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

January 4, 2005

Carolina Power & Light Company
ATTN: Mr. C. J. Gannon
Vice President
Brunswick Steam Electric Plant
P. O. Box 10429
Southport, NC 28461

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC TRIENNIAL FIRE PROTECTION INSPECTION REPORT NOS. 05000325/2004010 AND 05000324/2004010

Dear Mr. Gannon:

On November 19, 2004, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick Units 1 and 2 facilities. The enclosed inspection report documents the inspection findings, which were discussed on that date with Mr. T. Cleary and other members of your staff.

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

This report documents one NRC-identified finding of very low safety significance (Green) involving a violation of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program, the NRC is treating the finding as a non-cited violation (NCV) consistent with Section VI.A of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator Region 2; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Brunswick Steam Electric Plant.

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 Publically Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

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Charles A. Casto, Director
Division of Reactor Safety

Docket Nos: 50-325, 50-324
License Nos: DPR-71, DPR-62

Enclosure: NRC Triennial Fire Protection Inspection Report 05000325, 324/2004010
w/Attachment: Supplemental Information

cc w/encl:
T. P. Cleary, Director
Site Operations
Brunswick Steam Electric Plant
Progress Energy Carolinas, Inc.
Electronic Mail Distribution

David H. Hinds
Plant Manager
Brunswick Steam Electric Plant
Carolina Power & Light Company
Electronic Mail Distribution

James W. Holt, Manager
Performance Evaluation and
Regulatory Affairs PEB 7
Carolina Power & Light Company
Electronic Mail Distribution

Edward T. O'Neil, Manager
Support Services
Carolina Power & Light Company
Brunswick Steam Electric Plant
Electronic Mail Distribution

(cc w/encl cont'd - See page 3)
(cc w/encl cont'd)
Lenny Beller, Supervisor
Licensing/Regulatory Programs
Carolina Power and Light Company
Electronic Mail Distribution

Steven R. Carr
Associate General Counsel - Legal Dept.
Progress Energy Service Company, LLC
Electronic Mail Distribution

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

Beverly Hall, Acting Director
Division of Radiation Protection
N. C. Department of Environment
and Natural Resources
Electronic Mail Distribution

Peggy Force
Assistant Attorney General
State of North Carolina
Electronic Mail Distribution

Chairman of the North Carolina
Utilities Commission
c/o Sam Watson, Staff Attorney
Electronic Mail Distribution

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

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

(cc w/encl cont'd - See page 4)

(cc w/encl cont'd)
David R. Sandifer
Brunswick County Board of
Commissioners
P. O. Box 249
Bolivia, NC 28422

Warren Lee
Emergency Management Director
New Hanover County Department of
Emergency Management
P. O. Box 1525
Wilmington, NC 28402-1525

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.:	50-325, 50-324
License Nos.:	DPR-71, DPR-62
Report Nos.:	05000325/2004010 and 05000324/2004010
Licensee:	Carolina Power and Light (CP&L)
Facility:	Brunswick Steam Electric Plant, Units 1 & 2
Location:	8470 River Road SE Southport, NC 28461
Dates:	November 1 - 5, 2004 (Week 1) November 15 - 19, 2004 (Week 2)
Inspectors:	C. Payne, Chief, Engineering Branch 2 (Lead Inspector) G. Wiseman, Senior Reactor Inspector N. Staples, Reactor Inspector F. Baxter, Electrical Engineer (Contractor)
Accompanying Personnel:	R. Rodriquez, Reactor Inspector T. Harrison, Fire Protection Co-op
Approved by:	Charles A. Casto, Director Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000325/2004-010, 05000324/2004-010; 11/01 - 05/2004 and 11/15 - 19/2004; Brunswick Steam Electric Plant; Triennial Fire Protection.

The report covered an announced two-week period of inspection by three regional inspectors and a contractor. One Green non-cited violation was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of Brunswick Steam Electric Plant Unit 1 Updated Facility Operating License DPR-71, and Unit 2 Updated Facility Operating License DPR-62, Condition 2.B. (6), for the licensee's failure to adequately implement the fire protection program. In 480 volt switchgear room E7 (Fire Area DG-8), Division II (Train B) circuits in two conduits were routed closer than 20 feet from the redundant Division I (Train A) circuits in the designated separation zone without being protected by a one-hour fire rated barrier, as required. A fire in this area could damage the unprotected cables to components required to achieve and maintain safe shutdown.

  This finding is greater than minor because it affected the Mitigating Systems Cornerstone objective of equipment availability and reliability, in that required fire barriers for equipment and circuits relied upon for safe shutdown following a fire were not in place. This finding is of very low safety significance because of the low likelihood of fire ignition of transient combustible materials in critical locations near the affected circuits and the exposure transit time of lubricating oil in area DG-8 during diesel generator oil changes is extremely low. In addition, other defense-in-depth fire protection elements including transient combustible administrative controls, passive fire barriers, automatic fire detection, manual suppression capability, and safe shutdown capability from the main control room were still available and effective. (Section 1R05.09)

B. Licensee-Identified Violations

None

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems and Barrier Integrity

1R05 Fire Protection

The purpose of this inspection was to review the Brunswick Steam Electric Plant (BSEP) fire protection program (FPP) for selected risk-significant fire areas. Emphasis was placed on verification that the post-fire safe shutdown (SSD) capability [from both the main control room (MCR) and the remote shutdown panel (RSP)] and the fire protection features provided for ensuring that at least one redundant train of SSD systems is maintained free of fire damage. The inspection was performed in accordance with the U.S. Nuclear Regulatory Commission's (NRC) Reactor Oversight Process using a risk-informed approach for selecting the fire areas (FA) and attributes to be inspected. The inspectors used the licensee's Individual Plant Examination for External Events and in-plant tours to choose three risk-significant FAs for detailed inspection and review. The FAs (or fire zones) chosen for review during this inspection were:

- **Fire Area CB-23, Control Building, Unit 2 Main Control Room:** The MCR area is shared between Unit 1 and Unit 2. The inspection focused on the Unit 2 MCR area. A fire in this area could involve evacuation of the MCR for both units and alternate shutdown of both units from their RSPs.

- **Fire Area DG-8, Diesel Building, E7 Switchgear Room:** This area contains Division I (Train A) and Division II (Train B) SSD cables within the same FA. This area has an Appendix R exemption based on a 20-foot (ft) combustible free zone between the Train A E7 switchgear and the Train B cables associated with the E4 switchgear. A fire in this area could involve shutdown of both units from the MCR.

- **Fire Area RB2-North, Fire Zone RB2-1-g(NC), Unit 2 Reactor Building:** This fire zone (FZ) is the north central area of the 20 ft level of the Unit 2 reactor building. The FA includes adjacent FZ RB2-1g(NW), adjacent FZ RB2-1g(NE), and FZ RB2-1g(EC). Fire Zone RB2-1g(SE) contains the Unit 2 RSP. Fire Zone RB2-1-g(NC) contains motor control centers (MCCs) 2XDA, 2XA, 2XA-2, 2XJ; Train A SSD cables; and cables for Residual Heat Removal (RHR) system Train B. A fire in this area could involve shutdown of Unit 2 from the MCR using Train B equipment.

The inspectors evaluated the licensee's FPP against applicable requirements, including BSEP Units 1 and 2 Updated Facility Operating License Condition 2.B.(6), Fire Protection Program; Title 10 of the Code of Federal Regulations (CFR), Part 50, Appendix R; 10 CFR 50.48; commitments to Branch Technical Position (BTP) Chemical and Mechanical Engineering Branch (CMEB) 9.5-1; related NRC safety evaluation reports (SERs); and plant Technical Specifications. The inspectors also reviewed related FPP requirements, as described in the Updated Final Safety Analysis Report (UFSAR), including Section 9.5.1, Fire Protection System, Fire Hazards Analysis, Fire Protection Program Description and the Post-Fire Safe Shutdown Analysis (SSA) Report. The inspectors evaluated all areas of this inspection, as documented below, against these requirements.

Specific documents reviewed by the inspectors are listed in the attachment.

