



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

November 4, 2013

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

**SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT - NRC INTEGRATED
INSPECTION REPORT 05000400/2013004**

Dear Mr. Kapopoulos:

On September 30, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Shearon Harris reactor facility Unit 1. The enclosed inspection report documents the inspection results which were discussed on October 29, 2013, with you and other members of your staff.

One NRC identified finding of very low safety significance (Green) was identified during this inspection. This finding involved a violation of NRC requirements. The NRC is treating this violation as non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest this non-cited violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Shearon Harris facility.

If you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II; and the NRC Resident Inspector at Shearon Harris facility.

E. Kapopoulos

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Document Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

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

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

Enclosure: NRC Inspection Report 05000400/2013004
w/Attachment: Supplemental Information

cc: Distribution via Listserv

E. Kapopoulos

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Letter to Ernie Kapopoulos from George T. Hopper dated November 4, 2013

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT - NRC INTEGRATED
INSPECTION REPORT 05000400/2013004

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-400

License No.: NPF-63

Report No.: 05000400/2013004

Licensee: Carolina Power and Light Company

Facility: Shearon Harris Nuclear Power Plant, Unit 1

Location: 5413 Shearon Harris Road
New Hill, NC 27562

Dates: July 1, 2013 through September 30, 2013

Inspectors: J. Austin, Senior Resident Inspector
P. Lessard, Resident Inspector
M. Bates, Senior Operations Engineer (Section 1R11.3)
J. Rivera-Ortiz, Senior Reactor Inspector (Section 4OA5)

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

Enclosure

SUMMARY OF FINDINGS

IR 05000400/2013-004: Carolina Power and Light Company on 07/01/2013 – 09/30/2013; Shearon Harris Nuclear Power Plant, Unit 1; Fire Protection.

The report covered a three month period of inspection by resident inspectors, a regional senior operations engineer, and a regional senior reactor inspector. One NRC-identified finding of very low safety significance (Green) was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, issued June 19, 2012, "Significance Determination Process" (SDP). The cross-cutting aspects were determined using IMC 0310, "Components Within the Cross-Cutting Areas," issued October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated January 28, 2013. The NRC's program for overseeing the safe operations of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" revision 4.

Cornerstone: Mitigating Systems

- **Green.** The inspectors identified a Green non-cited violation (NCV) of the Shearon Harris Nuclear Power Plant Operating License NPF-63 condition 2.F, Fire Protection Program, and 10 CFR 50.48(c), National Fire Protection Association (NFPA) Standard 805, for failing to implement required compensatory measures per licensee procedure FPP-013, Fire Protection. Specifically, the licensee failed to establish an hourly fire watch and stage backup fire suppression equipment for a blocked open fire door (FD-241) between the "A" and "B" safety related switchgear rooms on September 9, 2013. The licensee took corrective action by restoring the fire door to functional. The licensee entered this into the corrective action program (CAP) as Action Request (AR) #627493.

The failure to implement fire compensatory measures in accordance with licensee procedure FPP-013, Fire Protection during the two hour exposure period when the fire door between Switchgear Rooms A and B was propped open was determined to be a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the protection against external factors (fire) attribute of the Mitigating Systems Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, this failure inadvertently bypassed a three hour fire barrier and created the potential for a fire to affect both safety related switchgear rooms. The finding was screened in accordance with NRC Inspection Manual Chapter (IMC) 0609 attachment 4 which determined that an evaluation using NRC IMC 0609 Appendix F (Fire SDP) was required. The propped open door constituted a high degradation condition per NRC IMC 0609 appendix F Attachment 2 which required a detailed risk evaluation. A bounding phase 3 risk analysis was done by a regional SRA using a hand calculation and guidance from NRC IMC 0609 Appendix F. The major analysis assumptions included a duration factor of 2 hours, an ignition frequency of 2E-2/year, a base case conditional core damage probability (CCDP) of 0.1 (assumed large single SWGR room fire would require alternate safe shutdown), a non-conforming case

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CCDP of 1.0 (assumed a dual SWGR fire scenario would result in core damage), and a probability of non-suppression (PNS) of 1E-3. The dominant sequence was a challenging SWGR room fire which remained unsuppressed long enough to develop into a damaging hot gas layer scenario which would fail SSD equipment in both SWGR rooms A and B due to the open fire door and result in core damage. The licensee's fire PRA produced similar results. The short exposure period, ability to close the fire door, and the low PNS mitigated the risk. The analysis result was an increase in core damage of $< 1E-6$ /year, a finding of very low safety significance (Green). The finding had a cross-cutting aspect of Work Planning, as described in the Work Control component of the Human Performance cross-cutting area because the licensee failed to identify the need for a compensatory action due to the blocked open fire door. [H.3(a)] (Section 1R05)

