



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

January 26, 2010

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

**SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT - NRC INTEGRATED  
INSPECTION REPORT 05000400/2009005**

Dear Mr. Burton:

On December 31, 2009, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Shearon Harris reactor facility. The enclosed integrated inspection report documents the inspection results, which were discussed on January 21, 2010, with you and other members of your staff.

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). This finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program (CAP), the NRC is treating the finding as non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV, 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. In addition, if you disagree with the characterization of the finding 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 the Shearon Harris facility. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and 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

CP&L

2

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/*

Randall A. Musser, Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

Docket No.: 50-400  
License No.: NPF-63  
Enclosure: NRC Inspection Report 05000400/2009005  
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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/**

Randall A. Musser, Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

Docket No.: 50-400  
License No.: NPF-63  
Enclosure: NRC Inspection Report 05000400/2009005  
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

PUBLICLY AVAILABLE       NON-PUBLICLY AVAILABLE       SENSITIVE       NON-SENSITIVE

ADAMS:  Yes    ACCESSION NUMBER: ML100261306

SUNSI REVIEW COMPLETE RAM 1/26/2010

OFFICE	RII:DRP	RII:DRP	RII:DRP	RII:DRP	RII:DRP		
SIGNATURE	GJW	Jgw1	PBL1 by email	JDA by email	RAM		
NAME	GWilson	JWorosilo	PLessard	JAustin	RMusser		
DATE	01/21/2010	01/25/2010	01/22/2010	01/24/2010	01/25/2010		
E-MAIL COPY?	YES    NO	YES    NO	YES    NO	YES    NO	YES    NO	YES    NO	YES    NO

OFFICIAL RECORD COPY

DOCUMENT NAME: I:\RPB4\HARRIS\REPORT\2009 REPORTS\IR 09-05.DOC

cc w/encl:

Brian C. McCabe  
Manager, Nuclear Regulatory Affairs  
Progress Energy Carolinas, Inc.  
Electronic Mail Distribution

R. J. Duncan, II, Vice President  
Nuclear Operations  
Carolina Power & Light Company  
Electronic Mail Distribution

Greg Kilpatrick, Training Manager  
Shearon Harris Nuclear Power Plant  
Progress Energy Carolinas, Inc.  
Electronic Mail Distribution

John C. Warner, Manager  
Support Services  
Progress Energy Carolinas, Inc.  
Electronic Mail Distribution

David H. Corlett, Supervisor  
Licensing/Regulatory Programs  
Progress Energy  
Electronic Mail Distribution

David T. Conley  
Associate General Counsel  
Legal Dept.  
Progress Energy Service Company, LLC  
Electronic Mail Distribution

Christos Kamilaris, Director  
Fleet Support Services  
Carolina Power & Light Company  
Electronic Mail Distribution

John H. O'Neill, Jr.  
Shaw, Pittman, Potts & Trowbridge  
2300 N. Street, NW  
Washington, DC 20037-1128

Joseph W. Donahue  
Vice President  
Nuclear Oversight  
Carolina Power and Light Company  
Electronic Mail Distribution

W. Lee Cox, III  
(Acting) Section Chief  
Radiation Protection Section  
N.C. Department of Environmental  
Commerce & Natural Resources  
Electronic Mail Distribution

Public Service Commission  
State of South Carolina  
P.O. Box 11649  
Columbia, SC 29211

Chairman  
North Carolina Utilities Commission  
Electronic Mail Distribution

Robert P. Gruber, Executive Director  
Public Staff - NCUC  
4326 Mail Service Center  
Raleigh, NC 27699-4326

Herb Council, Chair  
Board of County Commissioners of Wake  
County  
P.O. Box 550  
Raleigh, NC 27602

Chair  
Board of County Commissioners of  
Chatham County  
186 Emerson Road  
Siler City, NC 27344

Kelvin Henderson  
Plant General Manager  
Carolina Power and Light Company  
Shearon Harris Nuclear Power Plant  
Electronic Mail Distribution

CP&L

4

Letter to Christopher L. Burton from Randall A. Musser dated January 26, 2010

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT - NRC INTEGRATED  
INSPECTION REPORT 05000400/2009005

Distribution w/encl:

C. Evans, RII EICS

L. Slack, RII EICS

OE Mail

RIDSNNRRDIRS

PUBLIC

RidsNrrPMShearonHarris Resource

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-400

License No.: NPF-63

Report No.: 05000400/2009005

Licensee: Carolina Power and Light Company

Facility: Shearon Harris Nuclear Power Plant, Unit 1

Location: 5413 Shearon Harris Road  
New Hill, NC 27562

Dates: October 1, 2009 through December 31, 2009

Inspectors: J. Austin, Senior Resident Inspector  
P. Lessard, Resident Inspector

Approved by: Randall A. Musser, Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000400/200900005; October 1, 2009 – December 31, 2009; Shearon Harris Nuclear Power Plant, Unit 1; Fire Protection.

The report covered a three month period of inspection by resident inspectors. One Green Non-Cited Violation (NCV) 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); the cross-cutting aspect was determined using IMC 0305, Operating Reactor Assessment Program; and findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review.