.01 Systems Required to Achieve and Maintain Post-Fire Safe Shutdown

a. Inspection Scope

In addition to the requirements listed above, the inspectors reviewed the BSEP Appendix R Separation Analysis, SSD Component Index, SSD cable routing data sheets, electrical elementary drawings, and related operating procedures to evaluate the licensee's methodology for SSD in the event of a fire in any of the three selected FAs. Specifically, the following systems were selected: Reactor Core Isolation Cooling System (RCIC), Automatic Depressurization System, RHR System, Low Pressure Coolant Injection mode of RHR, and RHR Service Water System. The inspection was conducted taking into consideration off-site power being unavailable. The inspectors performed in-plant tours of the three FAs to identify equipment locations and layout. Specific documents and drawings reviewed during the inspection are listed in the attachment.

The objectives of this review were to:

- Verify that the licensee's post-fire safe shutdown methodology had correctly identified the components and systems necessary to achieve and maintain SSD conditions.
- Confirm the adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring and support system functions.
- Verify that SSD can be achieved and maintained with or without off-site power unless it can be confirmed that a postulated fire in any of the selected FAs could not cause the loss of off-site power.
- Verify that local manual operator actions are consistent with the plant's fire protection licensing basis.

The inspectors evaluated whether the SSA properly identified and categorized components in terms of safe shutdown function. The SSD components which were reviewed for operability during and after a fire in each of the selected FAs listed in the attachment.

The MCR (remote) and in-plant manual operator actions (local) for controlling plant operation, fire response, and achieving a SSD condition in response to a severe fire in the selected FAs were reviewed and walked down by the inspectors. To accomplish this task, the inspectors evaluated the following procedures:

- Annunciator Panel Procedure (APP) 0APP-UA-26, Panel 1-9, Fire Reactor Number (No.) 2 Elevation 20 East
- 0APP-UA-26, Panel 5-8, Fire Reactor No. 2 Elevation 20 CRD 1 & 2
- 0APP-UA-27, Panel 4-7, Fire Control Building Unit 1 EER
- 0APP-UA-27, Panel 5-8, Fire Control Building Control Room
- Pre-Fire Plan (PFP) 0PFP-013, General Fire Plan
- 0PFP-CB, Control Building Pre-fire Plans

- 2PFP-RB, Reactor Building Pre-fire Plans
- Alternative Safe Shutdown (ASSD) Procedure 0ASSD-00, User's Guide
- 0ASSD-01, Alternative Safe Shutdown Procedure Index
- 0ASSD-02, Control Building
- 1ASSD-03 (and 2ASSD-03), Unit 1 (and Unit 2) Train B Shutdown
- 1ASSD-04 (and 2ASSD-04), Unit 1 (and Unit 2) Train A Shutdown
- 2ASSD-05, Reactor Building North

The procedure reviews focused on ensuring that all required functions for post-fire safe shutdown, and the corresponding equipment necessary to perform those functions, were included in the procedures. The inspectors walked down applicable portions of the procedures listed above to verify that local manual operator actions were feasible and could be reliably performed in a timely manner.

b. Findings

No findings of significance were identified.

.02 Fire Protection of Safe Shutdown Capability

a. Inspection Scope

For the selected FAs, the inspectors evaluated the separation of systems necessary to achieve safe shutdown. The inspectors evaluated the separation of electrical components and circuits located within the same FA to ensure that at least one train of safe shutdown systems is free of fire damage. The inspectors reviewed the adequacy of the bus duct between 480 volt (V) Unit Substations E7 and E8 which penetrates the three-hour rated masonry wall separating FAs DG-8 and DG-9 to verify the separation of systems necessary to achieve safe shutdown. The inspectors reviewed the Diesel Generator (DG) loading calculation to determine if the DGs had sufficient capacity and capability to supply the required post-fire shutdown loads under various postulated conditions. Additionally, the power and control cables for the DG No. 3 fuel transfer pumps 3A and 3B, were reviewed to determine if they traversed FA DG-8.

For the selected FAs, the inspectors evaluated the potential for fires, the combustible fire load characteristics, potential exposure fire severity, the separation of systems necessary to achieve safe shutdown, and the separation of electrical components and circuits to ensure that at least one safe shutdown path was free of fire damage. The inspectors reviewed selected portions of the Unit 1 and Unit 2 Updated Facility Operating Licenses, UFSAR Section 9.5.1, administrative procedure (AP) 0AP-033, "Fire Protection Program Manual," and plant program procedure 0PLP-01.1, "Fire Protection Commitment Document." This review was conducted to determine if the licensee's commitments, as established in the fire protection licensing basis documents, were satisfied.

The inspectors reviewed licensee documents which establish and implement controls and practices to prevent fires, and to control the storage of permanent and transient combustible materials and ignition sources, to verify that the objectives established by

the NRC-approved FPP were satisfied. The documents reviewed are listed in the attachment.

The inspectors toured the selected plant FAs to observe: (1) the material condition of fire protection systems and equipment, (2) the storage of permanent and transient combustible materials, and (3) the licensee's implementation of the programmatic procedures for limiting fire hazards, combustible waste collection, housekeeping practices, and cleanliness conditions. These reviews were accomplished to ensure that the licensee was maintaining the fire protection systems, had properly evaluated in-situ combustible fire loads, controlled hot-work activities, and limited transient fire hazards in a manner consistent with the UFSAR, administrative procedures and other FPP procedures. In addition, the inspectors reviewed design control procedures to determine if plant changes were adequately evaluated for the potential impact on the FPP, safe shutdown equipment and plant procedures (as required by the FPP).

The inspectors reviewed operator and fire brigade staffing, fire brigade response, fire brigade qualification training, and fire drill program procedures, and fire brigade drill critiques for brigade shifts from January, 2002, to August, 2004. Fire brigade response and emergency/incident reports from January 2002 through February 2004, as well as corrective action program (CAP) Action Requests (ARs) resulting from fire, smoke, sparks, arcing, and equipment overheating incidents were reviewed. The reviews were conducted to assess the effectiveness of the fire prevention program and to determine whether fire brigade drills had been conducted in high fire risk plant areas and whether fire brigade personnel training, qualifications, manning assignments, drill response, and performance met the requirements of the FPP.

The inspectors walked down the primary and secondary fire emergency equipment storage locker locations and dress-out areas to evaluate equipment accessibility and functionality. The inspectors inspected the fire brigades protective ensembles, self-contained breathing apparatus (SCBA), smoke control equipment, and various fire brigade equipment to determine operational readiness for fire fighting. The fire brigade SCBAs were reviewed for adequacy as well as the availability of supplemental breathing air bottles and the capability to refill these bottles. The inspectors observed whether backup emergency lighting was provided for access pathways to and within the fire brigade staging and dress-out areas in support of fire brigade operations should power fail during a fire emergency. Additionally, the inspectors assessed the adequacy of the off-site fire fighting assistance including entry into the plant area, communications, dosimetry, and fire equipment usage.

The inspectors reviewed fire fighting pre-fire plans and fire response procedures for the selected FAs to determine if appropriate information was provided to fire brigade members to identify SSD equipment and to facilitate suppression of an exposure fire that could impact SSD capability. The inspectors walked down the selected FAs to compare the associated pre-fire plans and drawings with as-built plant conditions and fire response procedures. This was done to verify that fire fighting pre-fire plan instructions and drawings were consistent with the fire protection features and potential fire conditions described in the fire hazards analysis. The inspectors also evaluated whether the fire response procedures and pre-fire plans for the selected FAs could be implemented as intended.

The inspectors reviewed criteria in the licensee engineering department standards and design control procedures to verify that plant changes were adequately reviewed for the potential impact on the FPP, fire protection features, SSD equipment, and procedures as required by BSEP Unit 1 and Unit 2 Updated Facility Operating License, Condition 2.B.(6). The inspectors also performed a review of flow diagrams and flooding analysis calculations, for fire suppression-caused flooding associated with the Unit 2 reactor building and DG building floor drains. This review focused on ensuring that ASSD systems and operator actions required for post-fire safe shutdown would not be inhibited by the effects of a fire event, fire brigade activities, or fire suppression systems within the selected FAs or from an adjacent plant area/zone.

b. Findings

No findings of significance were identified.

.03 Post-Fire Safe Shutdown Circuit Analysis

a. Inspection Scope

The inspectors performed a review of selected SSD equipment, including a number of valves, instruments, and other equipment, which the licensee credited for mitigating a fire in each of the three selected FAs. This review included the SSA Report; Electrical Distribution Documents; Brunswick Cable Access Management System (BCAMS); BNP-E-9.006, Appendix R Separation Analysis; and control wiring diagrams (CWDs).

