



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

August 5, 2009

Mr. David A. Heacock
President and Chief Nuclear Officer
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

**SUBJECT: SURRY POWER STATION - NRC TRIENNIAL FIRE PROTECTION
INSPECTION REPORT NOS. 05000280/2009007 AND 05000281/2009007**

Dear Mr. Heacock:

On June 26, 2009, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Surry Power Station, Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on June 26, 2009, with Mr. Bischof and other members of your staff. Subsequently, additional in-office reviews were conducted and the final inspection results were discussed by telephone with Mr. W. (Mat) Adams, and other members of your staff on August 5, 2009.

The inspection examined activities conducted under your licenses as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. 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 be a violation of NRC requirements. However, because of the very low safety significance of the issue and because it was entered into your corrective action program, the NRC is treating this finding as non-cited violation (NCV) consistent with Section VI.A.1 of the NRC's Enforcement Policy. If you contest the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States 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 Surry Power Station. In addition, if you disagree with the characterization of any 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 Surry Power Station. 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, 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 the 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 Walter Roger for/

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

Docket Nos.: 50-280, 50-281
License Nos.: DPR-32, DPR-37

Enclosure: Inspection Report 05000280/2009007 and 05000281/2009007
w/ Attachment: Supplemental Information

cc w/encl.: (See page 3)

cc w/encl:

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/RA/

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cc w/encl. (See next page)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-280, 50-281

License No.: DPR-32, DPR-37

Report No.: 05000280/2009007 and 05000281/2009007

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: Surry Power Station, Units 1 and 2

Location: 5850 Hog Island Road
Surry, VA 23883

Dates: June 8 - 12, 2009 (Week 1)
June 22 - 26, 2009 (Week 2)

Inspectors: P. Fillion, Senior Reactor Inspector (Lead Inspector)
N. Merriweather, Senior Reactor Inspector
K. Miller, Reactor Inspector
L. Suggs, Reactor Inspector

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

Enclosure

SUMMARY OF FINDINGS

IR 05000280/2009-007, 05000281/2009-007; 06/08 - 12/2009 and 06/22 - 26/2009; Surry Power Station, Units 1 and 2; Triennial Fire Protection Inspection

This report covers an announced two-week triennial fire protection inspection by a team of four regional 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, if any, was determined using IMC 0305, "Operating Reactor Assessment Program." 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

NRC Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green: The team identified a performance deficiency and Green NCV for failing to implement a maintenance program for the backup batteries for the Halon 1301 system for the emergency switchgear rooms to ensure on a continuing basis that 24-hour backup power was available as required by the fire protection program (FPP) and Units 1 & 2 Operating License Condition 3.I, "Fire Protection." The licensee entered this finding into their corrective action program, and demonstrated that the backup battery had sufficient capacity in the short term until the long term corrective actions can be implemented.

The licensee's failure to implement a maintenance program to help ensure that the backup battery for the Halon 1301 system continued to meet its licensing basis requirement of providing backup power for 24 hours is a performance deficiency. The finding is more than minor because the backup battery actually degraded on several occasions in the past, and the finding is associated with the reactor safety, mitigating systems, cornerstone attribute of protection against external factors, and affected the objective of ensuring reliability and capability of systems that respond to initiating events. The finding was determined to be of very low safety significance because it represented a low degradation of the fixed fire suppression systems. A cross-cutting aspect was not identified in relation to this finding since the cause was not representative of current license performance. (Section 1R05.03.b (2))

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 conducted in accordance with NRC Inspection Procedure (IP) 71111.05T, "Fire Protection (Triennial)." The objective of the inspection was to review implementation of the Surry Power Station Units 1 and 2 FPP, in a minimum of three fire areas (FAs). The three FAs chosen for detailed review were selected based on available risk information as analyzed onsite by a senior reactor analyst from Region II, data obtained in plant walkdowns regarding potential ignition sources, location and characteristics of combustibles and location of equipment needed to achieve and maintain safe shutdown (SSD) of the reactor. Other considerations for selecting the FAs were the relative complexity of the post-fire SSD procedure, information contained in FPP documents, and results of prior NRC triennial fire protection inspections. Detailed inspection of these three fire areas fulfills the procedure completion criteria. The three areas chosen were:

- Unit 2 emergency switchgear and relay room, FA-4
- Unit 2 cable vault and tunnels, FA-2
- Units 1 and 2 main control room, FA-5.

For each FA selected, the inspection team evaluated the licensee's FPP against the applicable NRC requirements. The documents reviewed by the team are listed in the Attachment.

.01 SSD Analysis and Protection of SSD Capabilities

a. Inspection Scope

The team reviewed those portions of the Fire Protection Report (FPR) dealing with the SSD analysis. One objective of this review was to evaluate the completeness and depth of the analysis which determined the credited and fire-affected equipment for each of the three FAs selected and the strategy for accomplishing the various system functions necessary to achieve and maintain hot shutdown, accomplish long term cooldown and achieve cold shutdown following a severe fire. Particular attention was paid to reactor coolant system inventory control, reactivity control and steam generator inventory control. A secondary objective of reviewing the SSD analysis was to understand its details so it could be determined whether the operations post-fire shutdown procedure was consistent with the analysis.

Through a combination of design information review and in-plant inspection, the team ascertained whether the fire protection features in place to protect the SSD capability satisfy the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix R, Section III.G "Fire protection of safe shutdown capability."

b. Findings

No findings of significance were identified.

.02 Passive Fire Protection

a. Inspection Scope

For the selected FAs, the team evaluated the adequacy of fire barrier walls, ceilings, floors, mechanical and electrical penetration seals, fire doors, and fire dampers. The team compared the installed configurations to the approved construction details, and supporting fire endurance test data, which established the ratings of fire barriers. In addition, the team reviewed licensing bases documentation, such as NRC Safety Evaluation Reports (SERs) and exemptions from NRC regulations, to verify that passive fire protection features met license commitments.

The team walked down accessible portions of the selected FAs to observe the material condition of the passive fire barriers. In addition, a sample of completed surveillance and maintenance procedures for selected fire doors, fire dampers, and penetration seals were reviewed to ensure that these passive fire barriers were being properly inspected and maintained. The passive fire barriers included in the review are listed in the Attachment.

b. Findings

Introduction: The team identified an unresolved item (URI) involving the qualification documentation for wall and floor fire barrier penetration seals.

Description: While inspecting the wall and floor fire barrier penetration seals, the team requested the licensee's documentation for the qualification of a particular penetration seal configuration. That configuration was for one aluminum schedule 40 conduit (of various sizes as applicable) penetrating a 6 in. diameter floor or wall sleeve where the floor or wall was of poured concrete construction and the sleeve void around the conduit was filled with foamed silicon to the thickness of the floor or wall. The documentation package requested should establish a 3-hour fire rating, since the rated fire barrier walls and floors were required to have a 3-hour rating. In response, the licensee presented Impell Corporation Calculation No. 1250-111-C01, Penetration Seal Configuration Documentation Package, 10 in. Dow Corning Q3-6548 Silicone RTV Sealing Foam/North Anna and Surry, Rev.1. The qualification package or calculation was based on a tested configuration similar to that described above, except that the conduit was 3 in. or 4 in. galvanized steel. The team informed the licensee that this calculation was not valid to qualify aluminum conduit due to the lower melting temperature and greater heat conductance of aluminum as compared to steel. The licensee later transmitted supplemental information which included a fire barrier penetration seal fire test report for large diameter aluminum conduits through a sleeve. This new information was not a formal calculation comparing it to any installed penetration seal configuration at Surry. Moreover, certain aspects of the test data such as the temperature rise on the unexposed surfaces may not meet the licensing basis. At the time of issuance of this report, the team did not have sufficient information to determine the design criteria of that penetration seal. The team was aware that the fire barrier penetration seal configurations in question could probably be qualified by existing nuclear industry penetration seal testing data; therefore, there was no immediate safety concern. The

licensee Initiated CR 339567 with an action item to establish a valid qualification package for the penetration configuration described above. URI 05000280, 281/2009007-01, "Qualification of Fire Barrier Floor/Wall Penetration of Aluminum Conduit Through Sleeve," was established to track this issue until the final qualification package is reviewed.

.03 Active Fire Protection

a. Inspection Scope

The team performed in-plant observations of fire detection and suppression systems protecting the FAs selected for review, reviewed design documents, and reviewed applicable National Fire Protection Association (NFPA) codes and standards, to assess the material condition and operational lineup of fire detection and suppression systems. The appropriateness of detection and suppression methods for the category of fire hazards in the various areas was reviewed.

The team reviewed the fire detection and suppression surveillance instructions as well as the most recently completed surveillance tests for each of the three selected FAs. The team reviewed the fire protection water supply system and operational valve lineups associated with the electric motor-driven fire pump and the diesel engine-driven fire pump.

The team also reviewed documentation, such as NRC SERs and exemptions from NRC regulations, to verify that active fire protection features met the licensing basis.

Fire hose and standpipe systems were evaluated from source to discharge device against NFPA 14, "Standard for the Installation of Standpipe and Hose Systems for Fire Protection." The team reviewed the compliance calculations performed by the licensee to demonstrate adequate flow, pressure, and water distribution. During plant tours, the team observed placement of the fire hoses and extinguishers to verify they were not blocked and were consistent with the fire fighting pre-plan strategies and FPP documents.

