



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW, SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

December 19, 2008

Mr. Christopher L. Burton  
Vice President  
Carolina Power & Light Company  
Shearon Harris Nuclear Plant  
P.O. Box 165, Mail Zone 1  
New Hill, NC 27562-0165

**SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT - NRC TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000400/2008008 AND EXERCISE OF ENFORCEMENT DISCRETION**

Dear Mr. Burton:

On October 10, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed a triennial fire protection inspection at your Shearon Harris Nuclear Plant. The enclosed inspection report documents the inspection results, which were discussed on October 10, 2008, with you and other members of your staff. Following completion of additional review in the Region II office, another exit meeting was held by telephone with you and other members of your staff on December 18, 2008, to provide an update on changes to the preliminary inspection findings.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one NRC-identified finding of very low safety significance (Green) which was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it was entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV in this report, 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 site.

In addition, the enclosed report documents one noncompliance that was identified during the inspection for which the NRC is exercising enforcement discretion. The NRC is not taking any enforcement action for this noncompliance because it meets the criteria of the NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)," and NRC Inspection Manual Chapter 0305, "Violations in Specified Areas of Interest Qualifying for Enforcement Discretion."

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 component of NRC's document 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: Paul fillion for/

Rebecca L. Nease, Chief,  
Engineering Branch 2  
Division of Reactor Safety

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

Enclosure: Inspection Report 05000400/2008008  
w/Attachment: Supplemental Information

cc w/encl.: (See page 3)

cc w/encl:

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Letter to Christopher L. Burton from Rebecca L. Nease signed by Paul Fillion dated December 19, 2008

SUBJECT: SHEARON HARRIS NUCLEAR PLANT - NRC TRIENNIAL FIRE PROTECTION INSPECTION REPORT 05000400/2008

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No.: 50-400

License No.: NPF-63

Report No.: 05000400/2008008

Licensee: Carolina Power and Light Company

Facility: Shearon Harris Nuclear Power Plant, Unit 1

Location: New Hill, North Carolina

Dates: September 22-26, 2008 (Week 1)  
October 6-10, 2008 (Week 2)

Inspectors: M. Thomas, Senior Reactor Inspector (Team Lead)  
O. Lopez, Fire Protection Inspector in Training  
B. Melly, Fire Protection Engineer (Consultant)  
N. Merriweather, Senior Reactor Inspector  
K. Miller, Reactor Inspector in Training  
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Approved by: Rebecca L. Nease, Chief  
Engineering Branch 2  
Division of Reactor Safety

Enclosure

## SUMMARY OF FINDINGS

IR 05000400/2008008; 09/22-26/2008 and 10/06-10/2008; Shearon Harris Nuclear Power Plant, Unit 1; Triennial Fire Protection Inspection.

This report covers an announced two-week triennial fire protection inspection by a team of four regional inspectors and one contract inspector. One Green non-cited violation was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

### A. NRC-Identified and Self-Revealing Findings

#### Cornerstone: Mitigating Systems

- Green: The team identified a non-cited violation of Shearon Harris Unit 1 operating license condition 2.F, for the licensee's failure to install the sprinkler system in Cable Spreading Room A (CSRA) in accordance with the approved fire protection program (FPP). Specifically, the installed system would not have been able to deliver the sprinkler system design density of 0.3 gallons per minute/square foot in CSRA, as stated in the FPP in Updated Final Safety Analysis Report Section 9.5.1.2.3. The licensee entered this issue in the corrective action program and established a continuous fire watch in CSRA as a compensatory measure in accordance with the Shearon Harris FPP.

The licensee's failure to install the sprinkler system in CSRA in accordance with the approved FPP is a performance deficiency. This finding is more than minor because the installed sprinkler system degraded one of the fire protection defense in depth elements and it affected the reactor safety Mitigating Systems cornerstone objective. The team completed a Phase 2 screening of the finding in accordance with IMC 0609, Appendix F, Attachment 1, Part 2, Fire Protection SDP Phase 2 Worksheet, and concluded that the finding was of very low safety significance (Green), in accordance with Step 2.5, Task 2.5.5 of the Worksheet, because there was a safe shutdown path available which was independent of CSRA. The cause of this finding was not associated with a cross-cutting area because it is not reflective of current licensee performance. (Section 1R05.04)

### B. Licensee-Identified Violations

None.

## REPORT DETAILS

### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R05 Fire Protection

This report presents the results of a triennial fire protection inspection for a plant in transition to National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition." This inspection was conducted in accordance with NRC Inspection Procedure (IP) 71111.05TTP, "Fire Protection-NFPA 805 Transition Period (Triennial)." The objective of the inspection was to review the Shearon Harris Unit 1 FPP for selected risk-significant fire areas (FAs)/fire zones (FZs). The team selected three FAs for detailed review to examine the licensee's implementation of the FPP. The three FAs were selected based on risk insights from the licensee's Individual Plant Examination for External Events, information contained in FPP documents, results of prior NRC triennial fire protection inspections, and in-plant walk downs by the team. Section 71111.05-05 of the IP specifies a minimum sample size of three FAs. Detailed inspection of these three FAs fulfills the procedure completion criteria. The three FAs selected were:

- FA 1-A-CSRA, Cable Spread Room A, Reactor Auxiliary Building (RAB), 286 foot (ft.) elevation.
- FA 1-A-SWGRA, Switchgear Room A, RAB 286 ft. elevation.
- FA 12-A-CRC1/FZ 12-A-6-PICR1, Control Room Complex, Process Instrument Cabinet Room, RAB 305 ft. elevation.

The team evaluated the licensee's FPP against applicable requirements, including Operating License Condition 2.F; Title 10 of the Code of Federal Regulations, Part 50.48 (10 CFR 50.48); commitments to NRC Branch Technical Position (BTP) Chemical Engineering Branch (CMEB) 9.5-1, Guidelines for Fire Protection for Nuclear Power Plants; Shearon Harris Updated Final Safety Analysis Report (UFSAR); related NRC safety evaluation reports (SERs) including all applicable supplements; NRC Safety Evaluation dated January 12, 1987; and plant Technical Specifications. The team evaluated each selected FA/FZ against these requirements. The specific documents reviewed by the team are listed in the Attachment to this inspection report.

#### .01 Post-Fire Safe Shutdown From Main Control Room (Normal Shutdown)

##### a. Inspection Scope

##### Methodology

The team reviewed the licensee's FPP described in UFSAR Section 9.5.1; NRC SER dated November 1983 (and Supplements 1 through 4); applicable sections of the licensee's post-fire safe shutdown analysis (SSA); plant procedures; simplified flow diagrams; electrical drawings; and other supporting documents. The reviews were performed to verify that hot and cold shutdown could be achieved and maintained from

the main control room (MCR) for postulated fires in FAs 1-A-CSRA and 1-A-SWGRA. This review also included verification that shutdown from the MCR could be performed both with and without the availability of offsite power. Plant walkdowns were performed to verify that the plant configuration was consistent with that described in the fire hazards analysis and the SSA. The inspection activities focused on ensuring the adequacy of systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring instrumentation, and support system functions. The team reviewed the systems and components credited for use during this shutdown method to verify that they would remain free from fire damage.

### Operational Implementation

The team reviewed the adequacy of procedures utilized for post-fire safe shutdown and performed a walk through of procedure steps to ensure the implementation and human factors adequacy of the procedures. The team also reviewed selected operator actions to verify that the operators could reasonably be expected to perform the specific actions within the time required to maintain plant parameters within specified limits.

The team reviewed cable routing data for a sample of safe shutdown (SSD) components to determine if the power and/or control circuits for the SSD components could be potentially damaged by a fire in any of the FAs selected. The team reviewed and/or walked down applicable sections of the following abnormal operating procedures (AOPs) for FAs 1-A-CSRA and 1-A-SWGRA.

- AOP-036.05, Fire Areas: 1-A-CSRA, 1-A-CSR B
- AOP-036.08, Fire Areas: 1-A-SWGRA, 1-A-SWGR B

The team reviewed local operator manual actions to ensure that the actions could be implemented in accordance with plant procedures in the times necessary to support the SSD method for the applicable FA and to verify that those actions met the criteria in Enclosure 2 of NRC IP 71111.05TTP. The team reviewed the existing manual action required for hot standby that were specified in the licensee's SSA. The team also reviewed licensee nuclear condition report (NCR) 205333, which was initiated to assess and track resolution of the operator manual action issue as part of the plant-wide risk evaluation during the transition to NFPA 805.

