Docket No.

Docket Nos. 50-325
and 50-324

November 22, 1977

Carolina Power & Light Company
ATTN: Mr. J. A. Jones
Executive Vice President
336 Fayetteville Street
Raleigh, North Carolina 27602

Gentlemen:

The Commission has issued the enclosed Amendment No. 11 to Facility Operating License No. DPR-71 for Unit No. 1 and Amendment No. 37 to Facility Operating License No. DPR-62 for Unit No. 2 of the Brunswick Steam Electric Plant. These amendments consist of changes to the licenses for both units and to Apendix A-Prime of the Unit No. 1 license and are in partial response to your submittals of December 29, 1976, June 23, August 23, August 24 and September 20, 1977.

These amendments add license conditions relating to the completion of facility modifications for fire protection. Amendment No. 11 also revises the Unit No. 1 Appendix A-Prime Technical Specifications to incorporate limiting conditions for operations and surveillance requirements for existing fire protection systems and administrative controls. The enclosed Technical Specifications have been somewhat modified from those proposed in your August 23, 1977, submittal. These changes have been discussed with and agreed to by your staff.

Appendix A to License No. DPR-62 is presently being converted to Standard Technical Specification format (similar to the format of Appendix A-Prime for License No. DPR-71). Limiting conditions for existing Unit No. 2 fire protection systems also are being prepared in standard format and prior to restart of Unit No. 2, will be issued, as an integral part of the converted Appendix A Technical Specifications for that unit.

We have also received your submittals dated October 14, 1977, and November 8, 1977, which provide additional information in regard to some of the items identified in the Safety Evaluation as requiring additional information. These submittals are under review and the results of that review will be included in a supplement to the enclosed

Const. 1
50

OFFICE➤						
SURNAME➤						
DATE➤						

Safety Evaluation after completion of our review. You must also submit the remaining information indicated by the asterisked items of Section 3.1 of the Safety Evaluation Report and all the items of Section 3.2 except 3.2.1 by March 31, 1978. The information required by 3.2.1 must be submitted by September 30, 1978.

Copies of the Safety Evaluation and Notice of Issuance are also enclosed.

Sincerely,

Original signed by

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Enclosures:
1. Amendment No. 11 to DPR-71
2. Amendment No. 37 to DPR-62
3. Safety Evaluation
4. Notice

cc w/encl:
See next page

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NRC FORM 318 (9-76) NRCM 0240 ☆ U.S. GOVERNMENT PRINTING OFFICE: 1976 — 626-624

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 22, 1977

Docket Nos. 50-325
and 50-324

Carolina Power & Light Company
ATTN: Mr. J. A. Jones
Executive Vice President
336 Fayetteville Street
Raleigh, North Carolina 27602

Gentlemen:

The Commission has issued the enclosed Amendment No. 11 to Facility Operating License No. DPR-71 for Unit No. 1 and Amendment No. 37 to Facility Operating License No. DPR-62 for Unit No. 2 of the Brunswick Steam Electric Plant. These amendments consist of changes to the licenses for both units and to Appendix A-Prime of the Unit No. 1 license and are in partial response to your submittals of December 29, 1976, June 23, August 23, August 24 and September 20, 1977.

These amendments add license conditions relating to the completion of facility modifications for fire protection. Amendment No. 11 also revises the Unit No. 1 Appendix A-Prime Technical Specifications to incorporate limiting conditions for operations and surveillance requirements for existing fire protection systems and administrative controls. The enclosed Technical Specifications have been somewhat modified from those proposed in your August 23, 1977 submittal. These changes have been discussed with and agreed to by your staff.

Appendix A to License No. DPR-62 is presently being converted to Standard Technical Specification format (similar to the format of Appendix A-Prime for License No. DPR-71). Limiting conditions for existing Unit No. 2 fire protection systems also are being prepared in standard format and prior to restart of Unit No. 2, will be issued, as an integral part of the converted Appendix A Technical Specifications for that unit.

