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SERIAL: BSEP 95-0378
10 CFR 50.12

AUG 31 1995

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324/LICENSE NOS. DPR-71 AND DPR-62
REQUEST FOR EXEMPTION TO 10 CFR 50, APPENDIX R
FIRE PROTECTION PROGRAM FOR NUCLEAR POWER FACILITIES

Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Parts 50.12, Carolina Power & Light Company (CP&L) hereby requests an exemption from the requirements of 10 CFR Part 50, Appendix R, Section III.L.2.b for the Brunswick Steam Electric Plant (BSEP), Units 1 and 2. The exemption pertains to the extent that reactor coolant must remain above the top of the core during the use of the alternative shutdown system. This exemption would allow an additional method of reactor pressure and level control through the use of Low Pressure Coolant Injection and safety/relief valves as the redundant safe shutdown system. A revision to an existing exemption for Section III.G.2 separation is also requested to allow this additional method of reactor pressure and level control.

In addition, CP&L requests a revision to an existing exemption for Section III.G.2 separation to allow the use of fire stops as an additional option for establishing separation zones in Unit 1 and 2 Reactor Buildings.

Approval of these exemptions is needed to support CP&L's Thermo-Lag Resolution Actions identified in our letter dated March 23, 1995. CP&L has identified circuit modifications which, when implemented, will reduce the amount of Thermo-Lag required in the plant. Implementation of these modifications is currently scheduled for the 1996 refueling outages. If these exemptions are not acceptable to the NRC Staff, additional circuit modifications may be required in outages following the 1996 refueling outages due to guidance specified in NRC Information Notice 95-27 dated May 31, 1995. CP&L requests your response by December 15, 1995 in order to support planning activities for the upcoming Unit 2 refueling outage, which is currently scheduled to begin on February 2, 1996. CP&L considers this request to be a cost-beneficial licensing action for the Brunswick Plant, with anticipated savings in excess of \$400,000 for the plant. Therefore, CP&L requests that the proposed exemption be given appropriate review priority.

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Please refer any questions regarding this submittal to Mr. George Honma at
(910) 457-2741.

Sincerely,



William R. Campbell

GMT/gmt

Enclosure:

1. Basis for Exemption Request
2. List of Regulatory Commitments

cc: Mr. S. D. Ebnetter, Regional Administrator, Region II
Mr. D. C. Trimble, NRR Project Manager - Brunswick Units 1 and 2
Mr. C. A. Patterson, Brunswick NRC Senior Resident Inspector
The Honorable H. Wells, Chairman - North Carolina Utilities Commission

ENCLOSURE 1

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
NRC DOCKET NOS. 50-325 AND 50-324
OPERATING LICENSE NOS. DPR-71 AND DPR-62
REQUEST FOR EXEMPTION TO 10 CFR 50, APPENDIX R
FIRE PROTECTION PROGRAM FOR NUCLEAR POWER FACILITIES

BASIS FOR EXEMPTION REQUEST

INTRODUCTION

Based on our analysis and in accordance with the provisions of 10 CFR 50.12.a.1, Carolina Power & Light Company (CP&L) hereby requests exemption from the requirements of Section III.L.2.b of Appendix R to 10 CFR 50 to the extent that reactor coolant must remain above the top of the core during the use of the alternate shutdown system to achieve safe shutdown. This exemption would allow an additional method of reactor pressure and level control through the use of Low Pressure Coolant Injection and safety/relief valves as a redundant safe shutdown system. Based on this additional method, CP&L is also requesting a revision to the existing exemption of Section III.G.2 in the Reactor Building RB1-6 and RB2-6 fire areas associated with separation of safe shutdown components.

In addition, CP&L requests a revision to an exemption of Section III.G.2 in the Reactor Building RB1 and RB2 fire areas to allow the use of fire stops to establish the separation zone on the 50 foot elevation in lieu of the existing one hour fire barriers that are currently installed utilizing Thermo-Lag material.

These exemptions will not present an undue risk to the public health and safety, and are consistent with the common defense. Additionally, application of the regulation is not necessary to achieve the underlying purpose of the rule.