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

#### **Cornerstone: Mitigating Systems**

- Green. The inspectors identified a Green NCV of the Shearon Harris Nuclear Power Plant Operating License condition 2.F, Fire Protection Program, for failing to correctly install spot type smoke detectors between four and twelve inches down from the ceiling to the top of the detector as required by National Fire Protection Association (NFPA) 72E, Automatic Fire Detectors. Specifically, it was determined that eight spot type smoke detectors are installed approximately five feet below the ceiling in the plant's Computer Room. The licensee took immediate corrective action by initiating compensatory fire watches. The licensee entered this into the corrective action program (CAP) as Action Request (AR) #363555.

The finding was determined to be more than minor because it affected the Mitigating Systems Cornerstone objective of availability, reliability, and capability of the fixed fire detection system and was associated with the protection against external factors (fire) attribute. Specifically, this failure could affect the timeliness of response to a fire due to the delayed detection of smoke and resulting alarm, allowing the fire to grow larger prior to the fire brigade taking action. Using MC 0609, Appendix F, it was determined that this issue was in the category of fixed fire protection systems which had moderate degradation due to the fact that the system would function, although delayed. Further, it was determined that this issue was a Fire Damage State Zero (FDS0). As such, only the fire ignition source and initiating fuels are damaged by the fire. FDS0 is not analyzed in the fire protection SDP as a risk contributor and is therefore of very low safety significance (Green). Due to the fact that this condition has been present since initial installation during plant construction, it was determined that this was not indicative of current licensee performance and therefore no cross-cutting aspect was identified. (Section 1R05)

### B. Licensee-Identified Violations

None.

Enclosure

## REPORT DETAILS

### Summary of Plant Status

Unit 1 reduced power to approximately 90% for turbine valve testing on October 24, 2009, and resumed operation at or near Rated Thermal Power (RTP) on the same day. Additionally, the plant was shut down from November 15, 2009, until November 20, 2009, due to a manual reactor trip to perform repairs following a hydrogen seal oil filter failure. With those exceptions, Unit 1 operated at or near RTP for the remainder of the inspection period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R01 Adverse Weather Protection

##### .1 Winter Seasonal Readiness Preparations

###### a. Inspection Scope

The inspectors performed a review of the licensee's preparations for winter conditions to verify that the plant's design features and implementation of procedures were sufficient to protect mitigating systems from the effects of adverse weather. Documentation for selected risk-significant systems was reviewed to ensure that these systems would remain functional when challenged by inclement weather. During the inspection, the inspectors focused on plant specific design features and the licensee's procedures used to mitigate or respond to adverse weather conditions. Additionally, the inspectors reviewed the Updated Final Safety Analysis Report (UFSAR) and performance requirements for systems selected for inspection, and verified that operator actions were appropriate as specified by plant specific procedures. Cold weather protection, such as heat tracing and area heaters, was reviewed to be in operation where applicable. The inspectors also reviewed CAP items to verify that the licensee was identifying adverse weather issues at an appropriate threshold and entering them into the CAP in accordance with station corrective action procedures. Specific documents reviewed during this inspection are listed in the attachment. The inspectors' reviews focused specifically on the following plant systems due to their risk significance or susceptibility to cold weather issues:

- Heat Tracing and Freeze Protection
- HVAC Auxiliary Building
- HVAC Emergency Service Water (ESW) Intake Structure

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

- AR #315092, Equipment Rooms (North) Air Handler (AH-14Z) Low Temperature Trip

Enclosure



- AR #316900, Security 125 VDC System Power Parameter Fluctuations
- AR #270601, AP-301 (Seasonal Weather Preparations and Monitoring Procedure) Actions
- AR #304592, Heat Trace Panel Not Functioning
- AR #322965, Service Water Intake Structure Exhaust Fan Found Running after B ESW Pump was Secured

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

.1 Quarterly Partial System Walkdowns

a. Inspection Scope

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

- B Residual Heat Removal (RHR) system while the A RHR system was inoperable for maintenance on October 14, 2009;
- A Emergency Diesel Generator (EDG) while the B EDG was inoperable for maintenance on October 29, 2009;
- A and B ESW system while they were protected due to replacement of breaker 52-6 (Cape Fear South breaker) in the switchyard causing an elevated risk condition on November 6, 2009.

The inspectors selected these systems based upon 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 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 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.

Enclosure

b. Findings

No findings of significance were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

On November 10, 2009, the inspectors performed a complete system alignment inspection of the Auxiliary Feedwater (AFW) System to verify the functional capability of the system. This system was selected because it was considered risk significant in the licensee's probabilistic risk assessment. The inspectors walked down the system to review mechanical and electrical equipment line ups, electrical power availability, system pressure and temperature indications, component labeling, component lubrication, component and equipment cooling, hangers and supports, operability of support systems, and to ensure that auxiliary equipment or debris did not interfere with equipment operation. A review of a sample of past and outstanding work orders (WOs) was performed to determine whether any deficiencies significantly affected the system function. In addition, the inspectors reviewed the CAP database to ensure that system equipment alignment problems were being identified and appropriately resolved.