We have also received your submittals dated October 14, 1977, and November 8, 1977, which provide additional information in regard to some of the items identified in the Safety Evaluation as requiring additional information. These submittals are under review and the results of that review will be included in a supplement to the enclosed

Safety Evaluation after completion of our review. You must also submit the remaining information indicated by the asterisked items of Section 3.1 of the Safety Evaluation Report and all the items of Section 3.2 except 3.2.1 by March 31, 1978. The information required by 3.2.1 must be submitted by September 30, 1978.

Copies of the Safety Evaluation and Notice of Issuance are also enclosed.

Sincerely,

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Enclosures:
1. Amendment No. 11 to DPR-71
2. Amendment No. 37 to DPR-62
3. Safety Evaluation
4. Notice

cc w/encl:
See next page

cc: Richard E. Jones, Esquire
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Raleigh, North Carolina 27602

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Wilmington, North Carolina 28401

Southport - Brunswick County Library
109 W. Moore Street
Southport, North Carolina 28461

Mr. Steve J. Varnam
Chairman, Board of County
Commissioners of Brunswick County
Southport, North Carolina 28461

Office of Intergovernmental
Relations
116 West Jones Street
Raleigh, North Carolina 27603

Chief, Energy Systems
Analyses Branch (AW-459)
Office of Radiation Programs
U.S. Environmental Protection Agency
Room 645, East Tower
401 M Street, SW
Washington, D.C. 20460

U.S. Environmental Protection Agency
Region IV Office
ATTN: EIS COORDINATOR
345 Courtland Street, NW
Atlanta, Georgia 30308

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

CAROLINA POWER & LIGHT COMPANY

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 11
License No. DPR-71

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by Carolina Power & Light Company (the licensee) dated December 29, 1976, June 23, August 23, August 24, and September 20, 1977, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the applications, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, add paragraph 2.B(6) and paragraph 2.C.(2) of Facility Operating License No. DPR-71 is hereby amended to read as follows:

"(6) The licensee may proceed with and is required to complete the modifications identified in Paragraphs 3.1.1 through 3.1.35 of the NRC's Fire Protection Safety Evaluation Report on the Brunswick facility dated November 22, 1977. These modifications shall be completed by the end of the first refueling outage of Brunswick Unit 1 and prior to return to operation for Cycle 2. In addition, the licensee shall submit the additional information identified in Table 3.1 of this Safety Evaluation Report in accordance with the scheduled contained therein. In the event these dates for submittal cannot be met, the licensee shall submit a report explaining the circumstances, together with a revised schedule."

2.C.(2) Technical Specifications

The Technical Specifications contained in Appendices A, A-Prime and B, attached hereto, as revised through Amendment No. 11, are hereby incorporated in this license. Appendix A shall be effective from the date of issuance of the Unit 1 operating license until the Appendix A-Prime becomes effective on or before the initial criticality of Brunswick Unit 2 following its initial refueling outage. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications as indicated above. The licensee shall inform the Office of Inspection and Enforcement, Region II, of the date that the Appendix A-Prime becomes effective."

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: November 22, 1977

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

CAROLINA POWER & LIGHT COMPANY

DOCKET NO. 50-324

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 37
License No. DPR-62

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by Carolina Power & Light Company (the licensee) dated December 29, 1976, June 23, August 23, August 24, and September 20, 1977, comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the applications, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations:

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, add paragraph 2.B.(7) to Facility Operating License No. DPR-62 to read as follows:

"(7) The licensee may proceed with and is required to complete the modifications identified in Paragraphs 3.1.1 through 3.1.35 of the NRC's Fire Protection Safety Evaluation Report on the Brunswick facility dated November 22, 1977. These modifications shall be completed by the end of the second refueling outage of Brunswick Unit 2 and prior to return to operation for Cycle 3. In addition, the licensee shall submit the additional information identified in Table 3.1 of this Safety Evaluation Report in accordance with the scheduled contained therein. In the event these dates for submittal cannot be met, the licensee shall submit a report explaining the circumstances, together with a revised schedule."