The team reviewed the design, installation, and testing of the Halon and carbon dioxide (CO₂) suppression systems in the selected FAs to evaluate compliance with NFPA 12A, "Standard on Halogenated Fire Extinguishing Agent Systems – Halon 1301," and NFPA 12, "Standard on Carbon Dioxide Extinguishing Systems," respectively. The team also reviewed recent design changes made to the CO₂ suppression system in the Cable Tunnel to resolve NRC concerns identified in the previous triennial fire protection inspection.

The team reviewed the fire brigade staging and dress-out areas to assess the operational readiness of fire fighting and smoke control equipment. The fire brigade personal protective equipment, self-contained breathing apparatuses (SCBAs) and SCBA cylinder refill capability were reviewed for adequacy and functionality. The team also reviewed operator and fire brigade staffing, fire brigade response reports, offsite fire department communications and staging procedures, fire fighting pre-plan strategies, fire brigade qualification training, and the fire brigade drill program procedures. Fire brigade response-to-drill scenarios and associated brigade drill evaluations/critiques that transpired over the last 12 months for the selected FAs were reviewed.

The team reviewed the fire fighting pre-plan strategies for the selected FAs and fire response procedures to verify that pertinent information was provided to fire brigade members to identify potential effects to plant and personnel safety, and to facilitate suppression of an exposure fire that could impact SSD capability. The team walked down the selected FAs to compare the associated fire fighting pre-plan strategy drawings with as-built plant conditions and fire response procedures. This was done to verify that fire fighting pre-plan strategies and drawings were consistent with the fire protection features and potential fire conditions described in the fire hazards analysis (FHA). The team also evaluated whether the fire response procedures and fire fighting pre-plan strategies for the selected FAs could be implemented as intended.

b. Findings

(1) Fire Brigade Equipment

Introduction: The team identified a URI, involving the handling of portable ventilation equipment needed for pre-fire-fighting smoke removal.

Description: Appendix A to Branch Technical Position APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976," dated August 23, 1976, Section B.5, states that the need for good organization, training, and equipping of fire brigades at nuclear power plant sites requires effective measures be implemented to assure proper discharge of these functions. Section B.1 states that guidance for the good organization, training, and equipping of fire brigades is contained in NFPA-27, "Private Fire Brigades." The licensee committed to NFPA 27-1975 in their FPP. It is generally accepted that the minimum fire brigade equipment consists of personnel protective equipment such as turnout coats, boots, gloves, hard hats, emergency communications equipment, portable lights, portable ventilation equipment, portable extinguishers and SCBAs. It is preferable that the fire brigade equipment be brought to the scene of a fire at the time of the initial response. However, as a minimum, if any of this equipment is not initially brought with the fire brigade, it should be in a location where it can be promptly obtained. Consistent with this principle, NFPA 27-1975, Section 72, "Equipment Storage," states that storage space for the brigade equipment should be provided so that it can be promptly obtained for use and be properly maintained.

The team found that the licensee had chosen to store the portable ventilation fans at four locations. Two of those locations were the station administration building and the protected area administration building. The fans at those locations did not have flexible air ducts stored with them, so they could not be used for all fire situations. Two of the locations were at the emergency response building: one on a fire engine and one on the "B.5.b" emergency response truck. Those fans did have flexible ductwork and ductwork adapters stored with them. There were no dedicated plant personnel to transport this equipment to the fire scene.

The licensee stated their practice was to have a non-fire brigade person drive the fire engine to a point close to the fire brigade staging area. The idea was to have the portable ventilation fans and other equipment on the fire engine promptly available for use by the fire brigade. Another option was to have a non-fire brigade person deliver one of the fans stored at the administration buildings to the fire brigade. The team questioned how this concept would work in an actual emergency that may take place at times when minimum staff was on site. All plant personnel may not know the locations of the fans. The emergency response building is outside the owner controlled area which

may preclude the equipment from being promptly obtained in some circumstances. Apparently, forethought had not been given to designating reliable power outlets for the fans at the various FAs?

Portable ventilation fans are needed at Surry because no special smoke exhausting systems are installed at the plant. Existing ventilation systems in the plant are not designed for smoke removal. This condition was recognized in the SER dated September 19, 1979, as evidenced by Section 4.4.1, Smoke Removal, which states that no special smoke exhausting systems are provided at the plant. It further states that when normal ventilation systems cannot be used (for smoke removal), the fire brigade will use the portable ventilation units with flexible ducting available at the plant for smoke removal. In order to allow time for answering these questions and evaluating the situation, a URI is established: 05000280, 281/2009007-02, "Availability of Portable Ventilation Fans for Use by the Fire Brigade"

(2) Backup Battery for the Halon 1301 System for the Emergency Switchgear Rooms

Introduction: The team identified a performance deficiency and Green NCV for failing to implement a maintenance program for the backup batteries for the Halon 1301 system for the emergency switchgear rooms to ensure on a continuing basis that 24-hour backup power was available as required by the FPP and Units 1 & 2 Operating License Condition 3.I, "Fire Protection."

Description: The Surry FPP credits a manually operated total flooding Halon 1301 System for fixed fire suppression in the Unit 1 and Unit 2 emergency switchgear rooms. Both primary (normal) and secondary (backup power) have been provided for the system. UFSAR Section 9.10.2.2.9, "Halon 1301 Systems," states, "In the event of loss of normal power, the control panel will provide battery backup to operate the panel under normal load for 24 hours and then be capable of operating the system for five minutes continuously during an alarm condition." The team found that the licensee did not have a maintenance program for this backup battery to help ensure that the 24-hour capacity was maintained. The licensee provided the work history for the Halon 1301 panel. From this history, the team determined that the backup battery had been replaced in 1991, 1995, 1999 and 2005. These replacements had been prompted by trouble alarms generated by the control panel circuitry. The team concluded from this data that the backup battery was degraded at times over the years of operation. The trouble alarm goes to alarm condition when the open circuit voltage of the battery is below 24 V or 1.75 volts per cell. In that condition, the battery no longer has the full 24-hour capacity.

The ramification of having no maintenance program for the backup batteries in the Halon 1301 panel is that there were periods of time when the backup batteries did not have the capacity to fulfill their required function to power the system for 24 hours following a postulated loss of normal power to the panel.

Analysis: The licensee's failure to implement a maintenance program to help ensure that the backup battery for the Halon 1301 system continues to meet its licensing basis requirement of providing backup power for 24 hours is a performance deficiency. The finding is more than minor because the backup battery became degraded on several occasions in the past, and the finding is associated with the reactor safety, mitigating systems, cornerstone attribute of protection against external factors and it affects the objective of ensuring reliability and capability of systems that respond to initiating events.

In terms of safe-shutdown of the plant, that situation is of very low safety significance. The capacity of the backup battery (or lack thereof) to have any effect on safe shutdown would take a combination of low probability events as follows. Loss of normal power would have to occur in the brief time period following fire detection and actuation of the Halon 1301 system. The backup battery would have to be so degraded that it could not deliver power for even a brief period of time (and there was no evidence that this was the case). The team evaluated the finding using the guidelines of IMC 0609, Appendix F, "Fire Protection Significance Determination Process." The finding was determined to be of very low safety significance (Green) because it represents a low degradation of the fixed fire suppression. The licensee entered this finding into its corrective action program to ensure that a maintenance program would be established. They also presented evidence that the installed battery is not near the end of its rated service life, thus allowing time to replace it.

The cause of the finding was evaluated against IMC 0305, "Operating Reactor Assessment Program." However, the cause of this finding was determined to not represent current licensee performance.

Enforcement: Surry's Unit 1 and 2 Operating License Condition 3.I requires that the licensee implement and maintain in effect all provisions of the approved FPP as described in the UFSAR, and as approved by various NRC Safety Evaluation Reports. Section 9.10.2.2.9, "Halon 1301 Systems," in the UFSAR states that the control panel for the Halon 1301 System will provide battery backup to operate the panel under normal load for 24 hours and then be capable of operating the system for five minutes continuously during an alarm condition. Section 9.10.1.2 of the UFSAR states that the FPP document and the associated administrative procedures describe the administrative and technical controls associated with fire protection. Administrative Procedure VPAP-2401, "Fire Protection Program," Section 6.1.16, "Fire Equipment Testing and Maintenance," establishes the requirements for performing inspection and maintenance on fire equipment to ensure that conditions adverse to fire protection are promptly identified and corrected.

Contrary to the above, the licensee failed to perform inspections and implement a maintenance program on the Halon 1301 System batteries, to help ensure that the 24-hour backup power capability was maintained. The violation existed since 1985 when the Halon 1301 system was installed. Because this finding was of very low safety significance (Green), and was entered into the licensee's corrective action program, as CRs 339317 and 341454, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy and is identified as NCV 05000280-281/2009007-03, Failure to Establish Maintenance for Backup Battery for the Halon 1301 System in ESGRs.