This inspection completes the requirements of the Operating Experience Smart Sample FY 2009-02, "Negative Trend and Recurring Events Involving Feedwater Systems." The documents used for the walkdown and issue review are listed in the attachment.

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

- AR #290473, NRC Information Notice 2008-13 Main Feedwater (MFW) System Issues and Related 2007 Reactor Trips

b. Findings

No findings of significance 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 Train Electrical Penetration Area;
- B Train Electrical Penetration Area;

- Main Control Room, Auxiliary Relay Room and Computer Room;
- ESW Intake Screening Structure;
- Chemical and Volume Control System and Boron Thermal Regeneration System Chillers, Boric Acid Batching and Boron Recycle System Areas;
- Access Hall to Fuel Pool Cooling System Heat Exchanger, Demineralizer and Filter Areas.

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, degraded or inoperable fire protection equipment, systems, or features in accordance with the licensee's fire plan. The inspectors selected fire areas based upon 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 CAP.

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

- AR #363555, Detection in the Computer Room
- AR #365438, Reactor Auxiliary Building (RAB) 305' Computer Room Fire Detection not restored in 14 Days

b. Findings

Introduction: The inspectors identified a Green NCV of the Shearon Harris Nuclear Power Plant Operating License condition 2.F, Fire Protection Program, for failing to correctly install spot type smoke detectors between four and twelve inches down from the ceiling to the top of the detector as required by NFPA 72E, Automatic Fire Detectors. Contrary to this requirement, the licensee failed to maintain their Fire Protection Program because spot type smoke detectors are installed approximately five feet below the ceiling in the plant's Computer Room.

Description: On October 29, 2009, NRC inspectors conducted a walkdown of the Computer Room and observed eight spot type smoke detectors installed on an open grid ceiling, approximately five feet below the true ceiling. NFPA 72E, Automatic Fire Detectors, section 4-3, Location and Spacing, states that spot-type smoke detectors shall be located between four and twelve inches down from the ceiling to the top of the detector. As installed in the plant's Computer Room, the detectors may experience a

Enclosure

delay in their activation due to smoke passing through the open grid and collecting on the true ceiling until the smoke layer accumulates and reaches the detectors. After NRC inspectors identified the degraded detectors, the licensee took immediate corrective action by initiating compensatory fire watches.

Analysis: The licensee's failure to install smoke detectors in accordance with the Fire Protection Program was a performance deficiency. The finding was determined to be more than minor because it affected the Mitigating Systems Cornerstone objective of availability, reliability, and capability of the fixed fire detection system and was associated with the protection against external factors (fire) attribute. Specifically, this failure could affect the timeliness of response to a fire due to the delayed detection of smoke and resulting alarm, allowing the fire to grow larger prior to the fire brigade taking action. Using MC 0609, Appendix F, it was determined that this issue was in the category of fixed fire protection systems which had moderate degradation due to the fact that the system would function, although delayed. Further, it was determined that this issue was a Fire Damage State Zero (FDS0). As such, only the fire ignition source and initiating fuels are damaged by the fire. FDS0 is not analyzed in the fire protection SDP as a risk contributor and is therefore of very low safety significance (Green). Because this condition has been present since initial installation during plant construction, it was determined that this was not indicative of current licensee performance and therefore no cross-cutting aspect was identified.

Enforcement: The Shearon Harris Nuclear Power Plant Operating License NPF-63 condition 2.F, Fire Protection Program, requires that the licensee implement and maintain all provisions of the approved fire protection program as described in the UFSAR as amended and as approved in the Safety Evaluation Report (SER) dated November 1983, (and Supplements 1 through 4) and the Safety Evaluation dated January 12, 1987. SER Section 9.5.1.5, Fire Detection and Suppression, requires that a fire detection system is provided for all areas containing safety-related equipment and for all areas that present a fire exposure to safety-related equipment and that detectors must be installed in accordance with NFPA 72E, Automatic Fire Detectors. NFPA 72E section 4-3, Location and Spacing, states that spot-type smoke detectors shall be located between four and twelve inches down from the ceiling to the top of the detector. Contrary to the above, the licensee failed to maintain their Fire Protection Program because spot type smoke detectors are installed approximately five feet below the ceiling in the plant's Computer Room. Once the eight smoke detectors were found noncompliant, the licensee initiated compensatory fire watches. Because this violation was of very low safety significance and was entered into the CAP as AR #363555, this violation is being treated as an NCV, consistent with the NRC Enforcement Policy (NCV 05000400/2009005-01), Failure to Properly Install Spot Type Smoke Detectors.