The inspectors also performed circuit analysis of SSD equipment in order to evaluate the potential effects of open circuits, short circuits, and shorts to ground of SSD equipment from fire induced damage in the three FAs chosen. The criteria for acceptance was that a fire in any of the FAs will not defeat the capability to achieve and maintain safe hot shutdown. The inspectors used CWDs and elementary diagrams to identify and evaluate circuits important to safe shutdown. These cables were reviewed to determine the plant areas that the cables were routed. The team inspected the relevant plant areas to verify the routing and barrier information contained in the design documents. The inspectors assessed the above information, SERs, and performed walkdowns to verify that protection of control and power cables were consistent with the licensing basis. The scope of the safe shutdown equipment reviewed is listed in the attachment.

b. Findings

No findings of significance were identified.

.04 Alternative Shutdown Capability

a. Inspection Scope

The inspectors reviewed the licensee's ASSD methodology to determine the adequacy of the identified components and systems used to achieve and maintain SSD conditions

for each of the selected FAs for review and to verify conformance with applicable requirements as mentioned in Section .01 above. Electrical diagrams of power and instrumentation cables required to support ASSD were analyzed for fire induced faults that could defeat operation from the MCR or the RSP. The inspectors verified that the selected SSD components were physically and electrically separated from the selected FAs. The electrical schematics were also evaluated to verify that circuits, capable of disabling control of SSD equipment due to fire damage, were isolated by the local transfer switches when placed in the local position. In addition, the inspectors reviewed wiring diagrams for instrumentation located on the RSP to verify necessary process monitoring was available per 10 CFR 50, Appendix R, Section III.L. The following Instrumentation loops required to support ASSD from the RSP were reviewed:

- 2-B21-LI-5977, Unit No. 2 Reactor Water Level
- 2-B21-LI-R604-BX, Unit No. 2 Reactor Water Level
- 2-CAC-LI-3342, Unit No. 2 Suppression Pool Water Level
- 2-CAC-TR-778, Unit No. 2 Suppression Pool Water Temperature

The licensee's FPP and plant configuration were reviewed to determine the components and systems necessary to achieve and maintain SSD conditions from the RSP in the event of fire in the MCR. The objectives of this evaluation were to:

- Verify that the licensee's alternative shutdown methodology had correctly identified the components and systems necessary to achieve and maintain an SSD condition.
- Confirm the adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring and support system functions.
- Verify that hot and cold shutdown from outside the MCR can be achieved and maintained with offsite power available or not available.

A sample of control circuits were reviewed to check they incorporated isolation / transfer switches as necessary to ensure that the RSP was independent of FA CB-23. Coordination of overcurrent protective devices in the isolation / transfer circuits was also reviewed.

b. Findings

No findings of significance were identified.

.05 Operational Implementation of Alternative Shutdown Capability

b. Inspection Scope

The inspectors reviewed the operational implementation of the ASSD capability that would be used during a severe fire in the MCR (FA CB-23). This review was performed to determine if: (1) the training program for licensed personnel included ASSD capability; (2) personnel required to achieve and maintain the plant in hot standby following a fire using the RSP could be provided from normal onsite staff, exclusive of the fire brigade; (3) the licensee had incorporated the operability of ASSD transfer and control functions into plant administrative procedures; and (4) the licensee periodically

performed operability testing of the ASSD instrumentation, and transfer and control functions.

The inspectors reviewed and walked down the following procedures that implemented the licensee's ASSD strategy:

- 0ASSD-01, Alternative Safe Shutdown Procedure Index
- 0ASSD-02, Control Building
  - Section A, Unit 2 SCO Actions
  - Section B, Unit 2 Rx Bldg MCC Operator Actions
  - Section D, Emergency Switchgear Operator Actions
  - Section E, Diesel Generator Operator Actions

The procedure reviews focused on ensuring that all required functions for post-fire safe shutdown, and the corresponding equipment necessary to perform those functions, were included in the procedures. The inspectors walked down each procedure and section listed above to verify that local manual operator actions were feasible and could be reliably performed in a timely manner.

b. Findings

No findings of significance were identified.

.06 Communications

a. Inspection Scope

The inspectors reviewed the ASSD sound-powered phone system for electrical isolation of the transfer circuits required for post-fire SSD at the RSP. During plant walk downs, the inspectors inspected the ASSD sound-powered phone jacks to confirm they were in good condition, free of foreign material, and installed at the proper locations to support required shutdown actions identified in the procedures. The inspectors reviewed ASSD Sound-Powered Phone System Functional Test Procedure 0PT-48.4, Revision 11 to assess whether the functional test was sufficient to verify proper isolation of the system.

The inspectors reviewed plant communication capabilities to evaluate the availability of the communication systems to support fire event notification, fire brigade fire fighting activities, and plant personnel in the performance of manual operator actions to achieve and maintain a safe shutdown condition. The inspectors reviewed the fixed plant communications systems (telephone/page) for use during safe shutdown, as credited in UFSAR Section 9.5.2. The inspectors also reviewed the use of the portable radio system for use during fire fighting activities. Both fixed and portable communication systems were reviewed for the impact of any damage which could results from fires in the selected FAs on the functions the systems were intended to support, and to ensure that the design of the systems was adequate to support operator and fire brigade actions, as applicable. The inspectors reviewed completed fire brigade drill critique reports for brigade shifts from January 2002 to August 2004 to assess proper operation and effectiveness of the fire brigade command post portable radio communications during fire drills and to identify any history of operational or performance problems with

radio communications during fire drills. In addition, the inspectors reviewed preventative maintenance and surveillance test procedures and test records to evaluate the licensee's maintenance practices for the communications equipment.

b. Findings

No findings of significance were identified.

.07 Emergency Lighting

a. Inspection Scope

The inspectors reviewed the design, placement, and operation of self-contained battery-powered emergency lighting units (ELU) and dedicated battery-powered portable ELUs. The inspectors verified battery power supplies were rated with at least an 8-hour capacity, as required by Section III.J of 10 CFR 50, Appendix R. During walk downs of selected FAs where operators perform local manual actions, the inspectors assessed area ELUs for proper operation. The ELUs were reviewed for the impact of any damage which could result from fires in the selected FAs. The inspectors reviewed the licensee's breaker/fuse coordination analysis for a sample of SSD power supplies (e.g., motor control centers and distribution panels) to verify that ELUs had proper breaker and fuse coordination. Specific breakers and circuits reviewed are listed in the attachment to this report. The inspectors assessed the aiming of lamp heads to verify sufficient illumination would be available to adequately illuminate the shutdown actions required by procedure, SSD equipment, equipment identification tags, and access and egress routes thereto. The inspectors also reviewed vendor manuals, maintenance, and surveillance procedures to ensure that the licensee properly maintained the ELUs.

The inspectors observed whether emergency exit lighting was provided for personnel evacuation pathways to the outside exits as identified in the National Fire Protection Association (NFPA) 101, Life Safety Code, and the Occupational Safety and Health Administration (OSHA) Part 1910, Occupational Safety and Health Standards. This review also included examination of whether backup emergency lighting was 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.

.08 Cold Shutdown Repairs

a. Inspection Scope

The inspectors reviewed the need for post-fire repairs to transition from hot standby to cold shutdown. The licensee's SSD methodology provides that one train of equipment will be free of fire damage from full power to hot standby to cold shutdown. The inspectors evaluated this capability for the FAs inspected with respect to cable separation and protection, operating procedures and equipment available post-fire to achieve and maintain hot standby and proceed to cold shutdown.

b. Findings

No findings of significance were identified.

.09 Fire Barriers and Fire Area/Zone/Room Penetration Seals

a. Inspection Scope

For the selected FAs, the inspectors evaluated the fire resistance of barrier enclosure walls, ceilings, floors, fire barrier mechanical and electrical penetration seals, fire doors, and fire dampers in accordance with the requirements of 10 CFR 50 Appendix R, Section III.G.2, BTP CMEB 9.5-1, Positions C.5.a, Building Design, and C.7, Guidelines for Specific Plant Areas. The review was performed to ensure that at least one train of SSD equipment was free of fire damage. This was accomplished by observing the material condition and configuration of the installed fire barrier features, as well as reviewing construction details, engineering evaluations and fire endurance tests for the installed fire barrier features, to verify that the as-built configurations were either properly evaluated or qualified by appropriate fire endurance tests. The fire protection features included in the review are listed in the attachment.