.04 Protection from Damage from Fire Protection Activities

a. Inspection Scope

With regard to the Unit 2 emergency switchgear and relay room and the Units 1 and 2 main control room, the team evaluated whether fire brigade activities such as use of fire hoses could adversely affect the credited SSD equipment. Similarly, the team evaluated whether actuation of the open head sprinkler system in the Unit 2 tunnel could affect credited SSD equipment, for example by flooding adjacent plant areas where the SSD equipment was located. The team also considered whether lack of containment of

smoke or carbon dioxide could create uninhabitable conditions for plant operators in areas where operator actions must take place as part of the SSD process.

b. Findings

No findings of significance were identified.

.05 Methodology and Operational Implementation of Alternate Shutdown

a. Inspection Scope

The team reviewed the circuit analysis in Chapter 3 of the safe shutdown analysis (SSA) to determine the special post-fire operator actions specified by the analysis as resolution to potential fire-induced cable damage. The team checked whether the SSD procedures (i.e., fire contingency action procedures) included steps to prevent or mitigate the consequences of spurious operations. The team also made a comparison of the SSA and the SSD procedures with regard to credited SSD equipment to check that the two were consistent with each other. Each of the selected FAs require alternative shutdown methods, however, the main control room (MCR) fire may require the control room to be abandoned requiring use of the auxiliary shutdown panel as well as the remote monitoring panel.

The team reviewed control and instrumentation circuits for selected components to determine whether transfer/isolation transfer switches and redundant fuses were provided as necessary to ensure that alternate shutdown systems would be isolated from any damage that may occur as a result of a control room fire. Reviews included a verification that alternative shutdown could be accomplished with or without offsite power. The team reviewed completed test records of the functional testing performed on the transfer circuits used to transfer electrical controls from the MCR to the alternative shutdown panel as well as the calibration records for process monitoring instruments on the remote monitoring panel. The team reviewed the test and calibration records to confirm that the components were being maintained in accordance with the surveillance test and preventive maintenance programs.

The team reviewed the fire contingency action (FCA) procedures which operators would follow to shutdown the plant following a severe fire, for example, procedure 2-FCA-4.00 "Limiting Emergency Switchgear Room Number 2 Fire." The makeup of operator crews required to carry out the procedure were evaluated. The team estimated the time to complete operator actions and compared these to time constraints given in the SSA for time critical operator actions such as termination of inadvertent auxiliary pressurizer spray, restoration of stable reactor coolant makeup, precluding spurious pressurizer power operated relief valve opening, etc. The team walked down the in-plant location of all operator actions specified in the FCA procedures with operations personnel to evaluate the expected ambient conditions, relative difficulty and operator familiarization associated with each operator action. The team evaluated the suitability of each procedure to deal with various fire scenarios and fire-induced spurious actuations that may occur. The system flow diagrams were studied as appropriate to understand the particular alignments being implemented by the FCAs.

Training records related to the FCAs for each shift crew were reviewed. These records covered the 12-hour shift organization which was effective June 8, 2008.

b. Findings

No findings of significance were identified.

.06 Circuit Analysis

a. Inspection scope

The team reviewed how systems would be used to achieve inventory control, core heat removal and reactor coolant system pressure control during and following a postulated fire in the fire areas selected for review. System flow diagrams and post-fire operating procedures were reviewed in conjunction with the SSA to identify those components credited for SSD. The team reviewed cable routing information for credited components to determine if a fire in the chosen areas would impact them. If there was a potential for components to be impacted by fire, the team performed additional analysis and reviewed credited resolutions. The components whose control cables were routed through the selected FAs were examined for potential spurious operation that could either affect system operation or which could affect high/low pressure system interface boundaries. For those components subject to spurious operation the team assessed the adequacy of the licensee's action to resolve the condition.

The team reviewed the fuse and breaker coordination study (for example, the 120 V uninterruptible power supply power supplies 2A-1 and 2A-2 and the vital bus distribution panels VB2-I and VB2-III) to verify that the power supplies required for SSD in the three FAs would not be lost due to fire damage. The team also reviewed a sample of maintenance work order records on fuse replacements to verify that the as-built plant was being maintained in accordance with the fuse breaker coordination study

b. Findings

No findings of significance were identified.

.07 Communications

a. Inspection Scope

The team reviewed plant communication systems to evaluate their availability to support plant personnel in fire event notification, fire brigade fire fighting activities and the performance of local operator manual actions to achieve and maintain SSD conditions. During this review, the team considered the effects of ambient noise levels, clarity of reception, and reliability. The team also reviewed the communications available at different locations. This review included inspector walkdowns of the central site equipment and the backup repeater system. Both fixed and portable communication systems, including antennas, amplifiers, repeaters and associated power sources were reviewed for the impact of fire damage in the selected FAs. A review was performed to verify the availability of the portable radios for use during the SSD procedures. The team also reviewed preventative maintenance and surveillance test records to verify that the communication equipment was being properly maintained.

b. Findings

No findings of significance were identified.

.08 Emergency Lighting

a. Inspection Scope

The team performed plant walkdowns of selected areas to observe the placement and coverage area of fixed eight-hour battery pack emergency lights throughout the fire areas to evaluate their adequacy for illuminating access and egress pathways and any equipment requiring local operation and/or instrumentation monitoring for post fire safe shutdown. The team also reviewed the battery power supplies to verify they were rated for at least an eight-hour capacity.

The emergency lighting system is scoped into the licensee's Maintenance Rule Program and the team reviewed maintenance and design aspects of the emergency lighting system. Preventive maintenance procedures, maintenance rule evaluations, system health reports and completed surveillance tests were reviewed to ensure adequate maintenance, surveillance testing and periodic battery replacements were in place to ensure reliable operation of the fixed emergency lights. The team reviewed vendor manuals to ensure that the emergency lights and batteries were being maintained consistent with the manufacturer's recommendations.

b. Findings

No findings of significance were identified.

.09 Cold Shutdown Repairs

a. Inspection Scope

The team reviewed the licensee's FPP and SSA to determine if any repairs were necessary to achieve cold shutdown. Dedicated Shutdown Procedures 0-ECM-1401-04, "Emergency Installation of Component Cooling Water Motors," and 0-ECM-1410-02, "Emergency Power to Residual Heat Removal Motors," describe methods for repairing equipment, following a fire, needed to bring the unit from hot standby to cold shutdown. The team inspected the fire damage repair kits and inventoried their contents in accordance with station procedure 0-EPM-2302-01, "RHR/CC Appendix R Equipment Inspection (Warehouse). The team verified that the dedicated repair procedures, equipment and materials required to accomplish repairs were available and accessible on site within the allotted time frames specified by Appendix R and license specific requirements.

b. Findings

No findings of significance were identified.

.10 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 post-fire safe shutdown functions or capabilities). The team reviewed selected fire protection impairment permits and compared them with the conditions and actions required in their fire protection program for degraded fire protection components. The compensatory measures that had been established in these impairments 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.

In addition, the team reviewed the licensee's short term compensatory measures (compensatory fire watches) to verify that they were adequate to compensate for a degraded function or feature until appropriate corrective action 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.

.11 Control of Combustibles and Ignition Sources

a. Inspection Scope

The team reviewed the administrative control of combustible materials and ignition sources. Plant administrative procedures were reviewed to determine if adequate controls were in place to control the handling of in-situ and transient combustibles in the plant. The team inspected numerous areas in the plant for control of combustible materials, storage of in-plant materials, transient combustibles and general housekeeping. The team reviewed controls on the potential ignition sources of welding and grinding. There were no hot work activities ongoing during the inspection so that observation of this activity could not be performed.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The team reviewed recent independent licensee audits for thoroughness, completeness and conformance to requirements. Requirements for the independent audits are contained in Generic Letter 82-21 "Technical Specifications for Fire Protection Audits" and the licensee's Quality Assurance Manual, DOM-QA-1, Section 18.5, as well as

Appendix A to Branch Technical Position APCS 9.5-1 "Guidelines for Fire Protection for Nuclear Power Plants," Section C.10, "Audits." The team reviewed Audit 08-03, "Fire Protection Implementation and Appendix R Program, and Audit 07-04, Fire Protection Quality Assurance Program". In addition, two self-assessment reports in the area of fire protection were reviewed, dated July 2, 2007, and December 16, 2008.

A number of CRs were reviewed with regard to the attributes of a good corrective action program such as timeliness, apparent cause determination, proposed corrective action addresses the apparent cause, reportable, operability determination, etc. The CRs reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified. Audits meeting the requirements of triennial audits were conducted on a two-year frequency, and the 24-month audits of quality assurance for fire protection were also conducted. The audits were complete and comprehensive, except that they did not address the area of safe shutdown as a major area to be audited. Some audits did contain specific checklist questions on aspects of safe shutdown, such as local operator actions and time critical actions. Since the requirement documents mentioned above did not specifically mention safe shutdown, the audits met the requirements. The licensee acknowledged that the general audit plan should be enhanced by inclusion of safe shutdown because it is a major part of defense in depth against fire events, and initiated CR 339438 to address this issue.