III.L Exemption:

Section III.L.2.b of 10 CFR 50, Appendix R requires that the reactor coolant level be maintained above the top of the core for boiling water reactors during a post fire shutdown using alternate shutdown systems.

The safe shutdown methodology credited in the Alternate Shutdown Capability Assessment and discussed in Section 2.1.1 of the NRC Safety Evaluation Report (SER) and revision of the SER was as follows:

"Systems required for safe shutdown in the event of a fire concurrent with a loss of offsite power, reactor shutdown is initiated from the control room by a manual scram of the control rods, if an automatic scram has not occurred. Reactor coolant inventory and pressure control can be maintained by the use of safety relief valves and Reactor Core Isolation Cooling (RCIC) or High Pressure Coolant Injection (HPCI)

systems during hot shutdown and by the use of the Residual Heat Removal (RHR) system Low Pressure Coolant Injection (LPCI) mode during cold shutdown."

CP&L's Alternative Safe Shutdown (ASSD) procedures presently utilize Reactor Core Isolation Cooling (RCIC) System (Train B Shutdown) or High Pressure Coolant Injection (HPCI) System (Train A shutdown) to provide reactor pressure and level control. CP&L proposes an additional method of reactor pressure and level control through the use of Low Pressure Coolant Injection and safety/relief valves as a redundant alternate shutdown system.

Basis for III.L Exemption

CP&L proposes to use the Low Pressure Coolant Injection and safety/relief valves option for a Train B Alternate Shutdown if RCIC becomes unavailable following a fire. The ASSD procedures will identify RCIC as the primary alternate shutdown system for Train B shutdown and utilize LPCI as a redundant system. This is consistent with the December 3, 1982, NRC memorandum from L. S. Rubenstein to R. J. Mattson, "Use of the Automatic Depressurization (ADS) and Low Pressure Coolant Injection to meet Appendix R, Alternate Shutdown Goals." An analysis (GE Calculation EAS-61-0989) has been performed to ensure that fuel cladding temperatures remain within acceptable limits for the period that the core may be uncovered. The analysis states that after the initial pressurization due to reactor isolation, reactor pressure would be reduced by cycling three safety relief valves (SRVs). At approximately 38 minutes into the event, water level is at the top of the core and cycling of the SRVs causes water level to swell at each operation until at approximately 40 minutes, with three SRVs open, the LPCI pumps inject coolant into the core returning reactor water to the required level. Adequate core cooling is provided during SRV operation due to coolant flow through the core.

This method of achieving safe shutdown is reflected in the existing BNP Emergency Operating Procedures and the ASSD Procedures for a Control Building and a Unit 2 north Reactor Building fire. The use of this shutdown method was reviewed by the NRC Region II during the Appendix R Inspection conducted during May - June 1989 and documented in NRC Inspection Report Nos. 50-325/89-11 and 50-324/89-11 dated July 21, 1989. The required components necessary to utilize LPCI for reactor pressure and level control were included in the original Alternate Shutdown Capability Assessment submitted April 24, 1984, since the RHR system LPCI mode was required to provide makeup water to the reactor from the torus after depressurization. These components and cables will be maintained as part of the Safe Shutdown Analysis and the appropriate procedure changes to reflect this shutdown methodology will be added to the ASSD procedures.

REVISIONS TO EXISTING EXEMPTIONS

CP&L submitted the Alternate Shutdown Capability Assessment Report (ASCA) for the Brunswick Steam Electric Plant (BSEP) Unit Nos. 1 and 2 on April 24, 1984 (Serial No. NLS-84-159). As part of this submittal, CP&L requested eleven (11) exemptions from Section III.G.2, III.G.3, and III.J of 10 CFR 50, Appendix R. These exemptions were

granted by the NRC in a letter dated December 30, 1986, and in clarifications to SER issued December 6, 1989.