REPORT DETAILS

Summary of Plant Status

On August 2, 2013, Unit 1 power was reduced to eight percent to take the turbine offline to address increased bearing vibrations. Power was restored to Rated Thermal Power (RTP) on August 5, 2013. Also, on September 14, 2013, Unit 1 power was reduced to seven percent to take the turbine offline to again address increased bearing vibrations. With those exceptions, Unit 1 operated at or near RTP for the entire inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

The inspectors performed four partial system walkdowns of the following risk-significant systems:

- The "B" Normal Service Water (NSW) pump while the "A" NSW pump was out of service (OOS) for planned maintenance on July 22, 2013;
- The "B" Emergency Service Water (ESW) pump while the "A" ESW pump was OOS for planned maintenance on July 24, 2013;
- The "B" Essential Services Chilled Water (ESCW) chiller while the "A" ESCW chiller was OOS for planned maintenance on August 1, 2013; and
- Auxiliary bus 1D2 when it was protected due to the loss of auxiliary bus 1E2 on August 8, 2013.

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors attempted to identify any discrepancies that could impact the function of the system and, therefore, potentially increase risk. The inspectors reviewed applicable operating procedures, system diagrams, applicable portions of the Updated Final Safety Analysis Report (UFSAR), Technical Specification (TS) requirements, outstanding work orders, condition reports, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have rendered the systems incapable of performing their intended functions. The inspectors also walked down accessible portions of the systems to verify system components and support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors also verified that the licensee had properly identified and resolved equipment alignment problems that could cause initiating events

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or impact the capability of mitigating systems or barriers and entered them into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Quarterly Resident Inspector Tours

a. Inspection Scope

The inspectors conducted six fire protection walkdowns which were focused on availability, accessibility, and the condition of firefighting equipment in the following risk-significant plant areas:

- “A” Switchgear and Battery Rooms and Non-Safety Battery Room
- “B” Switchgear and Battery Rooms and Alternate Control Panel Room
- “A” Diesel, 280’ and 292’ Elevation
- “B” Diesel, 280’ and 292’ Elevation
- “A” Train ESW Pump Room
- “B” Train ESW Pump Room

The inspectors reviewed areas to assess if the licensee had implemented a fire protection program that adequately controlled combustibles and ignition sources within the plant, effectively maintained fire detection and suppression capability, maintained passive fire protection features in good material condition, and had implemented adequate compensatory measures for out of service (OOS), degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee’s fire plan. The inspectors selected fire areas based on their overall contribution to fire risk as documented in the plant’s Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate or mitigate a plant transient, or their impact on the plant’s ability to respond to a security event. Using the documents listed in the attachment, the inspectors verified that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed, that transient material loading was within the analyzed limits; and fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors also verified that minor issues identified during the inspection were entered into the licensee’s CAP.

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

- AR #627493, Blocked Fire Door not Documented in Out of Service Log
- AR #631340, Unexpected Failure of Emergency Light

b. Findings

Introduction: The inspectors identified a Green NCV of the Shearon Harris Nuclear Power Plant Operating License NPF-63 condition 2.F, Fire Protection Program, and 10 CFR 50.48(c) National Fire Protection Association (NFPA) Standard 805 for failing to implement required compensatory measures per licensee procedure FPP-013, Fire Protection. Specifically, the licensee failed to establish an hourly fire watch and stage backup fire suppression equipment for a blocked open fire door (FD-241) between the “A” and “B” safety related switchgear rooms.

Description: On September 9, 2013, NRC inspectors conducted a walkdown of the “A” and “B” safety related switchgear rooms. During this time, the licensee was removing a large non-safety related transformer. As part of this evolution, the licensee blocked open FD-241, which is designed to separate the “A” and “B” safety related switchgear rooms. However, the licensee failed to recognize that they had rendered that fire barrier inoperable. As a result, they failed to establish an hourly fire watch and stage backup fire suppression equipment as required by licensee procedure FPP-013, Fire Protection. This violation was recognized by the NRC inspectors, who immediately questioned the licensee. The licensee placed this issue into the CAP as AR #627493. Upon investigation, the licensee determined that they blocked open FD-241 for approximately two hours which was in violation of licensee procedure FPP-013. Specifically, they determined that FPP-013 step 9.5.2.d required them to establish an hourly fire watch and stage backup fire suppression as a compensatory measure for this condition, which they had failed to do.

