests

2006983/20023830  
2002380/20024188  
2004607/20023463  
12234649/20019815  
20045353/20017298  
20040688/20015466  
13352262

Audits

Nuclear Oversight – Audit, Harris Fire Protection Audit, 2016-HNP-FP-01  
Nuclear Oversight – Audit of Fire Protection, H-FP-15-01  
Assessment of HNP Fire Protection Program, H-FP-12-01

Other documents

BHI Energy, Harris Plant – Fire Watch Guidelines, Rev. 5  
Duke Energy FFD Training Material  
Duke Energy SCWE Training Material

Records and Data Reviewed

List of Contract Companies and their badged employees by name  
Part 26 – work hour control; self-declaration; and fatigue assessments (October 1, 2015 –  
July 10, 2016)  
Firewatch logs – May 2016 to July 10, 2016