The safe shutdown methodology identified in the Alternate Shutdown Capability Assessment and discussed in Section 2.1.1 of the SER was as follows:

"In the event of a fire concurrent with a loss of offsite power, reactor shutdown is initiated from the control room by a manual scram of the control rods, if an automatic scram has not occurred. Reactor coolant inventory and pressure control can be maintained by the use of safety relief valves and Reactor Core Isolation Cooling (RCIC) or High Pressure Coolant Injection (HPCI) systems during hot shutdown and by the use of the Residual Heat Removal (RHR) system Low Pressure Coolant Injection (LPCI) mode during cold shutdown."

The existing approved exemptions for which CP&L is requesting revision are:

- 1) Unit 1 Reactor Building (Fire Area RB1)
- 2) Unit 2 Reactor Building (Fire Area RB2)
- 3) Unit 1 Emergency Core Cooling System Room (Fire Area RB1-6)
- 4) Unit 2 Emergency Core Cooling System Room (Fire Area RB2-6)

RB1 and RB2 Exemptions

Basis for Existing Exemptions:

For the RB1 (Unit 1) and RB2 (Unit 2) exemptions, the existing exemptions' technical basis is as follows:

Exemption from III.G.2 provisions for safe shutdown separation features on -17, 20, and 50 foot elevations in Unit 1 and 2 Reactor Building.

Justification is based upon automatic detection and suppression, separation zone considerations, physical separation of redundant trains, water curtain, venting paths precluding stratification, use of fire stop and 1-hour barriers on exposed cables, and addition of sprinklers.

As stated in the SER, "The licensee proposes to (1) establish 20 foot wide separation zones free of significant quantities of intervening combustibles between the redundant safe shutdown trains on the -17, 20 and 50 foot elevations, (2) reroute exposed electrical cables in the separation zones out of the zone, place the cables in conduit, enclose the cables in non-combustible enclosures, or wrap the cables in 1-hour fire rated barriers, and (4) install closely spaced closed sprinklers and draft stops across each separation zone to serve as water curtains."

CP&L implemented modifications associated with this approach which were reviewed by the NRC Region II during a 1989 Appendix R Compliance Assessment (NRC Inspection Report Nos. 50-325/89-11 and 50-324/89-11 dated July 21, 1989).

Basis for Revision:

The Unit 1 and Unit 2 Reactor Building East separation zones on the 50 foot elevation contain a bank of six cable trays which pass through these zones. The cable loading in these six trays varies from 0 to 32 cables with corresponding tray fill from 0 to 5.54 percent. These cables are not required for safe shutdown following a fire. The control of combustibles and ignition sources in the separation zone is controlled by administrative procedures. Fire detection is also provided in the separation zone. CP&L has also installed closely spaced sprinklers in the separation zones to limit the spread of the fire.

The cable trays are currently wrapped with Thermo-Lag material. Based on the NRC's concern identified in Information Notice 95-27, CP&L proposes to remove the Thermo-Lag material and replace it with fire stops at the north and south ends of the separation zone similar to the design used in the Southwest corner of the Unit 1 Reactor Building Separation Zone. The typical configuration of the proposed fire stop design is shown in Attachment A. The combination of the administrative controls, closely spaced sprinklers acting as a water curtain, fire detection system, smoke draft stops and the addition of these cable tray fire stops provides assurance that a single fire will not adversely impact the ability to achieve and maintain safe shutdown.

This configuration of closely spaced sprinklers acting as a water curtain and cable tray fire stops establishing a separation zone was previously accepted by the NRC for the southwest corner of the Unit 1 Reactor Building (NRC Inspection Report Nos. 50-325/89-11 and 50-324/89-11 dated July 21, 1989).

RB1-6 and RB2-6 Exemptions

The existing exemption technical basis for the RB1-6 (Unit 1) and RB2-6 (Unit 2) fire areas (Emergency Core Cooling System (ECCS) Rooms) is described in detail in the Alternative Shutdown Assessment Capability Report, dated April 24, 1984, and the NRC Safety Evaluation Report dated December 30, 1986. A general summary of the technical basis supporting the existing exemption is the low fire potential; lack of ignition sources; electrical cables inside conduit; sufficient propagation retardancy; adequate separation and fire detection; installation of fire wrap, fuses, and a "quick response" sprinkler head; an inerted primary containment; and features of existing penetration seals.