Analysis: The failure to implement fire compensatory measures in accordance with licensee procedure FPP-013, Fire Protection, during the two hour exposure period when the fire door between Switchgear Rooms A and B was propped open, was determined to be a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the protection against external factors (fire) attribute of the Mitigating Systems Cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, this failure inadvertently bypassed a three hour fire barrier and created the potential for a fire to affect both safety related switchgear rooms. The finding was screened in accordance with NRC Inspection Manual Chapter (IMC) 0609 attachment 4 which determined that an evaluation using NRC IMC0609 Appendix F (Fire SDP) was required. The propped open door constituted a high degradation condition per NRC IMC 0609 appendix F Attachment 2 which required a detailed risk evaluation. A bounding phase 3 risk analysis was done by a regional SRA using a hand calculation and guidance from NRC IMC 0609 Appendix F. The major analysis assumptions included a duration factor of 2 hours, an ignition frequency of 2E-2/year, a base case conditional core damage probability (CCDP) of 0.1 (assumed large single SWGR room fire would require alternate safe shutdown), a non-conforming case CCDP of 1.0 (assumed a dual SWGR fire scenario would result in core damage), and a probability of non-suppression (PNS) of 1E-3. The dominant sequence was a challenging SWGR room fire which remained unsuppressed long enough to develop into a damaging hot gas layer scenario which would fail SSD equipment in both SWGR

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rooms A and B due to the open fire door and result in core damage. The licensee's fire PRA produced similar results. The short exposure period, ability to close the fire door, and the low PNS mitigated the risk. The analysis result was an increase in core damage of $< 1E-6$ /year, a finding of very low safety significance (Green). The finding had a cross-cutting aspect of Work Planning, as described in the Work Control component of the Human Performance cross-cutting area because the licensee failed to identify the need for a compensatory action due to the blocked open fire door. [H.3(a)]

Enforcement: The Shearon Harris Nuclear Power Plant Operating License NPF-63 condition 2.F, Fire Protection Program, and 10 CFR 50.48(c), National Fire Protection Association (NFPA) Standard 805, require the licensee to implement their FPP-013, Fire Protection procedure. FPP-013 step 9.5.2.d requires the licensee to establish an hourly fire watch and stage backup fire suppression as a compensatory measure if FD-241 is blocked open.

Contrary to this requirement, the licensee failed to establish an hourly fire watch and stage backup fire suppression equipment for blocked open FD-241 on September 9, 2013, for approximately two hours. The licensee took corrective action by restoring the fire door. Because this violation was of very low safety significance and was entered into the CAP as AR #627493, this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy (NCV 05000400/2013004-01), "Failure to Compensate for a Blocked Open Fire Door."

.2 Annual Fire Protection Drill Observation

a. Inspection Scope

On September 23, 2013, the inspectors observed fire brigade performance during an announced fire drill coordinated with offsite fire department response. The drill tested the fire brigade's ability to extinguish a fire on the top elevation of the turbine building, while coordinating with two local fire departments who responded to the site. The inspectors verified that the licensee staff identified deficiencies; openly discussed them in a self-critical manner at the drill debrief, and took appropriate corrective actions. Specific attributes evaluated were:

- Proper wearing of turnout gear and self-contained breathing apparatus
- Proper use and layout of fire hoses
- Employment of appropriate fire fighting techniques
- Sufficient firefighting equipment brought to the scene
- Effectiveness of fire brigade leader communications, command, and control
- Search for victims and propagation of the fire into other plant areas
- Smoke removal operations
- Utilization of preplanned strategies
- Adherence to the preplanned drill scenario
- Fulfillment of drill objectives

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program

.1 Quarterly Review

a. Inspection Scope

On September 30, 2013, the inspectors observed a crew of licensed operators in the plant's simulator during licensed operator requalification examinations to verify that operator performance was adequate, evaluators were identifying and documenting crew performance problems and training was being conducted in accordance with licensee procedures. The inspectors evaluated the following areas:

- Licensed operator performance
- Crew's clarity and formality of communications
- Ability to take timely and conservative actions
- Prioritization, interpretation, and verification of annunciator alarms
- Correct use and implementation of abnormal and emergency procedures
- Control board manipulations
- Oversight and direction from supervisors
- Ability to identify and implement appropriate TS actions and Emergency Plan actions and notifications

The crew's performance in these areas was compared to pre-established operator action expectations and successful critical task completion requirements.

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

- AR #632734, Lost Drill/Exercise Performance Opportunities for September

b. Findings

No findings were identified.