4OA6 Meetings, Including Exit

On June 26, 2009, the lead inspector presented the summary of inspection results to Mr. G. Bischof, Site Vice President, and members of the licensee's staff. The licensee acknowledged the findings. Subsequently, additional in-office reviews were conducted and the final inspection results were discussed by telephone with Mr. W. (Mat) Adams and other members of the licensee staff on August 5, 2009. Proprietary information is not included in this report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel:

R. Adams, Operations Training
W. Adams, Director Nuclear Engineering
G. Bischof, Site Vice President
J. Carson, Nuclear Engineering Specialist
R. Dillard, Appendix R Engineer
E. Downer, Manager Supply Chain Services
B. Garber, Supervisor Licensing
D. Green, System Engineer
T. Green, Operations Shift Unit Supervisor
F. Grover, Acting Plant Manager
A. Harrow, Supervisor Secondary Systems
L. Hilbert, Manager Nuclear Oversight
P. Kerschner, Licensing Engineer
R. Lynch, Safety and Loss Prevention
J. Martin, Corporate Fire Protection
C. Olsen, Manager Nuclear Site Engineering, Systems and Components
D. Padula, Design Engineer Electrical
J. Rayno, Fire Protection System Engineer
D. Shepherd, Operations Training Instructor
R. Simmons, Maintenance Manager
B. Sloan, Manager of Engineering Programs, Corporate Office
M. Smith, Manager of Engineering Programs, Surry Plant
B. Stanley, Director Station Safety and Licensing
H. Warren, Supervisor Engineering Programs (licensee inspection team lead)
W. Webster, Supervisor Station Nuclear Safety
D. Williams, Supervisor Nuclear Site Safety

NRC Personnel

J. Nadel, Resident Inspector Surry Power Station
R. Nease, Branch Chief Engineering Branch 2 Region II
C. Welch, Senior Resident Inspector Surry Power Station

LIST OF ITEMS OPENED AND CLOSED

Opened

05000280, 281/2009007-01	URI	Qualification of Fire Barrier Floor/Wall Penetration of Aluminum Conduit Through Sleeve (1R05.02)
05000280, 281/2009007-02	URI	Availability of Portable Ventilation Fans for Use by the Fire Brigade (1R05.03.b (1))

Opened and Closed

05000280, 281/2009007-03	NCV	Failure to Establish Maintenance for Backup Battery for the Halon 1301 System in ESGRs (1R05.03.b (2))
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LIST OF COMPONENTS REVIEWEDFire Dampers

2-VS-FDMP-10, Turbine Building to Emergency Switchgear Room Ventilation System – Unit 2
 2-VS-FDMP-15A, Emergency Switchgear Room Exhaust Duct at 27' Elevation
 1-VS-FDMP-22, Emergency Switchgear Room Supply Duct Inside Main Control Room in Southwest Corner at 27' Elevation
 1-VS-FDMP-121, Between Mechanical Equipment Room 3 (MER 3) and Unit 2 Emergency Switchgear Room
 1-VS-FDMP-122, Between Mechanical Equipment Room 3 (MER 3) and Unit 2 Emergency Switchgear Room

Fire Doors

1-BS-DR-18, Emergency Switchgear Room Dividing Wall
 2-BS-DR-20, Unit 2 Emergency Switchgear Room Stairwell
 2-BS-DR-21, Unit 2 Emergency Switchgear Room to Unit 1 Turbine Building
 2-BS-DR-24, Unit 2 Cable Vault to Auxiliary Building
 2-BS-DR-27, Unit 2 Emergency Switchgear Room to Cable Tunnel

Fire Barrier Penetration Seals

1-CRP-PEN-00173, Fire Barrier Between Main Control Room and Unit 1 Cable Spreading Room
 1-FP-FBAR-027CNRM06, Fire Barrier Between Main Control Room Air Conditioning #1 and Stairwell
 1-FP-FBAR-027CNRM10, Fire Barrier Between Main Control Room Air Conditioning #1 and Unit 2 Emergency Switchgear Room
 1-FP-FBAR-009ESGR05, Fire Barrier Between Unit 1 Emergency Switchgear Room and Unit 2 Emergency Switchgear Room
 2-FP-FBAR-013AB02, Fire Barrier Between Auxiliary Building and Unit 2 Cable Vault Pipe Chase

SSD Components Examined as Described in Sections 1R05.01 /1R05.05 / 1R05.06Valves

2-CH-HCV-2137, Excess Letdown Isolation Valve
 2-CH-LCV-2460A, Letdown Isolation Valve
 2-CH-MOV-2287C, Charging Pump Discharge To Alternate Charging Header
 2-CH-MOV-2286C, Charging Pump Discharge
 2-CH-MOV-2289A, Charging Pump Discharge Header

2-CH-MOV-2289B, Charging Pump Discharge Header
 2-MS-TV-201A, SG A Main Steam Isolation Valve (MSIV)
 2-MS-TV-201B, SG B MSIV
 2-MS-TV-201C, SG C MSIV
 2-SI-MOV-2842, Alternate Cold Leg Injection Isolation Valve
 2-SI-MOV-2869A, Hot Leg Injection Isolation Valve
 2-SI-MOV-2869B, Hot Leg Injection Isolation Valve
 2-SI-MOV-2867C, Safety Injection To RCS Cold Legs
 2-SI-MOV-2867D, Safety Injection To RCS Cold Legs
 2-RC-PCV-2455C, Pressurizer PORV
 2-RC-PCV-2456, Pressurizer PORV
 2-RC-MOV-2536, Pressurizer Block Valve
 2-RC-MOV-2535, Pressurizer Block Valve
 2-RC-SOV-200A-1 & 200A-2 Reactor Vessel Head Vents

Pump Motors

2-SW-P-10A, Charging Pump Service Water Pump
 2-SW-P-10B, Charging Pump Service Water Pump
 2-RH-P-1A, RHR Pump A
 2-RH-P-1B, RHR Pump B
 1-CC-P-1C, Component Cooling Water Pump
 1-CC-P-1D, Component Cooling water Pump

Process Instruments

2-RC-TE-2413-2, Wide Range Hot Leg Temperature
 2-RC-TE-2433-2, Wide Range Hot Leg Temperature
 2-FW-LI-2477A, SG A Wide Range Level
 2-FW-LI-2487A, SG B Wide Range Level
 2-FW-LI-2497A, SG C Wide Range Level
 2-RC-PI-2449, RCS Wide Range Pressure
 2-RC-LI-2459A, Pressurizer Level

LIST OF DOCUMENTS REVIEWED

Procedures

0-AP-48, Abnormal Procedure – Fire Protection – Operations Response, Rev. 23
 0-DPR-049, Time Critical Actions
 0-FCA-1, Fire Contingency Action Procedure - Limiting Main Control Room Fire, Rev. 42
 0-FCA-12.00, Emergency Diesel Generator Operation, Rev. 14
 0-FCA-13.00, Cross-Connecting Emergency Buses, Rev. 2
 0-FCA-14, Fire Contingency Action Procedure – Establishing Stable RCS Makeup Flowpaths,
 Rev. 8
 2-FCA-3, Fire Contingency Action Procedure – Limiting Cable Vault and Tunnel Fire, Rev. 24
 2-FCA-4, Fire Contingency Action Procedure – Limiting Emergency Switchgear Room No. 2
 Fire, Rev. 25
 0-VSP-M2, Emerg Swgr Rm Halon Sys/Fire/Trbl, Rev. 4
 0-VSP-E3, Annunciator Response Procedure, Fire Detected, Rev. 19
 0-VSP-C8, Annunciator Response Procedure, Fire Detected, Rev. 0
 0-VSP-F3, Annunciator Response Procedure, Fire Det Sys Trbl, Rev. 15

2-FS-FP-101, Loss Prevention Fire Strategy, Unit 2 Cable Vault Penetration Area, Elevation 15 Feet - 0 Inches, Rev. 1

2-FS-FP-102, Loss Prevention Fire Strategy, Unit 2 Cable Vault Tunnel, Elevation 9'-6", Rev. 1

2-FS-FP-107, Loss Prevention Fire Strategy, Unit 2 Emergency Switchgear Room, Elevation 9'-6", Rev. 1

2-FS-FP-108, Loss Prevention Fire Strategy, Unit 2 Relay Room, Elevation 9'-6", Rev. 1

2-FS-FP-109, Loss Prevention Fire Strategy, Battery Room 2A, Elevation 9'-6", Rev. 1

0-FS-FP-116, Loss Prevention Fire Strategy, Control Room Elevation 27 Feet-6 Inches, Rev. 3

0-EPM-0901-01, Smoke and Thermal Detector Test (Robertshaw), Rev. 10

0-EPM-0901-02, Smoke Detector Test (Pyrotronics), Rev. 6

0-EPT-0904-03, Six Month Smoke Detector Test (Robertshaw), Rev. 13

2-EPT-0902-01, Fire Protection Low Pressure CO₂ System Puff Test, Rev. 17

2-EPT-0902-02, Fire Protection Low Pressure CO₂ System Equipment Test, Rev. 16

0-OPT-FP-005, Motor Driven Fire Protection Water Pump 1-FP-P-1, Rev. 14

0-OPT-FP-009, Diesel Driven Fire Protection Water Pump 1-FP-P-2, Rev. 17

0-LPT-FP-001, Fire Doors/Fire Dampers/Fire Wrap/CO₂ Dampers, Rev. 11

0-LPT-FP-012, Fire Barriers (Including Penetration Seals), Rev. 2

0-LPT-FP-013, Fire Barriers (Including Penetration Seals), Rev. 1

0-LPT-FP-014, Fire Barriers (Including Penetration Seals), Rev. 1

0-LPT-FP-015, Fire Barriers (Including Penetration Seals), Rev. 1

0-LPT-FP-016, Fire Barriers (Including Penetration Seals), Rev. 1

2-LPT-FP-015, Cable Tunnel Sprinkler System Inspection, Rev. 4

2-LPT-FP-016, Flow Test of Cable Tunnel Sprinkler System, Rev. 5

2-LPT-FP-017, Flow Test of Emergency Switchgear Room Halon System, Rev. 7

2-LPT-FP-018, Emergency Switchgear Room Halon System Cylinder Pressure and Weight Test, Rev. 7