#### b. Findings

No findings of significance were identified.

### .02 Protection of Safe Shutdown Capabilities

#### a. Inspection Scope

The team reviewed the fire protection features used to protect safe shutdown cables and components to ensure they satisfy the separation and design requirements specified in the BTP CMEB 9.5-1 and implemented by the licensee in UFSAR Section 9.5.1 and the licensee's SSA (Calculation E-5525).

The team reviewed those portions of the UFSAR dealing with the safe shutdown. One objective of this review was to evaluate the completeness and depth of the analysis

which determined the strategy for protecting the various system functions necessary to achieve and maintain hot standby, accomplish long term cool down and achieve cold shutdown following a severe fire.

Through a combination of design information review and in-plant inspection, the team ascertained whether the fire protection features in place to protect SSD capability satisfied the separation and design requirements specified in BTP CMEB 9.5-1 (e.g., a FA with one-hour fire barriers around the SSD cables together with area wide automatic suppression and detection would meet the requirements).

b. Findings

No findings of significance were identified.

.03 Passive Fire Protection

a. Inspection Scope

The team inspected the material condition and fire rating of the fire area boundaries of the selected FAs/FZs and electrical raceway fire barrier systems inside the selected FAs/FZs to ensure that they were appropriate for the fire hazards in the area. Barriers reviewed included reinforced concrete walls/floors/ceilings, masonry block walls, Thermo-Lag 330-1 walls, mechanical and electrical penetration seals, doors, dampers and HEMYC wrap. Construction details and fire endurance test data which established the ratings of these fire barriers were reviewed. Engineering evaluations related to fire barriers were also reviewed. Where applicable, the team examined installed barriers to compare the configuration of the barrier to the rated configuration. The overall criterion applied to this element of the inspection procedure was that the passive fire barriers had the capability to contain fires for one hour or three hours as applicable.

The team reviewed the station penetration seal program and selected seals during plant walkdowns to verify that the penetration seal engineering designs could be traced back to qualified fire tests that support the penetration seals rating.

The team reviewed the licensee's responses (dated April 28, 2006, and June 9, 2006) to Generic Letter 2006-03, Potentially Nonconforming HEMYC and MT Fire Barrier Configurations, to verify that compensatory measures were in place until resolution of the degraded fire barriers is accomplished during the licensee's transition process to NFPA 805.

b. Findings

No findings of significance were identified.

.04 Active Fire Protection

a. Inspection Scope

The team evaluated the material condition and operational lineup of fire detection and suppression systems through in-plant observation of systems, design document reviews, and reference to the applicable NFPA codes and standards. The detection and

suppression methods for the category of fire hazards in the selected FAs were reviewed. The team compared the detector layout drawings against actual detector field locations and then reviewed those locations against NFPA Code 72E, "Automatic Fire Detectors," spacing and placement requirements.

The preaction sprinkler system in Cable Spreading Room A (CSRA) was reviewed. This consisted of reviewing the system layout drawings against the field installation. Also, the hydraulic calculation was reviewed against the field installed configuration to ensure that the calculation bounded the installed configuration.

The team also reviewed fire brigade staffing, fire brigade response strategy, fire fighting pre-plans, fire brigade training, and the fire brigade drill program procedures. Particular attention was given to location and capacity of hose stations and approach routes to the FAs. The fire brigade equipment locker was inspected by the team. Documentation reviews were supplemented by discussions with persons responsible for fire brigade performance to assess the readiness of the fire brigade to suppress any and all fires that may occur.

b. Findings:

Introduction: The team identified a Green non-cited violation (NCV) of Shearon Harris Unit 1 operating license condition 2.F, for the licensee's failure to install the sprinkler system in CSRA in accordance with the approved FPP. Specifically, the installed system would not have been able to deliver the sprinkler system design density of 0.3 gallons per minute (gpm)/square foot (sq. ft.) in CSRA, as stated in the FPP in UFSAR Section 9.5.1.2.3.

Description: During review of the preaction sprinkler system in the CSRA, the team identified that the hydraulic calculation was incorrect and the installed system would not deliver the sprinkler system design density of 0.3 gpm/sq. ft. for the most remote areas of 3,000 sq. ft. or less, as stated in the UFSAR.

UFSAR Section 9.5.1.2.3, Fire Protection (active systems), stated that sprinkler systems were provided to protect high hazards or vital process, storage and other operational areas and were designed in conformance with distribution system hydraulic calculations which determined water flow density and system pressure available to the protected areas. The UFSAR further stated that sprinkler system discharge densities were hydraulically designed to deliver 0.3 gpm/sq. ft. for the most remote areas of 3,000 sq. ft. or less. The licensee's hydraulic calculation for CSRA (FA 1-A-CSRA) was based on delivering a design density of 0.3 gpm/sq. ft. over an area of 3,000 sq. ft., with a maximum sprinkler head coverage area of 62 sq. ft. per sprinkler head. The hydraulic calculation was based on a maximum spacing between sprinkler heads of 8.0 ft. and a maximum spacing between sprinkler lines of 7.71 ft. The team performed a detailed review of the licensee's sprinkler layout drawings and field installation for CSRA and identified instances in the CSRA where the spacing between sprinkler heads on a branch line exceeded 8.0 ft. and the distance between sprinkler lines exceeded 7.71 ft. This resulted in the sprinkler head coverage area for a number of the sprinkler heads exceeding the maximum 62 sq. ft. per sprinkler head used in the calculation. The licensee's distribution system hydraulic calculation was not performed in accordance with the licensee's sprinkler system code of record (NFPA 13 - 1978 edition). The calculation used an incorrect value for the sprinkler head coverage area. The incorrect

sprinkler head coverage area used in the hydraulic calculation resulted in some of the sprinkler heads on the system being unable to provide the required design density of 0.3 gpm/sq. ft. The team performed a comparison calculation to determine if the larger sprinkler head coverage area would have an impact on the capability of the sprinkler system to deliver the required design density. The comparison calculation identified that 12 of 44 sprinkler heads (approximately 27%) would not provide the design density of 0.3 gpm/sq. ft. as required by UFSAR Section 9.5.1.2.3. The team discussed this issue with licensee personnel who initiated NCR 297789 to address this issue in the corrective action program (CAP). Also, a continuous fire watch was established in CSRA as a compensatory measure in accordance with the Shearon Harris FPP.

Analysis: The licensee's failure to install the sprinkler system in CSRA in accordance with the approved FPP is a performance deficiency. This finding is more than minor because the installed sprinkler system degraded one of the fire protection defense in depth elements and it affected the reactor safety Mitigating Systems cornerstone objective. The team completed a Phase 2 screening of the finding in accordance with IMC 0609, Appendix F, Attachment 1, Part 2, Fire Protection SDP Phase 2 Worksheet, and concluded that the finding was of very low safety significance (Green) in accordance with Step 2.5, Task 2.5.5 of the Worksheet, because there was a safe shutdown path available which was independent of the FA of concern. The cause of this finding was not associated with a cross-cutting area because it is not reflective of current licensee performance.

Enforcement: Shearon Harris operating license condition 2.F. states in part that Carolina Power & Light Company shall implement and maintain in effect all provisions of the approved fire protection program as described in UFSAR Section 9.5.1 for the facility, as amended and as approved in the SER dated November 1983 (and Supplements 1 through 4), and the Safety Evaluation dated January 12, 1987.

UFSAR Section 9.5.1.2.3, Fire Protection (active systems), states that sprinkler system discharge densities are hydraulically designed to deliver 0.3 gpm/sq. ft. for the most remote areas of 3,000 sq. ft. or less.

Contrary to the above, on December 18, 2008, the team identified that the sprinkler system in CSRA was not installed in accordance with the FPP. Specifically, the installed system would not deliver the sprinkler system design density of 0.3 gpm/sq. ft. for the most remote areas of 3,000 sq. ft. or less, as stated in the FPP in UFSAR Section 9.5.1.2.3. The licensee's distribution system hydraulic calculation used an incorrect value for the sprinkler head coverage area which resulted in 12 of 44 sprinkler heads (approximately 27% of the sprinkler heads on the system) not being able to deliver the required design density of 0.3 gpm/sq. ft. The team determined that this condition has existed since at least 1987. The licensee entered this issue in the CAP as NCR 297789 and established a continuous fire watch in CSRA as a compensatory measure in accordance with the Shearon Harris FPP. Because this finding is of very low safety significance and was entered into the licensee's corrective action program, this finding is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. This finding is identified as NCV 05000400/2008008-01, Sprinkler System in Cable Spreading Room A Does Not Meet Licensee's Fire Protection Program Requirements.