.2 Licensed Operator Performance in the Actual Plant/Main Control Room

a. Inspection Scope

On August 2, 2013, the inspectors observed operators in the plant's main control room during a downpower to support taking the turbine generator OOS for repairs to address increased bearing vibrations. On August 8, 2013, inspectors observed operators'

response to a faulted transformer 1E2 (6.9 kV to 480 VAC). The inspectors evaluated the following areas:

- Operator compliance and use of plant procedures, including procedure entry and exit, performing procedure steps in the proper sequence, procedure place-keeping, and TS entry and exit;
- Control board/in-plant component manipulations;
- Communications between crew members;
- Use and interpretation of plant instruments, indications, and alarms; diagnosis of plant conditions based on instruments, indications, and alarms;
- Use of human error prevention techniques, such as pre-job briefs and peer checking;
- Documentation of activities, including initials and sign-offs in procedures, control room logs, TS entry and exit, entry into OOS logs; and
- Management and supervision of activities, including risk management and reactivity management.

b. Findings

No findings were identified.

.3 Annual Review of Licensee Requalification Examination Results

a. Inspection Scope

On February 21, 2013, the licensee completed the annual requalification operating examinations required to be administered to all licensed operators in accordance with 10 CFR 55.59(a)(2). The inspectors performed an in-office review of the overall pass/fail results of the individual operating examinations and the crew simulator operating examinations in accordance with Inspection Procedure (IP) 71111.11, "Licensed Operator Requalification Program." These results were compared to the thresholds established in IMC 609, "Significance Determination Process," Appendix I, "Operator Requalification Human Performance Significance Determination Process."

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the selected systems. In addition, the inspectors verified maintenance effectiveness issues were entered into the CAP with the appropriate significance characterization. Documents reviewed are listed in the Attachment. The inspectors evaluated degraded performance issues involving the following risk significant components:

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- AR #614527, "A" Train Anticipated Transient Without Scram Mitigation System Actuation Circuitry (AMSAC) Controller not Functioning
- AR #620381, "B" ESW Screen Wash Pump Oil Leak

The inspectors focused on the following attributes:

- Implementing appropriate work practices;
- Identifying and addressing common cause failures;
- Scoping of systems in accordance with 10 CFR 50.65(b) of the maintenance rule;
- Characterizing system reliability issues for performance;
- Counting unavailability time during performance of maintenance;
- Trending key parameters for condition monitoring;
- Ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification; and
- Verifying appropriate performance criteria for structures, systems, and components (SSCs)/functions classified as (a)(2) are appropriate and adequate goals and corrective actions for systems classified as (a)(1).

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed the licensee's evaluation and management of plant risk for the maintenance and emergent work activities affecting risk-significant equipment listed below to verify that the appropriate risk assessments were performed prior to removing equipment for work:

- Yellow risk activities due to planned maintenance on the reactor make-up water system on July 10, 2013;
- Yellow risk activities while the demineralized water transfer pumps were secured for maintenance on July 16, 2013;
- Yellow risk activities for the downpower and uppower performed to support corrective maintenance for increased turbine vibrations on August 2-5, 2013;
- Green risk condition following the loss of the 1E2 transformer on August 8, 2013; and
- Elevated green risk condition while the failed 1E2 transformer was removed from the "B" Switchgear room on September 9, 2013;

These activities were selected based on their potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that risk assessments were performed as required by 10 CFR 50.65(a)(4) and were accurate and complete. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors reviewed the scope

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of maintenance work, discussed the results of the assessment with the licensee's probabilistic risk analyst or shift technical advisor, and verified plant conditions were consistent with the risk assessment. The inspectors also reviewed TS requirements and walked down portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

b. Findings

No findings were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors selected the following five potential operability issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to the licensee's evaluations, to determine whether the components or systems were operable. 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 also reviewed a sampling of corrective action documents to verify that the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the Attachment.

- AR #625944, Trip of the "A" ESCW System Chiller
- AR #621677, Replace 1B2-SB Transformer
- AR #621485, Loss of 480 VAC BUS 1E2 caused a Trip Condition
- AR #617350, "A" Component Cooling Water (CCW) Pump Cavitation
- AR #615100, Error in Evaluation of Condensate Storage Tank Depletion Due to Pipe Break

b. Findings

No findings were identified.

1R18 Plant Modifications

a. Inspection Scope

The following engineering design package was reviewed and selected aspects were discussed with engineering personnel:

- Engineering Change (EC) #93097, Temporary Modification to Electrically Shut 1SI-298 (Safety Injection Accumulator Vent Valve) While Retaining the Capability to Operate

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This document and related documentation were reviewed for adequacy of the associated 10 CFR 50.59 safety evaluation screening, consideration of design parameters, implementation of the modification and post-modification testing. In addition, the inspectors reviewed relevant procedures, design documents, and licensing documents to ensure they were properly updated. The inspectors observed ongoing and completed work activities to verify that installation was consistent with the design control documents. The temporary modification installed a switch in the Main Control Room to operate 1SI-298. 1SI-298 was allowing nitrogen to leak by while its solenoid was energized.