The inspectors reviewed fire barriers walls shown on the fire plan drawings for the selected FAs to evaluate the adequacy of the fire resistance of concrete and cellular concrete block enclosure walls. The inspectors also reviewed the fire loading calculations to verify that the loading used by the licensee was appropriate for determining the fire resistive rating of the fire barrier enclosures. In addition, the inspectors reviewed the licensing documentation, such as 10 CFR 50 Appendix R exemptions, engineering evaluations of fire barrier features, and engineering evaluations for NFPA code deviations to verify that the fire barrier installations met design requirements and licensing basis commitments.

The inspectors reviewed the design, installation details, and qualification testing for four mechanical fire dampers in the selected FAs. Selected fire damper location and vendor detail drawings, and heating, ventilation, and air conditioning system drawings were reviewed to verify that access to ASSD equipment and performance of SSD operator actions would not be inhibited by smoke migration through duct work from the area of a fire to adjacent plant areas/zones. The inspectors also reviewed engineering evaluations and a summary of completed inspection and maintenance procedures for three fire doors in the selected fire FAs. These reviews were performed to ensure that

these passive fire barrier features were properly inspected, maintained, and met the licensing and design bases as described in licensing submittals, SERs, and the UFSAR.

The inspectors selected four penetration fire seals in the selected FAs for review. The inspectors conducted a detailed examination of the seals to confirm proper installation and qualification. The inspectors reviewed installation details, penetration seal detail drawings, fire resistance and water tightness qualification tests, and the penetration seal engineering evaluation to verify that the fire seal installations met design requirements, license commitments, and standard industry practices. The inspectors compared the penetration seal ratings with the ratings of the barrier enclosures in which they were installed. The inspectors also reviewed the licensing documentation and engineering evaluations for NFPA code deviations to verify that the fire seal installations met design requirements and license commitments. In addition, the inspectors reviewed a summary of completed surveillance and maintenance procedures for the selected fire barrier walls to verify the fire seals were being adequately inspected and maintained.

The inspectors reviewed the physical configurations of electrical raceway fire barrier systems (ERFBS) in the selected FAs. Visual inspections of selected ERFBS barriers within the DG building, 480 V switchgear room E7 separation zone were performed to confirm that the one-hour fire rated barriers were installed on the required circuits and their installations were consistent with the tested configurations. The inspectors also reviewed design and installation drawings, qualifications testing documents and engineering analyses for the selected configurations. This was accomplished to verify that the selected ERFBS systems met their design and licensing basis.

b. Findings

Introduction: A non-cited violation (NCV) of BSEP Unit 1 Updated Facility Operating License DPR-71, and Unit 2 Updated Facility Operating License DPR-62, Condition 2.B. (6), for the licensee's failure to adequately implement the fire protection program. In 480 volt switchgear room E7 (Fire Area DG-8), Division II (Train B) circuits in two conduits were routed closer than 20 feet from the redundant Division I (Train A) circuits in the designated separation zone without being protected by a one-hour fire rated barrier, as required. A fire in this area could damage the unprotected cables to components required to achieve and maintain safe shutdown.

Description: 480 V switchgear room E7 (FA DG-8), is located in the southwest corner of the DG building on the 23-foot elevation. This room has a smooth floor without floor drains. The ceiling is of concrete beam construction. Ionization products of combustion smoke detectors are installed in the room at ceiling level within each of the beam pockets. The FA contains the Division I 480 V switchgear E7, a Division I dry substation transformer, and associated cables on the east side of the room. This switchgear is connected to DG No. 3 and is one of the emergency power supplies to several safety-related MCCs in the plant. Division II cables from the 4160 V E4 emergency switchgear (located in FA DG-14, on the 50-ft elevation of the building above FA DG-8) are routed in trays and conduits near the ceiling on the west side of the E7 switchgear room. Fire area DG-8 has an NRC approved exemption from certain Appendix R requirements as described in an SER dated December 30, 1986. In the SER , BSEP committed to separating redundant SSD circuits by a minimum of 20-ft with no intervening

combustibles, unless the circuits were protected by a one-hour fire rated barrier. The combustible free 20-foot separation zone begins at the face of the E7 bus and extends west to a line marked on the floor (this line was actually 22-ft from the E7 bus). The inspectors identified that two conduits from the E4 switchgear, containing Division II SSD control circuits, were located within the 20-ft separation zone without being protected by a one-hour fire rated barrier. Thus, a severe fire in this area could damage the redundant SSD control circuits. The licensee has corrected this problem by installing a one-hour fire rated barrier wrap on the conduits.

Analysis: The inspectors and risk analysts used the SDP to evaluate the effects of the finding during a fire that could occur in FA DG-8. Based on that analysis, the inspector and analysts concluded that this finding was greater than minor because it affected the Mitigating Systems Cornerstone objective of equipment availability and reliability, in that required fire barriers for equipment and circuits relied upon for SSD following a fire were not in place. The inspectors determined the fraction of a year credible transient combustible materials were in the area DG-8 (a barrel of lubricating oil transiting the area during DG oil changes) and multiplying that result by the yearly likelihood of a high energy electrical fire that could ignite the transient combustible material. Because the exposure transit time of lubricating oil in area DG-8 during DG oil changes is extremely low (less than four hours per year), and the likelihood of occurrence of a energetic electrical fault sufficient to ignite lubricating oil, given there is an spill on the floor, is extremely small; the initiating event frequency for a fire involving lubricating oil was determined to be less that the 1E-6 threshold of the Phase 1 SDP. Therefore, this finding was of very low safety significance (Green). In addition, other area fire protection defense-in-depth features, including transient combustible administrative controls, passive fire barriers, automatic fire detection, manual suppression capability, and safe shutdown capability from the MCR, were still available and effective.

Enforcement: 10 CFR 50.48 states, in part, “Each operating nuclear power plant must have a fire protection program that satisfies Criterion 3 of Appendix A to this part.” Brunswick Steam Electric Plant Unit 1 Updated Facility Operating License DPR-71, and Unit 2 Updated Facility Operating License DPR-62, Condition 2.B. (6), specify, in part, that the licensee implement and maintain in effect all provisions of the approved fire protection program as described in the UFSAR and as approved in the SER dated November 22, 1977, and subsequent supplements.

Appendix R Exemption SER dated December 30, 1986, states in part, that: “the licensee proposed to provide 20 foot separation zones which are free of intervening combustibles by protecting one train of redundant cables with one-hour fire rated barriers at locations where redundant trains are within 20 feet of one another.”

Contrary to the above, the licensee failed to properly implement the NRC approved fire protection program to install and maintain one-hour fire barriers for two conduits containing Division II (Train B) SSD circuits which were closer than 20 feet to their redundant counterparts in the DG-8 separation zone. Once identified, the licensee initiated corrective actions and compensatory fire watches in FA DG-8. Because the finding is of very low safety significance, was entered into the CAP (AR 142655), and was corrected during the inspection period, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000325,

324/2004010-001, Inadequate Implementation of the Fire Protection Program For ERFBS Fire Barrier Protection of Circuits In Fire Area DG-8.

.10 Fire Protection Systems, Features and Equipment

a. Inspection Scope

For a sample of fire protection systems, the inspectors reviewed the design of the manual fire fighting equipment and passive fire protection features. The inspectors verified that the selected components of fire protection water delivery and supply systems required for manual fire fighting and/or water-based fire suppression systems protecting redundant trains of systems for shutdown were not damaged or inhibited from fire-induced failures of electrical power supplies or control circuits. The inspectors reviewed the material condition, operational lineup, and operational effectiveness in accordance with the design and plant configuration. Additionally, the inspectors reviewed the post-fire hydrogen concentration calculations for the battery rooms to verify that hydrogen limits would not be exceeded following a loss of all battery room ventilation. The inspectors also assessed the separation for power and control cables of the electric-driven fire pump within FA DG-8. Cable and raceway system reports and inspector plant walkdowns were used to verify cable routes for the selected fire pump cables through FA DG-8.