2-LPT-FP-024, Emergency Switchgear Room Halon System Valve Alignment, Rev. 3

2-LSP-FP-007, Inspection of Fire Retardant Coatings, Penetration Seals, Cable Trays, and Fire Stops, Rev. 3

0-PT-24.38, HVAC Fire Damper Operability, Rev. 9

0-MPM-1910-10, Mechanical Preventive Maintenance, Inspection (Functional Check) of Swinging Safety-Related Special Purpose Fire Doors, Rev. 7

2-OSP-CH-002, Testing of Charging Pump Cross-Connect Manual Isolation Valve, Rev. 003

0-OSP-FP-006, Monthly Fire Door Inspection, Rev. 15

2-OSP-ZZ-001, Auxiliary Shutdown Panel, Rev. 9

2-OSP-ZZ-002, Appendix R Isolation/Transfer Switch Functional Surveillance, Rev. 11

2-OSP-ZZ-006, Operation Check of the Aux Shutdown Panel And Transfer Relay Cabinets, Rev. 000

0-LSP-FP-004, Fire Drills, Rev. 4

0-LSP-FP-004-OPS-B, 91 Day Frequency, LP Fire Drills, Unit 1 Turbine Building Basement/01-CN-P-1C, June 8, 2009

0-OSP-FP-011, Technical Support Center Emergency Equipment Locker Inspection and Inventory, Rev. 17

0-ECM-0105-01, Appendix R ELT Inspection and Rework, Rev. 20

1-MOP-EP-204, Maintenance Operating Procedure, Rev. 16

0-ECM-1401-04, Emergency Installation of Component Cooling Water Motors, Rev. 3

0-ECM-1410-02, Emergency Power to Residual Heat Removal Motors, Rev. 4

0-FCA-17.00, Limiting Fire Cooldown (With 14 Attachments), Rev. 27

0-EPM-2302-01, RHR/CC Appendix R Equipment Inspection (Warehouse), Rev. 9

0-OSP-FP-005, Appendix R Radio System Test, Rev. 3

DrawingsAppendix R Flowpath

11548-DAR-088B, Chemical and Volume Control System, Sheet 1, Rev. 24
 11548-DAR-088B, Chemical and Volume Control System, Sheet 2, Rev. 21
 11548-DAR-088B, Chemical and Volume Control System, Sheet 3, Rev. 13
 11548-DAR-088C, Chemical and Volume Control System, Sheet 1, Rev. 13

Sections 1R05.02: Passive Fire Protection & 1R05.03: Active Fire Protection

11448-FA-24A, Sheet 1, Floor and Equipment Drains, Turbine RM, Surry Power Station–Unit 1, Rev. 19
 11448-FA-27A, Sheet 1, Plumbing & Fire Protection, Service Building, Surry Power Station – Unit 1, Rev. 19
 11548-FB-15A, Sheet 1, Floor & Equipment Drains, Turbine Area, Surry Power Station – Unit 2, Rev. 22
 11448-FB-25A, Sheet 1, Ventilation & Air Conditioning, Service Building, Surry Power Station – Unit 1, Rev. 9
 11448-FB-25B, Sheet 1, Ventilation & Air Conditioning, Service Building, Surry Power Station – Unit 1, Rev. 10
 11448-FB-25C, Sheet 1, Ventilation & Air Conditioning, Service Building, Surry Power Station – Unit 1, Rev. 20
 11448-FB-25D, Sheet 1, Ventilation & Air Conditioning, Service Building, Surry Power Station – Unit 1, Rev. 16
 11448-FB-25E, Sheet 1, Ventilation & Air Conditioning, Service Building, Surry Power Station – Unit 1, Rev. 22
 11448-FB-25F, Sheet 1, Ventilation - Service Building, Floor Elevations 42'-0" and 47'-0", Columns 2 ¼ to 6, Surry Power Station – Unit 1, Rev. 15
 11448-FB-47B, Sheet 1, Flow/Valve Operating Numbers Diagram, Fire Protection System, Surry Power Station Unit 1, Virginia Power, Rev. 27
 11448-FB-47B, Sheet 2, Flow/Valve Operating Numbers Diagram, Fire Protection System, Surry Power Station Unit 1, Virginia Power, Rev. 23
 11448-FB-47B, Sheet 3, Flow/Valve Operating Numbers Diagram, Fire Protection System, Surry Power Station Unit 1, Virginia Power, Rev. 25
 11448-FB-47B, Sheet 4, Flow/Valve Operating Numbers Diagram, Fire Protection System, Surry Power Station Unit 1, Virginia Power, Rev. 3
 11448-FB-47B, Sheet 5, Flow/Valve Operating Numbers Diagram, Fire Protection System, Surry Power Station Unit 1, Virginia Power, Rev. 2
 11448-FB-47C, Sheet 1, Flow/Valve Operating Numbers Diagram, Fire Protection System, Surry Power Station Unit 1, Virginia Power, Rev. 18
 11448-FB-47C, Sheet 2, Flow/Valve Operating Numbers Diagram, Fire Protection System, Surry Power Station Unit 1, Virginia Power, Rev. 1
 11448-FB-47C, Sheet 3, Flow/Valve Operating Numbers Diagram, Fire Protection System, Surry Power Station Unit 1, Virginia Power, Rev. 0
 11448-FB-47E, Sheet 1, Flow/Valve Operating Numbers Diagram, Low Pressure Carbon Dioxide System, Surry Power Station Unit 1 & 2, Virginia Power, Rev. 7
 11448-FB-47E, Sheet 2, Flow/Valve Operating Numbers Diagram, Low Pressure Carbon Dioxide System, Surry Power Station Unit 1 & 2, Virginia Power, Rev. 1
 11448-FB-47E, Sheet 3, Flow/Valve Operating Numbers Diagram, Low Pressure Carbon Dioxide System, Surry Power Station Unit 1 & 2, Virginia Power, Rev. 2

11448-FB-47E, Sheet 4, Flow/Valve Operating Numbers Diagram, Low Pressure Carbon Dioxide System, Surry Power Station Unit 1 & 2, Virginia Power, Rev. 2

11448-FB-47E, Sheet 5, Flow/Valve Operating Numbers Diagram, Low Pressure Carbon Dioxide System, Surry Power Station Unit 1 & 2, Virginia Power, Rev. 2

11548-FB-047F, Sheet 1, Flow/Valve Operating Numbers Diagram, RCP Oil Collection System, Surry Power Station Unit 2, Virginia Power, Rev. 2

11448-FE-42V, Sheet 1, Conduit & Sections, Cable Spreading Room, El. 45'-3", Surry Power Station – Unit 1, Rev. 12

11448-FE-64HS, Sheet 1, Conduit Plan, Fire Detection System – Service Bldg, El. 42'-0", 45'-3" and 47'-0", Surry Power Station – Unit 1, Rev. 3

11448-FAR-200, Sheet 1, Site Fire Boundaries - Appendix 'R' Plot Plan, Surry Power Station – Unit 1 & 2, Virginia Power, Rev. 14

11448-FAR-205, Sheet 1, Equipment Location - Appendix 'R', Auxiliary Building, Plan - El. 2'-0", Surry Power Station – Unit 1 & 2, Rev. 15

11448-FAR-205, Sheet 2, Equipment Location - Appendix 'R', Auxiliary Building, Plan-El. 13'-0", Surry Power Station – Unit 1 & 2, Rev. 16

11448-FAR-205, Sheet 5, Equipment Location - Appendix 'R', Auxiliary Building, Sections, Surry Power Station – Unit 1 & 2, Rev. 2

11448-FAR-206, Sheet 1, Equipment Location - Appendix 'R', Service Building, Plan - El. 58'-0", Surry Power Station – Unit 1, Rev. 14

11448-FAR-206, Sheet 2, Equipment Location - Appendix 'R', Service Building, Plan - El. 42'-0", 45'-3", 47'-0", Surry Power Station – Unit 1, Rev. 14

11448-FAR-206, Sheet 3, Equipment Location - Appendix 'R', Service Building, Part Plan - El. 27'-0", Surry Power Station – Unit 1, Virginia Power, Rev. 15

11448-FAR-206, Sheet 4, Equipment Location - Appendix 'R', Service Building, Part Plan - El. 27'-0", Surry Power Station – Unit 1, Rev. 19

11448-FAR-206, Sheet 8, Equipment Location - Appendix 'R', Service Building, Plan - El. 9'-6", Surry Power Station – Unit 2, Rev. 20

11448-FAR-305, Sheet 2, Fire Barrier Penetrations, Auxiliary Building, Plan - El. 13'-0", Surry Power Station – Units 1 & 2, Rev. 0

11448-FAR-305, Sheet 6, Fire Barrier Penetrations, Auxiliary Building, Sections, Surry Power Station – Unit 1, Rev. 0

