



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION II
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May 31, 2006

Southern Nuclear Operating Company, Inc.
ATTN: Mr. H. L. Sumner, Jr.
Vice President - Hatch Plant
P. O. Box 1295
Birmingham, AL 35201-1295

SUBJECT: EDWIN I. HATCH NUCLEAR POWER PLANT - NRC TRIENNIAL FIRE
PROTECTION INSPECTION REPORT 05000321/2006006 AND
05000366/2006006

Dear Mr. Sumner:

On April 21, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed a triennial fire protection team inspection at the Hatch Nuclear Plant Units 1 and 2. The enclosed report documents the inspection findings which were discussed at an exit meeting on that date, with Mr. Steven M. Douglas and other members of your staff.

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.

Based on the results of this inspection, no findings of significance were identified.

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

Sincerely,

\RA by P. Fillion Acting For

Edwin Lea Jr., Acting Chief
Engineering Branch 2
Division of Reactor Safety

Docket Nos.: 50-321, 50-366
License Nos.: DPR-57, NPF-5

Enclosure: NRC Triennial Fire Protection Inspection Report 05000321/2006006 and
05000366/2006006 w/Attachment: Supplemental Information

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Edwin Lea, Acting Chief

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Letter to: Mr. H. L. Sumner, Jr.

SUBJECT: EDWIN I. HATCH NUCLEAR POWER PLANT - NRC TRIENNIAL FIRE
PROTECTION INSPECTION REPORT 05000321/2006006 AND
05000366/2006006

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-321, 50-366

License Nos.: DPR-57, NPF-5

Report Nos.: 05000321/2006006, 05000366/2006006

Licensee: Southern Nuclear Operating Company, Inc.

Facility: Edwin I. Hatch Nuclear Plant, Units 1 and 2

Location: P. O. Box 2010
Baxley, Georgia 31515

Dates: April 3 - 7, 2006 (Week 1)
April 17- 21, 2006 (Week 2)

Inspectors: N. Merriweather, Senior Reactor Inspector (Lead Inspector)
R. Fanner, Reactor Inspector
G. MacDonald, Senior Reactor Inspector
R. Rodriguez, Reactor Inspector
G. Wiseman, Senior Reactor Inspector

Accompanying Personnel: D. Mas-Penaranda, Reactor Inspector (Training)

Approved by: Edwin Lea, Acting Chief
Engineering Branch 2
Division of Reactor Safety

Enclosure

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SUMMARY OF FINDINGS

IR 05000321/2006006, 05000366/2006006; 04/3-7/2006 and 04/17-21/2006; Edwin I. Hatch Nuclear Plant, Units 1 and 2; Fire Protection.

This report covers a two-week triennial fire protection inspection by five regional inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG 1649, "Reactor Oversight Process" Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

No findings of significance were identified.

B. Licensee-Identified Violations

None.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and 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." The objective of the inspection was to assess whether the licensee has implemented an adequate fire protection program and that post-fire safe shutdown capabilities have been established and are being properly maintained at the Edwin I. Hatch Nuclear facility. The following fire areas (FAs) and/or fire zones (FZs) were selected for detailed review based on both risk insights from the licensee's Individual Plant Examination of External Events and in-plant tours by the inspectors:

- FZ 0014K, Unit 1 Control Building, North/South Corridor, Elevation 130 feet
- FZ 0024C, Unit 1 Main Control Room
- FA 1016, Unit 1 West 600 Volt (V) Switchgear Room 1C
- FA 1404, Unit 1 4160 V Switchgear Room 1G

Section 71111.05-05 of the IP specifies a minimum sample size of three fire areas. Inspection of these four areas/zones fulfills the procedure completion criteria. The inspection team evaluated the licensee's fire protection program (FPP) against applicable requirements which include plant Technical Specifications (TS); Units 1 and 2 Operating License Condition 2.C.(3); NRC Safety Evaluation Reports (SERs); Appendix R and Section 50.48 to Title 10 of the Code of Federal Regulations (CFR) Part 50 (hereafter referred to as 10 CFR 50); and NRC Approved Exemptions to 10 CFR 50, Appendix R (hereafter referred to as Appendix R). The team also reviewed related documents that include the Fire Hazards Analysis (FHA) and the Post-Fire Safe Shutdown Analysis (SSA) Report.

Those specific documents reviewed by the team are listed in the Attachment.

.01 Post-Fire Safe Shutdown From Main Control Room (Normal Shutdown) For Fires in FAs 1016, 1404, and FZ 0014K

a. Inspection Scope

Methodology

The team reviewed the FHA, SSA, operating procedures, piping and instrumentation drawings (P&IDs), electrical drawings, the FPP and other supporting documents for fires in FA 1016, 1404 and FZ 0014K to verify that the shutdown methodology properly identified the components and systems necessary to achieve and maintain safe shutdown conditions.

Enclosure

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

Operation Implementation

The team reviewed the training program for licensed and non-licensed operators to verify that the training reinforced the shutdown methodology in the SSA and fire procedures for the selected FAs and FZs.

The team reviewed the adequacy of procedures utilized for post-fire safe shutdown (SSD) and performed an independent walk through of procedure steps to ensure the implementation and human factors adequacy of the procedures. The team also reviewed select operator actions to verify that the operators could reasonably be expected to perform the specific actions within the time required to maintain plant parameters within specified limits. Specific actions which were verified included restoration of alternating current (AC) electrical power to Division II battery chargers and Intake Structure Motor Control Centers (MCCs), and manually operating Residual Heat Removal (RHR) injection and minimum flow valves for decay heat removal. Communications and emergency lighting necessary to support accomplishment of the manual actions were reviewed.

Specific procedures reviewed are listed in the Attachment.

The team also examined operator manual actions to ensure that they had been properly reviewed and approved by NRC, as applicable, and that the actions could be implemented in accordance with plant procedures in the time necessary to support the SSD method for each fire area. NRC inspection report 05000321, 366/2003006 documented a non-cited violation (NCV) for manual actions that had not received appropriate NRC approval. The extent of condition review for that NCV by the licensee included manual actions in the fire areas inspected during the current inspection. The team reviewed the manual actions to verify that those actions met the criteria in Attachment 2 of NRC Inspection Procedure 71111.05T and that condition report (CR) 2003800166 remained open to track resolution of the manual action issues at the Hatch facility.

b. Findings

Introduction: The team identified an unresolved item (URI) involving reliance on manual operator actions (MOAs) in lieu of the cable protection required by Appendix R, Section III.G.2. Three examples of this problem applied to Fire Zone FZ 0014K, however the extent of this problem went beyond the fire areas selected for this inspection.

Enclosure

Use of MOAs is a generic industry issue discussed in Federal Register Notice 71 FR 11169, dated March 6, 2006. Notice 71 FR 11169 provides for enforcement discretion if specified conditions are met. The URI was opened to monitor resolution of the MOA issue and determine whether enforcement discretion can be applied.

Description: The licensee's strategy for accomplishing post fire SSD for a postulated fire in FZ 0014K utilized three MOAs outside of the MCR which were not approved by the NRC. The MOAs were:

- Restoring power to division II battery chargers
- Restoring power to intake structure ventilation
- Manually opening the RHR low pressure coolant injection (LPCI) inboard discharge valve (1E11-F015B), and closing the RHR pump minimum flow valve (1E11-F018B)

The first MOA required the operators to pass through the fire affected area to access panel 1R25-S002, switchgear 1R23-S004, and battery chargers 1R42-S029, 1R42-S030, and 1R42-S031 in compartments which could not be entered without traversing the fire affected area. These actions were required to be performed within two hours of the postulated fire in FZ 0014K. The team performed an evaluation of the fire scenario timeline for a postulated fire in FZ 0014K including: detector response time, suppression system response time, fire brigade response time, FZ combustible loading and potential fire duration, and ventilation system smoke removal capability. The evaluation revealed that the fire would most likely be extinguished and smoke removed in time to permit traversing through the area to accomplish the MOA. The team concluded that the MOA met the criteria of IP 71111.05T for an acceptable compensatory measure. Need for this MOA could result from fire damage to a control cable which would result in a spurious loss-of-voltage signal. The licensee entered this unapproved MOA into the corrective action program in CR 2006100755 and was considering rerouting the affected cabling to eliminate the need for the MOA.

The second MOA also required the operators to pass through the fire affected area to access switchgear 1R23-S004 to restore power to intake structure ventilation. Need for this MOA was the fact that a control cable could be damaged resulting in a spurious tripping of the feeder breaker to the motor control center which feeds the ventilation fan. Similar to the MOA described above, execution of this action would have to be delayed until the area was accessible to the operator. The inspectors determined that loss of ventilation could be sustained for this delay time without defeating, or significantly affecting, any shutdown function. The team concluded that the MOA met the criteria of IP 71111.05T for an acceptable compensatory measure. Furthermore, the FHA/SSA indicated that only one intake structure ventilation fan was required for SSD. In most scenarios, the Unit 2 intake structure ventilation fans would provide the cooling during the time that it would take to allow the operator to access the switchgear passing through the fire affected zone. The team reviewed the routing for Unit 2 intake structure ventilation

electrical cables which also traversed FZ 0014K on the opposite side of the FZ from the Unit 1 intake structure cabling and determined that there was not a credible fire which could affect both sides of FZ 0014K and completely eliminate intake structure ventilation. The licensee entered this unapproved MOA into the corrective action program in CR 2006100755 and was considering rerouting the affected cabling to eliminate the need for the MOA.