The existing exemption was requested because the technical requirements of Section III.G.2 could not be met due to redundant shutdown components not separated by 20 feet free of intervening combustibles and because the fire area was not protected by a fixed automatic fire suppression system.

Basis for Revision:

The shutdown functions of concern in this area are the reactor pressure level control (RPLC), shutdown cooling (SDC), and residual heat removal cooling water (RHRCW). The specific redundant hot shutdown components of RPLC include the electrical cables and motor operators for the HPCI and RCIC steam outboard isolation valves (valves E41-F001 and E51-F008). These components are presently separated by a physical distance of approximately 8 feet. Shutdown following a fire in this area will be accomplished from the Control Room using normal shutdown systems.

CP&L proposes the use of Low Pressure Coolant Injection and safety/relief valves as a redundant safe shutdown system. The new redundant shutdown equipment components for the reactor pressure level control function for a fire in this area consist of electrical cables and motor-operated valves for the RHR injection inboard isolation Train A and B valves (E11-F015A and E11-F015B). Attachments B and C identify the location of the HPCI, RCIC and RHR isolation valves. The Train A and Train B RHR injection valves and cables are greater than 20 feet apart and are located between 9 to 19 feet from their redundant HPCI or RCIC isolation valve. A partial height concrete wall (approximately 5 ½ feet tall) is also located between these components and a fast response automatic sprinkler head is located adjacent to the RCIC steam outboard isolation valve. This fire area is also provided with a fire detection system.

The original exemption identified cable protection for the RCIC valve (E51-F008) and the RHR Shutdown Cooling valve (E11-F008) to ensure availability of these components in the event of a fire on the north side of the partial height wall. CP&L proposes to use the Low Pressure Coolant Injection System, if fire damage occurs to the RCIC or HPCI components and cables instead of fire wrap protection for these circuits. As stated above the separation between the LPCI valves and cables is greater than 20 feet with low fixed combustible loading in the area, partial height concrete wall, limited accessibility into the area during operation (locked fire door), area fire detection system, and a fast response automatic sprinkler head adjacent to the RCIC valve which provides suppression between the redundant safe shutdown components. Attachments B and C show the arrangement of the equipment located in the ECCS rooms (RB1-6 and RB2-6) and the distances between the components. The RHR Shutdown Cooling valve (E11-F008) is normally closed and is not required post-fire until shutdown cooling is necessary. CP&L will perform a manual operation of this valve if fire damage to the associated cabling results in a loss of the normal valve controls. Emergency lighting will be provided by means of portable lighting since this action is not required for hot shutdown.

As identified in the original exemption request, the fixed fire hazards in the area consist of the combustible jacket of the flexible conduits and approximately 45 pounds of grease distributed among and contained inside the motor-operated valves. This equates to an in-situ fire loading of less than 1 minute. CP&L has calculated the additional combustible loading due to the Thermo-Lag material in the fire area as part of our Thermo-Lag Resolution Actions and the fire loading increased to approximately 21 minutes. This loading is still considered low for the fire area; however, based on this change in shutdown methodology and to reduce the amount of combustibles in the area, CP&L plans to remove the existing Thermo-Lag in the fire area.

CP&L believes that adequate separation exists between the components in these fire areas, considering the existing fire protection features and the additional safe shutdown systems.