11448-FAR-306, Sheet 6, Fire Barrier Penetrations, Auxiliary Building, Plan - El. 27'-0", Surry Power Station – Unit 1, Rev. 0

11448-FE-64A, Sheet 1, Conduit Plan, Fire Detection System, Service Building – Control Room, Surry Power Station – Unit 1, Rev. 8

11448-FE-64HB, Sheet 1, Conduit Plan, Fire Detection System, Service Building – El. 9'-6", Surry Power Station – Unit 1, Rev. 8

11448-FE-64HK, Conduit Plan, Fire Detection Sys., MN ST, QU SPR & CA Vault Area–Unit 2, Rev. 6

DC-79-78-E100, Sprinkler Fire Protection System Cable Vaults & Tunnels, Rev. 1

DC-79-78-E1, Sprinkler Fire Protection System Cable Vaults & Tunnels, Rev. 0

1284640-BKS-12-5, Sprinkler Fire Protection System Cable Vaults & Tunnels, Rev. 5

11448-FE-1A1, 4160 Volt System Unit 1 & 2 Surry Power Station, Rev. 23

11548-ESK-6EB1, Elementary Diagram Solenoid Operated Pneumatic Valve, Rev. 5

11548-ESK-6EB2, Elementary Diagram Solenoid Operated Pneumatic Valve, Rev. 5

11548-ESK-6BL2, Elementary Diagram 480V Circuit MOVs 02-RC-MOV-2535 & 2536, Rev. 5

11548-FE-1AA1, One Line Diagram Appendix R Evaluation Surry Power Station Unit 2, Rev. 25

11548-FE-19AG, Elementary Diagram EDG No.2 Engine Auxiliaries, Rev. 17

11548-FE-19AA, Elementary Diagram EDG No.2 Legend, Rev. 20

11548-FE-3EG, Sheet 2, Wiring Diagram DGRH Diesel Isolation Panel 2DIP-DRGH, Rev. 2

11548-FE-3EF, DGRH Diesel Isolation Panel 2DIP-DGRH and TB-DGR2, Rev. 6

11548-FE-90EA, Appendix R Block Diagram Emergency Electrical Distribution System, Rev. 6
 11548-FE-90GA, Sh.1, Appendix R Block Diagram HI/LO Boundary Valves, Rev. 1
 11548-FE-90GB, Sh.2, Appendix R Block Diagram HI/LO Boundary Valves, Rev. 3
 11548-FE-90GC, Sh.3, Appendix R Block Diagram HI/LO Boundary Valves, Rev. 1
 11548-FE-90GD, Sh.4, Appendix R Block Diagram HI/LO Boundary Valves, Rev. 1
 11548-FE-90GE, Sh.5, Appendix R Block Diagram HI/LO Boundary Valves, Rev. 1
 11548-FE-90DA, Sh.1, Appendix R Block Diagram Instrumentation, Rev. 3
 11548-FE-1G, 125V DC One Line Diagram Unit 2, Rev. 32
 11548-FE-1L, 480V One Line Diagram Unit 2, Rev. 57
 11548-FE-1M, 480V One Line Diagram Unit 2, Rev. 61

Other

11548-SE-120B, Miscellaneous, Sh. 2, dated 6/10/1986
 11548-FE-83Z, Cable Tray Schematic Cable Tray Room, Revision 3
 11548-FE-83U, Cable Tray Schematic Emergency Switchgear Room, Relay Room and Mechanical Equipment Room No. 3, Revision 1
 11448-FE-90CA, Appendix R Block Diagram Emergency Radio Communications, Revision 9
 11548-FE-13A, Lighting Distribution Wiring Diagram, Revision 15
 11448-FE-64HB, Fire Detection System Service Building – EL 9'-6" Conduit Plan, Revision 17
 11448-FE-51T, Emergency Switchgear Room Halon System Wiring Diagram, Revision 8

Condition Reports and Plant Issues Reviewed

327220, Discrepancy in time critical operator action validation time was discovered
 336350, Containment fan has ground on C phase (with Operational Decision Making ODM000102)
 006354, Industrial Safety Related Lighting Transformer Caught Fire
 022901, Oil Leak on 1-RC-P-1B Reactor Coolant Pump
 022766, Flammable Storage Locker Found Open with Flammable Materials Inside
 054414, Emergency Switchgear Room Halon Panel 1-FPH-CP1 Indicated Battery Trouble Which Would Not Clear After Surveillance Testing
 090399, Recurring Shortfalls Have Challenged the Station's Fire Protection Capabilities
 090704, Two Appendix R Fire Penetrations Were Discovered Without Foam (Seals)
 091256, Monthly Fire Door Inspection (0-OSP-FP-006) Completed Unsatisfactory
 096698, Unit 1 & 2 ESGR Battery Room Fire Barriers Are Not in Compliance With Appendix R
 097208, UFSAR Section 9.10.2.2.4 Does Not Agree With the Approved FP-SER Dated 9/19/79
 097578, Unit 2 Cable Trays Not Vacant and Fire Stops Required
 097768, Fire Team Responds to Report of Smoke from Temporary Ventilation Equipment
 099011, No Oil Collection Dam on New RCP Motor (2-RC-P-1A)
 324140, Void Found in Foam (Seal) During Final Inspection of Fire Barrier Penetration
 331717, Unsealed Holes in 1-RC-P-1B Reactor Coolant Pump Oil Collection System (North Anna OE)
 338618, Oil Collected at RCP Motor Stator Cooler – OE From North Anna
 341454, Configuration management problems associated with the backup battery for the Halon system
 PI S-2003-0643-R3, Resolution of NCV 05000280,281/2003008-004, Alternate Shutdown Panel Ventilation System Not Independent From Impacts Of A Main Control Room Fire
 ACE017476, Apparent Cause as a Result of MRE 010281 Maintenance Preventable Functional Failure; Unsatisfactory ELT in Fire Area 28
 MRE0100281, Maintenance Rule Evaluation to Engineering (Fire Area 28)

Condition Reports Generated during the Inspection

337900, Pressure and weight test performed on Halon system has incorrect pressures recorded on completed PT

339250, Discrepancy found with Appendix R cold shutdown repair material in warehouse

339303, Lack of UL label on fire door 2-BS-DR-20

339307, Backup battery for Halon system may not have correct capacity rating

339309, Spare SCBA bottles and portable smoke fans not brought to scene of fire by fire brigade

339313, Typo type errors in Procedure 2-OSP-ZZ-002 (testing of transfer/isolation switches)

339317, PM activities not established for Halon panel backup battery

339438, NRC triennial fire inspection – audit scope enhancement

339460, NRC inspection questions concerning flooding of emergency switchgear room due to actuation of open head system in the cable tunnel or use of fire hose in SWGR room

339567, Inadequate qualification documentation for fire rating of electrical penetration

340919, ESGR Halon battery compartment is not ventilated

343486, Fire drills and portable ventilation equipment

Training Documents

LO JPM #06.05-DRR, Close the Manually-Operated Smoke Dampers for the MCR, issued 4/23/09

LO JPM #41.03-DRR, Locally Establish Charging Pump Crosstie, issued 5/13/09

NL-08.3-AG-1-DRR, Appendix R Breaker Tasks, issued 5/22/08

RQ-08.3-ST-2-DRR, FCA-1.00 (MCR Fire) with Control Room Evacuation, issued 4/8/08

F & H Training, Basic Fire Training Instructor Guide (FIRE0011), Rev. 5, 1/31/08

F & H Training, Fire Behavior Instructor Guide (FIRE0108), Rev. 1, 2/2/07

F & H Training, Fire Control Instructor Guide (FIRE0109), Rev. 3, 3/4/08

F & H Training, Fire Fighter Safety and PPE Instructor Guide (SAFE0101), Rev. 1, 2/2/07

F & H Training, Incident Command System Instructor Guide (SAFE0140), Rev. 6, 11/30/04

F & H Training, Search and Rescue Instructor Guide Lesson Plan (SAFE0039), Rev. 1, 12/31/06

F & H Training, Self-Contained Breathing Apparatus Instructor Guide (SAFE0102), Rev. 2, 9/24/07

F & H Training, Tools, Hose, and Appliances Instructor Guide (SAFE0140), Rev. 1, 2/2/07

Licensing Basis Documents and Other Docketed Correspondence

Updated Final Safety Analysis Report (UFSAR), Rev 40, Chapter 9: Auxiliary and Emergency Systems

Safety Evaluation Report by the Office of Nuclear Reactor Regulation US NRC in the matter of VEPCO Fire Protection Program for Surry Power Station, Units 1 & 2, Compliance With Appendix A to BTP APSCB 9.5-1, dated September 19, 1979

Station Administrative Procedure No. VPAP-2401, Fire Protection Program, Rev. 29

Surry Power Station Appendix R Report, Rev. 28

Letter, Virginia Electric and Power Company to USNRC, Review of Existing Fire Protection Provisions at the Surry Station Unit Nos. 1 and 2 Against Standard Review Plan 9.5.1, dated May 28, 1976

Letter, Virginia Electric and Power Company to USNRC, Submittal of Proposed Fire Protection Technical Specification, dated December 31, 1976