.05 Protection From Damage From Fire Suppression Activities

a. Inspection Scope

Through a combination of in-plant inspection and drawing reviews, the team evaluated the selected FAs/FZs to determine whether redundant trains of systems required for post-fire SSD could be subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems. The team considered the effects of water, drainage, heat, hot gasses, and smoke that could potentially damage redundant trains.

b. Findings

No findings of significance were identified.

.06 Post-Fire Safe Shutdown From Outside the Main Control Room (Alternative Shutdown)

a. Inspection Scope

Methodology

The team reviewed the licensee's ability to implement an alternative shutdown strategy for the FA/FZ selected. The team reviewed the licensee's FPP program described in UFSAR Section 9.5.1; applicable sections of the SSA; AOPs; simplified flow diagrams; control wiring diagrams (CWDs); and other supporting documents for postulated fires in FA 12-A-CRC1/FZ 12-A-6-PICR1. The reviews focused on ensuring that the required functions for post-fire SSD and the corresponding equipment necessary to perform those functions were included in the procedures. The review included assessing whether hot and cold shutdown from outside the MCR could be implemented, and that transfer of control from the MCR to the auxiliary control panel (ACP) could be accomplished. This review also included verification that shutdown from outside the MCR could be performed both with and without the availability of offsite power.

Plant walkdowns were performed to verify that the plant configuration was consistent with that described in the SSA. These inspection activities focused on ensuring the adequacy of systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring instrumentation, and support system functions. The team reviewed the systems and components credited for use during this shutdown method to verify that they would remain free from fire damage.

Operational Implementation

The team reviewed training lesson plans and job performance measures for licensed and non-licensed operators to verify that the training reinforced the shutdown methodology in the SSA and AOPs for the selected FZ. The team also reviewed shift turnover logs and shift manning to verify that personnel required for SSD using the alternative shutdown systems and procedures were available on-site, exclusive of those assigned as fire brigade members.

The team reviewed procedures utilized for post-fire SSD and performed a walk-through of procedure steps to ensure the implementation and human factors adequacy of the

procedures. The team also reviewed selected operator actions to verify that the operators could reasonably be expected to perform the specific actions within the time required to maintain plant parameters within specified limits.

Time critical actions reviewed included: electrical power distribution alignment, establishing control at the ACP, establishing reactor coolant makeup, and establishing decay heat removal. The team reviewed and/or walked down applicable sections of procedure AOP-004, Remote Shutdown.

The team reviewed cable routing data for a sample of SSD components referenced in AOP-004 to determine if the power and/or control circuits for the SSD components could be potentially damaged by a fire in FZ 12-A-6-PICR1. For those specific SSD components that had associated cables routed through the selected FZ, the team reviewed the CWDs to determine if those components and associated circuits were designed to be electrically isolated from fire damage such that they could be restored once the controls were transferred from the MCR to the ACP. The team also reviewed cable routing data for a sample of process monitoring instrument channels with indicators located on the ACP to verify that they would be unaffected by a fire in the selected FZ.

The team also reviewed testing performed on the electrical circuits which are used to transfer controls from the MCR to the ACP. The test procedures and test records were reviewed to ensure that adequate tests were performed to verify the functionality of the alternative shutdown capability. The team also reviewed the test deficiencies to verify that they were correctly entered into the licensee's corrective action program. The components and documents reviewed are listed in the Attachment.

b. Findings

Introduction: The team identified a noncompliance of very low safety significance with Shearon Harris Technical Specification 6.8.1.a, for inadequate procedural guidance which directed usage of instruments that were not protected from fire damage in FZ 12-A-6-PICR1. Specifically, procedure AOP-004, Remote Shutdown, directed the operators to verify emergency service water (ESW) header flows were above the minimum flow requirement of 7500 gpm using flow indicators (FI) FI-9101A2 and FI-9101B2. These instruments would be unreliable during operation from the ACP because their cables were routed through the FZ of concern and the cables were not protected from fire damage. The violation meets the criteria of NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)" for enforcement discretion.

Description: The team noted that procedure AOP-004, Remote Shutdown, would be used to safely shut down the plant from the ACP (utilizing Train B equipment) for a fire in FZ 12-A-6-PICR1. The procedure directed operators to verify ESW header (HDR) flows using FI-9101A2, A HDR Flow and FI-9101B2, B HDR Flow. The team reviewed cable routing data and noted that FI-9101A2 and FI-9101B2 may not provide reliable ESW flow indication for the operators at the ACP because the cables were routed through FZ 12-A-6-PICR1 and were not protected from fire damaged. This may potentially delay operator actions required to bring the plant to SSD conditions. Based on discussions with operations personnel and review of service water system simplified flow diagrams, the team determined that the ESW system was flow balanced to ensure that the 7500

gpm minimum flow would be provided to ESW HDR A and ESW HDR B. During walkdowns of the ACP, the team noted that valve position indication (i.e., open/close) was provided at the ACP for various ESW valves, including 1SW-270, HDR A to Auxiliary Reservoir and 1SW-271, HDR B to Auxiliary Reservoir. These valves were required to be opened (from the ACP) to ensure adequate ESW header flow. Review of cable routing data for valve 1SW-271 showed that this valve was not routed through FZ 12-A-6-PICR1 and would not be affected by a postulated fire in this FZ. The team determined that, based on operator experience, training, and indication of the position of ESW valve 1SW-271 at the ACP, it was likely plant operators would be able to determine that sufficient ESW flow was available and they would take the appropriate actions required to ensure post-fire SSD conditions. The licensee initiated NCR 298072 to address this issue in the CAP.

Analysis: The team determined that the inadequate SSD procedure guidance is a performance deficiency. This noncompliance is considered to be more than minor because it is associated with the procedure quality attribute of the Mitigating Systems cornerstone and it affected the cornerstone objective of protection against external events, i.e., fire. The inspectors assessed the noncompliance using IMC 0609, Appendix F, Fire Protection Significance Determination Process. This noncompliance was determined to be of very low safety significance (Green) using Appendix F of the Significance Determination Process (SDP), because it did not adversely affect components credited for reactivity control, reactor coolant makeup, reactor heat removal, and support systems functions. The team determined that based on experience, training, and ESW valve 1SW-271 position indication available at the ACP, it is likely plant operators would be able to determine that sufficient ESW flow was available and they would take the appropriate actions required to ensure post-fire SSD conditions.

Enforcement: Technical Specification 6.8.1.a. requires that written procedures shall be established, implemented, and maintained covering the activities in Appendix A of Regulatory Guide 1.33, Revision 2, dated February 1978. Regulatory Guide 1.33, Appendix A, Section 6.v., requires procedures for combating emergencies such as plant fires. AOP-004, Remote Shutdown, Rev. 42, provided instructions for placing Shearon Harris Unit 1 in a safe condition if operations could not be performed from the MCR due to a fire in the process instrument cabinet room (FZ 12-A-6-PICR1).

Contrary to the above, on October 10, 2008, the team identified that procedure AOP-004 provided inadequate guidance for monitoring ESW header flow at the ACP. Specifically, procedure AOP-004 directed the operators to verify ESW header flows were above the minimum flow requirement of 7500 gpm using flow indicators FI-9101A2, A HDR Flow and FI-9101B2, B HDR Flow. These instruments would be unreliable during operation from the ACP because their cables were routed through the FZ of concern and the cables were not protected from fire damage. The licensee initiated NCR 298072 to correct the procedure.

No enforcement action is required for the above noncompliance because pursuant to the Commission's Enforcement Policy and NRC Manual Chapter 0305, under certain conditions fire protection noncompliances at nuclear power plants that transition their licensing bases to 10 CFR 50.48(c) are eligible for enforcement and reactor oversight process (ROP) discretion. The Enforcement Policy and ROP also state that the noncompliance must not be evaluated as Red.

Because the licensee committed, prior to December 31, 2005, to adopt NFPA 805 and change their fire protection licensing bases to comply with 10 CFR 50.48(c), the NRC is exercising enforcement discretion for this issue in accordance with the NRC Enforcement Policy, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)." Specifically, it was likely this issue would have been identified and addressed during the licensee's transition to NFPA 805, it was entered into the licensee's corrective action program and will be corrected, was not likely to have been previously identified by routine licensee efforts, was not willful, and was not associated with a finding of high safety significance.