Conclusion

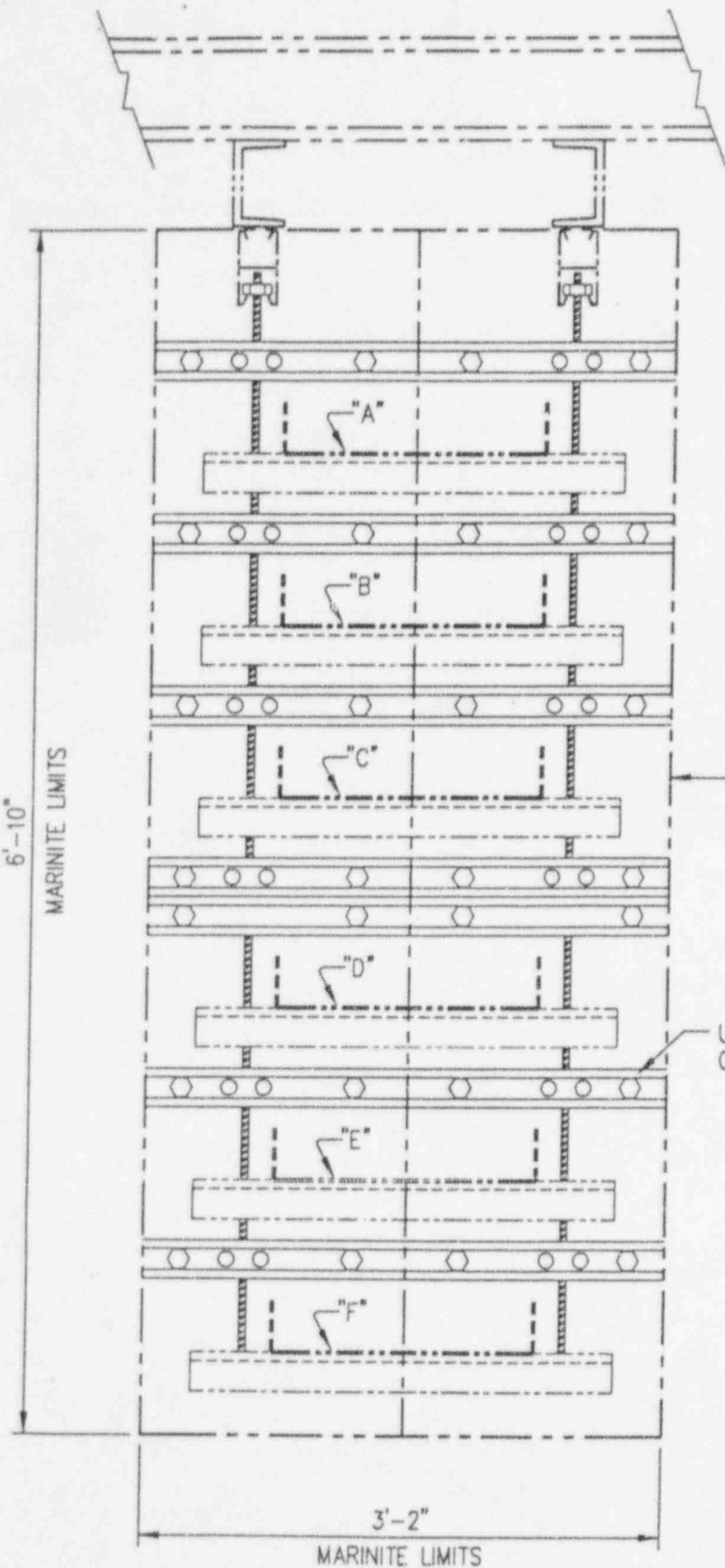
Carolina Power & Light Company believes that utilizing the Low Pressure Coolant Injection and safety/relief valves shutdown methodology in addition to the existing shutdown systems provides assurance of the achievement of safe shutdown following a fire and reduces the requirements for additional fire protective wrapping materials. Additionally, the use of fire stops to limit the propagation of fire through the separation zones in addition to the existing fire detection and suppression in the zones provides adequate means of assurance that the safe shutdown capability will be available following a fire.

Environmental Assessment Information

CP&L has concluded that there is no significant environmental impacts associated with the requested exemption.

References

- Alternative Shutdown Capability Assessment Report (ASCA) for the Brunswick Steam Electric Plant (BSEP) Unit Nos. 1 and 2 on April 24, 1984 (Serial No. NLS-84-159).
- GE Calculation EAS-61-0989 (Proprietary).
- NRC Inspection Report Nos. 50-325/89-11 and 50-324/89-11 dated July 21, 1989.
- NRC by letter dated December 30, 1986, and clarifications to Safety Evaluation (SER) issued December 6, 1989.
- NRC memorandum dated December 3, 1982, from L. S. Rubenstein to R. J. Mattson, "Use of the Automatic Depressurization (ADS) and Low Pressure Coolant Injection (LPCI) to meet Appendix R, Alternate Shutdown Goals."