The third MOA was performed in the reactor building and necessitated manual operation of valves 1E11-F015B and 1E11-F018B. Valve 1E11-F015B is located in a high temperature, poorly lit, potentially contaminated environment over the Unit 1 drywell access. The power to motor operated valve 1E11-F015B was from Unit 2 600 V switchgear bus 2D via Unit 1 MCC R24-S018B. Damage to Unit 2 control cable 2R23-S004-ES8-C02 could necessitate manual valve operation to achieve SSD. Similarly, fire damage to electrical cables could necessitate manual operation of valve 1E11-F018B. The team determined this action was feasible, since a fire in FZ 0014K would not require LPCI immediately, and sufficient time was available to accomplish the manual valve operations. The team concluded that the MOA met the criteria of IP 71111.05T for an acceptable compensatory measure. The licensee entered this MOA into the corrective action program in CR 2006100755 and was considering installing manual transfer switches and alternate power feeds to eliminate the need for this MOA.

Analysis: The issue is a performance deficiency, because even though it involves a generic industry issue, the licensee should not have used MOAs in lieu of protecting cables important to safe shutdown from potential fire damage. The performance deficiency is associated with the reactor safety mitigating system cornerstone attribute of protection against external events, i.e., fire. It also affects the cornerstone objective of ensuring reliability of systems that respond to events in that MOAs are less reliable than fixed fire protection features.

Enforcement: 10 CFR 50.48(b)(1) requires, in part, that all nuclear power plants licensed to operate prior to January 1, 1979, must satisfy the applicable requirements of Appendix R, Section III.G. Section III.G.2 applies to the ability to achieve and maintain hot SSD from the control room during a fire. It states, in part, that where cables or equipment, including associated non-safety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside of primary containment, one of three means of protecting cables to ensure that one of the redundant trains is free of fire damage shall be provided. The three means involve physical protection or separation of cables to preclude fire damage - III.G.2 does not allow MOAs in lieu of protection.

Contrary to the above, on April 21, 2006, cables of systems necessary to achieve and/or maintain hot standby conditions were not protected from fire damage. Lack of cable protection could result in de-energizing or losing remote control over battery chargers, ventilation equipment and valves important to achieving and/or maintaining hot standby

conditions. Instead the plant relied on MOAs to recover from the potential adverse effects. However, in the March 6, 2006, Federal Register Notice (71 FR 11169) that withdrew the proposed rulemaking on manual actions, the NRC stated that, for cases involving feasible manual actions, the licensee would be eligible for enforcement discretion if they initiated corrective actions within six months of the issue date of the notice and completed all corrective actions within 3 years. The licensee has entered this item into their corrective action program as CR 2006100755 and indicated that they plan to require that all manual actions identified in the Safe Shutdown Analysis Report be re-evaluated for compliance with 10 CFR 50 Appendix R, Section III.G.2.

The licensee has indicated that they plan to either submit exemption requests to 10 CFR 50, Appendix R, for any unapproved manual actions or implement modifications to eliminate the need for the manual action.

The URI was opened to monitor resolution of the MOA issue and determine whether enforcement discretion can be applied. It is identified as URI 05000321, 366/2006006-001, Local Operator Actions in Lieu of Cable Protection for a Fire Area Subject to the Requirements of III.G.2.

.02 Protection of Safe Shutdown Capabilities

a. Inspection Scope

The team reviewed the FHA, post-fire SSA, and supporting drawings and documentation to verify that SSD capabilities were properly protected. The team verified that separation requirements of the FPP were maintained for the credited safe shutdown equipment and their supporting power, control and instrumentation cables. This review included an assessment of the adequacy of the selected systems for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring, and associated support system functions.

For the selected fire areas/zones, the team evaluated the potential for fires, the combustible fire load characteristics, and the potential exposure fire severity. The team reviewed the licensee procedures, plant smoking policy, and programs for the control of ignition sources and transient combustibles. These reviews were conducted to assess their effectiveness in preventing fires and in controlling combustible loading within limits established in the FPP. Samples of transient combustible control permits were also reviewed.

The team performed plant walkdowns to verify (1) the material condition of fire protection systems and equipment, (2) the storage of permanent and transient combustible materials, and (3) the administrative controls for limiting fire hazards, combustible waste collection, housekeeping practices, and cleanliness conditions were being implemented consistent with the final safety analysis report (FSAR), administrative procedures, and other FPP procedures.

The team also reviewed the licensee's design control procedures to ensure that the process included appropriate reviews and controls to assess plant changes for any potential adverse impact on the fire protection program and/or post-fire SSA and procedures.

The specific documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

.03 Passive Fire Protection

a. Inspection Scope

The team reviewed the adequacy of the fire resistance design of fire area boundaries (e.g., masonry hollow block and poured concrete walls, ceilings, floors, fire barrier mechanical and electrical penetration seals, fire doors, and fire dampers) to verify that they were designed in accordance with licensee commitments to NRC Branch Technical Position Auxiliary and Power Conversion Systems Branch 9.5-1. The team walked down accessible portions of the selected FAs and FZs to observe material condition and configuration of the installed fire barrier features, as well as reviewing construction detail drawings and fire endurance tests. The installed fire barrier features were reviewed in detail to verify that the as-built configurations met design requirements, licensee commitments, standard industry practices or had been either properly evaluated or qualified by appropriate fire endurance tests. The team also reviewed plant calculations to verify that the fire loading used by the licensee was appropriate for determining the fire resistive rating of the fire barrier enclosures. In addition, a summary of completed inspection and maintenance procedures for a sample of fire doors, dampers, and penetration seals in the selected fire areas/zones was reviewed to ensure that these passive fire barrier features were properly inspected and maintained.

The team reviewed similar records for electrical raceway fire barrier system wraps within fire zone 0014K to confirm rated fire barrier wraps were installed on the required circuits, the fire barrier material was of an appropriate fire rating, and the barrier installations were consistent with the tested configurations. In addition, the team reviewed the licensing documentation, such as Appendix R exemptions, engineering evaluations of fire barrier features, and engineering evaluations for National Fire Protection Association (NFPA) code deviations, to verify that the fire barrier installations met design requirements and licensing basis commitments. The fire protection features included in the review are listed in the Attachment.

b. Findings

No findings of significance were identified.

.04 Active Fire Protection

a. Inspection Scope

The team reviewed P&IDs, cable routing information, system operating instructions, operational valve lineup procedures, and vendor documentation associated with the fire pumps and fire protection water supply system. Using operating and valve alignment procedures, team members performed inspections of selected fire pumps and portions of the fire main piping system to evaluate material condition, consistency of as-built configurations with engineering drawings, and to verify correct system valve lineups. The common fire protection water delivery and supply components were reviewed to assess if they could be damaged or inhibited by fire-induced failures of electrical power supplies or control circuits. In addition, the team reviewed periodic surveillance and operability flow test data for the electric and diesel fire pumps and fire main loop, to assess whether the test program was sufficient to validate proper operation of the fire protection water supply system in accordance with its design requirements.

The team reviewed the design, maintenance, testing and operation of the fire detection systems in the selected plant fire areas/zones to verify that the systems would function as required and met the licensing and design bases as described in the licensee submittals, NRC SERs, and the FSAR. This included walk downs of the systems and examination of the types of installed detectors as shown per location drawings. The team also assessed whether the areas were protected by fire detectors in accordance with the NFPA code of record. The team performed in-plant walkdowns of the Unit 1 Control Building North Corridor on elevation 130 ft. automatic wet pipe sprinkler suppression system to verify the proper type, placement and spacing of the sprinkler/spray heads as well as the lack of obstructions. The team also examined vendor information, engineering design calculations/evaluations, licensing basis documents and completed fire detection and sprinkler system surveillance procedures to verify that testing of the systems met the technical operability requirements of the Hatch Technical Requirements Manual, Appendix B, Section 9.2 and to verify that the systems would actuate in the early stage of a fire.

The team reviewed the manual portable extinguishers and fire hose stations to verify adequate design, installation, and operation in the selected fire areas/zones. The team also examined flow/pressure test data to verify that sufficient pressure and flow volume was available to produce electrically safe and effective fire hose operation within the nozzle manufacturer's specified flow range. During plant tours, the team observed placement of the fire hoses and extinguishers to verify they were not blocked and were consistent with the pre-fire plans and FPP documents. Additionally, samples of fire hose lengths were checked to confirm they could reach the affected fire areas/zones in support of manual fire brigade fire fighting efforts. The team also performed in-plant walkdowns of the diesel generator building Unit 1 4 kilo-Volt Switchgear Room 1G (Fire Area 1404) manual carbon dioxide hose reel suppression system to determine correct system controls and valve lineups to assure accessibility and functionality of the system, as well as associated ventilation system fire dampers.