Letter, Virginia Electric and Power Company to USNRC, Interim Submittal of Fire Protection Program Review, APCS 9.5-1, Surry Power Station Units 1 and 2, dated April 5, 1977

Letter, Virginia Electric and Power Company to USNRC, Submittal of Additional Copies of Fire Protection Systems Review, dated July 14, 1977

Letter, Virginia Electric and Power Company to USNRC, Request for Amendment to Operating License Fire Protection Technical Specification, dated August 1, 1977

Letter, USNRC to Virginia Electric and Power Company, Amendment to facility Operating License Incorporating Fire protection Technical Specifications, dated November 30, 1977

Letter, USNRC to Virginia Electric and Power Company, Request for Review of Fire Protection Program for Conformance with "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls, and Quality Assurance", dated February 3, 1978

Letter, Virginia Electric and Power Company to USNRC, Response to USNRC Letter of February 3, 1978, dated March 6, 1978

Letter, USNRC to Virginia Electric and Power Company, Request for Additional Information for Review of the Surry Fire Protection Program, dated April 6, 1978

Letter, Virginia Electric and Power Company to USNRC, Partial Supplemental Information in Response to USNRC Letter of April 6, 1978, dated April 17, 1978

Letter, Virginia Electric and Power Company to USNRC, Balance of Supplemental Information in Response to USNRC Letter of April 6, 1978, dated April 24, 1978

Letter, Virginia Electric and Power Company to USNRC, Additional Supplemental Information in Response to USNRC Letter of April 6, 1978, dated May 25, 1978

Letter, USNRC to Virginia Electric and Power Company, Staff Position on Proposed Fire Protection Modifications at Surry Power Station Units 1 and 2, dated June 14, 1978

Letter, Virginia Electric and Power Company to USNRC, Response to USNRC Letter of June 14, 1978, dated July 21, 1978

Letter, Virginia Electric and Power Company to USNRC, Supplemental Response to USNRC Letter of June 14, 1978, dated August 11, 1978

Letter, Virginia Electric and Power Company to USNRC, Response to Draft Fire Protection Safety Evaluation Report and Agreement to Implement Previously Proposed Fire Protection Modifications, dated August 17, 1979

Letter, Virginia Electric and Power Company to USNRC, Response to Draft Fire Protection Safety Evaluation Report with Schedule for Completion of Previously Proposed Fire Protection Modifications, dated September 7, 1979

Fire Protection Safety Evaluation Report by the Office of Nuclear Reactor Regulation, Surry Power Station, Units 1 & 2, dated September 19, 1979

Letter, Additional Fire Protection Information Review (Enclosure 1) and Fire Protection Review Status (Enclosure 2), Surry Power Station, Units 1 and 2, dated May 29, 1980.

Letter, Summary of Staff Requirements (Enclosure 1), Additional Fire Protection Information Review (Enclosure 2) and Fire Protection Review Status (Enclosure 3), Surry Power Station, Units 1 and 2, October 9, 1980.

Supplement 1 to Fire Protection Safety Evaluation Report dated on September 19, 1979 (Enclosure 1) and Fire Protection Status Review (Enclosure 2), Surry Power Station, Units 1 and 2, dated December 18, 1980.

Supplement 2 to Fire Protection Safety Evaluation Report dated on September 19, 1979 (Enclosure 1), and Unresolved Fire Protection Issues (Enclosure 2), Surry Power Station, Units 1 and 2, dated February 13, 1981

Safety Evaluation Report by the Office of Nuclear Reactor Regulation, Appendix R to 10 CFR Part 50, Sections III.G.3 and III.L, VEPCO Fire Protection Program for Surry Power Station, Units 1 & 2, dated December 4, 1981

Supplemental Safety Evaluation Report (SSER) by the Office of Nuclear Reactor Regulation, For Appendix R to 10 CFR Part 50, Sections III.G.3 and III.L, dated November 18, 1982

Safety Evaluation related to Amendment No. 93 to Facility Operating License No. DPR-32 and Amendment No. 92 to Facility Operating License No. DPR-37, Surry Power Station, Units 1 and 2, dated January 17, 1984.

Safety Evaluation Report by the Office of Nuclear Reactor Regulation Relative to Appendix R Exemptions Requested for VEPCO Fire Protection Program for Surry Power Station, Units 1 & 2, dated February 25, 1988

Safety Evaluation Report by the Office of Nuclear Reactor Regulation, Post-Fire Safe Shutdown, dated July 23, 1992.

Fire Protection Safety Evaluation Related to Issuance of Amendments RE: Relocation of Fire Protection Requirements from Technical Specification to the Updated Final Safety Evaluation Report (UFSAR), Surry Power Station, Units 1 and 2, dated December 16, 1998.

Appendix A to Branch Technical Position APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976," dated August 23, 1976

NFPA 12 – 1973, Standard on Carbon Dioxide Extinguishing Systems

NFPA 12A – 1973, Standard on Halogenated Fire Extinguishing Agent Systems – Halon 1301

NFPA 13 – 1971, Standard for the Installation of Sprinkler Systems

NFPA 14 – 1974, Standard for the Installation of Standpipe and Hose Systems for Fire Protection

NFPA 15 – 1973, Standard for Water Spray Fixed Systems

NFPA 72D – 1967, Standard for the Installation, Maintenance and Use of Proprietary Protective Signaling Systems for Watchman, Fire Alarm and Supervisory Service

Calculations, Analysis and Design Guides

Technical Report No. EP-0012 – Rev. 11, Combustible Loading Analysis, Surry Power Station, Units 1 and 2

Technical Report No. EP-0013, Rev. 0, Fire Protection Information Relating to Appendix A to BTP 9.5-1, 1979 FP-SER and National Fire Protection Association Codes, dated June 30, 1999

Electrical Engineering Nuclear Standard STD-EEN-0305, Rev. 3

General Nuclear Standard, Appendix R Design Guidelines, STD-GN-0021, Rev. 17

System Design Basis Document for Fire Protection System Surry Power Station, SDBD-SPS-FP, Rev. 8, 4/07/09

ET CEE 00-0016, Rev. 0, Evaluates the miscoordination between the 4160V load center feeder breakers and the 480V main load center breakers

ET CEP-99-0001, Rev. 1, Appendix "R" Engineering Evaluation 1 – Evaluation of Minor Modifications to Fire Doors, dated April 26, 2005

ET CEP-99-0009, Rev. 0, Appendix "R" Engineering Evaluation 9 - Evaluation of Fire Detector Locations, dated May 12, 1999 with Professional Loss Control, Fire Detection Study of Surry Power Station prepared February 12, 1985 attached

ET CEP-99-0011, Rev. 0, Appendix "R" Engineering Evaluation 11 - Evaluation of Emergency Switchgear Room Halon System Test Results, dated May 12, 1999

ET CEP-99-0017, Rev. 0, Appendix "R" Engineering Evaluation 17 - Evaluation of Fire Barrier Rating Service Building Stairwell, dated May 12, 1999

ET CEP-99-0019, Rev. 1, Appendix "R" Engineering Evaluation 19 - Evaluation of Fire Barrier Rating Battery Rooms, dated May 21, 1999

ET CEP-99-0026, Rev. 0, Appendix "R" Engineering Evaluation 26 - Evaluation of Non-Labeled Fire Door Frames in Concrete Walls, dated May 12, 1999

ET CEP-99-0030, Rev. 0, Technical Basis For Manual Halon System Meeting NFPA-12A Actuation Requirements, dated March 25, 1999

ET CEP-99-0031, Rev. 0, Penetration Seal Configuration Evaluations, dated April 29, 1999

ET CEP-99-0033, Rev. 0, Technical Changes to Exemptions 14, 17, 22 and 23, dated July 7, 1999

Calculation NE-0155, Rev. 0, Fire Hose Station Calculation for Main Control Room (MCR), (Unit 1 & 2) Emergency Switchgear Rooms and the (Unit 1 & 2) Normal Switchgear Rooms, dated 2/17/05

Calculation ME-0839, Rev. 0, Surry Unit 2 Cable Tunnel Hose Rack, dated 6/22/09

Calculation ME-0904, Rev. 0, Hydraulic Calculation for Unit 2 Service Building Cable Vault and Tunnel Sprinkler System, dated 6/24/09

Design Change No. SU-08-0030, RCP Bearing Lift Pump Oil Collection Enclosure – Vent Baffle Box Modification/Surry/1 & 2

Design Change No. 00-031, RCP Motor Oil Leakage Collection System/Surry/Units 1 & 2

Design Change No. DC-88-131, RCP Oil Collection Enclosure Modification/Surry/1

Design Change No. DC-79-S78, Water Suppression System (Cable Tunnel & Cable Vault)/Surry/1 & 2

Design Change No. DC-84-01, Emergency Switchgear Room Halon System, Surry Power Station Units 1 & 2

Design Change No. 06-035, Low Pressure CO₂ Fire Protection System Modifications/Surry/Units 1 & 2

Design Change No. 06-055, Fire Detection System Replacement/Surry/Units 1 and 2

Design Change No. 07-046, Replacement of 1-FP-P-2 Diesel Driven Fire Pump/Units 1 & 2

Impell Corporation Calculation Number 1250-111-C01, Penetration Seal Configuration Documentation Pkg., 10" DC Q3-6548 Silicone Foam/NA & Surry, Rev. 1