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Date of Issuance:

ATTACHMENT TO LICENSE AMENDMENT NO. 11

FACILITY OPERATING LICENSE NO. DPR-71

DOCKET NO. 50-325

Revise A-Prime Technical Specifications as follows:

Remove Pages	Add Pages
-	3/4 3-50
-	3/4 3-51
-	3/4 3-52
-	3/4 7-35
-	3/4 7-36
-	3/4 7-37
-	3/4 7-38
-	3/4 7-39
-	3/4 7-40
-	3/4 7-41
-	3/4 7-42
-	3/4 7-43
-	3/4 7-44
B 3/4 3-4	B 3/4 3-4
B 3/4 7-3	B 3/4 7-3
-	B 3/4 7-4
6-1	6-1
6-2	6-2
-	6-3a
6-5	6-5
6-11	6-11
6-12	6-12
6-13	6-13
6-14	6-14

INSTRUMENTATION

FIRE DETECTION INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.5.7 As a minimum, the fire detection instrumentation for each fire detection zone shown in Table 3.3.5.7-1 shall be OPERABLE.

APPLICABILITY: Whenever equipment in that fire detection zone is required to the OPERABLE.

ACTION:

With one or more of the fire detection instrument(s) shown in Table 3.3.5.7-1 inoperable:

a. Within 1 hour, increase the inspection frequency for the zone(s) with the inoperable instrument(s) to at least once per hour, and

b. Restore the inoperable instrument(s) to OPERABLE status within 14 days or, in lieu of any other report required by Specification 6.9.1, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 30 days outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the instrument(s) to OPERABLE status.

c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.5.7.1 Each of the above required fire detection instruments shall be demonstrated OPERABLE at least once per 6 months by performance of a CHANNEL FUNCTIONAL TEST.

4.3.3.7.2 The non-supervised circuits between the local panels associated with the detector alarms of each of the above required fire detection instruments and the control room shall be demonstrated OPERABLE at least once per 31 days in accordance with approved procedures.

TABLE 3.3.5.7-1

FIRE DETECTION INSTRUMENTS

INSTRUMENT LOCATION	MINIMUM INSTRUMENTS OPERABLE		
	FLAME	HEAT	SMOKE
1. Reactor Building #1			
Zone 1 -17'	0	0	1
Zone 2 -17'	0	0	1
Zone 3 -17'	0	0	1
Zone 4 -17'	0	0	1
Zone 5 20'	0	0	1
Zone 6 20'	0	0	3
Zone 7 20'	0	0	3
Zone 8 50	0	0	3
Zone 9 50	0	0	4
Zone 10 80'	0	0	1
Zone 11 80'	0	0	1
Zone 12 80'	0	0	1
Zone 13 117'	0	0	1
2. Control Building			
Zone 1 70'	0	0	3
Zone 2 49'	0	0	1
Zone 3 49'	0	0	1
Zone 4 49'	0	0	9
Zone 5 49'	0	0	9
Zone 6 49'	0	0	1
Zone 7 23'	0	0	1
Zone 8 23'	0	0	1
Zone 9 23'	0	0	12
Zone 10 23'	0	0	12
Zone 11 23'	0	0	1
Zone 12 23'	0	0	1
3. Diesel Generator Building			
Zone 1 2'	0	0	7
Zone 2 2'	0	0	7
Zone 3 23'	0	3	0
Zone 4 23'	0	0	1
Zone 5 23'	0	0	1
Zone 6 23'	0	0	1
Zone 7 23'	0	0	1
Zone 8 23'	0	1	0
Zone 9 23'	0	1	0
Zone 10 50'	0	3	0

TABLE 3.3.5.7-1 (Continued)

INSTRUMENT LOCATION	MINIMUM INSTRUMENTS OPERABLE		
	FLAME	HEAT	SMOKE
4. Service Water Building			
Zone 1 -13'	0	1	0
Zone 2 20	0	3	0
5. AOG Building			
Zone 1 20'	0	0	1
Zone 2 20'	0	0	1
Zone 3 20'	1	0	1
Zone 4 36' - 11 1/2"	0	0	1
Zone 5 49'	0	0	1

PLANT SYSTEMS

3/4.7.7 FIRE SUPPRESSION SYSTEMS

FIRE SUPPRESSION WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.7.1 The fire suppression water system shall be OPERABLE with;

a. Two OPERABLE fire pumps, one motor-driven and one diesel-driven, each with a capacity of 2000 gpm, with their discharges aligned to the fire suppression yard main,

b. The fire protection water tank, with a minimum contained volume of 200,000 gallons, and the demineralized water tank, with a minimum contained volume of 90,000 gallons, and

c. An OPERABLE flow path capable of taking suction from each of the water supplies and transferring the water through the yard main and distribution piping with OPERABLE sectionalizing control or isolation valves to, but not including, the yard hydrant curb valves and the first valve ahead of each sprinkler and hose standpipe system required to be OPERABLE per Specification 3.7.7.2 and 3.7.7.4.