The inspectors reviewed SSD calculations, vendor documentation, flow diagrams, cable routing information, system operating instructions, operational valve lineup procedures, and system availability studies associated with the fire pumps and fire protection water supply system. Using operating and test procedures, the inspectors toured 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 inspectors evaluated the common fire protection water delivery and supply components to assess if they could be damaged or inhibited by fire-induced failures of electrical power supplies or control circuits. In addition, the inspectors reviewed periodic surveillance and operability flow test data for the 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 those design requirements and acceptance criteria specified in procedure 0PLP-01.2, Fire Protection System Operability, Action, and Surveillance Requirements and the UFSAR.

For the selected FAs, the inspectors reviewed the adequacy of the design, installation, and operation of the automatic detection and alarm system to actuate in the early stage of a fire. This included walk downs of the systems and an examination of the types of detectors, detector spacing, the licensee's technical NFPA Code Compliance evaluation of the detector locations, and the ceiling, steel beam reinforcing plans to assess whether the areas were protected by a fire detectors in accordance with the Code of Record requirements (NFPA 72E, 1982). The inspectors also reviewed the licensee's submittals and associated SERs for the selected FAs to ensure that the fire detection systems for the selected FAs were installed in accordance with the design and licensing bases of the plant. Additionally, the inspectors reviewed fire detection surveillance procedures to determine the adequacy of fire detection component testing to ensure that the detection systems could function when needed.

The inspectors reviewed the manual suppression standpipe and fire hose system to verify adequate design, installation, and operation in the selected FAs. The inspectors examined flow measurement and 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 of the selected FAs, the inspectors observed placement of the fire hoses and extinguishers to verify they were not blocked and were consistent with the fire fighting pre-plan drawings and FPP documents. Additionally, the inspectors checked a sample of fire hose lengths to confirm they could reach the affected FAs in support of manual fire fighting efforts.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The inspectors reviewed the administrative controls for out-of-service, degraded, and/or inoperable, fire protection features. The inspectors reviewed selected active items on the fire protection impairment tracking log and compared them with the FAs selected for inspection. The compensatory measures that had been established in these areas were compared to those specified in procedure 0PLP-01.2 to verify that the risk associated with removing fire protection from service was properly assessed and adequate compensatory measures were implemented in accordance with the approved FPP. Additionally, the inspectors reviewed the adequacy of the licensee's short term compensatory measures to compensate for a degraded function or feature until appropriate corrective actions were taken.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

1. Triennial Fire Protection Review

a. Inspection Scope

The inspectors reviewed selected licensee audits, self assessments, and ARs to verify that items related to fire protection and SSD were appropriately entered into the licensee's CAP in accordance with the licensee's quality assurance program and procedural requirements. This review included ARs related to fire protection, post-fire SSD, and related operating experience.

Corrective action program ARs resulting from fire, smoke, sparks, arcing, and equipment overheating incidents for the period January 2002 to February 2004, as well as selected fire brigade response, emergency / incidents, and fire safety inspection reports, were reviewed. These review were 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 ARs, and operating experience program (OEP) documents to verify that industry-identified fire protection problems potentially or actually affecting BSEP were appropriately entered into, and resolved by, the CAP process. Items included in the OEP effectiveness review were 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 FPP 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.

4OA3 Event Followup 71153

(Discussed) LER 05000324/2002-02-00, Remote Shutdown Panel Power Supply Inverter Design Deficiency

The team reviewed this LER to determine if the incident described could cause a similar fire-induced failure on DG circuits in the MCR with a resulting failure of the RSP inverter. A fire-induced failure of the RSP inverter could result in a loss of the credited SSD makeup system, the RCIC system, during a severe fire in the MCR. In addition, the team reviewed the modified inverters to verify that a fully developed fire within the cabinet of the installed inverters would not propagate to nearby components of the distribution system. The team concluded that, in the event of a similar fire, the operators would most likely be able to contain the fire, and the MCR would not have to evacuated. The team also reviewed corrective actions for the conditions described in the LER and found them to be adequate.

4OA6 Meetings, Including Exit

On November 19, 2004, the lead inspector presented the inspection results to Mr. T. Cleary, and other members of his staff, who acknowledged the findings. Proprietary information was provided and examined during the inspection, however, proprietary information is not contained in this report.

Attachment: Supplemental Information

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:

L. Beller, Supervisor - Licensing/Regulatory Programs
T. Cleary, Director - Site Operations
S. Hardy, Fire Protection Engineer - Brunswick Engineering Support Services (BESS)
D. Hinds, Plant General Manager
G. Johnson, Supervisor - Nuclear Assessment
B. Kitchen, Manager - BESS
D. Neal, Training Specialist
E. O'Neil, Manager - Site Support Services
S. Tabor, Lead Engineer - Technical Support
H. Willets, Supervisor - BESS
M. Williams, Manager - Operations

NRC personnel:

E. DiPaolo, Senior Resident Inspector
J. Austin, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000325,324/2004010-001	NCV	Inadequate Implementation of the Fire Protection Program For ERFBS Fire Barrier Protection of Circuits In Fire Area DG-8 (Section 1R05.09)

Opened

None

Closed

None

Discussed

05000324/2002-02-00	LER	Remote Shutdown Panel Power Supply Inverter Design Deficiency

LIST OF POWER AND CONTROL CIRCUITS INSPECTED IN RELATION TO SAFE SHUTDOWN REQUIREMENTS

Section 1R05.03: Post-Fire Safe Shutdown Circuit Analysis

Component Identification	Description
1-B21-F013A	Auto Depressurization valve
1-B21-F013D	Auto Depressurization valve
1-B21-F013E	Auto Depressurization valve
1-CH-FCV-1122	Charging Pump Flow Control valve
1-CH-HCV-1310A	Charging to Loop 2 Isolation valve
2-E11-F047B	RHR Heat Exchanger 2B Inlet valve
2-E11-F003B	RHR Heat Exchanger 2B Outlet valve
2-E11-F048B	RHR Heat Exchanger 2B Bypass valve
2-E41-F004	HPCI Pump Suction from CST valve
2-E51-F010	RCIC Pump Suction from CST valve
2-E51-F013	RCIC Injection valve

Section 1R05.07: Emergency Lighting (Fuse/Breaker Coordination)

125/250 V DC Switchboard 2A, 2A-GJ0, Circuit Breakers GK1/GJ0
125/250 V DC Switchboard 2A, 2A-GJ2, Circuit Breakers GK1-GK2/GJ2
125/250 V DC Switchboard 2A, 2A-GJ6/2, Circuit Breakers GJ6
125/250 V DC Switchboard 2A, 2A-GJ7, Circuit Breakers GJ7
125/250 V DC Switchboard 2A, 2A-GK2, Circuit Breakers GB1/GB3
125/250 V DC Switchboard 2A, 2A-GK4, Circuit Breakers GK1–GK2/Fuse
125/250 V DC Switchboard 2B, 2B-GK5, Circuit Breakers GM2-GM3/Fuse
125/250 V DC Switchboard 2B, 2B-GL0, Circuit Breakers GM3/GL0
125/250 V DC Switchboard 2B, 2B-GL2, Circuit Breakers GM2/GL2
125/250 V DC Switchboard 2B, 2B-GL6/-GL6/2, Circuit Breakers GL6
125/250 V DC Switchboard 2B, 2B-GM2, Circuit Breakers GB4/GB6

Section 1R05.09: Fire Barriers and Penetration Seals

Fire Wall Identification	Description
Block Wall, 2-DGB-MAS-EL-023-9F	Diesel Generator Building Fire Area DG-8 to Fire Area DG-1

Fire Door Identification	Description
2-DGB-DR-El023-112	Fire Area DG-8, Fire Door to Fire Area DG-2
2-DGB-DR-El023-127	Fire Area DG-8, Fire Door to Fire Area DG-1
2-CTB-DR-El049-222	Fire Area CB-23, Door to Fire Zone CB-15

Fire Damper Identification	Description
2-DG-FDMP-03	Fire Area DG-8, Damper to Fire Area DG-14
2-DG-FDMP-25	Fire Area DG-8, Damper to Fire Area DG-09
2-DG-FDMP-12	Fire Area DG-8, Damper to Fire Area DG-1
2-RB-FDMP-87	Fire Area RB2-1, Fire Zone RB2-1g(NC), Damper to Fire Area RB2-6