Impell Corporation Calculation Number 1250-111-C03, Penetration Seal Configuration Documentation Pkg., 10" DC Q3-6548 Silicone Foam Blockout/NA & Surry, Rev. 0

RAS000097, Calculation of Battery Capacity Versus Load Profile for the Halon 1301 panel for ESGR, dated July 2009

Miscellaneous

Surry Power Station Fire Team Roster, Rev. Date June 8, 2009

Surry Power Station, Units 1 and 2, Technical Requirements Manual (TRM)

TRM, TR 3.7.1 Fire Suppression Water System, Rev. 19

TRM, TR 3.7.2 Spray and Sprinkler System, Rev. 19

TRM, TR 3.7.5, Halon System, Rev. 19

TRM Table 3.3.2-1, Appendix R Instrumentation

TRM Section 3.7.9, Appendix R Alternate Shutdown Equipment

TRM 3.7.9-1, Appendix R Alternate Shutdown Equipment

TRM Table Section 3.7.11, Appendix R Emergency Lighting

TRM Section 3.7.12, Emergency Communication Radios

TRM Section 3.7.13, Appendix R Emergency Communication Equipment

TRM Table 3.7.13-1, Appendix R Emergency Communication Systems

TRM, TR 3.7.3, Low Pressure CO₂ System, Rev. 19

TRM, TR 3.7.6 Fire Hose Stations, Rev. 19

TRM, TR 3.7.8, Fire Barriers, Rev. 23

TRM, TR 3.7.10 Reactor Coolant Pump Oil Collection System, Rev. 19

TRM, TR 3.7.12 Emergency Communication Radios, Rev. 19

TRM, TR 3.7.14 Passive Fire Protection Items, Rev. 19

2007 Fourth Quarter System Health Report (Emergency Lighting)

2008 Fourth Quarter System Health Report (Emergency Lighting)

Eagle Picher, Carefree CFR-6V58 Vendor Specifications

Eagle Picher, Carefree CFR-6V58FR-59 Vendor Specifications

Chase Doors Specifications Models 1000, 1001, 2000, 2001, Saino Economical Fire Door System

Rixson-Siemens CP-35 System 3™ Control Panel, Engineer and Architect Specifications,
 Catalog Number 3060
 Operating and Installation Instructions for Pyrotronics Control Panel by Siemens Co. Publication
 No. 315-085060-7 (Halon 1301 System)
 Test Report #TR-189, Transco Products Inc. Test Report Fire and Hose Stream Test of 6 in., 8
 in. and 10 in. thick specimens of TCO-050 Silicone Foam in an electrical blockout penetrated
 by steel, aluminum, and PVC jacketed flexible conduits and threaded rod, dated 8/29/85

Work Orders (WO)

0-VSP-M2, Emerg Swgr Rm Halon Sys/Fire/Trbl, Rev. 4
 0-VSP-E3, Annunciator Response Procedure, Fire Detected, Rev. 19
 0-VSP-C8, Annunciator Response Procedure, Fire Detected, Rev. 0
 0-VSP-F3, Annunciator Response Procedure, Fire Det Sys Trbl, Rev. 15
 2-FS-FP-101, Loss Prevention Fire Strategy, Unit 2 Cable Vault Penetration Area, Elevation 15
 Feet - 0 Inches, Rev. 1
 2-FS-FP-102, Loss Prevention Fire Strategy, Unit 2 Cable Vault Tunnel, Elevation 9'-6", Rev. 1
 2-FS-FP-107, Loss Prevention Fire Strategy, Unit 2 Emergency Switchgear Room, Elevation 9'-
 6", Rev. 1
 2-FS-FP-108, Loss Prevention Fire Strategy, Unit 2 Relay Room, Elevation 9'-6", Rev. 1
 2-FS-FP-109, Loss Prevention Fire Strategy, Battery Room 2A, Elevation 9'-6", Rev. 1
 0-FS-FP-116, Loss Prevention Fire Strategy, Control Room Elevation 27 Feet-6 Inches, Rev. 3
 0-EPM-0901-01, Smoke and Thermal Detector Test (Robertshaw), Rev. 10
 0-EPM-0901-02, Smoke Detector Test (Pyrotronics), Rev. 6
 0-EPT-0904-03, Six Month Smoke Detector Test (Robertshaw), Rev. 13
 2-EPT-0902-01, Fire Protection Low Pressure CO₂ System Puff Test, Rev. 17
 2-EPT-0902-02, Fire Protection Low Pressure CO₂ System Equipment Test, Rev. 16
 0-OPT-FP-005, Motor Driven Fire Protection Water Pump 1-FP-P-1, Rev. 14
 0-OPT-FP-009, Diesel Driven Fire Protection Water Pump 1-FP-P-2, Rev. 17
 0-LPT-FP-001, Fire Doors/Fire Dampers/Fire Wrap/CO₂ Dampers, Rev. 11
 0-LPT-FP-012, Fire Barriers (Including Penetration Seals), Rev. 2
 0-LPT-FP-013, Fire Barriers (Including Penetration Seals), Rev. 1
 0-LPT-FP-014, Fire Barriers (Including Penetration Seals), Rev. 1
 0-LPT-FP-015, Fire Barriers (Including Penetration Seals), Rev. 1
 0-LPT-FP-016, Fire Barriers (Including Penetration Seals), Rev. 1
 2-LPT-FP-015, Cable Tunnel Sprinkler System Inspection, Rev. 4
 2-LPT-FP-016, Flow Test of Cable Tunnel Sprinkler System, Rev. 5
 2-LPT-FP-017, Flow Test of Emergency Switchgear Room Halon System, Rev. 7
 2-LPT-FP-018, Emergency Switchgear Room Halon System Cylinder Pressure and Weight
 Test, Rev. 7
 2-LPT-FP-024, Emergency Switchgear Room Halon System Valve Alignment, Rev. 3
 2-LSP-FP-007, Inspection of Fire Retardant Coatings, Penetration Seals, Cable Trays, and Fire
 Stops, Rev. 3
 0-PT-24.38, HVAC Fire Damper Operability, Rev. 9
 0-MPM-1910-10, Mechanical Preventive Maintenance, Inspection (Functional Check) of
 Swinging Safety-Related Special Purpose Fire Doors, Rev. 7
 0-OSP-FP-006, Monthly Fire Door Inspection, Rev. 15
 0-LSP-FP-004, Fire Drills, Rev. 4
 0-LSP-FP-004-OPS-B, 91 Day Frequency, LP Fire Drills, Unit 1 Turbine Building Basement/01-
 CN-P-1C, June 8, 2009

S-PMTE—2006-0155, Quarterly Appendix R ELT Inspection, dated 07/13/2006
 Work Order 38102302807, PM: Tool Storage Inventory and Inspection, dated 5/20/2009
 Work Order 38078574601, 547 Day Frequency PT: Appendix R Radio System Test, dated 03/26/2009
 S-PMTE—2006-0155, Quarterly Appendix R ELT Inspection, dated 07/13/2006
 WO 00770751 01, Perform Reference Calibration SG C WR Level Loop (Remote Mon Panel)
 WO 00770954 01, Perform Reference PM/CAL RCS WR Pressure to Remote Mon Panel
 WO 00770944 01, Perform Reference PM/CAL PZR Level to Remote Mon Panel
 WO 00770739 01, Perform Reference CAL SG A WR Level Loop (Remote Mon Panel)
 WO 00770745 01, Perform Reference CAL SG B WR Level Loop (Remote Mon Panel)
 WO 00743269 01, Replace Panel Fuse (FU-801) UPS Panel 2A-2
 WO 38102302807, PM: Tool Storage Inventory and Inspection, dated 5/20/2009
 WO 38102151062, Perform PM/CAL WR Hot Leg Temp Loop for Remote Mon Panel
 WO 38078574601, 547 Day Frequency PT: Appendix R Radio System Test, dated 03/26/2009
 WO 38075238801, Appendix R Isolation/Transfer Switch Functional Test, Completed 10/28/06
 WO 38079694401, Appendix R Isolation/Transfer Switch Functional Test, Completed 5/16/2008
 WO 38075238701, Aux Shutdown Panel Functional Surveillance, Completed 11/11/06
 WO 38079694301, Aux Shutdown Panel Functional Surveillance, Completed 5/17/08

LIST OF ACRONYMS AND ABBREVIATIONS

APCSB	Auxiliary and Power Conversion Systems Branch
CO ₂	carbon dioxide gas
CFR	Code of Federal Regulations
CR	Condition Report
DPR	demonstration power reactor
ESGR	emergency switchgear room
FA	fire area – a volume within the plant enveloped by 3-hour fire barriers
FCA	fire contingency action
FHA	fire hazards analysis
FPP	fire protection program
FPR	fire protection report
Halon 1301	Bromotrifluoromethane gas effective for extinguishing fires
IDHL	immediately dangerous to life or health
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	inspection report
MCR	main control room
NCV	non-cited violation
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
NUREG	An explanatory document published by the NRC
OSHA	Occupational and Safety Health Administration
SCBA	self-contained breathing apparatus
SDP	significance determination process
SER	Safety Evaluation Report
SSA	safe shutdown analysis
SSD	safe shutdown
UFSAR	Updated Final Safety Evaluation Report
URI	unresolved item
V	Volts