APPLICABILITY: At all times.

ACTION:

a. With one pump and/or one water supply inoperable, restore the inoperable equipment to OPERABLE status within 7 days or, in lieu of any other report required by Specification 6.9.1, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the next 30 days outlining the plans and procedures to be used to provide for the loss of redundancy in this system. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

b. With the fire suppression water system otherwise inoperable:

1. Establish a backup fire suppression water system within 24 hours, or

2. Be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours, and

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

3. In lieu of any other report required by Specification 6.9.1, submit a Special Report in accordance with Specification 6.9.2;

   a) By telephone within 24 hours,

   b) Confirmed by telegraph, mailgram or facsimile transmission no later than the first working day following the event, and

   c) In writing within 14 days following the event, outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.7.7.1.1 The fire suppression water system shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying the contained water supply volume is at least the minimum specified.

b. At least once per 31 days on a STAGGERED TEST BASIS by starting each pump and operating it for at least 15 minutes.

c. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

d. At least once per 12 months by cycling each testable valve in the flow path through at least one complete cycle of full travel.

e. At least once per 18 months by performing a system functional test which includes simulated automatic actuation of the system throughout its operating sequence, and:

   1. Verifying that each pump develops at least 2000 gpm at a system head of 125 psig,

SURVEILLANCE REQUIREMENTS (Continued)

2. Cycling each valve in the flow path that is not testable during plant operation through at least one complete cycle of full travel, and

3. Verifying that each fire pump starts sequentially to maintain the fire suppression water system pressure $\geq$ 125 psig.

f. At least once per 3 years by performing a flow test of the system in accordance with Chapter 5, Section 11 of the Fire Protection Handbook, 14th Edition, published by the National Fire Protection Association.

4.7.7.1.2 The fire pump diesel engine shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying;

1. The fuel storage tank contains at least ___ gallons of fuel, and

2. The diesel starts from ambient conditions and operates for at least 20 minutes.

b. At least once per 92 days by verifying that a sample of diesel fuel from the fuel storage tank, obtained in accordance with ASTM-D270-65, is within the acceptable limits specified in Table 1 of ASTM D975-74 for standard #2 fuel oil.

c. At least once per 18 months, during shutdown, by:

1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for the class of service, and

2. Verifying the diesel starts from ambient conditions on the auto-start signal and operates for $\geq$ 20 minutes while loaded with the fire pump.

4.7.7.1.3 The fire pump diesel starting 24-volt battery bank and charger shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

1. The electrolyte level of each battery is above the plates, and

2. The overall battery voltage is $\geq$ 24 volts.

SURVEILLANCE REQUIREMENTS (Continued)

b. At least once per 92 days by verifying that the specific gravity is appropriate for continued service of the battery.

c. At least once per 18 months by verifying that:

1. The batteries, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration, and

2. The battery-to-battery and terminal connections are clean, tight, free of corrosion and coated with anti-corrosion material.

PLANT SYSTEMS

SPRAY AND/OR SPRINKLER SYSTEMS

LIMITING CONDITION FOR OPERATION

3.7.7.2 The following spray and/or sprinkler systems shall be OPERABLE:

a. Diesel Generator #1 Preaction System - Diesel Generator Building

b. Diesel Generator #2 Preaction System - Diesel Generator Building

c. Diesel Generator #3 Preaction System - Diesel Generator Building

d. Diesel Generator #4 Preaction System - Diesel Generator Building

e. Two Standby Gas Treatment Train 1A Deluge Systems - Reactor Building #1.

f. Two Standby Gas Treatment Train 1B Deluge Systems - Reactor Building #1.