## 1R06 Flood Protection Measures

### .1 Review of Areas Susceptible to Internal Flooding

#### a. Inspection Scope

The inspectors reviewed selected risk important plant design features and licensee procedures intended to protect the plant and its safety related equipment from internal flooding events. The inspectors reviewed flood analyses and design documents, including the UFSAR, engineering calculations, and abnormal operating procedures (AOPs), for licensee commitments. The specific documents reviewed are listed in the attachment. In addition, the inspectors reviewed licensee drawings to identify areas and equipment that may be affected by internal flooding caused by the failure or misalignment of nearby sources of water, such as the fire suppression or the circulating water systems. The inspectors also reviewed the licensee's corrective action documents with respect to past flood-related items identified in the CAP to verify the adequacy of the corrective actions. The inspectors performed a walkdown of the following plant areas to assess the adequacy of watertight doors and verify drains and sumps were clear of debris and were operable, and that the licensee complied with its commitments:

- RAB 236', Auxiliary Feedwater Pump Area
- RAB 190', B Residual Heat Removal and Containment Spray Pump Room

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

- AR #311731, Expected Information not in Flooding Calculation

#### b. Findings

No findings of significance were identified.

### .2 Annual Review of Cables Located in Underground Bunkers/Manholes

#### a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could disable risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including manhole MH70B-SA and MH73B-SA, to verify that the A ESW pump cables were not submerged in water, that cables and/or splices appear intact and to observe the condition of cable support structures. When applicable, the inspectors verified proper dewatering device (sump pump) operation and verified level alarm circuits are set appropriately to ensure that the cables will not be submerged. Where dewatering devices were not installed; the inspectors ensured that drainage was provided and was functioning properly.

The inspectors reviewed the following ARs associated with this area to verify that the

Enclosure

licensee identified and implemented appropriate corrective actions:

- AR #370463, Wetted Cables within Manhole MH73B-SA
- AR #370464, Possible Corrosion Buildup Found during Manhole MH70B-SA Inspection

b. Findings

Introduction: The inspectors identified an unresolved item (URI) associated with the submergence of Safety Related cables in an underground bunker. This item is unresolved pending further review and evaluation of the licensee's environmental qualifications of submerged 6.9kV cabling.

Description: The inspectors identified A ESW pump power supply cables submerged in approximately 2.5 feet of standing water within manhole MH73B-SA. Additional inspection activities are needed to determine if the A ESW pump power supply cables are suitable for submersion in water. Pending the results of this additional inspection, an URI will be opened and designated as URI 05000400/2009005-02, A ESW Pump Power Supply Cables Submerged in Water.

1R11 Licensed Operator Requalification Program

.1 Quarterly Review

a. Inspection Scope

On November 10, 2009, 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 scenario tested the crew's ability to respond to a tube rupture in the B steam generator combined with a stuck open safety valve. The inspectors evaluated the following areas:

- Licensed operator performance;
- Crew's clarity and formality of communications;
- Ability to take timely actions in the conservative direction;
- Prioritization, interpretation, and verification of annunciator alarms;
- Correct use and implementation of abnormal and emergency procedures;
- Control board manipulations;
- Oversight and direction from supervisors; and
- 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.

Enclosure

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectivenessa. Inspection Scope

The inspectors assessed performance issues with respect to the reliability, availability, and condition monitoring of the two issues listed below. 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:

- AR #303580, Radiation Monitor (REM-3530) Tank Area Drain Room Declared Inoperable
- AR #361899, Auxiliary Feedwater Pump 1B Suction Pressure Transmitter Calibration is Required

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;
- Charging unavailability for performance;
- Trending key parameters for condition monitoring;
- Ensuring 10 CFR 50.65(a)(1) or (a)(2) classification or re-classification;
- Verifying appropriate performance criteria for structures, systems; and components (SSCs)/functions classified as (a)(2) or appropriate and adequate goals and corrective actions for systems classified as (a)(1).

b. Findings

No findings of significance 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 four 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:

- Scheduled maintenance in the switchyard to replace breaker 52-1 on October 5, 2009;
- Emergent work on 1SW-129 (Cross connect isolation valve between B ESW and the Turbine Driven Auxiliary Feedwater Pump) due to excessive leak-by following maintenance on October 26, 2009;
- During a qualitative yellow risk condition during plant startup following the forced outage on November 20, 2009;
- Scheduled period of inoperability for A ESW while pumping water out of associated underground bunkers/manholes on December 12, 2009.

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 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.

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

- AR #362130, 1SW-129 has Valve Seat Leak-By when Valve is Shut from Control Switch

#### b. Findings

No findings of significance were identified.

### 1R15 Operability Evaluations

#### a. Inspection Scope

The inspectors selected the following four 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

Enclosure



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. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations. 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 #358453, 6.9 KV Vacuum Breakers Mechanically Operated Cell (MOC) Switch Performance under Seismic Conditions needs to be Reviewed
- AR #361689, Containment Spray Add Tank Discharge Flow Found out of Calibration
- AR #364539, Unexpected Foreign Material in A EDG Intake Headers
- AR #364130, Main Control Room Bypass Permissive Light Box Loss of Indication

b. Findings

No findings of significance 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 75397, Temporary Modification to Disable Flow Switch (FIS-9303) A and B Permissive to start Normal Service Water (NSW) Pump A and B while the NSW tank is removed from service.

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, post-modification testing, and relevant procedures, design, and licensing documents were properly updated. The inspectors observed ongoing and completed work activities to verify that installation was consistent with the design control documents. The modification was designed to provide a means of quickly starting either NSW pump without the normal alignment of seal water from the seal injection tank, or without normal seal water flow from the discharge of the other pump (assuming the other pump tripped).