The team reviewed fire brigade pre-fire plans and smoke removal procedures for the selected fire areas to determine if appropriate information was provided to fire brigade members and plant operators to identify SSD equipment and instrumentation, and to facilitate suppression of a fire that could impact post-fire SSD. The team walked down the selected fire areas/zones to compare the associated pre-fire plans with as-built plant conditions and fire response procedures. This was done to verify that fire pre-fire plan drawings were consistent with the fire protection features and potential fire conditions described in the FHA and FSAR. In addition, the team inspected the fire brigade's protective ensembles, self-contained breathing apparatus (SCBA), and various fire brigade equipment (including smoke removal equipment) to determine operational readiness for fire fighting.

b. Findings

No findings of significance were identified.

.05 Protection From Damage From Fire Suppression Activities

a. Inspection Scope

The team performed document reviews and in-plant walkdowns to verify that redundant trains of systems required for hot shutdown were not subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems. Specifically, the team:

- Reviewed fire damper location and vendor detail drawings, and heating, ventilation, and air conditioning system drawings to verify that a fire in one of the selected fire areas would not directly, through production of smoke, heat or hot gases, inhibit access to alternate shutdown equipment or performance of alternate safe shutdown operator actions by smoke migration through duct work from the area of a fire to adjacent plant areas/zones.
- Reviewed the physical configuration of electrical raceways and SSD components in the selected fire areas to verify water from a pipe rupture, actuation of the automatic suppression system, or manual fire suppression activities would not directly cause damage to all redundant trains within the fire area or an adjacent plant area that could inhibit SSD (e.g., fire suppression caused flooding of other than the locally affected train).
- Reviewed floor drain locations and building drain system drawings to verify that adequate drainage is provided in areas protected by water suppression systems.

The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

.06 Post Fire Alternative Shutdown Capability From Outside MCR For FZ 0024C

a. Inspection Scope

Methodology

The team reviewed the FHA, SSA, operating procedures, P&IDs, electrical drawings, the FPP and other supporting documents for a postulated fire in the MCR, FZ 0024C, to verify that the shutdown methodology properly identified the components and systems necessary to achieve and maintain post fire SSD conditions. This review included verification that alternate shutdown from outside the main control room could be performed both with and without the availability of offsite power. Plant walkdowns were also performed to verify that the plant configuration was consistent with that described in safe shutdown and fire hazards analyses. These inspection activities focused on ensuring the adequacy of systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring instrumentation and support systems functions. The team reviewed the systems and components credited for use during this shutdown method to verify that they would remain free from fire damage.

Operation Implementation

The team reviewed the training program for licensed and non-licensed operators to verify that the training reinforced the shutdown methodology in the SSA and fire procedures for a fire in the MCR requiring evacuation and implementation of alternate shutdown. Selected alternate shutdown training job performance measures were reviewed to determine if the training was conducted in accordance with the procedures and the FHA/SSA. Shift turnover records (dayshift and nightshift) for selected dates was reviewed to determine if minimum staffing requirements were met for SSD of both units irrespective of assigned fire brigade personnel. The actual staffing was compared to the minimum criteria defined in the licensing basis May 18, 1981, Supplemental Response to 10 CFR 50.48 and Appendix R for Hatch Units 1 and 2.

The team reviewed the adequacy of procedures utilized for post-fire alternate shutdown and performed an independent walk through of procedure steps to ensure the implementation and human factors adequacy of the procedures. The team also reviewed select operator actions to verify that the operators could reasonably be expected to perform the specific actions within the time required to maintain plant parameters within specified limits. Actions verified included, restoration of AC electrical power, reactor pressure and level control, and Reactor Core Isolation Cooling system operation from the remote shutdown panel. Communications and emergency lighting necessary to support accomplishment of alternate shutdown actions at the six Unit 1 remote shutdown panel locations were reviewed.

The team also reviewed the periodic test procedures and test records of the alternative shutdown transfer capability and instrumentation and control functions to ensure the tests are adequate to verify the functionality of the alternative shutdown capability.

Specific documents reviewed for alternative safe shutdown are listed in the Attachment.

b. Findings

Inadequate Testing of Remote Shutdown Panel (RSDP) Transfer Switches

Introduction: The team identified a URI associated with inadequate testing of RSDP Transfer switches in that the testing did not verify proper isolation of all switch contact circuits between the MCR and the RSDP as required for Appendix R.

Description: The licensee's SSD strategy relied on the remote shutdown system to shutdown both units in the event of a fire in the MCR. Unit 1 has six RSDPs and Unit 2 has one. Prior to leaving the MCR, the operators will scram the reactor, close the main steam isolation valves and shutdown both units utilizing the RSDP. At these panels, the operators will transfer control functions from various systems from the MCR to the RSDP. Several switches are utilized to accomplish this transfer. The transfer switches are designed not only to allow control of the components from the remote shutdown panels, but also to isolate control electrically from the MCR (i.e., Appendix R function). TS Surveillance Requirement (SR) 3.3.3.2.2 requires verification by test every 24 months that each required control circuit and transfer switch is capable of performing its intended safety function. This is implemented by Surveillance Procedure 34SV-C82-003-1, "Remote Shutdown Panel Function Checks," as well as other surveillance procedures listed in the Attachment, and consists of placing the RSDP transfer switches to emergency and verification that an annunciator comes on in the MCR as well as operating the affected equipment from the remote shutdown panel.

Upon review of completed surveillance test records and post modification testing, the team determined that 9 out of 19 switches on Unit 1 and all the switches on Unit 2 were not properly tested to meet Appendix R requirements or TS. The functional testing of the transfer switches on the remote shutdown panel did not verify proper electrical isolation of the transfer circuits between the MCR and the RSDP. The team found that not all the switch contacts were being verified. In reviewing the history of the switches, the inspectors found that several Condition Reports had been initiated due to switch failures on Unit 1. The corrective actions required the replacement of the Unit 1 switches. In addition, the surveillance interval had been increased from a 24 month frequency to every six months. The team found that in October 2004, CR 2004108804 had been initiated to respond to a question from NRC regarding the requirement to functionally test the isolation function of the transfer switch. The response to CR 2004108804 was included in AI 2004203791 and was closed by corporate licensing without communicating the information in the response to the plant site. The response specified that the isolation function shall be tested per TS SR 3.3.3.2.2 which requires verification that the transfer

switch is capable of performing its intended safety function every 24 months. It also specified that this testing should be performed when installing a new switch. Because the information had not been communicated to the site, the surveillance test procedures for units 1 and 2 had not been revised, and 9 of 19 new replacement switches were installed on Unit 1 without proper post-modification testing to verify the isolation function of all transfer switch contacts between the MCR and the RSDP. After the team raised this concern, the licensee initiated CR 2006104675 to address the fact that the AI response from corporate did not get communicated to the site and to further review the regulatory testing requirements for the RSDP transfer switches.

A list of the specific switches that were not tested are in the Attachment to the report.

Based on the above, this issue is unresolved pending review of the completed surveillance test results or the results of the licensee's re-analysis of the regulatory testing requirements for the switches. Since this issue affects both units it will be identified as URI 05000321, 366/2006006-002, Inadequate Testing of Remote Shutdown Panel Transfer Switches .

.07 Circuit Analyses

a. Inspection Scope

The team verified that the licensee performed a post-fire SSA for the selected fire areas and that the analysis appropriately identified the structures, systems and components important to achieving and maintaining safe shutdown. Additionally, the team verified that the licensee's analysis ensured that necessary electrical circuits were properly protected and that those circuits that could adversely impact safe shutdown due to hot shorts, shorts to ground or other failures were identified, evaluated and dispositioned to ensure spurious actuations would not prevent safe shutdown. The team's review considered fire and cable attributes, potential undesirable consequences and common power supply/bus concerns. Specific items included the credibility of the fire threat, cable insulation attributes, cable failure modes, multiple spurious actuations, and actuations resulting in flow diversion or loss of coolant events. The team also reviewed information in the cable routing database for a sample of components, including a sample of instrumentation circuits required for post-fire SSD to verify that the licensee's program appropriately evaluated the adequacy of cable routing by fire area as described in the cable routing database files.

The cable failure modes were reviewed for the components listed in the Attachment.

The team also reviewed, on a sampling basis, the results of the circuit breaker coordination studies for the 600/208 V buses on Unit 1 to ensure equipment needed to conduct post-fire SSD activities would not be impacted due to a lack of coordination. The team confirmed that coordination studies had addressed multiple faults due to fire.

b. Findings

No findings of significance were identified.

.08 Communications

a. Inspection Scope

The team reviewed SSD procedures, the SSA and associated documents to verify an adequate method of communications would be available to plant operators following a fire. During this review the team considered the effects of ambient noise levels, clarity of reception, reliability and coverage patterns.

The team also inspected the designated emergency storage lockers to verify the availability of portable radios for the fire brigade and for plant operators. MCR SCBA storage was reviewed to determine if adequate SCBAs were available. The team reviewed the communications available at the six RSDP locations. The team also verified that communications equipment such as repeaters, transmitters, etc. would not be affected by a fire in the selected areas. Communications via radios were observed at the reactor building RSDP locations and at the locations of selected manually operated valves in the RHR/Core Spray rooms.