Fire Barrier Penetration Seal Identification	Description
2-FP-DG-2-215	Fire Area DG-8, Conduit 9UN1/CB, Seal to Fire Area DG-1
2-FP-DG-2-216	Fire Area DG-8, Conduit 9UN2/CB Seal to Fire Area DG-1
2-FP-DG-2-222	Fire Area DG-8, Cable Raceway 63L/AB, Seal to Fire Area DG-2
2-FP-DG-2-244	Fire Area DG-8, Equipment Hatch to Fire Area DG-14

ERFBS Identification	Description
Fire Barrier Enclosure	Fire Area DG-8, One-Hour Rated ERFBS For Raceways 63L/AB and 64L/AB

LIST OF DOCUMENTS REVIEWED

Procedures

0AP-033, Administrative Procedure, Fire Protection Program Manual, Rev. 10
0AP-050, Administrative Procedure, Site Command, Control, and Communications Procedure, Rev. 8
0APP-UA-26, Annunciator Procedure for Panel UA-26, Alarms 1-9 and 5-8, Rev. 18
0APP-UA-27, Annunciator Procedure for Panel UA-27, Alarms 4-7 and 5-8, Rev. 28
0ASSD-00, Alternative Safe Shutdown Procedure, User's Guide, Rev. 30
0ASSD-01, Alternative Safe Shutdown Procedure, Alternative Safe Shutdown Procedure Index, Rev. 26
0ASSD-02, Alternative Safe Shutdown Procedure, Control Building, Rev.37
0ERP, Emergency Response Plan, Appendix B, Agreements, Rev. 64
0FPP-005, Fire Protection Procedure, Fire Watch Program, Rev. 25
0FPP-008, Fire Protection Procedure, Fire Protection Equipment Weekly Surveillance, Rev. 29
0FPP-013, Fire Protection Procedure ,Transient Fire Load Evaluation, Rev. 31
0FPP-014, Fire Protection Procedure, Control of Combustibles, Transient Fire Loads, and Ignition Sources, Rev. 26
0FPP-027, Fire Protection Procedure, Impairing Ionization-Type Fire Detectors, Rev. 10
0FPP-031, Fire Protection Procedure, Fire Brigade Staffing Roster and Equipment Requirements, Rev. 28
0MST- ELU11Q, Battery-Powered Emergency Lighting Units Functional Test, Rev. 2
0PFP-013, Pre-fire Plan Procedure, General Fire Plan, Rev. 22
0PFP-CB, 0PFP-CB-23, Pre-fire Plan Procedure, Control Building, Control Room, Rev. 3
0PFP-DG, 2PFP-DG-8, Pre-fire Plan Procedure, Diesel Generator Building, E7 Switchgear Room, Rev. 8
0PLP-01.1, Fire Protection Commitment Document, Rev. 26
0PLP-01.2, Fire Protection System Operability, Action, and Surveillance Requirements, Rev. 21
0PLP-01.5, Alternative Shutdown Capability Controls, Rev. 11
0PT-34.2.2.1, Fire Door, ASSD Access/Egress Door, Severe Weather Door Inspection, Rev. 30
0PT-34.2.4.4, Fire Detection System Circuit Testing: Diesel Generator Building, Rev. 7
0PT-34.5.2.1, Fire Hose Station Inspection, Rev. 4
0PT-48.4, Periodic Test Procedure, ASSD Sound-Powered Phone System Functional Test, Rev. 11
1APP-UA-14, Annunciator Procedure for Panel UA-14, Rev. 18
1ASSD-03, Alternative Safe Shutdown Procedure, Train B Shutdown, Rev. 19
1ASSD-04, Alternative Safe Shutdown Procedure, Train A Shutdown, Rev. 19
2ASSD-03, Alternative Safe Shutdown Procedure, Train B Shutdown, Rev. 18
2ASSD-04, Alternative Safe Shutdown Procedure, Train A Shutdown, Rev. 17
2ASSD-05, Alternative Safe Shutdown Procedure, Reactor Building North, Rev. 34
2PFP-RB, 2PFP-RB2-1gN, Pre-fire Plan Procedure, Reactor Building North, Rev. 6
ADM-NGGC-0203, Standard Procedure, Preventative Maintenance and Surveillance Testing Administration, Rev. 5
EGR-NGGC-00005, Engineering Change, Rev. 22
NGGM-PM-0007, Quality Assurance Program Manual, Rev. 8
SD-50.1, 4160 V AC Electrical Distribution System, Rev. 6

Drawings

D-02523, Reactor Building HPCI Sys, Sh.1, Rev. 53
D-02529, Reactor Building RCIC Sys, Sh.1, Rev. 53
D-02040, Unit 1 & Unit 2 Condensate & Demineralized Water Transfer Systems, Sh. 1B, Rev. 31
D-2764, Reactor Building Floor & Equipment Drains, Unit 2, Rev. 5
D-04106, Piping Diagrams Plant Fire Protection System, Units 1& 2, Rev. 18
D-42013, Unit 1 Appdx R SSD Analysis RHR Sys, Shutdown Cooling (RHR-SDC) Train-A, Rev. 11
D-42014, Unit 1 Appdx R SSD Analysis RHR Sys, Shutdown Cooling (RHR-SDC) Train-B, Rev. 12
D-42017, Unit 1 Appdx R SSD Analysis RCIC Sys, Train-A, Rev. 13
E-302-675, Sh.3, Chemical and Volume Control FSAR Figure 9.3-16, Rev. 22
F-02011, Diesel Generator Building, General Arrangement Plans, Rev. 9
F-03054, DC Single Line, Emergency Lighting Distribution, Rev. 14
F-04022, Diesel Generator Building, Fire Protection & Drainage Piping, Rev. 16
F-04169, Fire Damper Details, Rev. 1
F-04170, Fire Damper Schedule, Rev. 3
LL-FB-07207, Diesel Generator Building, Fire Barrier Penetrations, Switchgear Room, Rev. 6

Elementary Diagrams

1-FP-05889, Unit 1 Core Spray System E21-1040, Sh. 2, Rev. U
1-FP-50017, Unit 1 RHR System E11-1040, Sh. 4, Rev. Q
1-FP-50017, Unit 1 RHR System, Sh. 7, Rev. N
1-FP-05887, Unit 1 Automatic Depressurization System, Sh. 1, Rev. R
1-FP-05887, Unit 1 Automatic Depressurization System, Sh. 2, Rev. M
1-FP-05887, Unit 1 Automatic Depressurization System, Sh. 3, Rev. Q
9527-LL-9272, Unit 2 MCC 2XDA - Compt 2-B14 HPCI Pump Suction Valve from Condensate Storage Tank Valve 2-E41-F004 Cable Diagram, Sh. 18, Rev. 4
9527-LL-9273, Unit 2 MCC 2XDB - Compt B38 RCIC Pump Suction from Condensate Storage Tank Valve 2-E51-F010 Cable Diagram, Sh. 18, Rev. 8
F-02011, DG Bldg. General Arrangement, Plans, Unit 1 & Unit 2, Rev. 9
F-02018, DG Bldg. General Arrangement, Sections, Unit 1 & Unit 2, Rev. 5
F-03003, Unit 1 & 2 Aux. One Line Dgm. 4160 V Emergency System Swgr. E1 & E2, Rev. 10
F-03004, Unit 1 & 2 Aux. One Line Dgm. 4160 V Emergency System Swgr. E3 & E4, Rev. 10
F-03005, Unit 2 Aux. One Line Dgm. 480 V System Unit Sub. 2E, 2F, E7, E8 & Common, Rev. 19
F-03006, Unit 2 Single Line Dgm. 125-250 V DC System Dist. Swbd. 2A & 2B, Rev. 37
F-03007, Unit 2 Three Line Dgm. 125-250 V DC System Dist. Swbd. 2A & 2B, Rev. 24
F-03008, Unit 2 Three Line Dgm. 125-250 V DC System MCC 2XDA, 2XDB, 2TDA & 2TDB, Rev. 26
F-03049, Unit 2 Aux. One Line Dgm. 480 V System MCC 2XA, 2XC, 2XE, 2XG, 2XJ, 2XL & 2XA-2, Rev. 75
F-03054, Unit 1 & Unit 2 DC Single Line Emergency Lighting Distribution, Rev. 14