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

- AR #365131, NSW Tank through Wall Leaks

Enclosure

- AR #370908, Reevaluate Permanent Repair Strategy for NSW Tank

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

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

<u>Test Procedure</u>	<u>Title</u>	<u>Related Maintenance Activity</u>	<u>Date Inspected</u>
OST-1008	1A-SA Residual Heat Removal (RHR) Pump Operability Test, Quarterly Interval, Modes 1-2-3	1) Work Order (WO) 1296460, Perform 480VAC Motor Electrical Inspection 2) WO 1351376, A RHR Motor Oil Change 3) WO 1402340, Lubricate Valve Stem for 1SI-322 4) WO 1348345, Lubricate Valve Stem for 1SI-326	October 14
OST-1086	1B-SB Emergency Diesel Generator (EDG) Operability Test, Semiannual Interval, Modes 1-6	1) WO 1560891, 1DFO-191 will not Remain Shut with Pump Running 2) WO 1604504, Replace 87DG, Add 87X1 Relays per EC 74010 (EDG Differential Control 87DG Relays Obsolete)	October 30

Enclosure

OP-149	Fire Protection	WO 1298932, Inspect and Refurbish Jockey Fire Pump	November 13
OST-1808 and OST-1046	Main Steam Isolation Valve (MSIV) Operability Test Quarterly Interval Mode 3-5 and MSIV; ESF Response Time 18 Month Interval Modes 3-5	WO 1655708, B MSIV Failed to Close from Control Switch	November 19
OST-1021 and OP-104	Daily Surveillance Requirements Daily Interval Mode 1, 2; Rod Control System	WO 1551917, Digital Rod Position Indication (DRPI) non-urgent alarm came in and cleared	November 19

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.

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

- AR #360882, Increased Vibrations during Run of A RHR
- AR #360908, A RHR Pump Motor Oil Sample Discolored from Upper Bearing
- AR #363504, Exceeded Planned Time for B-EDG Outage
- AR #363490, B EDG Frequency Timed Incorrectly During Test
- AR #363527, B EDG Lube Oil Dresser Coupling Leak
- AR #366031, Jockey Fire Pump Seized upon Post Maintenance Test Start
- AR #366175, B MSIV Failed to Close from Control Switch

Enclosure

- AR #361805, RPI Non-Urgent Alarm Received and Cleared in Main Control Room

b. Findings

No findings of significance were identified.

1R20 Outage Activities

For the forced outage that began on November 15, 2009, and ended on November 20, 2009, the inspectors evaluated licensee outage activities as described below to verify that licensees considered risk in developing outage schedules, adhered to administrative risk reduction methodologies they developed to control plant configuration, and adhered to operating license and TS requirements that maintained defense-in-depth. The inspectors also verified that the licensee developed mitigation strategies for losses of the following key safety functions:

- Decay Heat Removal
- Inventory Control
- Power Availability
- Reactivity Control
- Containment Integrity

Documents reviewed are listed in the attachment.

.1 Licensee Control of Outage Activities

a. Inspection Scope

During the outage, the inspectors observed risk-significant items and activities to verify that the licensee maintained defense-in-depth commensurate with the outage risk-control plan for the key safety functions listed above and applicable TS when taking equipment out of service. The inspectors also reviewed responses to emergent work and unexpected conditions to verify that resulting configuration changes were controlled in accordance with the outage risk control plan, and to verify that control-room operators were kept cognizant of the plant configuration.

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

- AR #366174, Strainer Handle Disconnected Forcing Manual Plant Trip
- AR #366181, Components Affected by Seal Oil Leak
- AR #367198, Digital Rod Position Indication Non-Urgent Alarm Received on Shut Down Bank A Rod C-9

b. Findings

No findings of significance were identified.

.2 Monitoring of Heatup and Startup Activities

a. Inspection Scope

Prior to mode changes and on a sampling basis, the inspectors reviewed system lineups and/or control board indications to verify that TSs, license conditions, and other requirements, commitments, and administrative procedure prerequisites for mode changes were met prior to changing modes or plant configurations.

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

- AR #367327, B Condensate Booster Pump Tripped on Start

b. Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems

a. Inspection Scope

Periodically, the inspectors reviewed the items that had been entered into the CAP to verify that the licensee had identified problems related to outage activities at an appropriate threshold and had entered them into the CAP. For the problems documented in the CAP and listed below, the inspectors reviewed the results of the investigations to verify that the licensee had determined the cause and implemented appropriate corrective actions, as required by 10 CFR 50, Appendix B, Criterion XVI, Corrective Action.

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

- AR #366176, A Main Feed Pump Trip Shortly after Turbine Trip
- AR #366178, Condensate Booster Pumps Tripped to Manual
- AR #366179, Loss of Hydrogen Seal Oil (HSO) to the Turbine and Generator
- AR #366233, Main Steam Power Operated Relief Valve Oscillations
- AR #366585, Unit Auxiliary Transformer (UAT) 1A-X and UAT 1A-Y Inspection
- AR #366772, A Train Solid State Protection System Decoder Board Replaced Twice

b. Findings

No findings of significance were identified.