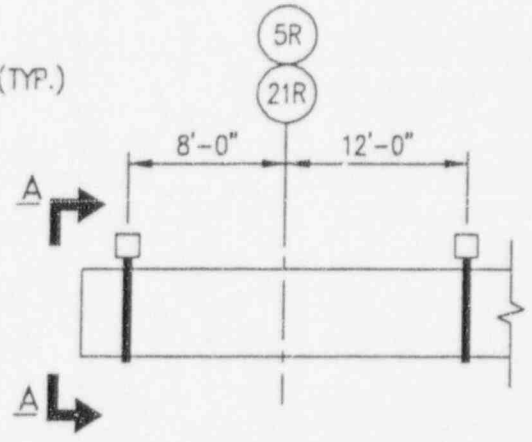
ELEVATION VIEW
"SECTION A-A"

UNIT 1		UNIT 2	
"A" = ▲ 47R/BA	"A" = ▲ 47G/BA	"B" = ▲ 45S/BA	"B" = ▲ 45G/BA
"B" = ▲ 45S/BA	"B" = ▲ 45G/BA	"C" = ▲ 45S/CA	"C" = ▲ 45G/CA
"C" = ▲ 45S/CA	"C" = ▲ 45G/CA	"D" = ▲ 47R/CA	"D" = ▲ 47G/CA
"D" = ▲ 47R/CA	"D" = ▲ 47G/CA	"E" = ▲ 48R/CA	"E" = ▲ 48G/CA
"E" = ▲ 48R/CA	"E" = ▲ 48G/CA	"F" = ▲ 45S/DA	"F" = ▲ 45G/DA
"F" = ▲ 45S/DA	"F" = ▲ 45G/DA		

NOTE:
TWO FIRE BREAKS PER UNIT - ONE AT EACH END OF 20' SEPARATION ZONE.

1" MARINITE BOARD FASTENED TO STEEL SUPPORTS

UNISTRUT CHANNEL (TYP.)