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

- AR #627412, Differing Positions on Applicability of 50.59
- AR #618698, 1SI-298 is Continuously Venting

b. Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed the following six post-maintenance test (PMT) activities to verify that procedures and test activities were adequate to ensure system operability and functional capability:

<u>Procedure</u>	<u>Title</u>	<u>Related Maintenance Activity</u>	<u>Date</u>
OP-148	ESCW System	Work Order (WO) #2270354, Replace Lube Oil Thermostat on "A" ESCW Chiller	August 1, 2013
OP-155	Diesel Generator Emergency Power System	WO #1957323, Preventative Maintenance on 1C-SB Starting Air Compressor	August 7, 2013
OP-178	Emergency Service Water Intake Structure HVAC System	WO #2127607, Replace Contacts in 42 Relay Coil for ESW Intake Exhaust Fan	August 20, 2013
OST-1032	Reactor Auxiliary Building Emergency Exhaust System Train A Operability Monthly Interval Modes 1-4	WO #2172305, Perform Preventative Maintenance on Breaker 1A35-SA-12B	August 28, 2013

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OST-1045	Engineered Safety Features Actuation System (ESFAS) Train B Slave Relay Test Quarterly Interval Modes 1 -4	OWP-SW, Operations Work Procedure Service Water to Support "B" Emergency Diesel Generator (EDG) Maintenance	September 12, 2013
OST-1076	"B" Auxiliary Feedwater Pump Operability Test Quarterly Interval Modes 1-4	WO #1822753 and 2085531, Replace and Calibrate Hydramotor Actuator	September 18, 2013

These activities were selected based upon the structure, system, or component's ability to impact risk. The inspectors evaluated these activities for the following: the effect of testing on the plant had been adequately addressed; testing was adequate for the maintenance performed; acceptance criteria were clear and demonstrated operational readiness; test instrumentation was appropriate; tests were performed as written in accordance with properly reviewed and approved procedures; equipment was returned to its operational status following testing, and test documentation was properly evaluated. The inspectors evaluated the activities against TS and the UFSAR to ensure that the test results adequately ensured that the equipment met the licensing basis and design requirements. In addition, the inspectors reviewed corrective action documents associated with post-maintenance tests to determine whether the licensee was identifying problems and entering them in the CAP and that the problems were being corrected commensurate with their importance to safety. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R22 Surveillance Testing

.1 Routine Surveillance Testing

a. Inspection Scope

For the four surveillance tests below, the inspectors observed the surveillance tests and/or reviewed the test results for the following activities to verify the tests met TS surveillance requirements, UFSAR commitments, in-service testing requirements, and licensee procedural requirements. The inspectors assessed the effectiveness of the tests in demonstrating that the SSCs were operationally capable of performing their intended safety functions.

- OST-1216, CCW System Operability Quarterly Interval Modes 1-4 on July 25, 2013;
- OST-1023, Off Site Power Availability Verification Weekly Interval Modes 1-6 on August 8, 2013;

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- OPT-1530, Dedicated Shutdown Diesel Generator Operability Test Monthly Interval All Modes on September 9, 2013; and
- OST-1861, Remote Shutdown: Individual Component Tests 18 Month Interval Modes 1-3 on September 13, 2013.

b. Findings

No findings were identified.

.2 In service Testing (IST) Surveillance

a. Inspection Scope

The inspectors reviewed the performance of OST-1073, "B" Emergency Diesel Generator Operability Test Monthly Interval Modes 1-6 on September 12, 2013, to evaluate the effectiveness of the licensee's American Society of Mechanical Engineers (ASME) Section XI testing program for determining equipment availability and reliability. This surveillance satisfies the IST requirements for the "B" Fuel Oil Transfer Pump. The inspectors evaluated selected portions of the following areas:

- Testing procedures and methods
- Acceptance criteria
- Compliance with the licensee's IST program, TS, selected licensee commitments, and code requirements
- Range and accuracy of test instruments
- Required corrective actions

b. Findings

No findings were identified.

1EP6 Emergency Planning Drill Evaluation

a. Inspection Scope

The inspectors observed an emergency preparedness (EP) drill conducted on September 23, 2013, to verify licensee self-assessment of classification, notification, and protective action recommendation development in accordance with 10 CFR Part 50, Appendix E. The drill tested the licensee's ability to manage a turbine failure, a steam generator tube rupture and a failed open steam generator safety relief valve.