The team reviewed the plant communications systems that would be relied upon to support fire event notification and fire brigade fire fighting activities. The team also reviewed selected fire brigade drill critique reports to assess proper operation and effectiveness of the fire brigade command post portable radio communications during fire drills and identify any history of operational or performance problems with radio communications during fire drills. In addition, the team verified the radio battery usage ratings for the fire brigade radios stored and maintained on charging stations.

b. Findings

No findings of significance were identified.

.09 Emergency Lighting

a. Inspection Scope

The team observed the placement and coverage area of emergency lights throughout the selected 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 SSD. The team also verified that the battery power supplies were rated with at least an eight-hour capacity. Preventive maintenance procedures and various documents, including the vendors manual and completed surveillance tests were reviewed to ensure adequate surveillance testing and periodic battery replacements were in place to ensure reliable operation of the eight-hour emergency lights and that the emergency

lighting units (ELUs) were being maintained consistent with the manufacturer's recommendations and accepted industry practices.

NRC inspection report 05000321,366/2003006 documented a non-cited violation for inadequate emergency lighting for operation of post-fire SSD equipment. The extent of condition of the corrective actions for that NCV included ELUs in the fire areas inspected during the current inspection. The team reviewed the corrective actions for the lighting in the selected areas.

The team also observed whether emergency exit lighting was provided for personnel evacuation pathways to the outside exits as identified in the NFPA 101, Life Safety Code, and the Occupational Safety and Health Administration Part 1910, Occupational Safety and Health Standards.

This review also included examination of whether backup ELUs were provided for the primary and secondary fire emergency equipment storage locker locations and dress-out areas in support of fire brigade operations should power fail during a fire emergency.

b. Findings

No findings of significance were identified.

.10 Cold Shutdown Repairs

a. Inspection Scope

The team verified that the licensee had evaluated the need for any dedicated repair procedures, equipment, and materials to accomplish repairs of components required for cold shutdown which might be damaged by the fire to ensure cold shutdown could be achieved within the time frames specific in their design and licensing bases.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The team reviewed the administrative controls for out-of-service, degraded, and/or inoperable fire protection features (e.g., detection and suppression systems and equipment, passive fire barriers, or pumps, valves or electrical devices providing SSD functions or capabilities). The team reviewed selected items on the fire protection action sheets and compared them with the fire areas/zones selected for inspection. The compensatory measures that had been established in these areas/zones were compared to those specified for the applicable fire protection feature to verify that the risk associated

with removing the fire protection feature from service was properly assessed and adequate compensatory measures were implemented in accordance with the approved fire protection program. Additionally, 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.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

d. Inspection Scope

Corrective action program (CAP) CRs resulting from fire, smoke, sparks, arcing, and equipment overheating incidents for the period of November 2003 through March 2006, as well as a select sample of fire brigade response, emergency / incidents, and fire safety inspection reports were reviewed. This review was conducted to assess the frequency of fire incidents and effectiveness of the fire prevention program and any maintenance-related or material condition problems related to fire incidents.

The inspectors also reviewed other CAP documents, including completed corrective actions documented in selected CRs/AIs, and operating experience program (OEP) documents to verify that industry-identified fire protection problems potentially or actually affecting Hatch Nuclear Plant were appropriately entered into, and resolved by, the corrective action program process. Items included in the OEP effectiveness review were NRC Regulatory Issue Summaries, NRC Information Notices, industry or vendor-generated reports of defects and noncompliance under 10 CFR Part 21, and vendor information letters. In addition, the inspectors reviewed a sample of the fire protection program audits and self-assessments which the licensee performed in the previous two-year period. The inspectors evaluated the effectiveness of the corrective actions for the identified issues. The documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

On April 21, 2006, the lead inspector presented the inspection results to Mr. Steven M. Douglas and other members of his staff. Proprietary information is not included in this report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel:

M. Ajluni, Assistant General Manager - Plant Support
J. Dixon, Health Physics Manager
S. Douglas, Assistant General Manager - Plant Operations
B. Duval, Chemistry Manager
K. Kirksey, Senior Engineer
J. Lewis, Training and Emergency Preparedness Manager
J. Love, Quality Assurance Auditor
D. Parker, Senior Engineer
A. Owens, Senior Engineer
T. Spring, Work Controls Superintendent
K. Underwood, Performance Analysis Supervisor
E. Urquhart, Operations Superintendent
J. Vance, Senior Engineer
O. Vidal, Project Engineer
R. Williams, Maintenance Superintendent

NRC Personnel:

D. Simpkins, Senior Resident Inspector

Other Personnel:

Mr. D. Bruce, Director, Appling County Georgia Emergency Management Agency

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000321, 366/2006006-001	URI	Local Operator Actions in Lieu of Cable Protection for a Fire Area Subject to the Requirements of III.G.2. (Section 1R05.01.b)
05000321, 366/2006006-002	URI	Inadequate Testing of Remote Shutdown Panel Transfer Switches (Section 1R05.06.b)

Closed

None.

Discussed

None.

LIST OF DOCUMENTS REVIEWED

Section 1R05.01.a: Normal Safe Shutdown Procedures Reviewed

Normal Post-fire Safe Shutdown Procedures

34AR-651-160-1, Fire Alarm
 34AB-X43-001-1, Fire Procedure
 34AB-C71-001-1, Scram Procedure
 31EO-EOP-010-1 through 017-1, Emergency Operating Procedures
 73EP-EIP-001-1, Emergency Classification and Initial Actions
 34SO-R42-001-1, 125 VDC and 125/250 VDC System
 34SO-X41-002-0, Intake Structure Ventilation System

Section 1R05.03.a: List of Fire Barrier Features Inspected in Relation to Safe Shutdown Separation Requirements

Walls/Floors/Walls/Ceiling Identification

Description

Concrete Block Wall	Fire Area/Zone 0014K to Fire Area /Zone 1013
Concrete Block Wall	Fire Area/Zone 0014K to Fire Area /Zone 1023

Fire Damper Identification

Description

1Z41FDF062	Fire Area/Zone 1016 to Fire Area /Zone 1023
1Z41FDF063	Fire Area/Zone 1016 to Fire Area /Zone 1017
1Z41FDF134	Fire Area/Zone 0014K to Fire Area /Zone 1013

Fire Door Identification

Description

1L481C31	Fire Area/Zone 0014K to Fire Area /Zone 1017
1L481C35	Fire Area/Zone 0014K to Fire Area /Zone 1016
1L481C48	Fire Area/Zone 0014K to Fire Area /Zone 1013
1L481C50	Fire Area/Zone 0014K to Fire Area /Zone 0002
1L481C58	Fire Area/Zone 0014K to Fire Area /Zone 0002
1L481C82	Fire Area/Zone 0024C to Fire Area /Zone 0101
1L481C97	Fire Area/Zone 0024C to Fire Area /Zone 0101

Barrier Penetration Seal Identification

Description

1Y43-H113D	Fire Area/Zone 1404 to Fire Area /Zone 1408
1Y43-H114D	Fire Area/Zone 1404 to Fire Area /Zone 1408
1Y43-H115D	Fire Area/Zone 1404 to Fire Area /Zone 1408
1Y43-H116D	Fire Area/Zone 1404 to Fire Area /Zone 1408
1Y43-H118D	Fire Area/Zone 1404 to Fire Area /Zone 1408
1Z43-H622D	Fire Area/Zone 0014K to Fire Area /Zone 1013
1Z43-H625D	Fire Area/Zone 0014K to Fire Area /Zone 1013
1Z43-H627D	Fire Area/Zone 0014K to Fire Area /Zone 1013
1Z43-H005D	Fire Area/Zone 1016 to Fire Area /Zone 1017
1Z43-H861D	Fire Area/Zone 1016 to Fire Area /Zone 1017
1Z43-H1120D	Fire Area/Zone 1016 to Fire Area /Zone 1017

Section 1R05.06.a: Post-Fire Alternative Shutdown CapabilityAlternative (Remote) Shutdown Procedures Reviewed

34AR-651-160-1, Fire Alarm
 34AB-X43-001-1, Fire Procedure
 34AB-C71-001-1, Scram Procedure
 31EO-EOP-010-1 through 017-1, Emergency Operating Procedures
 31RS-OPS-001-1, Shutdown From Outside Control Room
 31RS-OPS-002-1, Electrical Restoration
 34AB-R43-001-1, Diesel Generator Recovery
 73EP-EIP-001-1, Emergency Classification and Initial Actions

Remote Shutdown Panel Surveillance Test Procedures and Work Order Records Reviewed

34SV-C82-003-1, Remote Shutdown Panel Function Checks, Rev. 3.3
 34SV-E11-002-1, RHR Valve Operability, Rev. 18.4
 34SV-R43-002-2, Diesel Generator 1B Monthly Test, Rev. 20.24
 52GM-B21-005-0, Main Steam Safety Relief Valve Maintenance
 Completed Surveillance Record for Remote Shutdown Panel Function Checks 34SV-C82-003-1,
 performed on 4/13/05 and 11/23/05
 Maintenance Work Order # 1040636201, Replacement of RSDP Transfer Switch 1C82-S2B