.07 Circuit Analyses

a. Inspection Scope

This segment is suspended for plants in transition because a more detailed review of cable routing and circuit analysis will be conducted as part of the fire protection program transition to NFPA 805. However, a review of the licensee's preliminary cable routing information was used by the team to assess the adequacy of the licensee's fire response procedures in the selected FAs/FZs. The routing information was based upon a list of SSD components submitted by the team.

b. Findings

A noncompliance of very low safety significance regarding fire response procedural guidance which directed operators to verify ESW flow using flow indicators at the ACP that had cables routed through the FZ of concern is discussed in Section 1R05.06.b. of this inspection report.

.08 Communications

a. Inspection Scope

The team reviewed the diverse plant communications systems that could be available and relied upon to support fire event notification, fire brigade fire fighting, and plant post-fire SSD. Specifically, the team reviewed the private automatic branch exchange system, which consisted of site telephones and their supporting equipment, the site paging system, the sound powered phone system and related equipment and connections, as well as the dedicated radio system and repeaters. The team conducted walkdowns of the plant communications systems in selected FAs/FZs to verify that equipment was properly staged for fire brigade and post-fire SSD activities and critical system components were readily available. The team also reviewed the cable routing for the radio repeaters and associated power sources. In addition, the team reviewed a sample of the surveillance records of maintenance periodic functional tests for the sound powered phones and radio systems. The team also reviewed the ARs that had been initiated for test failures to verify that the deficiencies were properly evaluated in accordance with the licensee's CAP. Additionally, the team reviewed AR 293578 that was initiated to address previously identified deficiencies in the sound powered phone system to ensure that appropriate corrective actions and compensatory measures were in place. The team reviewed the licensee's communications study to verify that the study was addressing the deficiencies as a part of the transition to NFPA 805.

b. Findings

No findings of significance were identified.

.09 Emergency Lighting

a. Inspection Scope

The team reviewed the emergency lighting system to verify that it was in accordance with 10 CFR 50.48, Operating License Condition 2.F, NRC SERs in NUREG 1038, and the UFSAR. The team conducted plant walkdowns of local manual operator actions identified in the post-fire SSD procedures to determine the adequacy of the emergency lighting units (ELUs) used to support plant personnel during post-fire SSD for the selected FAs/FZs. The team conducted walkdowns and observed the placement, alignment and coverage area of fixed 8-hour battery pack ELUs to evaluate their adequacy for illuminating access and egress pathways and any equipment requiring local operation and/or instrumentation monitoring for post-fire SSD.

The manufacturer's information and vendor manuals for the installed 8-hour battery pack ELUs were reviewed to verify that the battery power supplies were rated with at least an 8-hour capacity as described in UFSAR Section 9.5.1. The team reviewed test records for the past year of periodic maintenance functional tests, as well as the annual capacity tests, to confirm that the batteries were being properly maintained and had the capacity to supply eight hours of lighting. The team reviewed the ARs that had been initiated for the identified test failures to verify that the deficiencies were evaluated, tracked, and corrected in accordance with the CAP. Additionally, the team reviewed lighting layout drawings and lighting panel details for the selected FAs/FZs to assess if the lighting circuits and sources used for the areas were diverse such that a fire in one of the areas would not affect the lighting required for SSD operations in other areas.

b. Findings

No findings of significance were identified.

.10 Cold Shutdown Repairs

a. Inspection Scope

The team reviewed the licensee's SSA, FPP procedures, and conducted an electrical circuit analysis of the credited train of residual heat removal as a sample to verify the licensee's assertion that for damaged equipment repairs are not relied on to achieve post-fire cold shutdown. The team examined the cable routing with respect to the selected FAs/FZs to verify that the pump would be available for post-fire SSD without any necessary repairs. Based on this review, the team confirmed that the licensee's post-fire SSD procedures did not rely on cold shutdown repairs.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The team reviewed the administrative controls for out-of-service, degraded, and/or inoperable fire protection features (e.g., detection and suppression systems and equipment, passive fire barriers, or pumps, valves or electrical devices providing SSD functions or capabilities). The team reviewed selected items on the fire protection impairment log and compared them with the FAs/FZs selected for inspection. The compensatory measures that had been established in these areas/zones were compared to those specified for the applicable fire protection feature to verify that the risk associated with removing the fire protection feature from service was properly assessed and adequate compensatory measures were implemented in accordance with the approved FPP. Additionally, the team reviewed the licensee's short term compensatory measures (e.g., the continuous fire watch established for the degraded sprinkler system in CSRA) to verify that they were adequate to compensate for a degraded function or feature until appropriate corrective actions could be taken, and that the licensee was effective in returning the equipment to service in a reasonable period of time.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The team reviewed selected ARs and NCRs related to the Shearon Harris FPP to verify that items related to fire protection and SSD were appropriately entered into the licensee's CAP in accordance with the licensee's quality assurance program and procedural requirements. This review was conducted to assess the frequency of fire incidents and effectiveness of the fire prevention program and any maintenance-related or material condition problems related to fire incidents.

The team also reviewed other CAP documents, including completed corrective actions documented in selected ARs and NCRs, and operating experience program (OEP) documents to verify that industry-identified fire protection issues potentially or actually affecting Shearon Harris were appropriately entered into, and resolved by, the CAP process. Items included in the OEP effectiveness review were NRC regulatory issue summaries, information notices, generic letters, industry or vendor generated reports of noncompliances and defects under 10 CFR Part 21, and vendor information letters. Additionally, the team reviewed a sample of other identified issues. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

**4OA6 Meetings, Including Exit**

On October 10, 2008, the lead inspector presented the inspection results to Mr. C. Burton, Harris Plant Vice President, and other members of the licensee's staff. The licensee acknowledged the findings. Proprietary information is not included in this report. Following completion of additional reviews in the Region II office, another exit meeting was held by telephone with Mr. Burton and other members of his staff on December 18, 2008, to provide an update on changes to the preliminary inspection findings. The licensee acknowledged the findings.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee personnel**

R. Atkins, Reactor Operator  
C. Burton, Vice President Harris Plant  
D. Corlett, Supervisor, Licensing/Regulatory Programs  
M. Denny, Engineering Supervisor, Equipment Performance  
J. Doorhy, Licensing Specialist, Licensing/Regulatory Programs  
J. Dufner, Manager, Maintenance  
R. Duncan, Vice President Nuclear Operations  
J. Ertman, Supervisor, Corporate Fire Protection  
K. Harshaw, Manager, Site Support Services  
K. Henderson, Plant General Manager  
A. Holder, Senior Engineering Technical Support Specialist, Corporate Engineering Support  
G. Kilpatrick, Training Manager  
J. MacIntyre, Fire Protection Engineer  
L. Martin, Superintendent, Design Engineering  
S. O'Connor, Manager, Engineering  
A. Pearson, Fire Protection Engineer  
J. Pierce, Manager, Nuclear Assessment Section  
B. Rhodes, Lead Engineer, Fire Protection Team  
S. Saunders, Superintendent, Systems Engineering  
A. Zimmerman, Licensing Specialist, Licensing/Regulatory Programs

#### **NRC personnel**

K. Korth, Acting Senior Resident Inspector  
P. Lessard, Resident Inspector  
R. Musser, Chief, Reactor Projects Branch 4, Division of Reactor Projects  
R. Nease, Chief, Engineering Branch 2, Division of Reactor Safety  
M. Pribish, Acting Senior Resident Inspector

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

#### **Opened/Closed**

05000400/2008008-01	NCV	Sprinkler System in Cable Spreading Room A Does Not Meet Licensee's Fire Protection Program Requirements (Section 1R05.04)
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## LIST OF DOCUMENTS REVIEWED