F-03057, Unit 1 & Unit 2 480 V System MCC DGA, DGB, DGC & DGD Aux. One Line Dgm., Rev. 38
F-03518, DG Bldg. Plan, Cable Tray, Bus Duct & Conduit, El. 23' 0", South, Rev. 30
F-03520, DG Bldg. Plan, Conduit, El. 50' 0", South, Sh. 1, Rev. 26
F-03520, DG Bldg. Plan, Conduit, El. 50' 0", South, Sh. 2, Rev. 6
F-03525, DG Bldg. Sections, Cable Tray and Conduit, Rev. 6
F-03690, Sound Powered Telephone System Cable & Interconnection Wiring Diagram, Sh. 5, Rev. 2
F-03695, Unit 2 Computer Reactor Building Terminal Box W18 Interconnection Wiring Diagram, Sh. 1, Rev. 8
F-03695, Unit 2 Computer Reactor Building Terminal Box W18 Interconnection Wiring Diagram, Sh. 2, Rev. 7
F-09115, Unit 1 & Unit 2 DG Bldg. El. 23' 0" South & 50' 0", App. A & R Fire Protection Covering, Sh. 2, Rev. 5
F-09729, Remote Shutdown System Cable & Interconnection Wiring Diagram, Sh. 2, Rev. 25
F-30005, Unit 1 Aux. One Line Dgm. 480 V System Unit Sub. 1E, 1F, E5, E6 & Common, Rev. 24
F-30006, Unit 1 Single Line Dgm. 125-250 V DC System Dist. Swbd. 1A & 1B, Rev. 36
F-30007, Unit 1 Three Line Dgm. 125-250 V DC System Dist. Swbd. 1A & 1B, Rev. 27
F-30049, Unit 1 480 V System MCC 1XA, 1XC, 1XE, 1XJ, 1XL & 1XA-2 Aux. One Line Dgm., Rev. 94
F-39031, Trip Calibration Cabinet "AQ6" ECCS DIV I CB-XU-63 CWD, Sh. 2, Rev. 18
F-39032, Trip Calibration Cabinet "AQ7" ECCS DIV II CB-XU-64 CWD, Sh. 2, Rev. 19
F-90729, Remote Shutdown System Cable & Interconnection Wiring Diagram. Sh. 1, Rev. 18
LL-09206, Unit 1 & Unit 2 MCC DGC Compt. DJ4 DG No. 3 Fuel Oil Transfer pp. No. 3B, Cable Diagram, Sh. 47, Rev. 4
LL-09206, Unit 1 & Unit 2 MCC DGC Compt. DJ4 DG No. 3 Fuel Oil Transfer pp. No. 3B, Cable Diagram, Sh. 48, Rev. 4
LL-09272, Unit 2 MCC 2XDA - Comp 2-B14 HPCI Pump Suction Valve from Condensate Storage Tank Valve 2-E41-F004 CWD, Sh. 17, Rev.10
LL-09273, Unit 2 MCC 2XDB - Compt B38 RCIC Pump Suction from Condensate Storage Tank Valve 2-E51-F010 CWD, Sh. 17, Rev.13
LL-07330-B21, Unit 2 Reactor Water Level 2-B21-LT-N026B Instrument Loop Diagram, Sh. 2, Rev. 2
LL-07330-B21, Unit 2 Reactor Water Level B21-LT-5977 Instrument Loop Diagram, Sh. 6, Rev. 0
LL-07330-CAC, Unit 2 CAC SYS. Level XMTR. & Indicator 2-CAC-LT-3342 & LI-3342 Instrument Loop Diagram, Sh. 2, Rev. 0
LL-07330-B21, Level XMTR & Switch B21-LT-N012D-3 & LSH-N017D-3 Instrument Loop Diagram, Sh. 4, Rev. 4
LL-03024, 125/250 V DC System DG Bldg. Dist. Pnl. 2A-HC1, Sh. 4, Rev. 13
LL-03024, 125/250 V DC System DG Bldg. Dist. Pnl. 12A-HZ3, Sh. 13, Rev. 21
LL-03024, 125/250 V DC System DG Bldg. Dist. Pnl. 1A-HA7, Sh. 4, Rev. 11
LL-03024, 125/250 V DC System DG Bldg. Dist. Pnl. 21A-HY3, Sh. 13, Rev. 16
LL-03024, 125/250 V DC System 230 kV Swyd. Relay Hse. Dist. Pnl. 8A HR6, Sh. 10, Rev. 11
LL-03024, 125/250 V DC System 230 kV Swyd.. Relay Hse. Dist. Pnl. 8B HR6, Sh. 11, Rev. 14
LL-09306, Unit 1 & Unit 2 MCC DGC Compt. DJ4 DG No. 3 Fuel Oil Transfer pp. No. 3A,

CWD, Sh. 15, Rev.4
LL-09306, Unit 1 & Unit 2 MCC DGC Compt. DJ4 DG No. 3 Fuel Oil Transfer pp. No. 3A, CWD, Sh. 16, Rev. 3
LL-09112, 4160 V Swgr. E2 Compt. AH7, Fire Pump Normal Feed CWD, Sh. 41, Rev. 6
LL-09112, 4160 V Swgr. E2 Compt. AH7, Fire Pump Normal Feed CWD, Sh. 41A, Rev. 7
LL-09114, 4160 V Swgr. E4 Compt. AL3, Fire Pump Normal Feed CWD, Sh. 44, Rev. 7
LL-09114, 4160 V Swgr. E2 Compt. AL3, Fire Pump Normal Feed CWD, Sh. 44A, Rev. 8
LL-09237, Unit 2 MCC 2XB Compt. 2DM8, RHR Heat Exchanger 2B Bypass Vlv CWD, Sh. 74, Rev. 12
LL-09237, Unit 2 MCC 2XB Compt. 2DM8, RHR Heat Exchanger 2B Bypass Vlv Cable Diagram, Sh. 75, Rev. 9
LL-09237, Unit 2 MCC 2XB Compt. 2DK8, RHR Heat Exchanger 2B Outlet Vlv CWD, Sh. 38, Rev. 14
LL-09237, Unit 2 MCC 2XB Compt. 2DK8, RHR Heat Exchanger 2B Outlet Vlv Cable Diagram, Sh. 39, Rev. 6
LL-09237, Unit 2 MCC 2XDB Compt.B41, RCIC Pump Discharge Vlv CWD, Sh. 23, Rev. 19
LL-09237, Unit 2 MCC 2XDB Compt.B41, RCIC Pump Discharge Vlv Cable Diagram, Sh. 24, Rev. 10
LL-09237, Unit 2 MCC 2XB Compt. 2DM7, RHR Heat Exch 2B Inlet Vlv CWD, Sh. 72, Rev. 13
LL-09237, Unit 2 MCC 2XB Compt. 2DM7, RHR Heat Exch 2B Inlet Vlv Cable Diagram, Sh. 73, Rev. 6

Calculations, Analyses, and Evaluations

0-89-00001, Calculation, Combustible Loading, Rev. 3
84-0483, Evaluation, Cellular Concrete Block Stairway Enclosure Wall, Diesel Generator Building, South End, Rev. 0
85-125-0-04-F, Evaluation, Cellular Concrete Floor and Wall Blockout Electrical Penetrations, Rev. 0
118-003, Specification of Seal Design # 7, Internal Conduit Seal, Rev. 7
0FP-0001, Battery Room Hydrogen Generation, Rev. 1
0FP-1035, Evaluation, Code Compliance, NFPA 72E - Diesel Generator Building and Service Water Building, Rev. 1
2Y56.F, Fire Zone Qualification Analysis, Rev. 0
BNP-E-7.010, Emergency Diesel Generator Static and Dynamic Load Study, Rev. 3C
BNP-E-6.085, 125/250 VDC Switchboard 2B/2A, Attch C., Rev. 0
BNP-E-9.006, Appendix R Separation Analysis, Attch 3, Rev.5
BNP-E-9.004, Safe Shutdown Analysis Report, Rev.6

Engineering Change Request

51090, Removal of NLI Inverter Common Mode DC Surge Suppression Circuit, Rev. 1
Plant Modification 83-013, Install New Equipment Hatches With 3-Hour Rated Fire Protection Material in The Diesel Generator Building
Plant Modification 85-124, Install UL Listed Fire Dampers in Accordance with UL 555, Rev. 1