Enclosure

1R22 Surveillance Testing.1 Routine Surveillance Testinga. Inspection Scope

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

- OST-1211, Auxiliary Feedwater Pump 1A-SA Operability Test performed on October 5, 2009

b. Findings

No findings of significance were identified.

.2 In-Service Testing (IST) Surveillancea. Inspection Scope

The inspectors reviewed the performance of OST-1093, Chemical and Volume Control System and Safety Injection System Operability Train B Quarterly Interval Modes 1-4, performed on October 1, 2009, 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 following equipment:

- 1B-SB Charging Safety Injection Pump (CSIP)
- B Boric Acid Transfer Pump
- 1CS-752, 1B-SB CSIP Alternate Mini-flow Valve
- 1CS-460, Excess Letdown Isolation Valve
- 1CS-461, Excess Letdown Redundant Isolation Valve
- 1SI-179, Outside Containment Isolation Valve (CIV) for Refueling Water Storage Tank (RWST) to Accumulator Fill Line
- 1SI-264, Outside CIV for Accumulator to RWST Return Line
- 1SI-287, Outside CIV for Accumulator Nitrogen Supply

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

Enclosure

- Range and accuracy of test instruments
- Required corrective actions

c. Findings

No findings of significance were identified.

.3 Reactor Coolant System Leak Detection Inspection Surveillance

a. Inspection Scope

The inspectors observed and reviewed the test results for a reactor coolant system leak detection surveillance, OST-1026, Reactor Coolant System Leakage Evaluation, Computer Calculation, Daily Interval, Modes 1-2-3-4, on December 26, 2009. The inspectors observed in plant activities and reviewed procedures and associated records to determine whether: effects of the testing were adequately addressed by control room personnel or engineers prior to the commencement of the testing; acceptance criteria were clearly stated, demonstrated operational readiness, and were consistent with the system design basis; plant equipment calibration was correct, accurate, and properly documented; and the calibration frequency were in accordance with TSS, the UFSAR, procedures, and applicable commitments; applicable prerequisites described in the test procedures were satisfied; test frequencies met TS requirements to demonstrate operability and reliability; tests were performed in accordance with the test procedures and other applicable procedures; test data and results were accurate, complete, within limits, and valid; equipment was returned to a position or status required to support the performance of its safety functions; and all problems identified during the testing were appropriately documented and dispositioned in the CAP. Documents reviewed are listed in the attachment.

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

- AR #372413, Reactor Coolant System Leakage Surveillance Test Enhancements Needed to Prevent Possibly Missing Trigger Points 2 and 3

b. Findings

No findings of significance were identified.

1EP6 Emergency Planning Drill Evaluation

a. Inspection Scope

The inspectors observed an emergency preparedness drill conducted on November 3, 2009, to verify licensee self-assessment of classification, notification, and protective action recommendation development in accordance with 10 CFR 50, Appendix E. The scenario tested the licensee's ability to respond to an injured security officer, a reactor

Enclosure

scram and the loss of all three fission product barriers.

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

- AR #364658, Inconsistent Release Information in PEP-310 (Notifications and Communications Procedure) and PEP-500 (Recovery Procedure)
- AR #364659, Delayed Issuance of Potassium Iodide to the Technical Support Center Staff
- AR #364660, Inadequate Log-Keeping in the Technical Support Center, Operations Support Facility, and Emergency Operations Facility

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

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 action request reports.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in Section 4OA2.1 above, licensee trending efforts, and licensee human performance results. The inspectors' review nominally considered the six month period of July 1 through December 31, 2009, although some examples expanded beyond those dates where the scope of the trend warranted.

The review also included issues documented outside the normal CAP in major

Enclosure



equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self assessment reports, and Maintenance Rule assessments. The inspectors compared and contrasted their results with the results contained in the licensee's CAP trending reports. Corrective actions associated with a sample of the issues identified in the licensee's trending reports were reviewed for adequacy.

b. Findings

There were no findings of significance identified. The inspectors observed that the licensee performed adequate trending reviews. The licensee routinely reviewed cause codes, involved organizations, key words, and system links to identify potential trends in the CAP data. The inspectors compared the licensee process results with the results of the inspectors' daily screening and did not identify any discrepancies or potential trends in the CAP data that the licensee had failed to identify.

The inspectors identified an adverse trend in the area of evaluation of identified problems. Specifically, the evaluations do not always accurately identify or address the underlying causes, thus allowing the issue(s) to recur in a similar manner. The following issues illustrate this trend:

- AR #361821, Potential Error in AR #358062, B ESW Discharge Isolation Valve Reportability Evaluation Assignment
- AR #356873, Effectiveness Review on AR #254402, Containment Spray Eductor Flow Out of TS Limit, Determined Corrective Actions to Preclude Repetition were Ineffective
- AR #358458, 6.9KV Vacuum Breaker Mechanically Operated Cell Switch Performance under Seismic Conditions needs to be Reviewed
- AR #341355, Knowledge Gap Identified with Quality Control Verification Requirements for Engineering Change Installation

This issue was entered into the licensee's CAP as AR #367137 to increase awareness of the reduced regulatory margin and address the need for increased management attention.