Unit 1 Remote Shutdown Panel Switches and Associated Surveillance Test Procedures

<u>Switch Nos.</u>	<u>Panel Location</u>	<u>Function</u>	<u>Test Procedure</u>
1C82-S1	1H21-P173	SRV 1B21-F013G	52GM-B21-005-0
1C82-S2A	1H21-P175	RHR SW 1B	34SV-C82-003-1S
1C82-S2B	1H21-P175	RHR 1B	34SV-C82-003-1S
1C82-S3		1A CRD Pump	34SV-C82-003-1S
1C82-S4		1B CRD Pump	34SV-C82-003-1S
1C82-23A	1C82-P001	RHR	34SV-E11-002-1
1C82-23B	1C82-P001	RCIC	34SV-C82-003-1S
1C82-23C	1C82-P001	RCIC	34SV-C82-003-1S
1C82-23D	1C82-P001	RCIC	34SV-C82-003-1S
1C82-23E	1C82-P001	RCIC	
1C82-23F	1C82-P001	RCIC	34SV-C82-003-1S
1C82-23G	1C82-P001	RCIC	34SV-C82-003-1S
1C82-24A	1C82-P002	RHR	34SV-E11-002-1
1C82-24B	1C82-P002	RHR	34SV-C82-003-1S
1C82-24C	1C82-P002	SRV 1B21-F013C	52GM-B21-005-0
1C82-24D	1C82-P002	RHR	34SV-C82-003-1S
1C82-24E	1C82-P002	RHR	34SV-C82-003-1S
1C82-24F	1C82-P002	RHR	34SV-C82-003-1S
1C82-24G	1C82-P002	RHR	34SV-C82-003-1S
2R43-M01	DG1B north wall	DG1B Mode SW	34SV-R43-002-2

Unit 1 Switch Replacement Work Orders

*WO 1040356701, Remote Shutdown Panel SW 1C82S23A, 03/05/04
 WO 1040691301, Remote Shutdown Panel SW 1C82S23B, 11/10/05
 WO 1040691401, Remote Shutdown Panel SW 1C82S23C, 01/11/06
 WO 1040691501, Remote Shutdown Panel SW 1C82S23D, 11/03/05
 *WO 1040234201, Remote Shutdown Panel SW 1C82S23E, 03/01/04
 *WO 1040579801, Remote Shutdown Panel SW 1C82S23F, 03/12/04
 WO 1040691601, Remote Shutdown Panel SW 1C82S23G, 11/09/05
 WO 1040691701, Remote Shutdown Panel SW 1C82S24A, 11/30/05
 WO 1040692001, Remote Shutdown Panel SW 1C82S24B, 12/01/05
 *WO 1040692101, Remote Shutdown Panel SW 1C82S24C, 03/11/06
 WO 1040692201, Remote Shutdown Panel SW 1C82S24D, 03/24/06
 WO 1040692301, Remote Shutdown Panel SW 1C82S24E, 03/11/06
 *WO 1040692401, Remote Shutdown Panel SW 1C82S24F, 03/03/06
 WO 1040692501, Remote Shutdown Panel SW 1C82S24G, 03/21/06
 *WO 1040636101, Remote Shutdown Panel SW 1C82S2A, 08/25/04
 WO 1040636201, Remote Shutdown Panel SW 1C82S2B, 11/30/05
 *WO 1040636001, Remote Shutdown Panel SW 1C82S1, 03/08/06
 *WO 1040691101, Remote Shutdown Panel SW 1C82S3, 12/22/04
 *WO 1040691201, Remote Shutdown Panel SW 1C82S4, 09/17/04

Note: "*" identifies the 9 switches that were replaced on Unit 1 without adequate functional Appendix R testing.

Section 1R05.07.a: Components Reviewed for Cable Failure Modes

<u>Component No.</u>	<u>Description</u>
1E11-F027A/B	RHR Outlet Valve to Suppression Pool
1E11-F028A/B	RHR Outlet Valve to Suppression Pool
1E11-F009	RHR Shutdown Cooling Suction Isolation Valve
1E11-F015B	RHR Outlet Valve to Reactor Pressure Vessel (RPV) Loop B
1E11-F008	RHR Shutdown Cooling Suction Isolation Valve
1P41-C001B	Plant Service Water Pump 1B
1P41-F310B	Plant Service Water Turbine Bldg. Isolation Valve
1T41-B004A	Reactor Core Isolation Cooling (RCIC) Pump Room Cooler
1T41-B005B	High Pressure Coolant Injection (HPCI) Pump Room Cooler
1C32-R655	RPV Water Level Indicator
1E11-C001B	RHR Pump
1E51-R070	RCIC Pump Flow
1B21-R070	RPV Water Level Indicator
1T48-R072	Suppression Pool Water Temperature Indicator
1T48-R070	Suppression Pool Water Level Indicator
E41-N070A,B	Steam Leak Detection System
E41-N071A,B	Steam Leak Detection System
X41-C009A,B,C	Intake Structure Ventilation

LIST OF DOCUMENTS REVIEWED

Procedures

DI-OPS-72-1204, Fire Brigade Gear Restoration, Rev. 3
 10AC-MGR-022-0, Plant Housekeeping and Material Condition, Rev. 4.6
 31EO-EOP-010-1, RC RPV Control (Non-ATWS), Rev. 10
 31EO-EOP-011-1, RCA RPV Control (ATWS), Rev. 9
 31EO-EOP-012-1, PC Primary Containment Control, Rev. 5
 31EO-EOP-014-1, SC-Secondary Containment Control RR-Radioactive Release Control, Rev. 8
 31EO-EOP-015-1, Alternate Level Control, Steam Cooling, & Emergency RPV Depressurization, Rev. 7
 31EO-EOP-016-1, CP-2 RPV Flooding, Rev. 8
 31EO-EOP-017-1, CP-3 ATWS Level Control, Rev. 9
 31RS-E41-001-1, HPCI Operation From Outside Control Room, Rev. 0.2
 31RS-E51-001-1, RCIC Boron Injection From Outside Control Room, Rev. 0.3
 31RS-OPS-001-1, Shutdown From Outside Control Room, Rev. 5.7
 31RS-OPS-001-2, Shutdown From Outside Control Room, Rev. 6.6
 31RS-OPS-002-1, Electrical Restoration, Rev. 4.3
 31RS-T41-001-1S, Reactor Building Ventilation and Area Cooler Operation From Outside Control Room, Rev. 1ED2
 34AB-X43-001-1, Fire Procedure, Rev. 10.8
 34AB-X43-002-0, Fire Protection System Failures, Rev. 1.3
 34AB-C71-001-1, Scram Procedure, Rev. 10.14
 34AB-R43-001-1, Diesel Generator Recovery, Rev. 1.10
 34AR-651-160-1, Alarm Response Procedure, Fire Alarm, Rev. 3.2
 34IT-R51-001-0, Testing Emergency Signals, Rev. 0.4
 34SO-R23-001-1, 600V/480 V AC System, Rev. 9.6
 34SO-R42-001-1, 125 VDC and 125/250 VDC System, Rev. 12.4
 34SO-X41-002-0, Intake Structure Ventilation System, Rev. 4.0
 34SO-X43-001-1, Fire Pumps Operating Procedure, Rev. 4.3
 34SO-Z41-001-1, Control Room Ventilation System, Rev. 18.3
 34SO-Z43-001-0, Operation Of The Multiplex Fire Detection System, Rev. 3.5
 34SV-C82-003-1, Remote Shutdown Panel Function Checks, Rev. 3.3
 34SV-E11-002-1, RHR Valve Operability, Rev. 18.4
 34SV-R43-002-2, Diesel Generator 1B Monthly Test, Rev. 20.24
 40AC-ENG-008-0, Fire Protection Program, Rev. 9.8
 42SV-FPX-001-0, Fire Extinguisher Inspection, Rev. 1.0
 42SV-FPX-003-0, Emergency Lighting Surveillance, Rev. 9.5
 42SV-FPX-003-0, Emergency Lighting Surveillance, Rev. 10.0
 42SV-FPX-003-0, Emergency Lighting Surveillance, Rev. 11.0
 42FP-FPX-004-0, Fire Protection Reviews, Rev. 6
 42FP-FPX-005-0S, Drill Planning, Critiques and Drill Documentation Rev. 1
 42SV-FPX-006-0, Fire Damper Surveillance, Rev. 1.3
 42FP-FPX-007-0S, Hot Work, Rev. 1.4
 42FP-FPX-018-0, Use, Control, and Storage of Flammable/Combustible Materials, Rev. 1.1