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

- AR #626823, Missed Drill and Exercise Performance (DEP) Opportunity
- AR #626731, Emergency Response Organization Personnel Reported to the Technical Support Center without Proper Dosimetry

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verificationa. Inspection Scope

To verify the accuracy of the PI data reported to the NRC, the inspectors compared the licensee's basis in reporting each data element to the PI definitions and guidance contained in Nuclear Energy Institute (NEI) Document 99-02, Regulatory Assessment Performance Indicator Guideline.

Mitigating Systems Cornerstone

- Mitigating Systems Performance Index (MSPI), Emergency AC Power
- MSPI, Heat Removal System
- MSPI, High Pressure Injection Systems

The inspectors sampled licensee submittals for the MSPI performance indicators listed above for the period from the third quarter 2012 through the second quarter 2013. The inspectors reviewed the licensee's operator narrative logs, issue reports, MSPI derivation reports, event reports and NRC Integrated Inspection reports for the period to validate the accuracy of the submittals. The inspectors reviewed the MSPI component risk coefficient to determine if it had changed by more than 25 percent in value since the previous inspection, and if so, that the change was in accordance with applicable NEI guidance. The inspectors also reviewed the licensee's issue report database to determine if any problems had been identified with the PI data collected or transmitted for this indicator and none were identified. Documents reviewed are listed in the Attachment.

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

- AR #550825, Seat Leakage Suspected Via 1CS-746 ("A" Charging Safety Injection Pump (CSIP) Alternate Mini-Flow Valve)
- AR #584915, "A" CSIP Would Not Trip From Test Switch
- AR #550419, During B EDG Bar Water Issued From #5L Cylinder
- AR #563769, Scope Expansion Associated With Leaking "A" EDG JW Adaptor
- AR #567842, "B" EDG Fuel Oil Leak
- AR #566794, Turbine Drive Auxiliary Feedwater (TDAFW) Ramp Generator Failure
- AR #596297, 1MS-72 Did Not Open During OST-1124

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b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems

.1 Routine Review of Items Entered Into the Corrective Action Program

a. Inspection Scope

To aid in the identification of repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed frequent screenings of items entered into the licensee's CAP. The review was accomplished by reviewing daily AR reports.

b. Findings

No findings were identified.

.2 Annual Sample: Review of Operator Workarounds (OWAs)

a. Inspection Scope

The inspectors evaluated the licensee's implementation of their process used to identify, document, track, and resolve operational challenges. Inspection activities included, but were not limited to, a review of the cumulative effects of the OWAs on system availability and the potential for improper operation of the system, for potential impacts on multiple systems, and on the ability of operators to respond to plant transients or accidents. The inspectors performed a review of the cumulative effects of OWAs. The documents listed in the attachment were reviewed to accomplish the objectives of the inspection procedure. The inspectors reviewed both current and historical operational challenge records to determine whether the licensee was identifying operator challenges at an appropriate threshold, had entered them into their CAP and proposed or implemented appropriate and timely corrective actions which addressed each issue. Reviews were conducted to determine if any operator challenge could increase the possibility of an Initiating Event, if the challenge was contrary to training, required a change from long-standing operational practices, or created the potential for inappropriate compensatory actions. Daily plant and equipment status logs, degraded instrument logs, and operator aids or tools being used to compensate for material deficiencies were also assessed to identify any potential sources of unidentified operator workarounds.

b. Findings

No findings were identified.

.3 Selected Issue Follow-up Inspection: AR #619929, Trip of "A" Chiller (WC-2ASA)

a. Inspection Scope

The inspectors selected AR #619929, Trip of "A" Chiller (WC-2ASA) for detailed review. This AR was associated with an issue that occurred when WC-2ASA tripped on compressor low oil pressure on August 31, 2013. The inspectors reviewed this report to verify that the licensee identified the full extent of the issue, performed an appropriate evaluation, and specified and prioritized appropriate corrective actions. The inspectors evaluated the report against the requirements of the licensee's CAP as delineated in corporate procedure CAP-NGGC-0200, Condition Identification and Screening Process, and 10 CFR Part 50, Appendix B.

b. Findings

No findings were identified.

4OA3 Follow-up of Events

.1 Event Notification: Alert Declared due to Switchgear Explosion

a. Inspection Scope

The inspectors reviewed the plant's response to event notification 49249 alert declared due to a switchgear explosion that supplies safe shutdown equipment on August 8, 2013.

The licensee reported that there was an explosion in a non-safety related electrical bus (Bus 1E2), which is designated as a safe shut down bus. The licensee classified this event as an Alert based on an Emergency Action Level (EAL) entry condition of "An explosion of sufficient force to damage permanent structures or equipment within the Protected Area." Power was reduced due to the loss of moisture separator reheaters on the secondary side as a result of this event. There was no ongoing fire as a result of the bus explosion. No personnel were injured. No damage to other equipment has been identified at this time.