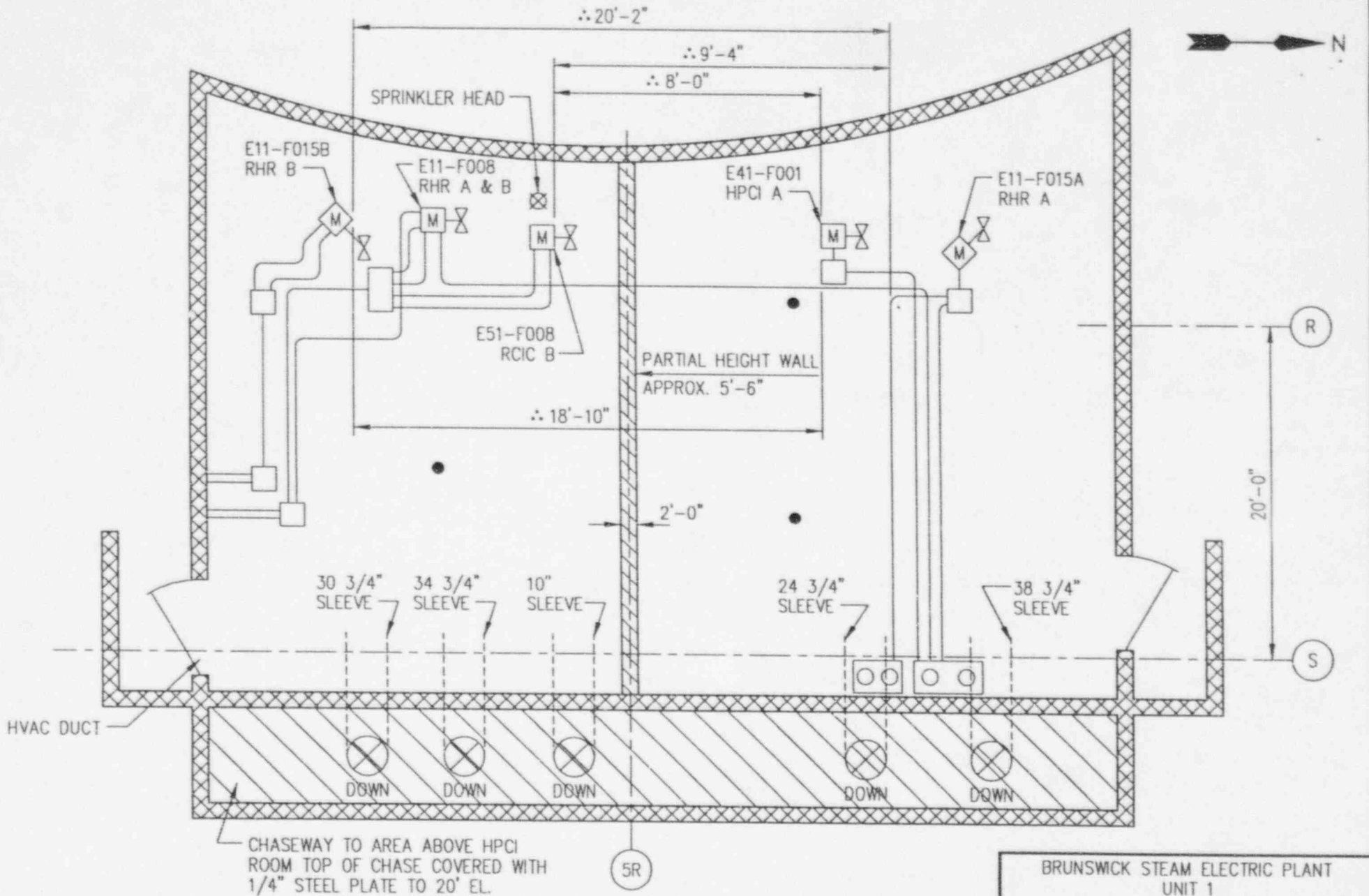


LOCATION PLAN

BRUNSWICK STEAM ELECTRIC PLANT
UNITS 1 & 2
CAROLINA POWER & LIGHT COMPANY

TYPICAL FIRE BREAK DESIGN
ELEVATION 50' - EAST

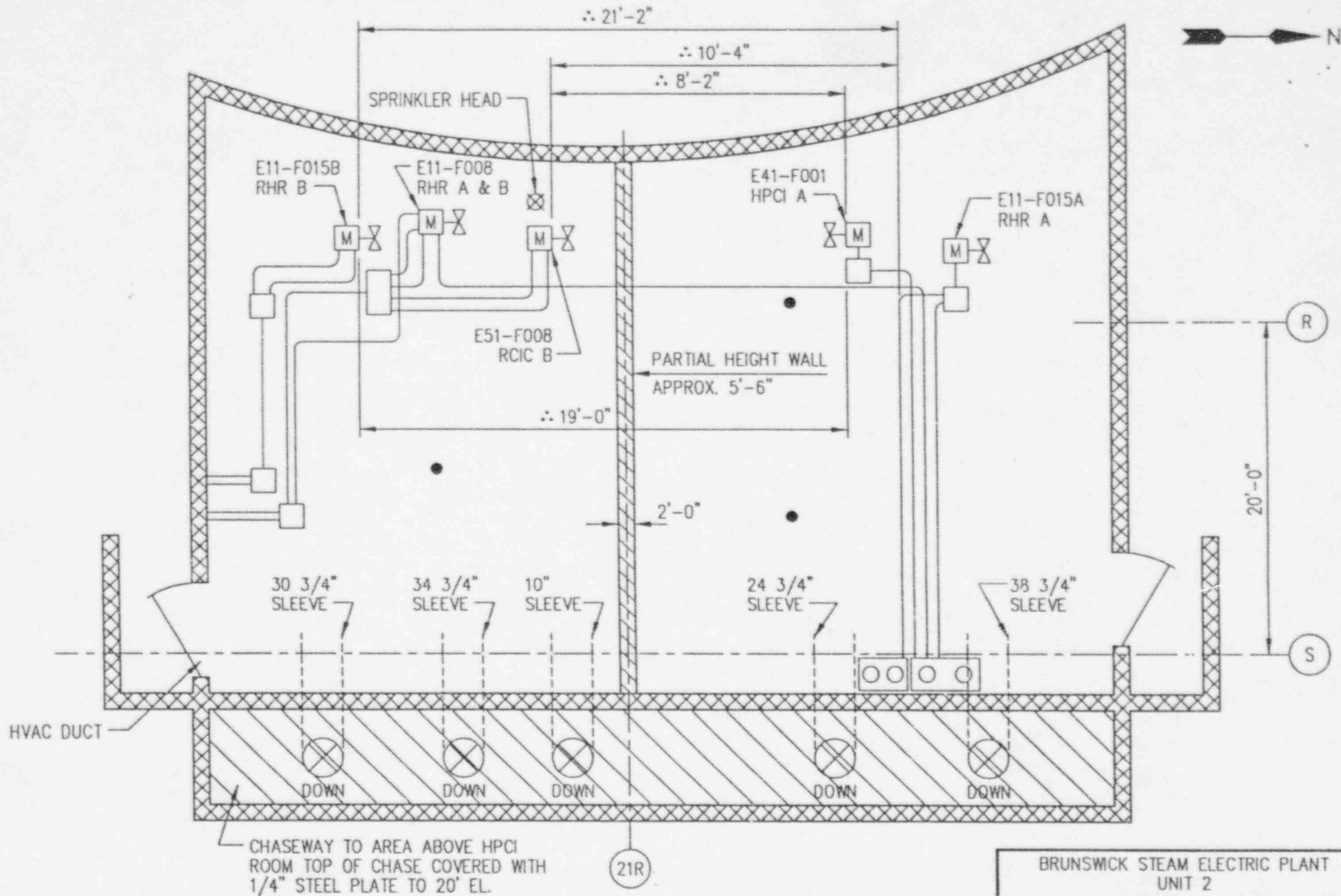
ATTACHMENT A'



APPROXIMATE LOCATIONS

● SMOKE DETECTORS

BRUNSWICK STEAM ELECTRIC PLANT UNIT 1 CAROLINA POWER & LIGHT COMPANY
FIRE AREAS RB1-6 SAFE SHUTDOWN RACEWAYS AND EQUIPMENT (N.T.S.)
ATTACHMENT B



APPROXIMATE LOCATIONS

● SMOKE DETECTORS

BRUNSWICK STEAM ELECTRIC PLANT UNIT 2 CAROLINA POWER & LIGHT COMPANY
FIRE AREAS RB2-6 SAFE SHUTDOWN RACEWAYS AND EQUIPMENT (N.T.S.)
ATTACHMENT C

ENCLOSURE 2

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324/LICENSE NOS. DPR-71 AND DPR-62
REQUEST FOR EXEMPTION TO 10 CFR 50, APPENDIX R
FIRE PROTECTION PROGRAM FOR NUCLEAR POWER FACILITIES

LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by Carolina Power & Light Company in this document. Any other actions discussed in the submittal represent intended or planned actions by Carolina Power & Light Company. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Manager-Regulatory Affairs at the Brunswick Nuclear Plant of any questions regarding this document or any associated regulatory commitments.

Commitment	Committed date or outage
1. Following approval of the revised exemptions, the Thermo-Lag utilized to meet the existing exemptions for the RB1-6 (Unit 1) and the RB2-6 (Unit 2) ECCS Rooms, protecting the RCIC steam isolation valve and RHR suction valve circuits will be removed.	N/A
2. Following approval of the revised exemptions, the Thermo-Lag utilized to meet the existing exemptions for the bank of six cable trays will be replaced with fire stops.	N/A