.3 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 inspectors reviewed both current and historical operational challenge records to determine whether

Enclosure

the licensee was identifying operator challenges at an appropriate threshold, had entered them into the 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 OWAs.

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

- AR #338961, B EDG Fuel Oil Day Tank Inlet Isolation Valve Failed to Remain Shut
- AR #351623, Containment Spray Eductor Flow Outside of Required Limits

b. Findings

No findings of significance were identified.

4. Selected Issue Follow-up Inspection: Core Exit Thermocouple (CET) Failures

a. Inspection Scope

The inspectors selected AR #199498, Core Exit Thermocouple (CET) Failures, for detailed review. This AR was associated with the determination of causes for repeat functional failures following refueling outage 14 in late 2007. 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, Corrective Action Program, and 10 CFR 50, Appendix B.

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

- AR #367806, Incore Nuclear Instrumentation Road to Excellence
- AR #208622, Operations Work Procedure and Caution Tags Greater than 90 Days Old during 2006 Audit
- AR #72142, CET TE-01RE-0049AW is Inoperable

b. Findings

No findings of significance were identified.

#### 4OA3 Follow-up of Events

##### .1 Plant Trip Due to Hydrogen Seal Oil (HSO) Filter Failure

###### a. Inspection Scope

The inspectors reviewed the plant's response to a plant trip due to HSO filter failure during the night of November 15, 2009. Documents reviewed in this inspection are listed in the attachment. Further review of this event was conducted under Inspection Procedure 71111.20, Refueling and Other Outage Activities, and is described in section 1R20 of this report.

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

- AR #366174, Plant Trip Due to HSO Filter Failure

###### b. Findings

No findings of significance 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 and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. 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.

###### b. Findings

No findings of significance were identified.

##### .2 (Closed) NRC Temporary Instruction (TI) 2515/180 Inspection of Procedures and Processes for Managing Fatigue

###### a. Inspection Scope

The objective of this TI was to determine if licensees' implementation procedures and processes required by 10 CFR 26, Subpart I, "Managing Fatigue" are in place to

Enclosure

reasonably ensure the requirements specified in Subpart I are being addressed. The TI applies to all operating nuclear power reactor licensees but is intended to be performed for one site, per utility. The inspector interfaced with the appropriate station staff to obtain and review station policies, procedures, and processes necessary to complete all portions of this TI.

b. Findings

No findings of significance were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On January 21, 2010, the inspectors presented the inspection results to Mr. Henderson 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

Enclosure

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee personnel

B. Bernard, Superintendent, Security  
C. Burton, Vice President Harris Plant  
D. Corlett, Supervisor, Licensing/Regulatory Programs  
J. Dills, Manager, Operations  
K. Harshaw, Manager, Outage and Scheduling  
K. Henderson, Plant General Manager  
G. Kilpatrick, Training Manager  
S. O'Connor, Manager, Engineering  
M. Parker, Superintendent, Radiation Protection  
H. Curry, Manager, Nuclear Oversight Section  
J. Robinson, Superintendent, Environmental and Chemistry  
J. Warner, Manager, Support Services

#### NRC personnel

R. Musser, Chief, Reactor Projects Branch 4, Division of Reactor Projects, Region II

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

#### Opened and Closed

05000400/2009005-01	NCV	Failure to Properly Install Spot Type Smoke Detectors (Section 1R05.1)
---------------------	-----	--

#### Opened

05000400/2009005-02	URI	"A" ESW Pump Power Supply Cables Submerged in Water (Section 1R06.2)
---------------------	-----	--

#### Closed

2515/180	TI	Inspection of Procedures and Processes for Managing Fatigue (Section 4OA5.2)
----------	----	--

## LIST OF DOCUMENTS REVIEWED

### **Section 1R01: Adverse Weather Protection**

#### Procedures

- ORT-1415, Electric Unit Heater Check Monthly Interval
- OP-161.01, Operations Freeze Protection and Temperature Maintenance Systems
- AP-300, Severe Weather
- AP-301, Seasonal Weather Preparations and Monitoring

#### Work Orders

- WO 1480695, Security Building HVAC, Cold Air Blowing out of Vents
- WO 1494506, Safety Related Exhaust Fan Continued to Run with ESW Pump Room at 44 Degrees

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

#### Partial System Walkdown

B RHR system:

- Procedure OP-111, Residual Heat Removal System,
- Drawing 2165-S-1324, Simplified Flow Diagram Residual Heat Removal System

A and B Emergency Service Water system:

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

A Emergency Diesel Generator System:

- Procedure OP-155, Emergency Diesel Generator System,
- Drawing 2165-S-0547, Simplified Flow Diagram Emergency Diesel Generator System
- Drawing 2165-S-0563, Simplified Flow Diagram Emergency Power Supply System