### SSD Components Examined for Cable Routing - Sections 1R05.01 / Section 1R05.06

#### Valves

- 1AF-130, Steam Supplied AFW To SG B [cables: 1255P, 1479J, 1479K, 1950H, 1950J, 1950M, 1950N, 1950P, 1950Q, 1951A, 1951G, 1951J, 1951K]
- 1CC-207, CCW To RCP Seals & Motor Cooler Outer Isolation Valve [cables: 0955A, 0955B, 0955C, 0955D, 0955E, 0955F, 0955G, and 0955H]
- 1CC-208, CCW To RCP Seals & Motor Cooler Inner Isolation Valve [cables: 0956A, 0956B, 0956C, 0956D, 0956E, 0956F, 0956G, 0956H, 0956J, 0956K, 0956L, and 1169L]
- 1CC-251, CCW Return Isolation Valve From RCP Thermal Barriers OB [cables: 0956H, 0956L, 0962A, 0962B, 0962C, 0962D, 0962E, 0962F, 0962G, 0962H, 0962J, and 1169L]
- 1CC-252, RCP Thermal Barriers FCV [cables: 0856A, 0947A, 0947B, 0947C, 0947D, 0947E, 0947F, 0947G, 0947H, 0947J, and 0970E]
- 1CS-214, CSIP Mini-flow Isolation Valve [cables: 0242G, 0270A thru G]
- 1CS-218, C CSIP Discharge X-Connect Valve with B CSIP [cables: 0293H, 0299A thru G]
- 1SW-270, ESW HDR A Return To Auxiliary Reservoir [cables: 2207L, 2207M, 2286A, 2286B, 2286C, 2286D, 2286E, 2286K, and 2286L]
- 1SW-271, ESW Header B Return To Auxiliary Reservoir [cables: 2208L, 2208M, 2287A thru E, 2287K, and 2287L]
- 1MS-60, MS-P19SB PWR Operated Relief Valve [cables: 1253D thru H, 1254J, 1254K, 1254L, 1255B, 1255C, 1255E, 1255F, 1255G, 1255L, 1255N, 1255P, 1255Q, and 1255R]
- 1MS-70, MS Line "B" To Steam Driven AFW Turbine CIV [cables: 1933G, 1975A thru H, 1975K, 1975N, 1975P, and 1975Q]
- 1MS-72, MS Line "C" To Steam Driven AFW Turbine MOV CIV [cables: 1974A thru H, 1974K, 1974L, 1974M, 1974P, 1974Q, 1974R, and 1974S]
- 1RC-113, PCV-444B Block Valve For 1RC-114 [cables: 0162A thru H, 0162J, 0162K, 0162L, 0162M, 0162N, and 0162P]
- 1RC-115, PCV-445B Block Valve For 1RC-116 [cables: 0161A thru H, and 0161J]
- 1RC-117, PCV-445A Block Valve For 1RC-118 [cables: 0160A thru H, 0160J, 0160K, 0160L, 0160M, 0160N, and 0160P]
- 1RC-114, PRZR PORV RC-P529SB [cables: 0149A, 0149J, 0149P, 0149Q, 0150E, 0156A, 0156B, 0156D, 0156F, 0156G, 0156H, 0156J, 0156L, 0156M, 0310P, 1479E]

#### Pump Motors

- 1A-SA RHR Pump Motor [cables: 0321A thru E, 0321G, 0321H, 0321J, 0321M, 0321P, 0321Q, 0321S, and 0321U]
- 1RH-RHRB:002, RHR Pump Motor [cables: 0322A, 0322B, 0322C, 0322D, 0322E, 0322G, 0322H, 0322J, 0322M, 0322P, 0322Q, 0322S, 0322U]
- 1SW-E006:002 ESW Pump 1B-SB [cables: 2212A, 2212C, 2212D, 2212F, 2212G, 2212N, 2212P, 2212R, 2212V, 2212W, 1957E, 1957F, 2213D]
- 1SW-E005:002, ESW Pump 1A-SA [cables: 2211A, 2211C, 2211D, 2211F, 2211G, 2211N, 2211P, 2211R, 2211V, 2211W, 1957G, 1957H, and 2213B]
- 1CS-CSIPB:002, Charging/SI Pump Motor B [cables: 0222A, 0222B, 0222C, 0222D, 0222E, 0222F, 0222G, 0222J, 0222K, 0222L, 0222M, and 0222Q]

#### Pressurizer Heater

- 1B1-4B, Pzr Htr B/U Grp "B" Power Panel Supply Breaker [cables: 0153A thru L, and 1786E]

Instruments

LI-01CE-9010B2SB, CST Level [cables: 1957D, 2092C, 2092J, and 2092K]  
 LI-01RC-0459A2SA, Pressurizer Level I [cables: 0145C, 0145E, 0145N, 2213E]  
 LI-01CT-7110, Refueling Water Storage Tank Level [cables: 2387A, 2387F, and 2387G]  
 NI-01RE-0060A2SAW [cables: 0071A, 0071B, 0071E thru H, 0071J , 0071K, 0071Q, 0071R,  
 0071S, 0995V]  
 FI-9101A2-SA, ESW Flow "A" [cables: 1975E, 1975G, 2213A, 2213C, 2213E, and 2213F]

Lighting Panel

LP-142, Auxiliary Control Panel Area Lighting [cables: 4459V, LP112C7, LP113C10, LP142C1]

Power Supplies

UPP-1-1 Vital, 120VAC Power PNL UPP-1-1 [cables: 4471E, 4470R]  
 UPP-1, Uninterruptible Power Supply [Power Internal from 1EE-E220]  
 1EE-E220, 60KVA Uninterruptible Power Supply [cables 1484C, 4444N, 4445J, 4445K]  
 DP-1B1-SB [cables: 4456K]  
 DP-1A-SA, [cables: 4443L, 4443N, 4443P, 4443Q, 4443T, 4443U]

Procedures

AOP-004, Remote Shutdown, Rev.42  
 AOP-036, Safe Shutdown Following a Fire, Rev. 40  
 AOP-036.05, Fire Areas: 1-A-CSRA, 1-A-CSR, Rev. 7  
 AOP-036.08, Fire Areas: 1-A-SWGRA, 1-A-SWGRB, Rev.6  
 AOP-038, Rapid Downpower, Rev. 18  
 Fire Pre-Plan FPP-012-02-RAB286  
 Fire Pre-Plan FPP-012-02-RAB305-324  
 FIR-NGGC-0003, Hot Work Permit, Rev. 3  
 FPP-001, Fire Protection Program Manual, Rev. 32  
 FPP-002, Fire Emergency, Rev. 32  
 FPP-003, Fire Investigation Report, Rev. 8  
 FPP-004, Transient Combustible Control, Rev. 20  
 FPP-005, Fire Watch Duties, Rev. 16  
 FPP-007, Control of Flammable and Combustible Liquids, Rev. 14  
 FPP-008, Control of Fuel Gasses and Oxygen, Rev. 9  
 FPP-013, Fire Protection – Minimum Requirements, Mitigating Actions and Surveillance  
 Requirements, Rev. 51  
 FPT-3500, Fire Door Check - 18 Month Interval, Rev. 28  
 FPT-3505, Fire Door Inspection - RAB - Semi-Annual Interval, Rev. 32  
 Job Performance Measure JPM-IP-050, Transfer Control to the ACP  
 JPM-IP-076, Start EDG-A-SA Locally  
 JPM-IP-119, Verify Charging Pump Valve Positions per AOP-004  
 JPM-IP-135, Energize a Dead Bus with a Diesel Locally  
 JPM-IP-141, Inhibit Both Trains of SSPS  
 MPT-E0032, Maintenance Periodic Test, Self-Contained DC Emergency Lighting System Eight  
 Hour Life Test, Rev. 19  
 MPT-E0038, Maintenance Periodic Test, Sound Powered Phones, Rev. 2  
 ORT-1407, ACP/Safe Shutdown Materials Audit Semiannual Interval Modes 1-6, Rev. 13  
 ORT-1407, ACP/Safe Shutdown Materials Audit Semiannual Interval Modes 1-6, Rev. 14

Completed Surveillance Test Procedures and Test Records

OST-1020, Remote Shutdown Monitoring and Accident Monitoring Instrumentation Channel Check Monthly Interval Modes 1-2-3, Rev. 17, Completed 09/09/2008

OST-1813, Remote Shutdown System Operability 18 Month Interval Modes 5, 6 or Defueled, Rev. 32, Completed 10/03/2007

OST-1813, Remote Shutdown System Operability 18 Month Interval Modes 5, 6 or Defueled, Rev. 32, Completed 10/05/2007

OST-1813, Remote Shutdown System Operability 18 Month Interval Modes 5, 6 or Defueled, Rev. 32, Completed 10/20/2007

OST-1815, Remote Shutdown: Test of Interposing MDR Relays Primary and Backup Fuses 18 Month Interval Modes 1-6 or Defueled, Rev. 5, Completed 09/23/2007

OST-1855, Containment Fan Cooler AH-1 and AH-4 Test Transferred to the ACP 18 Month Interval Modes 1-6, Rev. 5, Completed 09/24/2007

OST-1857, Remote Shutdown System Operability: Accumulator Isolation Valve and Letdown Isolation Valve Testing 18 Month Interval Modes 5, 6 or Defueled, Rev. 10, Completed 10/1/07