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

- AR #621768, Prompt Investigation Response Team Report for Harris Nuclear Plant Alert Declaration

b. Findings

No findings were identified.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel to ensure that the observed activities were consistent with licensee security procedures and regulatory requirements. These observations took place during both normal and off-normal plant working hours. These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status reviews and inspection activities.

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

- AR #614800, Loss of Integrated Video Management System Captured Video
- AR #617055, First Aid Call due to Accident at Security Barrier
- AR #620747, Loss of Security Computer Server

b. Findings

No findings were identified.

.2 (Closed) NRC Temporary Instruction (TI) 2515/182, Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks, Phase II

a. Inspection Scope

The inspectors conducted a review of records and procedures related to the licensee's program for buried piping and underground piping and tanks in accordance with Phase II of TI 2515/182 to confirm that the licensee's program contained attributes consistent with Sections 3.3.A and 3.3.B of Nuclear Energy Institute (NEI) 09-14, "Guideline for the Management of Buried Piping Integrity," Revision 3, and to confirm that these attributes were scheduled and/or completed by the NEI 09-14 Revision 3 deadlines. The inspectors interviewed licensee staff responsible for the buried piping program and reviewed activities related to the buried piping program to determine if the program was managed in a manner consistent with the industry's buried piping initiative.

The licensee's buried piping and underground piping and tanks program was inspected in accordance with paragraph 03.02.a of the TI and it was confirmed that activities which correspond to completion dates specified in the program, which have passed since the Phase I inspection was conducted, have been completed. The licensee's buried piping and underground piping and tanks program was inspected in accordance with paragraph 03.02.b of the TI and responses to specific questions found in

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<http://www.nrc.gov/reactors/operating/ops-experience/buried-pipe-ti-phase-2-insp-req-2011-11-16.pdf> were submitted to the NRC headquarters staff.

b. Findings

No findings were identified. Based upon the scope of the review described above, Phase II of TI 2515/182 was completed.

4OA6 Management Meetings

.1 Exit Meeting Summary

An exit meeting was conducted for the TI 2515/182 inspection on September 11, 2013, with Mr. Ernie Kapopoulos, and other members of the licensee staff. The inspectors returned all proprietary information back to the licensee or their respective vendors.

On October 29, 2013, the inspector presented the inspection results to Mr. Ernie Kapopoulos, and other members of the licensee staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection period.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

L. Bennett, Engineering Programs, Buried Piping Program Manager
D. Corlett, Supervisor, Licensing/Regulatory Programs
J. Dufner, Plant Manager
D. Griffith, Training Manager
L. Hughes, Superintendent, Environmental and Chemistry
E. Kapopoulos, Vice President Harris Plant
C. Kidd, Manager, Nuclear Oversight
S. O'Connor, Director, Engineering
M. Parker, Superintendent, Radiation Control
T. Slake, Manager, Security
M. Wallace, Senior Engineer, Licensing
J. Warner, Manager, Outage and Scheduling
F. Womack, Manager, Operations

NRC personnel

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

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000400/2013004-01	NCV	Failure to Compensate for a Blocked Open Fire Door (Section 1R05)
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Closed

Temporary Instruction (TI) 2515/182	TI	Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks, Phase II (Section 4OA5.2)
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LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

Partial System Walkdown

Normal Service Water system:

Procedure OP-139 Service Water System,
Drawing 2165-S-0547 and 0548, Simplified Flow Diagram Circulating and Service Water systems

FSAR 9.2.1 Service Water System

Emergency Service Water system:

Procedure OP-139 Service Water System,
Drawing 2165-S-0547 and 0548, Simplified Flow Diagram Circulating and Service Water systems

FSAR 9.2.1 Service Water System

Section 1R05: Fire Protection

FPP-001 Fire Protection Program Manual

FIR-NGGC-0009, NFPA 805 Transient Combustibles and Ignition Source Controls Program

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

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

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

FPP-012-02-RAB286, Reactor Auxiliary Building Elevation 286 Fire Pre-Plan

Section 1R11: Licensed Operator Requalification Program

Benchmark Tests

SST-001, “Steady State Accuracy and Stability Test”, Performed 11/16/09, 12/15/10

SST-002, “Steady State Accuracy and Stability Test”, Performed 11/16/09, 12/15/10