42SV-FPX-032-0, Automatic Sliding Fire Door Surveillance, Rev. 3.5
 42SV-FPX-034-0, Fire Protection Isolation Valves - Yard Area, Rev. 3.36
 42SV-FPX-035-0, Fire Protection Valve Cycling Surveillance, Rev. 5.0
 42SV-FPX-037-OS, Fire Detection Instrumentation Surveillance, Rev. 5.1
 42SV-FPX-041-0, Circuit Interface Surveillance of Fire Detection Systems, Rev. 2.2
 52GM-B21-005-0, Version 20.0, Main Steam Safety Relief Valve Maintenance
 52IT-MEL-001-0, Emergency Lighting Inspection and Test, Rev. 9.0
 73TRN-003-0, Fire Training Program, Rev. 5
 73EP-EIP-001-1, Version 15.2, Emergency Classification and Initial Actions
 95IT-OTM-001-0, Maintenance Work Order Functional Test, Attachment 1, Rev. 4.4

Completed Surveillance Test Procedures and Test Records

DI-OPS-72-1204, Fire Brigade Gear Restoration, completed 01/18/2006
 42SV-FPX-002-0, Low Pressure Carbon Dioxide System Surveillance, completed 7/15/2005
 42SV-FPX-022-0, Fire hydrants and Fire Hose Houses Surveillance, completed 3/6/2006
 42SV-FPX-024-0, Fire Hose Stations Surveillance, completed 3/16/2006
 42SV-FPX-032-0, Automatic Sliding Fire Door Surveillance, completed 11/15/2005
 42SV-FPX-034-0, Fire Protection Isolation Valves - Yard Area, completed 3/1/2006
 42SV-FPX-036-0, Annual Fire Pump Capacity Test, completed 5/13/2005
 42SV-FPX-037-0, Fire Detection Instrumentation Surveillance, completed 5/12/2005
 42SV-FPX-041-0, Circuit Interface Surveillance of Fire Detection Systems, completed 1/7/2006

Emergency Lighting Unit Surveillance Work Order (WO) Records

1030569401	1030926401	1040266401	1040553201
1040788801	1041413901	1041413901	1041451501
1041595801	1042165101	1042165101	1042490101
1042490101	1042778801	1050025701	1050434401
1051398201	1051668301	1052709201	

Calculations, Evaluations, and Specifications

SENH94-020, Coordination Review of Essential 600/208 V Buses, Rev. 1
 SMFP87-001, Hydraulic Analysis of Sprinkler System, Unit 1 Control Building N. Corridor El. 130', System 1Z43130W01, dated 03/03/1987
 SMNH92-004, Define Impact of Hydrogen Gas on FHA Combustible Loading, dated 11/11/1992
 SMNH94-009, Control Building Floor Drainage Capacity of Transformer Fluids, dated 04/12/1994
 SMNH94-046, Fire Resistance of Concrete Block at Hatch Nuclear Plant (HNP), dated 09/30/1994
 SMNH94-048, HNP Combustible Inventory Calorific Values, dated 06/1994
 SMNH94-060, Fire Protection Combustible Loading Data System, dated 06/18/1994
 SMNH98-023, Fire Protection Penetration Seal Deviation Analysis, Rev. 0, dated 06/1998
 SMNH00-011, Hose Nozzle Pressure Drop Analysis, dated 07/18/2000
 SMNH03-011, Curb Height for Oil Spill Containment of Indoor Transformers, dated 08/05/2003
 SMNH03-012, Determine Regulatory Separation Between Fire Areas, dated 09/12/2003

Fire Brigade Pre-Plans and Fire Drill Critique Reports

A-43965, Power-Block Areas Methodology, Rev. 0
 A-43965, Sheets 23A, B; Fire Area/Zone 0014A-J, M, N, Rev. 3
 A-43965, Sheets 24A, B; Fire Area/Zone 0014K, , Rev. 3
 A-43965, Sheets 48A, B; Fire Area/Zone 0024C, D, , Rev. 3
 A-43965, Sheets 28A, B; Fire Area 1016, Rev. 4
 A-43966, Sheets 09A, B; Fire Area 1404, Rev. 3
 42-FP-FPX-005-05, Hatch Unannounced Fire Drill Critique Report, Unit 1 West 600 V Switchgear
 Room 1-C, 12/18/2005, Crew C

Drawings

B-19631, Sheet 121, Penetration Seals-Type, Number and As-Built Location, Rev. 1
 B-19631, Sheet 128, Penetration Seals-Type, Number and As-Built Location, Rev. 0
 B-19631, Sheet 129, Penetration Seals-Type, Number and As-Built Location, Rev. 1
 B-19631, Sheet 130, Penetration Seals-Type, Number and As-Built Location, Rev. 1
 B-19631, Sheet 151, Penetration Seals-Type, Number and As-Built Location, Rev. 1
 B-19631, Sheet 158, Penetration Seals-Type, Number and As-Built Location, Rev. 3
 B-19631, Sheet 169, Penetration Seals-Type, Number and As-Built Location, Rev. 2
 B-19632, Sheet 17, Penetration Seals-Type, Number and As-Built Location, Rev. 1
 D-11001, Service Water Piping At Intake Structure, Rev. 77
 D-11004, RHR Service Water Outside Building, Rev. 39
 H-11024, Service Water Piping Sheet 1, Rev. 55
 H-11033, Sheet 1, Fire Protection - P&ID, Pumphouse Layout, Rev. 48
 H-11033, Sheet 2, Fire Protection - P&ID, Yard Layout, Rev. 23
 H-11035, Sheet 1, Fire Protection - P&ID, Turbine and Control Buildings, Rev. 22
 H-11037, Fuel Oil, Diesel Oil System, Rev. 28
 H-11232, Piping Drains, Control Bldg. El. 130'-0", Rev. 9
 H-11600, Service Water @ Diesel Generator, Rev. 33
 H-11609, Service Water Piping Sheet 2, Rev. 53
 H-11631, Sheet 1, Diesel Generator 1A & 1C, Rev. 25
 H-11631, Sheet 2, Diesel Generator 1A & 1C, Rev. 8
 H-11640, HPCI Oil Piping, Rev. 6
 H-11814, Fire Hazards Analysis Drawing, Control Building EL. 130'-0", Rev. 8
 H-11817, Fire Hazards Analysis Drawing, Control Building EL. 164'-0", Rev. 5
 H-11821, Fire Hazards Analysis Drawing, Turbine Bldg. El. 130'-0", Rev. 0
 H-11846, Fire Hazards Analysis, Drawing Diesel Generator Bldg., Rev. 2
 H-13350, Master Single Line Diagram, Rev. 20
 H-13356, Single Line Diagram 4160 V Bus 1E, R22-S005 & Bus 1F, R22-S006, Rev. 25
 H-13357, Single Line Diagram 4160 V Bus 1G, R22-S007, Rev. 17
 H-13361, 600 V Bus 1C & Bus 1D, Rev. 44
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 H-13369 Sheet 1, 120/208 V Essential AC System, Rev. 47
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 H-13370, Sheet 1, 125/250 V DC Station Service Division I, Rev. 56
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H-13388, Plant Service Water Motor Operated Valves System 1P41 Elementary Diagram, Rev. 4
H-13389, Intake Structure 600 V - 208 V MCC 1A & 1B, Rev. 32
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H-13420, Control Console H11-P652 Wiring Diagram, Rev. 33
H-13478, Wiring Diagram 4160 V Switchgear Bus 1B FR. 2, R22-S002, Rev. 12
H-13586, Elementary Diagram Plant Service Water Pumps, Rev.28
H-13587, Contact- Tabulation Diesel Generators Controls, Sheet 1, Rev. 29
H-13589, Elementary Diagram Emergency Station Service, Miscellaneous, Sheet 1, Rev. 23
H-13599, Wiring Diagram Diesel Generator 1A Relay Panel H21-P230, Rev. 19
H-13601, Wiring Diagram Diesel Generator 1C Relay Panel H21-P232, Rev. 19
H-13614, Wiring Diagram Fire Protection Pump House Equipment, Rev. 22
H-13635, 120 V Vital AC & 24/48 V DC Systems, Rev. 33
H-13647, Diesel Bldg 600 V-208 V MCC 1A, Rev. 26
H-13648, Diesel Building 600/208 V MCC-1B, Rev. 38
H-13649, Diesel Bldg 600 V-208 V MCC 1C, Rev. 24
H-14158, Wiring Diagram Diesel Bldg. 600/208 V MCC-1C Frames 4,5 & 6 R24-S027, Rev. 14
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H-16000, Nitrogen Inerting System, Rev. 42
H-16007, Drywell Cooling system, Rev. 21
H-16011, Reactor Building Service Water System, Rev. 60
H-16023, Safeguard Equipment Cooling, Rev. 10
H-16024, Primary Containment Purge & Inerting System, Rev. 50
H-16041, Control Building Ventilation Flow Diagram, Rev. 13
H-16054, Control Building Heating, Ventilation, and Air Conditioning (HVAC) System, Rev. 20
H-16062, Nuclear Boiler System Sheet 1, Rev. 46
H-16063, Nuclear Boiler System Sheet 2, Rev. 36
H-16286, Drywell Pneumatic System Sheet 1, Rev. 34
H-16299, Drywell Pneumatic System Sheet 2, Rev. 5
H-16329, RHR System Sheet 1, Rev. 66
H-16330, RHR System Sheet 2, Rev. 58
H-16331, Core Spray system, Rev. 30
H-16332, HPCI System Sheet 1, Rev. 59
H-16333, HPCI System, Sheet 2, Rev. 39
H-16334, RCIC System Sheet 1, Rev. 42
H-16335, RCIC System Sheet 2, Rev. 29
H-16567, Feedwater Control System Turbine Driven Feedpumps, Rev. 15
H-17010, Reactor Bldg 600 V AC Essential MCC 1C Sheet 1, Rev. 36
H-17011, Reactor Bldg 600 V AC Essential MCC 1B Sheet 1, Rev. 29
H-17012, Reactor Bldg 600 V MCC 1E-A & 1E-B, Rev. 28
H-17016, Reactor Bldg 600 V AC Essential MCC 1C Sheet 2, Rev. 29
H-17022, Reactor Bldg 250 VDC Essential MCC 1A & 1A1, Rev. 14