OST-1858, Remote Shutdown System Operability - Bus Drops Train A 18 Month Interval Modes 5, 6 or Defueled, Rev. 13, Completed 10/05/2007

OST-1859, Remote Shutdown System Operability - Bus Drops Train B 18 Month Interval Modes 5 or 6 or Defueled, Rev. 14, Completed 10/12/2007

OST-1860, Remote Shutdown: Reactor Trip Breakers 18 Month Interval Modes 5, 6 or Defueled, Rev. 6, Completed 10/17/2007

OST-1861, Remote Shutdown: Individual Component Tests 18-Month Interval Modes 1 - 3, Rev. 7, Completed 09/07/2007

OST-1861, Remote Shutdown: Individual Component Tests 18-Month Interval Modes 1 - 3, Rev. 7, Completed 09/14/2007

OST-1861, Remote Shutdown: Individual Component Tests 18-Month Interval Modes 1 - 3, Rev. 7, Completed 09/15/2007

WO 01022087 Perform MPT-E0032, Self Contained DC Emergency Lighting System Eight Hour Life Test, dated 12/21/2007

WO 01286898 EL, 1EAC-RAB-31, Light Failed 8-HR Discharge Test, dated 01/29/2008

WO 01286899 EL, 1EAC-RAB-80, Light Failed 8-HR Discharge Test, dated 01/29/2008

WO 01166545 Perform MPT-E0032, Self Contained DC Emergency Lighting System Eight Hour Life Test, dated 05/28/2008

WO 01388853 EL, 1EAC-RAB-137, Light Failed 8-HR Discharge Test, dated 07/24/2008

WO 01016722 Perform MPT-E0032, Self Contained DC Emergency Lighting System Eight Hour Life Test, dated 12/19/2007

WO 01284416 EL, 1EAC-RAB-47, Light Failed 8-HR Discharge Test, dated 12/19/2007

WO 01003685 Perform MPT-E0032, Self Contained DC Emergency Lighting System Eight Hour Life Test, dated 12/19/2007

WO 01284415 EL, 1EAC-RAB-72, Light Failed 8-HR Discharge Test, dated 01/24/2008

WO 01284414 EL, 1EAC-RAB-74, Light Failed 8-HR Discharge Test, dated 01/24/2008

WO 01101065 Perform MPT-E0032, Self Contained DC Emergency Lighting System Eight Hour Life Test, dated 05/28/2008

WO 01388854 EL, 1EAC-RAB-93, Light Failed 8-HR Discharge Test, dated 07/24/2008

WO 01020770 Perform MPT-E0032, Self Contained DC Emergency Lighting System Eight Hour Life Test, dated 01/01/2008

WO 01292991 EL, 1EAC-RAB-85, Light Failed 8-HR Discharge Test, dated 02/11/2008

WO 00806757 EL, MPT-E0038, Sound Powered Phone Testing, dated 01/09/2008

### Calculations / Engineering Analyses

E-5523, Instrumentation, Control and Transfer Switches for Components Credited in the Event of a Fire Requiring Control Room Evacuation, Rev. 5  
 E-5524, Safe Shutdown Separation Analysis, Rev. 10  
 E-5525, Safe Shutdown Analysis In Case Of Fire, Rev. 17  
 1-A-CSRA Hydraulic Sprinkler Calculations, "Walsh Calc.", Fire Area 1-A-CSRA Calculation, Cable Vault "A", Rev. 1, Dated 05-18-1995  
 1-A-1-286 Hydraulic Calculation, "Simplex Grinnell-Hass Calc.," Fire Area 1-A-CSRA & 1-A-CSRC Calculation, Cable Vault A & Cable Vault C, Dated 12-09-2002  
 Hydraulic Calc FP0004, Fire Protection Water Pressure Calculation, Rev. 0, 04-08-1980  
 Hydraulic Calc FP0040, Fire Protection Hydraulic Calculation for Sprinkler Specification No. BE-09, Rev. 0, Dated 11-02-1979  
 Fire Pump NPSH Calculation FP-001, Rev. 0, Dated 03-07-1973  
 HNP-M-BMRK-0001, NFPA 72E Code Compliance Evaluation, Rev. 2  
 HNP-M-BMRK-0002, NFPA 72D Code Compliance Evaluation, Rev. 1  
 HNP-M-BMRK-0003, NFPA 80 Code Compliance Evaluation, Rev. 2  
 HNP-M-BMRK-0004, NFPA 90A Code Compliance Evaluation, Rev. 1  
 HNP-M-BMRK-0005, NFPA 10 Code Compliance Evaluation, Rev. 2  
 HNP-M-BMRK-0006, NFPA 14 Code Compliance Evaluation, Rev. 2  
 HNP-M-BMRK-0007, NFPA 20 Code Compliance Evaluation, Rev. 2  
 HNP-M-BMRK-0008, NFPA 24 Code Compliance Evaluation, Rev. 2  
 HNP-M-BMRK-0009, NFPA 13 Code Compliance Evaluation, Rev. 1  
 HNP-M-MECH-1065, Assessment of Tested and As-Built Thermo-Lag Fire Barrier Configurations, Rev. 0  
 HNP-M-MECH-1089, Bounding Calculation for L-Shaped Thermo-Lag Fire Barrier Configurations in the Cable Spreading Rooms, Rev. 1  
 EC-48029R1, Thermo-Lag 330-1 Fire Wall  
 EC-50147R3, Fire Pumps Relief Valve Settings.

### Drawings

CPL-2165-S-0542, Simplified Flow Diagram Main Steam System, Rev. 25  
 CPL-2165-S-0544, Simplified Flow Diagram Feedwater System, Rev. 41  
 CPL-2165-S-0547, Sh.1, Simplified Flow Diagram Circulating&Service Water Systems, Rev. 45  
 CPL-2165-S-0548, Sh. 1, Simplified Flow Diagram Circulating&Service Water Systems, Rev. 46  
 CPL-2165-S-0548, Sh. 2, Simplified Flow Diagram Circulating&Service Water Systems, Rev. 6  
 CPL-2165-S-1300, Sh. 1, Simplified Flow Diagram Reactor Coolant System, Rev. 22  
 CPL-2165-S-1301, Sh. 2, Simplified Flow Diagram Reactor Coolant System, Rev. 9  
 CPL-2165-S-1303, Simplified Flow Diagram Chemical & Volume Control System, Rev. 9  
 CPL-2165-S-1303, Sh. 1, Simplified Flow Diagram Chemical & Volume Control System, Reactor Coolant Pump - Loop No. 2, Rev. 3  
 CPL-2165-S-1303, Sh. 2, Simplified Flow Diagram Chemical & Volume Control System, Reactor Coolant Pump - Loop No. 3, Rev. 3  
 CPL-2165-S-1304, Sh. 2, Simplified Flow Diagram Chemical & Volume Control System, Rev. 12  
 CPL-2165-S-1305, Simplified Flow Diagram Chemical & Volume Control System, Rev. 21  
 CPL-2165-S-1306, Sh. 4, Simplified Flow Diagram Chemical & Volume Control System, Rev. 10  
 CPL-2165-S-1307, Simplified Flow Diagram Chemical & Volume Control System, Rev. 7  
 CPL-2165-S-1308, Simplified Flow Diagram Safety Injection System, Rev. 12  
 CPL-2165-S-1309, Sh. 2, Simplified Flow Diagram Safety Injection System, Rev. 19