#### Complete System Walkdown

- Procedure OP-137, Auxiliary Feedwater System
- Student Text, Auxiliary Feedwater System
- Student Text, Condensate and Feedwater System
- System Health Report, Auxiliary Feedwater System
- System Health Report, Condensate System
- System Health Report, Main Feedwater System

- Design Basis Document-114, Auxiliary Feedwater System
- Design Basis Document-112, Condensate, Main Feedwater, Condensate Polishers, Feedwater Drains and Vents Systems
- Simplified Flow Diagram 2165-S-0542
- UFSAR 10.4.9, Auxiliary Feedwater
- UFSAR 10.4.7 Condensate and Feedwater
- Drawing 2166-B-0430, Instrument Schematics and Logic Diagram Feedwater Heater Systems
- Equipment Reliability Improvement Team Project Plan

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

- FPP-001 Fire Protection Program Manual
- FPP-004, Transient Combustible Control
- FPP-013, Fire Protection – Minimum Requirements, Mitigating Actions and Surveillance Requirements
- FPP-012-02-RAB261, Reactor Auxiliary Building Elevation 261 Fire Pre-Plan, A27, A Electrical penetration area
- FPP-012-02-RAB261, Reactor Auxiliary Building Elevation 261 Fire Pre-Plan, A28, B Electrical penetration area
- FPP-012-02-RAB305-324, Reactor Auxiliary Building Elevations 305 and 324 Fire Pre Plan, A51, Main Control Room, Panels and Raised Floor
- FPP-012-02-RAB305-324, Reactor Auxiliary Building Elevations 305 and 324 Fire Pre Plan, A52, Control Room Complex – Auxiliary Relay Panel Room
- FPP-012-02-RAB305-324, Reactor Auxiliary Building Elevations 305 and 324 Fire Pre Plan, A53, Control Room Complex – Computer Room
- FPP-012-08-SEC, Out Building Fire Pre-Plan, S01, ESW Intake Screening Structure and Yard
- FPP-012-02-RAB261, Reactor Auxiliary Building Elevation 261 Fire Pre-Plan, A20, Boric Acid Batching Area
- FPP-012-02-RAB261, Reactor Auxiliary Building Elevation 261 Fire Pre-Plan, A22, Demineralizer and Filter Area
- FPP-012-02-RAB261, Reactor Auxiliary Building Elevation 261 Fire Pre-Plan, A23, Access Hall to Fuel Pool Cooling System Heat Exchanger Area
- FPP-012-02-RAB 236, Reactor Auxiliary Building Elevation 236 Fire Pre-Plan, A12, Chemical and Volume Control System and Boron Thermal Regeneration System Chillers Area
- FPP-012-02-RAB 236, Reactor Auxiliary Building Elevation 236 Fire Pre-Plan, A15, Boron Recycle System Area
- Calculation HNP-M/BMRK-0001, Code Compliance Evaluation NFPA 72E, Automatic Fire Detectors
- HNP-P/LR-0612, License Renewal Aging Management Program Description of the Fire Protection Program
- NFPA 72-E, 1978 Edition, Automatic Fire Detectors
- Calculation E-5525, Safe Shutdown Analysis in Case of Fire, Attachment D, 12-A-CRC1, Control Room Complex, Elevation 305 ft

**Section 1R06: Flood Protection Measures****UFSAR Sections**

- 2.4.10, Flooding Protection Requirements
- 3.6A.6, Flooding Analysis

**Calculations**

- Appendix I to the HNP Probabilistic Safety Assessment, Internal Flooding Analysis
- Calculation #PRA-F/E-4, RAB Unit 1 Elevation 190' & 216' Flood Analysis, F-190-2, B Residual Heat Removal and Containment Spray Pump Room
- Calculation #PRA-F/E-4, RAB Unit 1 Elevation 190' & 216' Flood Analysis, F-216-2, Pipe Tunnel
- Calculation #PRA-F/E-5, RAB Unit 1 Elevation 236 Compartment Flood Analysis, F-236 2, Auxiliary Feedwater Pump Area

**Procedures**

- AOP-022, Loss of Service Water
- OP-139, Service Water System

**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
- 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 1R18: Plant Modifications**

- EGR-NGGC-005, Engineering Change

**Section 1R19: Post Maintenance Testing**

- Drawing 1364-94593, Air Valve Assembly Electro/Pneumatic Air Control Circuit
- Drawing 1364-94591, Tandem Cylinder with Accumulator Drawing



- Drawing 1364-94594, Hydraulic Pressure Dampener
- MSIV Testing Plan
- Smart Maintenance Report – MSIV Rebuild

**Section 1R20: Refueling and Outage Activities**

**Generic Letter 88-17 Documents**

- AOP-020, Loss of Reactor Coolant System Inventory or Residual Heat Removal While Shutdown
- AP-013, Plant Nuclear Safety Committee
- OMP-003, Outage Shutdown Risk Management

**Section 4OA2: Identification and Resolution of Problems**

- CAP-NGGC-0200, Corrective Action Program
- Performance Assessment and Trend Report, Third Quarter, 2009
- Performance Assessment and Trend Report, Second Quarter, 2009