H-17023, Reactor Bldg 250 VDC Essential MCC 1B, Rev. 22
 H-17041, Safeguard Equipment Cooling System T41B Elementary Diagram, Sheet 1, Rev. 27
 H-17043, Safeguard Equipment Cooling System T41B Elementary Diagram, Sheet 3, Rev. 15
 H-17109, Core Spray System E21 Elementary Diagram, Sheet 2, Rev. 35
 H-17151, RCIC System E51 Elementary Diagram Sheet 5, Rev. 46
 H-17152, RCIC System E51 Elementary Diagram Sheet 6, Rev. 29
 H-17153, RCIC System E51 Elementary Diagram Sheet 7, Rev. 36
 H-17755, Automatic Depressurization System B21C Elementary Diagram Sheet 3, Rev. 28
 H-17763, RHR System E11, Elementary Diagram Sheet 4, Rev.33
 H-17766, Residual Heat Removal System E11, Sheet 7, Rev. 31
 H-17771, RHR System E11, Elementary Diagram Sheet 12, Rev. 29
 H-17773, RHR System E11, Elementary Diagram Sheet 14, Rev. 37
 H-17774, RHR System E11, Elementary Diagram Sheet 15, Rev. 23
 H-17775, RHR System E11, Elementary Diagram Sheet 16, Rev. 31
 H-17781, RHR System E11, Elementary Diagram Sheet 22, Rev. 13
 H-17782, RHR System E11, Elementary Diagram Sheet 23, Rev. 26
 H-17783, Reactor Protection System C71 Elementary Diagram, Sheet 1, Rev. 31
 H-17786, Reactor Protection System C71 Elementary Diagram, Sheet 4, Rev. 12
 H-17787, Reactor Protection System C71 Elementary Diagram, Sheet 5, Rev. 19
 H-17791, Reactor Protection System C71 Elementary Diagram, Sheet 9, Rev. 11
 H-17792, Reactor Protection System C71 Elementary Diagram, Sheet 10, Rev. 11
 H-17793, Reactor Protection System C71 Elementary Diagram, Sheet 11, Rev. 10
 H-17794, Reactor Protection System C71 Elementary Diagram, Sheet 12, Rev. 12
 H-17807, Nuclear Steam Supply Shutoff System A71 Elementary Diagram, Sheet 2, Rev. 33
 H-17809, Nuclear Steam Supply Shutoff System A71 Elementary Diagram, Sheet 4, Rev. 27
 H-17814, Nuclear Steam Supply Shutoff System A71 Elementary Diagram, Sheet 9, Rev. 21
 H-17817, Nuclear Steam Shutoff System A71 Elementary Diagram, Sheet 12, Rev. 27
 H-17818, Nuclear Steam Shutoff System A71 Elementary Diagram, Sheet 13, Rev. 21
 H-19573, Remote Shutdown System (C82), Sheet 2, Rev. 19
 H-19610, Remote Shutdown System (C82), Sheet 3, Rev. 9
 H-19611, Residual Heat Removal System (C82) Elementary Diagram, Sheet 4, Rev. 17
 H-19612, Residual Heat Removal System (C82) Elementary Diagram, Sheet 5, Rev. 12
 H-19613, Remote Shutdown System Sheet 6, Rev. 11
 H-19614, Residual Heat Removal System (C82) Elementary Diagram, Sheet 7, Rev. 14
 H-19699, Remote Shutdown System (C82), Sheet 8, Rev. 10
 H-19807, Elementary Diagram ATT8, System A70, Sheet 7, Rev. 5
 H-195784, Shutdown Instrument Panel H21-P173 Wiring/External Connection Diagram, Rev. 6
 H-24608, Fire Zone and SSD Raceway Plan CB EL 130' Col. TA-TF T11-T14, Rev. 10
 H-24609, Fire Zone and SSD Raceway Plan CB EL 130' Col. TF-TI T11-T14, Rev. 8
 H-26250, Control Building Ventilation and Fire Damper Controls, Rev. 13
 H-40178, Appendix R Raceways Cont. Bldg EI 130' TA-TE & T10-T13, Rev. 9
 H-40179, Appendix R Raceways Cont. Bldg EI 130' TE-TI & T10-T13, Rev. 7
 H-40277, Control, Turbine, and Reactor Buildings HVAC Fire Damper Schedule, Rev. 1
 H-40406, Fire Protection P&ID - Control Building North Corridor, Fl. El. 130'-0", Rev. 5
 H-40429, Control Building Architectural Plan, Fl. El. 130'-0", Rev. 4
 H-41509, Diesel Generator Building CO2 System-P&ID, Rev. 5

H-43757, Penetration Seals-Drawings Index Plan-Control Building, Rev. 2
 H-43762, Penetration Seals-Drawings Index Plan-Diesel Generator Building, Rev. 0

Design Change

Request for Engineering Review (RER) 03-0227/LDCR 2002-061(File Log PS-03-1781), Revise Technical Requirements Manual and the Fire Hazards Analysis Section 9.2, Appendix B to Separate Regulatory from Non-Regulatory Operability Requirements, dated 09/12/2003
 As-Built Notice 05-504, Incorporate Design Change for Replacement Switch 1C82-S2B

Applicable Codes and Standards

National Fire Protection Association (NFPA) 10, Portable Fire Extinguishers, Installation, Maintenance, and Use, 1975 Edition
 NFPA 12, Standard for Carbon Dioxide Systems, 1973 Edition
 NFPA 13, Standard for the Installation of Sprinkler Systems, 1976 Edition
 NFPA 14, Standard for the Installation of Standpipe and Hose Systems, 1974 Edition
 NFPA 20, Standard for the Installation of Centrifugal Fire Pumps, 1973 Edition
 NFPA 30, Flammable Combustible Liquids Code, 1973 Edition
 NFPA 72D, Standard for the Installation, Maintenance, and Use of Proprietary Protection Signaling Systems, 1975 Edition
 NFPA 72E, Standard on Automatic Fire Detectors, 1974 Edition
 NFPA 80, Standard on Fire Doors and Windows, 1975 Edition
 NFPA 251, Fire Tests, Building Construction and Materials, 1975 Edition
 NUREG-1552, Supplement 1, Fire Barrier Penetration Seals in Nuclear Power Plants, dated January 1999
 Occupational Safety and Health Administration Standard 29 CFR 1910, Occupational Safety and Health Standards,
 Underwriters Laboratory, Fire Resistance Directory, January 1998

Technical Manuals and Vendor Information

Allison Control Inc., 9090 Continuous Thermal Sensor Overview, dated 1998
 Operation and Instruction Manual for Allison Control A888-M517 Linear Thermistor Control Unit, dated 12/1984
 Promatec Technologies, Inc., S-54872, Transmittal 99-2175, Installation of 1-Hour Fire Rated Promat Enclosure - Control Building North Corridor (EL. 130'-0"), Rev. 2, dated 12/17/1998
 Pullman Construction Industries, Inc., Drawing PSM-7206-FD-1NS, Zero Clearance Fire Dampers, Models FD-10V/H; FD-20V/H; FD-40V/H, Rev. 2
 Specification Sheet for Kenwood Portable Radios and Batteries, dated 4/4/2006
 Specification Sheet for Pyrotronics DT-3P-135 Thermal Fire Detector, Catalog Number 6132, dated 4/1985
 Specification Sheet for Pyrotronics DI-X3 Addressable Ionization Fire/Smoke Detector, Catalog Number 6135, dated 2/1984
 Specification Sheet for Pyrotronics DP-X3 Addressable Photoelectric Smoke Detector, Catalog Number 6136, dated 4/1985
 Specification Sheet for Pyrotronics DT-X3-135 Addressable Thermal Fire Detector, Catalog Number 6137, dated 4/1985
 Technical Manual, 10-453-97, Dow Corning 561 Silicone Transformer Fluid, dated 1997

Audits and Self Assessments

Audit Report No. H-FP-2005, Audit of Hatch Fire Protection, dated 3/09/2005

Audit Report No. H-FP-2004, Audit of Hatch Fire Protection, dated 5/28/2004

Audit Report No. 03-FP-1, Audit of Fire Protection, dated 4/21/2003

Licensing Basis Documents

Appendix A to Branch Technical Position (BTP) Auxiliary and Power Conversion Systems Branch (APCSB) 9.5-1 Guidelines for Fire Protection for Nuclear Power Plants, dated