SST-003, “Steady State Accuracy Test”, Performed 11/16/09, 12/15/10

TT-001, “Reactor Trip”, Performed 10/10

Job Performance Measure (JPM) Packages

Transfer Control to the ACP

Reset Turbine Driven Aux Feedwater Pump

Isolate Ruptured SG – MSIV Will Not Close

Place Containment Cooling in the Maximum Cooling Mode

Classify an Event – ALERT

General Documentation Reviewed

Biennial written examination for 2010 – weeks 1 through 5

Calculation E-5525, Safe Shutdown in Case of Fire

Remedial Action Plan – 2009 – 2010

Requal attendance records 2009-2010

EOP-User’s Guide, Part 4, Rev 29

LERs 2009 to 2010

Procedures

OSP-NGGC-1000, Fleet Conduct of Operations, Revision 3
 Operations Management Manual, OMM-001, Operations Administrative Requirements, Rev 92
 Training Administrative Procedure (TAP) -403, Examination and Testing, Rev 19
 TAP 410, NRC License Examination Security Program, Rev 15
 TAP-412, Simulator Operations, Maintenance and Testing, Rev 8
 Training Program Procedure (TPP)-206 Training Program Procedure-Simulator Rev 10
 TPP- 306, Licensed Operator Continuing Training Program, Revision 20
 TRN-NGGC-0002, Performance Review and Remedial Training, Rev 0
 TRN-NGGC-0420, Conduct of Simulator Training and Evaluation, Rev 0,
 TRN-NGGC-0440, Rev 0
 TRN-NGGC-1000, Conduct of Training, Rev 3
 AOP- 004, Remote Shutdown
 HNP-E/ELEC-0001 Appendix 1 Compliance Assessment by Scenario
 TRN-NGGC-1000, Conduct of Training, Rev 3

Section 1R12: Maintenance Effectiveness

NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants
 ADM-NGGC-0101, Maintenance Rule Program

Section 1R13: Maintenance Risk Assessments and Emergent Work Evaluation

OMP-003, Outage Shutdown Risk Management
 OMM-001, Conduct of Operations
 WCP-NGGC-1000, Conduct of On-Line Work Management
 OPS-NGGC-1311, Protected Equipment
 WCM-001, On-line Maintenance
 ADM-NGGC-0006, Online Equipment Out of Service (EOOS) Models for Risk Assessment

Section 1R15: Operability Evaluations

OPS-NGGC-1305, Operability Determinations

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: Identification and Resolution of Problems

CAP-NGGC-0200, Condition Identification and Screening Process
 CAP-NGGC-0205, Condition Evaluation and Corrective Action Process
 CAP-NGGC-0206, Performance Assessment and Trending

Section 4OA5: Other ActivitiesCorrective Action Program Documents

AR 00447729-33, Self-Assessment Recommendation # 5: Obtain NACE Specialist Services, Due 08/23/2012
 AR 00518613-19, PD-3, ER, Cathodic Protection System Performance Data, due 09/26/2013

AR 00531636-23, Self-Assessment Recommendation #1: Close Gaps between SPP-0008 & NACE SP0169, due 10/16/2013

AR 00531636-26, Self-Assessment Recommendation # 4: Revise SPP-0008 To Require Qualification,
Due 01/16/14

AR 00573049, Corrective Actions Associated with Fiberglass Buried Piping, 11/14/12

AR 00607036, Buried Piping Program Revised Scope and Regulatory Requirements, 05/16/13

AR 00328551, Priority 2 Adverse Condition Investigation, Due 05/07/09

AR 00374518, Water Leak near WTB, 01/01/2010

AR 00568055, LRPR-Waste Neutralization Basin Modifications, 10/18/12

AR 00567704, Repeat Leak on Waste Neutralization Pipe, Due 10/22/13

Procedures

ADM-NGGC-0114, Plant Health Process, Rev. 3

EGR-NGGC-0008, Engineering Programs, Rev. 14

EGR-NGGC-0209, Buried Piping Program, Rev. 5

EPT-251, B Train ESW Flow Verification/Balance, Rev. 20 (completed on 03/12/13)

EST-404, ASME System Pressure Test for Buried Piping, Rev. 0 (completed on 06/30/11)

MNT-NGGC-0024, Excavation and Backfill, Rev. 4

NDEP-0454, Digital Ultrasonic Thickness Measurement, Rev. 4

SI-GWT-100, GWT Piping Inspection General Procedure, Rev. 3

SPP-008, Distributive Ground Bed Cathodic Protection Inspection, Rev. 11

Other Documents

EC EVAL 92988, Buried Pipe Condition Assessment Report for Radiological "Buried Piping"
Shearon Harris Unit 1

QA4000.401, MAPPro© Risk User Guide (for Pipe), Version 2.5

Report No.: 1300024.401, GWT/UT Assessment at Shearon Harris Nuclear Power Station,
Revision A, April 2013

RMS 4949138, Buried Piping and Tanks Inspection Results – Cooling Tower Weir to Drop
Structure "B" (AR 328551), 06/24/09