CPL-2165-S-1310, Sh. 3, Simplified Flow Diagram Safety Injection System, Rev. 13  
 CPL-2165-S-1319, Sh. 1, Simplified Flow Diagram Component Cooling Water System, Rev. 17  
 CPL-2165-S-1320, Sh. 2, Simplified Flow Diagram Component Cooling Water System, Rev. 3  
 CPL-2165-S-1321, Sh. 3, Simplified Flow Diagram Component Cooling Water System, Rev. 8  
 CPL-2165-S-1322, Sh. 4, Simplified Flow Diagram Component Cooling Water System, Rev. 10  
 CPL-2165-S-1324, Simplified Flow Diagram Residual Heat Removal System, Rev. 11  
 1-A-CSRA, Reactor Auxiliary Building, System "E", Zone 1A-1-286, Elev. 286'-0" Sprinkler  
 Drawing, 1364-090055-S01, Rev. 1  
 1-A-CSRA, Fire Protection Sprinkler Piping, RAB, Cable Spreading Room "A", El. 286'-0",  
 1364-090055-S02, Rev.0  
 1-A-CSRA, Fire Protection Sprinkler Piping, RAB, Cable Spreading Room "A", El. 286'-0",  
 1364-090055-S03, Rev. 0  
 1-A-CSR B Sprinkler Mod - 1364-090055-S04  
 1-A-CSR B, Fire Protection Sprinkler Piping, RAB, Cable Spreading Room "C", El. 286'-0",  
 1364-090055-S05, Rev. 0  
 PIC - Reactor-Aux. Building El. 305'-0 - 6-S-2108  
 SWGR - CSR - Reactor-Aux. Building El. 286'-0 – CPL-2166 – S -2107, Rev. 5  
 Cable Spreading Room and Switchgear Room, CPL-2165-S -1001, Rev. 0  
 CAR-2168, G-033, S-07 – Arch. Door Schedule Sh. 2, Fire & Control Doors  
 CAR 2166-B-401, Sh. 970, CWD CC System Control Instrumentation, Rev. 5  
 CAR 2166-B-401, Sh. 1169, CWD Emergency Load Sequencer ESS Cabinet 1B-SB, Rev. 6  
 CAR 2166-B-401, Sh. 308, CWD Volume Control Tank - Pressure, Temp & Flow, Rev. 6  
 CAR 2166-B-401, Sh. 947, CWD RCP Thermal Barrier Isolation Valve 1-FCV-685, Rev. 15  
 CAR 2166-B-401, Sh. 955, CWD RCP CC Water Supply Isolation Valve 1-9480A, Rev. 14  
 CAR 2166-B-401, Sh. 956, CWD RCP CC Water Supply Isolation Valve 1-9480B, Rev. 17  
 CAR 2166-B-401, Sh. 962, CWD RCP Thermal Barrier Cont Isol Valve 1-9484, Rev. 17  
 CAR 2166-B-401, Sh. 153, CWD Pressurizer Heater Back-Up Group B, Rev. 15  
 CAR 2166-B-401, Sh. 1786, CWD 480V Emer Bus 1B1 Instrumentation - Potential, Rev. 12  
 CAR 2166-B-401, Sh. 1098, CWD Transfer Panel Relays 43T/NB Development, Rev. 10  
 CAR 2166-B-401, Sh. 1086, CWD Transfer Panel "1B" (Section B), Rev. 11  
 CAR 2166-B-401, Sh. 2287, CWD SW Ret Hdr B S/O Vlv to Aux Resv 3SW-B16SB, Rev. 14  
 CAR 2166-B-401, Sh. 2092, CWD CST 1X-SAB Instrumentation, Rev. 10  
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 (FCV-2071B-SB) 3AF-F6SB-1, Rev. 10  
 CAR 2166-B-401, Sh. 1255, CWD S/G B Atmospheric Relief Valve 2MS-P19-SB-1, Rev. 12  
 CAR 2166-B-401, Sh. 1479, CWD Control Power Distribution Transfer Panels, Rev. 8  
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 CAR 2166-B-401, Sh. 1974, CWD AFW Turbine 1X-SB Stm C Isol Valve 2MS-V9SB-1, Rev. 14  
 CAR 2166-B-401, Sh. 1975, CWD AFW Turbine 1X-SB Stm B Isol Valve 2MS-V8SA-1, Rev. 14  
 CAR 2166-B-401, Sh. 2213, CWD Emergency Service Water Pump Instrumentation, Rev. 5  
 CAR 2166-B-401, Sh. 1255, CWD S/G "B" Atmos Relief Valve 2MS-P19-SB-1, Rev. 12  
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 CAR 2166-B-401, Sh. 156, CWD Pressurizer Power Relief Valve 1-PCV-444B, Rev. 18  
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 CAR 2166-B-401, Sh. 150, CWD Pzr Vapor Temp. Inst. & Misc. Htr Interlocks, Rev. 10  
 CAR 2166-B-401, Sh. 149, CWD Pressurizer Pressure Control Instrumentation, Rev. 13  
 CAR 2166-B-401, Sh. 2286, CWD SW Ret Hdr A Shutoff Valve To Aux Reservoir, Rev. 14  
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 CAR-2166-B-047, Sh. 142, Unit 1 Lighting Panel Details, Rev. 2, dated 10/02/1987  
 Part Plan A(H7), Lighting Panel 142 on Aux Control Panel  
 CAR 2166-B-401, Sh. 1484, CWD 60KVA Static UPS and Alarms, Rev. 8, dated 04/04/1994  
 CAR 2166-B-401 0643, Unit 1 Pwr Dist. and Mtr Data 120VAC Power Panel UPP-1 Vital1A-SA  
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 CAR 2166-B-401, Sh. 706, Pwr Dist. and Mtr Data 120VAC UPP-1-1 Vital, Rev. 7, 01/13/2000  
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 PD-5165-B-C-001 AC Power Distribution System, Rev. 8, dated 5/16/1982  
 CAR 2166-B-401, Sh. 4444, CWD Miscellaneous Cables Sh. 24, Rev 11, dated 03/07/2003  
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 CAR-2166-G-049S10, Comm. Sys Gen Notes, Symbols & Details, Unit 1, Rev. 11, 05/26/1978  
 CAR 2166-B-401, Sh. 2212, CWD ESW Pump 1B-SB, Rev. 17, dated 02/10/1973  
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 CAR 2166-B-401, Sh. 2211, CWD ESW Pump 1A-SA, Rev. 18, dated 11/01/1998  
 CAR 2166-B-401, Sh. 222, CWD CSIP 1B-SB, Rev. 19, dated 04/05/2001  
 CAR 2166-B-401, Sh. 322, CWD RHR Pump 1B-SB, Rev. 20, dated 09/08/1985  
 CAR 2166-B-401, Sh. 2212, CWD ESW Pump 1B-SB, Rev. 17, dated 02/10/1978  
 CAR 2166-B-401, Sh. 822, CWD Aux Xfer Panel - "SB" (Sect SB), Rev. 7, dated 06/26/1984  
 CAR 2166-B-401, Sh. 2642, CWD Chiller WC-2 (1B-SB) SW Condenser Outlet Valve  
 3SW-B303 SB-1, dated 11/05/1979  
 CAR 2166-B-401, Sh. 4456, CWD Miscellaneous Cables Sh. 36, Rev. 5, dated 11/17/1995  
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 CAR 2166-B-401, Sh. 4443, CWD Miscellaneous Cables, Sh. 23, Rev. 10, dated 03/06/2000  
 CAR 2166-B-401, Sh. 821, CWD Aux Xfer Panel - "SA" (Sect SA), Rev. 7, dated 06/26/1984  
 CAR 2166-B-401, Sh. 3288, CWD ESW Intake Structure Electrical Equipment Room Supply  
 Fan AH-86 (1A-SA), Rev. 11, dated 11/01/1998

#### Technical Manuals and Vendor Information

Manual ID: VM-TNZ; Vendor: Dual-Lite/Lightguard, Rev. 5; 11/29/2006  
 Manual ID: VM-BDV; Vendor: Dukane Corp., Rev. 4; 04/23/1999  
 SD-180.03 System Description, Sound-Powered Telephones, Rev. 5  
 Vendor Manual Detectors-PAC

#### Licensing Basis Documents

NUREG-1038 Safety Evaluation Report Section 9.5.1.4, Lighting and Communication Systems  
 NUREG-1038 Safety Evaluation Report Section 9.5.2, Communication Systems  
 NUREG-1038 Safety Evaluation Report Section 9.5.3, Lighting Systems  
 Technical Specifications 3.3.3.5.a and b,  
 Technical Specifications 4.3.3.5.1 and 2,

Technical Specification Table 3.3-9, Remote Shutdown System

Technical Specification Table 4.3-6, Remote Shutdown Monitoring Instrumentation Surveillance Requirements

### Other Documents

Progress Energy DOC. NO. CTP-0800, Dated 12-03-02, 1-Hour Fire Resistance Evaluation of a Thermo-Lag Fire Barrier Enclosure Fire Test

Penetration Seal Test, CTP-1063, Three Hour Qualification Test B&B Light Density Silicone Elastomer (LDSE), B&B High Density Silicone Elastomer (HDSE), B&B Rad-Flex, Flexible Boots Seals and other Seal Matrices

CPL-2167, S-042 - Reactor Auxiliary Building, El. 305.00, Int. Wall Penetrations, Unit 1 Penetration E-806, ML-1

Circuit Analysis HNP-CCW-005E, 1CC-207, CCW To RCP Seals & Motor Coolers Outer Isolation Valve, dated 9/22/08

Circuit Analysis HNP-CCW-005E, 1CC-208, CCW To RCP Seals & Motor Coolers Inner Isolation Valve, dated 9/22/08