August 23, 1976

Hatch Facility Operating License No. DRP-57 Condition 2.C (3) (Unit 1)

Hatch Fire Hazards Analysis, Appendix D, BTP APCS 9.5-1 Compliance, Rev. 20

Hatch Fire Hazards Analysis, Appendix B, Fire Protection Surveillance Requirements, Rev. 23

Hatch Fire Hazards Analysis, Appendix H, Application of National Fire Protection Association (NFPA) Codes, Rev. 12B

Hatch Pre-Fire Plans for Fire Areas 0014, 24, 1016, and 1404

Hatch Supplemental Response to 10 CFR 50.48 and Appendix R, dated May 18, 1981

Hatch Unit 1 Technical Specifications

Hatch Unit 1 Technical Requirements Manual

Hatch Safe Shutdown Analysis Report, Units 1 and 2, Rev. 30

Operations Training Job Performance Measures

LR-JP-01.23-14, From The Remote Shutdown Panel, Start A Control Rod Drive (CRD) Pump

LR-JP-07.19-15, From The Remote Shutdown Panel, Start RHR And Inject Into The Reactor

LR-JP-07.20-14, From The Remote Shutdown Panel, Start RHR In Torus Cooling

LR-JP-07.21-14, From The Remote Shutdown Panel, Initiate RHR In Shutdown Cooling

LR-JP-10.17-13, From Outside The Control Room, Insert A Manual Reactor Scram By De-Energizing RPS

LR-JP-10.18-12, From Outside The Control Room, Insert A Manual Reactor Scram Using The Scram Discharge Volume Level Switches

LR-JP-13.72-05, From Outside the Control Room, During A Control Room Evacuation, Startup Reactor Building And Safeguard Equipment Cooling

LR-JP-25014-11, With A Fire, Prepare RCIC For Operation From The Remote Shutdown Panel

LR-JP-28.22-14, During A Fire In The Control Room, Prepare To Locally Start A Diesel Generator

LR-JP-28.26-12, From Outside The Control Room, Start A Diesel Generator

LR-JP-28.27-10, From Outside The Control Room, Adjust Diesel Generator Voltage And Frequency

LR-JP-38.07-13, From Outside The Control Room, Defeat The Auto Actuation Of Automatic Depressurization System (ADS)

LR-JP-39.16-13, From The Remote Shutdown Panel, Start RCIC For Injection Into The Reactor

Other Documents

Combustible Loading Data System, In-Situ Analysis Load, Fire Area/Zone 0014K, dated 04/06/2006

Combustible Loading Data System, In-Situ Analysis Load, Fire Area/Zone 0024C, dated 04/06/2006

Combustible Loading Data System, In-Situ Analysis Load, Fire Area/Zone 1016, dated 04/06/2006

Combustible Loading Data System, In-Situ Analysis Load, Fire Area/Zone 1404, dated 04/06/2006

Condition Reports (68 total) Resulting from Fire, Smoke, Sparks, Hot, Arcing, and Equipment

Overheating Incidents for the period November 2003 through March 2006
 Fire Protection Fire Action Sheets (OPS-1355) for Out of Service Impairments and Fire Protection Deficiencies from April 2005 to February 2006
 Fire Service Qualification Training, Lesson Plan S-FP-PP-10700-01, Ventilation/Salvage and Overhaul, dated 05/19/2005
 Hatch Inter-Company Letter LR-GM-002-1203, Smoking and Tobacco Use Policy, dated December 1, 2003
 Hatch Review of Electric Power Research Institute (EPRI) Report TR-109633, Guideline for the Evaluation and Treatment of Corrosion and Fouling in Fire Protection Systems, RER 03-0220, dated April 4, 2005
 Hatch Response to NRC Information Notice 2005-32, Product Alert for Fire Hydrants, dated December 23, 2005
 Hatch Response to NRC Regulatory Issue Summary 2005-07, Compensatory Measures to Satisfy Fire Protection Program Requirements, dated April 19, 2005
 Memorandum J. N. Hannon to A. T. Howell, Response to Region IV Task Interface Agreement 96TIA008 - Evaluation of Definition of Continuous Fire Watch (TAC No. M96550), dated August 17, 1998, [Adams No. ML01240048]
 Monthly Fire Inspection Report Log for the period August 2004 through March 2006
 Transient Combustible Permits, 1-05-0056 and 1-06-0044 for Fire Area/Zone 1404
 U. S. Consumer Product Safety Commission, Release # 06-084, SFC America Recall to Repair Fire Extinguishers, dated February 7, 2006
 Hatch Shift Turnover Records for 7/4/04, 10/29/05, 1/1/06, and 4/2/06
 Hatch Lesson Plan LC-LP-03602-00, Appendix R Refresher
 EPRI TR-100249R1s, Emergency Battery Lighting Unit Maintenance and Application Guide
 EPRI TR-106826 4031-01, Battery Performance Monitoring by Internal Ohmic Measurements
 Figure 6.1-2, Emergency Core Cooling System Initiation Signals Summary, Rev. 19
 Figure 7.19-1, Low Low Setpoint (LLS) Relief Logic Diagram, Rev. 19
 Figure 7.19-2, LLS Logic for Channel A, Rev. 19
 Figure 7.19-3, Channels A and C Indicators, Rev. 19
 Figure 8.7-1, 120-208/120-240 V AC Power System, Rev. 19
 Design Philosophy for Fire Detectors at E. I. Hatch Nuclear Plants, Rev. 2
 Units 1 & 2 Hatch Penetration Seal Installation Details and Cross-Reference Matrix, Purchase Order 89-007000752, dated May 10, 1990

Condition Reports Reviewed During This Inspection

CR 2003800152, Evaluate actions to slide links in the SSA to determine if they are to achieve hot SSD and if an exemption from Appendix R is required.
 CR 2004108804, Functional test performed after installing switch 1C82-S2A may not have been adequate
 AI 2004203791, Determine the functional test requirements on the remote shutdown panel transfer switches
 CR 2004100126, Fire Discovered in the "Kelly" Building on the Refueling Floor
 CR 2004102990, Breaker Overheated and Smoke Seen Coming from Breaker on 1C 600 V AC Bus
 CR 2004104037, Fire Discovered on a Power Pole in the Yard Cause the Loss of the Baxley Loop

CR2005107490, Chrome Plastic Light Diffuser Fixtures are Being Melted by the Incandescent Light Bulbs When they are Illuminated

CR 2005109982, Drive Shaft Bearing for Iso Phase Bus Duct Cooling Fan Failed With Smoke and Small Fire

CR 2005110536, Fire in Unit 1 Main Transformer

CR 2006100755, Using unapproved manual actions to achieve post-fire safe shutdown

Condition Reports Generated as a Result of This Inspection

CR 2006104185, Procedure 34AB-X43-001-1, Fire Procedure has an error

CR 2006104550, As-Built Notice E.D. SC-04-1-0038 for replacement of RSDP Switch 1C82-S2B appears to have omitted drawing H-19610

CR 2006104628, No dedicated 8-hour emergency light for alternative shutdown instruments on Unit 1 (add existing emergency light 1R42-E038 to Appendix R lights)

CR 2006104663, No dedicated 8-hour emergency light for alternative shutdown instruments on Unit 2

CR 2006104675, Further review of corporate licensing response included an action item and closed out without communicating the information in the response to the site

CR 2006104131, Fire Pump Reliability - Securing Diesel Driven Fire Pump Nos. 2 and 3 Quarter-Turn Cooling Water Valves

CR 2006104137, Fire Hazards Analysis Section 9.2 has used an incorrect designation to identify the Detection Zone System Type

CR 2006104675, No site response to action item which required specific testing of the RSDP control switches for Appendix R functionality

LIST OF ACRONYMS

AC	Alternating Current
ADS	Automatic Depressurization System
AI	Action Item
APCSB	Auxiliary and Power Conversion Systems Branch
ATWS	Anticipated Transient Without Scram
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
DC	Direct Current
ELU	Emergency Lighting Unit
EPRI	Electric Power Research Institute
FA	Fire Area
FHA	Fire Hazards Analysis
FPP	Fire Protection Program
FZ	Fire Zone
HNP	Hatch Nuclear Plant
HPCI	High Pressure Coolant Injection
IP	Inspection Procedure
JPM	Job Performance Measures
MCC	Motor Control Center
MCR	Main Control Room
MOA	Manual Operator Action
NCV	Non-Cited Violation
NFPA	National Fire Protection Association
NRC	U. S. Nuclear Regulatory Commission
OEP	Operating Experience Program
P&ID	Piping and Instrumentation Drawings
RER	Request for Engineering Review
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
RPV	Reactor Pressure Vessel
RSDP	Remote Shutdown Panel
SCBA	Self-Contained Breathing Apparatus
SER	Safety Evaluation Report
SR	Surveillance Requirement
SSA	Safe Shutdown Analysis
SSD	Safe Shutdown
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
V	Volt