Audits and Self-Assessments

27647, Self-Assessment Report, Fire Protection Program, dated October 15, 2001
83961, Self-Assessment Report, Fire Protection Program, dated October 17, 2003
107700, Self-Assessment Report, Fire Protection Program, dated June 30, 2004
B-FP-04-01, Nuclear Assessment Section, Fire Protection Assessment, dated September 28, 2004

Completed Surveillance Procedures and Test Records

Combustible Load Equivalents Inspections, OFPP-013, Attachment 3, Diesel Generator Building, Completed 7/24/03
Combustible Load Equivalents Inspections, OFPP-013, Attachment 3, Control Building, Completed 1/5/04
Hose Station Flow, Periodic Test Procedure OPT-34.7.2.1, Completed 4/29/03

Technical Manuals and Vendor Information

Data Sheet for Air Balance UL-Classified Fire Damper, Model 319ALV, Rev. C
Data Sheet for Allenco No. 7160 Adjustable Spray Shut-off Fire Hose Nozzle, W. D. Allen Manufacturing Co.
FP-81335, Exide Emergency Lighting
LEC 36, Exide Lightguard
LEC 361, Exide Lightguard
Underwriters Laboratory Letter to 3M Company, Type E50-D Endothermic Mat In 3-Hr Fire Rated Electrical Circuit Protective Systems For Conduit, Junction Box and Cable Bundle Drop Systems, dated June 23, 1986

Applicable Codes and Standards

NFPA 14, Standard for the Installation of Standpipe and Hose Systems, 1976 Edition
NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection, 1973 Edition
NFPA 20, Standard for the Installation of Centrifugal Fire Pumps, 1982 Edition
NFPA 72D, Standard for the Installation, Maintenance, and Use of Proprietary Protection Signaling Systems, 1973 Edition
NFPA 72E, Standard on Automatic Fire Detectors, 1974 Edition
NFPA 80, Standard on Fire Doors and Windows, 1983 Edition
NFPA 90A, Standard on Air Conditioning and Ventilating Systems, 1981 Edition
NUREG-1552, Supplement 1, Fire Barrier Penetration Seals in Nuclear Power Plants, dated January 1999
OSHA Standard 29 CFR 1910, Occupational Safety and Health Standards
Underwriters Laboratory Standard 401, Standard for Portable Spray Hose Nozzles for Fire Protection Service, dated August 27, 1993
Underwriters Laboratory Standard 555, Standard for Fire Dampers and Ceiling Dampers, dated May 14, 1979

Other Documents

Carboline Research and Development Laboratories, Report SR-144, Fire Test on Thermal

Transmission of Pyrocrete 241 at Varying Thicknesses, dated January 14, 1981
Fire Brigade Drill Critique Reports for Brigade Shifts from January, 2002 to August, 2004
FIR-NGGC-0003-2, Hot Work Permit 04-11-08, Rev. 0
FPT-CLS/LAB-LP-18F, Fire Protection Training Lesson Plan, Fire Hose, Foam and Appliances, Rev. 0
FPT-CLS-LP-1971, Fire Protection Training Lesson Plan, Fire Brigade Personal Protective Equipment/SCBA, Rev. 0
FPT-CLS-LP-001-A, Fire Protection Training Lesson Plan, Pre-Fire Plans, Rev. 0
HRI-SUBS-00350, Smoking Policy, Rev. 2
National Gypsum Fire Technology Laboratories, Report ZE-280, Fire Test on Penetration Seals In A Masonry Wall, dated June 28, 1978
NRC Information Notice 2003-08, Potential Flooding through Unsealed Concrete Floor Cracks, dated June 25, 2003
SEC-BNP-3005, Security Training Lesson Plan, Vehicle Search/Control Procedures, Rev. 12
U. S. Consumer Product Safety Commission, Recall of Whirlpool Dehumidifiers, dated January 31, 2002

License Basis Documents

Brunswick Individual Examination for External Events Submittal, dated June 30, 1995
Brunswick Safety Evaluation Report, dated November 22, 1977
Brunswick Safety Evaluation Report, dated April 6, 1979
Brunswick Safety Evaluation Report, dated June 11, 1980
Brunswick Safety Evaluation Report, dated November 10, 1981
Brunswick Safety Evaluation Report, dated July 27, 1983
Brunswick Safety Evaluation Report, dated December 30, 1986
Brunswick Safety Evaluation Report, dated May 29, 1987
Brunswick Safety Evaluation Report, dated August 27, 1987
Brunswick Safety Evaluation Report, dated February 10, 1994
Brunswick UFSAR Section 9.5.1, Fire Protection System, Rev. 18C
Brunswick UFSAR Section 9.5.1.4.4.3, Emergency Lighting System, Rev. 18C
Brunswick UFSAR Section 9.5.2, Communication Systems, Rev. 18C
Brunswick UFSAR Section 9.5.1.5, Fire Hazards Analysis, Rev. 18C
NRC Letter dated December 30, 1986 Subject: Exemption From Requirements Of Appendix R To 10 CFR Part 50, Sections III.G And J
Unit 1 Updated Facility Operating License, Condition 2.B.(6), Rev. 7/15/04
Unit 2 Updated Facility Operating License, Condition 2.B.(6), Rev. 7/15/04

Action Requests Reviewed

AR 111308, Associated with LER 2003003-00
AR 114938, Validation of DSP-005
AR 136088, Calculation 0-89-0001 Does Not Have Details To Confirm If In-situ Combustibles Inside Cabinets Were Considered
Action Requests resulting from fire, smoke, sparks, arcing, and equipment overheating incidents for the period January 2002 through February 2004

Action Requests Generated During this Inspection

AR 114112, ELU Battery Discharge Below Minimum Capacity
AR 142216, Unprotected Fire Safe Shutdown Raceways
AR 142365, BNP-E-9.004 Discrepancy, Battery Room HVAC and H2 Generation Calculation
AR 142611, PDP 2-8A & 2-8B Drawing Errors in Distribution Panel Breaker Interlock
AR 142655, UFSAR and SSA Discrepancy
AR 142759, ASSD Switchgear Operator Equipment Bag Inventory Improper Door Stops
AR 142781, BCAMS Fire Area/Fire Zone Data Missing
AR 143415, 0ASSD-02, Control Bldg, Rev. 37 Procedure Corrections/Enhancements
AR 143850, Risk Insights Associated with Combustible Controls
AR 144029, UFSAR Fire Zone Description for Unit 1 Computer Room Different Than Actual
AR 144035, 0PT-48.4, ASSD Sound Powered Phone Functional Test, Rev. 11 Procedure Corrections/Enhancements
AR 144084, Inadequate Documentation of Basis for Administrative Revisions to Plant Drawings
AR 144091, 0ASSD-02, Control Bldg, Rev. 37 Inconsistent with 0ASSD-05, Reactor Bldg North

LIST OF ACRONYMS

ADAMS	Agency-Wide Documents Access and Management System
AP	Administrative Procedure
APP	Annunciator Panel Procedure
AR	Action Request
ASSD	Alternative Safe Shutdown
BCAMS	Brunswick Cable Access Management System
BSEP	Brunswick Steam Electric Plant
BTP	Branch Technical Position
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CMEB	Chemical and Mechanical Engineering Branch
CWD	Control Wiring Diagram
DC	Direct Current
DG	Diesel Generator
ELU	Emergency Lighting Unit
FA	Fire Area
FPP	Fire Protection Program
FZ	Fire Zone
ERFBS	Electrical Raceway Fire Barrier Systems
ft	Foot (or Feet)
MCC	Motor Control Center
MCR	Main Control Room
NCV	Non-cited Violation
NFPA	National Fire Protection Association
No.	Number
NRC	U.S. Nuclear Regulatory Commission
OEP	Operating Experience Program
OSHA	Occupational Safety and Health Administration
PARS	Publicly Available Records Systems
PFP	Pre-Fire Plan
RCIC	Reactor Core Isolation Cooling System
RCS	Reactor Coolant System
RHR	Residual Heat Removal System
RSP	Remote Shutdown Panel
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
SER	Safety Evaluation Report
SSA	Safe Shutdown Analysis
SSD	Safe Shutdown
UFSAR	Updated Final Safety Analysis Report
V	Volt