Circuit Analysis HNP-CCW-005E, 1CC-251, CCW Return Isolation Valve From RCP Thermal Barriers OB, dated 9/22/08

Circuit Analysis HNP-CCW-005E, 1CC-252, RCP Thermal Barriers FCV, dated 9/22/08

Circuit Analysis HNP-RCSPC-019E, 1B1-4B, Pressurizer Heater Back-up Group B Power Panel Supply Breaker, dated 9/23/08

Circuit Analysis HNP-ESW-009E, 1SW-271, ESW Header B Return To Auxiliary Reservoir, dated 9/25/08

Circuit Analysis HNP-INST-020E, LI-01CE-9010B2SB, CST ACP (PAM), dated 9/22/08

Circuit Analysis HNP-INST-020E, LI-01RC-0459A2SA, Pressurizer Level I (PAM), dated 9/22/08

Circuit Analysis HNP-INST-020E, LI-01CT-7110, Refueling Water Storage Level, dated 9/22/08

Circuit Analysis HNP-INST-020E, NI-01RE-0060A2, Source Range Neutron Flux, dated 9/22/08

Circuit Analysis HNP-CVCS-004E, Charging SI Pumps Miniflow Isolation (1CS-214SA) Motor Operator, dated 09/22/08

Circuit Analysis HNP-CVCS-004E, C CSIP Discharge X-Connect Valve with B CSIP, 09/22/08

Circuit Analysis HNP-AFW-001E, 1AF-130, Steam Supplied AFW to S/G B, dated 09/22/08

Circuit Analysis HNP-MSS-017E, 1MS-72, MS Line "C" To Steam Driven AFW Turbine MOV CIV, dated 9/22/08

Circuit Analysis HNP-MSS-017E, 1MS-70, MS Line "B" To Steam Driven AFW Turbine CIV, dated 09/22/08

Circuit Analysis HNP-MSS-017E, 1MS-60, MS-P19SB PWR Operated Relief Valve, 09/22/2008

Circuit Analysis HNP-RCSPC-019E, PCV-445A Block Valve For 1RC-118, dated 09/23/2008

Circuit Analysis HNP-RCSPC-019E, PCV-445B Block Valve For 1RC-116, dated 09/23/2008

Circuit Analysis HNP-RCSPC-019E, PCV-444B Block Valve For 1RC-113, dated 9/23/08

Circuit Analysis HNP-ESW-009E, ESW HDR A Return to Auxiliary Reservoir, dated 10/06/08

Circuit Analysis HNP-RHRS-002E, 1A-SA RHR Pump Motor, dated 10/07/2008

Circuit Analysis HNP-CRLT-024E, LP 142, Aux Control Panel Area Lighting dated 10/06/2008

Circuit Analysis HNP-PDSOS-060E, 1EE-E220, UPS-60KVA, 60KVA Uninterruptible Power Supply, dated 10/07/2008

Circuit Analysis HNP-PDSOS-060E, UPP-1-1 Vital, UPP-1-1, 120VAC Power PNL UPP-1-1, dated 09/25/2008

Circuit Analysis HNP-ESW-009E, 1SW-E006:002, 1B-SB-390, ESW Pump 1B-SB, 10/06/2008

Circuit Analysis HNP-ESW-009E, 1SW-E005:002, 1A-SA-390, ESW Pump 1A-SA, 10/06/1008

Circuit Analysis HNP-CVCS-004E, 1CS-CSIPB:002, 1B-SB, CSIP Motor B, dated 10/07/2008

Circuit Analysis HNP-RHRS-002E, 1RH-RHRB:002, 1B-SB, RHR Pump Mtr, dated 10/07/2008

Circuit Analysis HNP-PDSDC-022E, DP-1B1-SB, 1B1-SB, dated 10/07/2008  
 Circuit Analysis HNP-SEQ-058E, CWD 1168, SEQ ESS Cabinet 1B-SB, dated 10/07/2008  
 Circuit Analysis HNP-PDSDC-022E, DP-1A-SA, 1A-SA, dated 10/07/2008  
 Circuit Information CWD 835, Auxiliary Transfer Panels, System HRAA [cables: 0822A, 0835A, 2642D, 3290D]  
 Circuit Information 1EE-E112, Auxiliary Transfer Panels, System ATP [cables: 0882A, 0823A, 0847C, 0847D]  
 Circuit Information CWD 848, Auxiliary Transfer Panels, System HRAA [cables: 0821A, 0848A, 3288D]  
 Circuit Information 1EE-E111, Auxiliary Transfer Panel SA, System ATP [cables: 0821A, 0824A, 0847A, 0847F]  
 SD-180.03 System Description, Sound Powered Telephones  
 System Monitoring System Detail Production, Emer. DC Lighting Functional Failure, 10/08/08

#### ARs / NCRs / PRRs Generated as a Result of This Inspection

NCR 297789, Discrepancies Exist in CSRA Fire Sprinkler Design Documents  
 AR 297836, FPP-013 Fire Protection Minimum Requirements  
 AR 297838, EC-48029 Failed to Identify all Procedure Changes  
 AR 298016, Revise FPT-3120 Fire Hose Valve Operability Test  
 NCR 298018, Meggitt Cable Surveillance Requirement  
 NCR 298072, AOP-004 Directs Usage of Instruments That Are Not Protected  
 NCR 298108, Calculations FP-0109 and FP-0110 Should be Voided  
 NCR 300039, NRC Concern with EC-48029 Sprinkler Calculations  
 PRR 300251, AOP-036.08, Fire Areas: 1-A-SWGRA, 1-A-SWGRB, Rev. 6  
 PRR 300326, AOP-036.05, Rev. 7, Fire Areas: 1-A-CSRA, 1-A-CSR  
 PRR 300331, AOP-004, Rev. 43, Remote Shutdown  
 NCR 300610, Evaluate the Need for Fire Damper Drop Testing for 1-A-CSRA  
 NCR 300616, Smoke Purge Guidance in Fire Pre-Plans

#### Other ARs / NCRs Reviewed During This Inspection

AR 80340, Fire Protection Circuit Analysis Issues Resolution  
 AR 248930, C-SA CSIP Breaker Did Not Operate From ACP During OST-1813  
 W/O Task 00806756, Performed MPT-0038 SAT, dated 11/01/2007  
 AR 265584, Inappropriate Act or Equipment Malfunction - Communication  
 AR 272042, Material Condition Deficiencies Noted on TB Sound Powered Phones  
 AR 293578, Alternate Shutdown, Sound Powered Phone Availability for AOP-004  
 AR 226005, System 5215, DC Emergency Lighting Functional Failure, dated 03/27/2007  
 AR 221098, Plant PA System and Alarm Capability Lost on 01/31/2007  
 AR 225842, WO 01026188 Initiated to Document Inability of Operations to Establish  
 Communications on Sound Powered Phone  
 AR 277122, EDG Walk Down Revealed Sound Powered Headset Box SP-DGB-09 not Installed  
 AR 294893, PMs Revealed that PA System Speakers Referenced in Drawings did not Match  
 Actual Plant Conditions  
 AR 158409, Battery Acid Leak from 1EAC-FHB-61  
 AR 158488, Eight SSD DC Batter Lights not Aligned Properly  
 AR 295099, SSD Battery Light 1EAC-TGB-22 Found Malfunctioning

**LIST OF ACRONYMS**

ACP	Auxiliary Control Panel
ADAMS	Agency Wide Documents Access and Management System
AOP	Abnormal Operating Procedure
AR	Action Request
BTP	Branch Technical Position
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CMEB	Chemical Engineering Branch
CSRA	Cable Spreading Room A
CWDs	Control Wiring Diagrams
ELUs	Emergency Lighting Units
ESW	Emergency Service Water
FA	Fire Area
FI	Flow Indicator
FPP	Fire Protection Program
ft.	Feet/Foot
FZ	Fire Zone
gpm	Gallons Per Minute
IMC	Inspection Manual Chapter
IR	Inspection Report
MCR	Main Control Room
NCR	Nuclear Condition Report
NCV	Non-Cited Violation
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
OEP	Operating Experience Program
PARS	Publicly Available Records
RAB	Reactor Auxiliary Building
Rev.	Revision
ROP	Reactor Oversight Process
SDP	Significance Determination Process
SER	Safety Evaluation Report
sq.	Square
SSA	Safe Shutdown Analysis
SSD	Safe Shutdown
UFSAR	Updated Final Safety Analysis Report