APPLICABILITY: Whenever equipment in the areas protected by the spray and/or sprinkler systems is required to be OPERABLE.

ACTION:

a. With one or more of the above required spray and/or sprinkler systems inoperable, establish a continuous fire watch with backup fire suppression equipment for the unprotected area(s) within 1 hour; restore the system to OPERABLE status within 14 days or, in lieu of any other report required by Specification 6.9.1, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the next 30 days outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

b. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.7.2 Each of the above required spray and/or sprinkler systems shall be demonstrated OPERABLE:

a. At least once per 12 months by cycling each testable valve in the flow path through at least one complete cycle of full travel.

b. At least once per 18 months:

1. By performing a system functional test which includes simulated automatic actuation of the system, and:

a) Verifying that the automatic valves in the flow path actuate to their correct positions on a simulated actuation signal, and

b) Cycling each valve in the flow path that is not testable during plant operation through at least one complete cycle of full travel.

2. By inspection of the the spray headers to verify their integrity, and

3. By inspection of each deluge nozzle to verify no blockage.

PLANT SYSTEMS

HIGH PRESSURE CO_2 SYSTEMS

LIMITING CONDITION FOR OPERATION

3.7.7.3 The following high pressure CO_2 systems shall be OPERABLE with a minimum contained weight of 67.5 lbs. of CO_2 in each cylinder of the inservice bank.

a. Unit No. 1 HPCI CO_2 System - Unit No. 1 Reactor Building.

b. Control Building CO_2 System - Control Building.

APPLICABILITY: Whenever equipment in the areas protected by the high pressure CO_2 systems is required to be OPERABLE.

ACTION:

a. With one or more of the above required high pressure CO_2 systems inoperable, establish backup fire suppression equipment for the unprotected area(s) within 1 hour; restore the system to OPERABLE status within 14 days or, in lieu of any other report required by Specification 6.9.1, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the next 30 days outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

b. The provisions of Specification 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.7.3 Each of the above required high pressure CO_2 systems shall be demonstrated OPERABLE:

a. At least once per 6 months by verifying that the high pressure CO_2 cylinders contain at least the minimum specified weight of CO_2.

b. At least once per 18 months by verifying:

1. The system control heads and associated ventilation dampers actuate manually and automatically, as appropriate, upon receipt of a simulated actuation signal, and

2. Performance of a flow test through flooding system headers and nozzles and hose reel system horns to assure no blockage.

PLANT SYSTEMS

FIRE HOSE STATIONS

LIMITING CONDITIONS FOR OPERATION

3.7.7.4 The fire hose stations shown in Table 3.7.7.4-1 shall be OPERABLE.

APPLICABILITY: Whenever equipment in the areas protected by the fire hose stations is required to be OPERABLE.

ACTION:

a. With one or more of the fire hose stations shown in Table 3.7.7.4-1 inoperable, within one hour:

   1. Provide an alternate means of fire suppression for the unprotected area(s) or

   2. Route an additional equivalent capacity fire hose to the unprotected area(s) from an OPERABLE hose station.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.7.4 Each of the fire hose stations shown in Table 3.7.7.4-1 shall be demonstrated OPERABLE:

a. At least once per 31 days by visual inspection of the station to assure all required equipment is at the station.

b. At least once per 18 months by:

   1. Removing the hose for inspection and re-racking, and

   2. Replacement of all degraded gaskets in couplings.

c. At least once per 3 years by:

   1. Partially opening each hose station valve to verify valve OPERABILITY and no flow blockage, and

   2. Conducting a hose hydrostatic test at a pressure at least 50 psig greater than the maximum pressure available at that hose station.

TABLE 3.7.7.4-1

FIRE HOSE STATIONS

LOCATION	ELEVATION	HOSE RACK#
Unit No. 1 Reactor Blg.	-17'	1-RB-19
	-17'	1-RB-20
	-17'	1-RB-24
	-17'	1-RB-25
	-17'	1-RB-26
	20'	1-RB-21
	20'	1-RB-22
	20'	1-RB-23
	20'	1-RB-27
	20'	1-RB-28
	20'	1-RB-29
	50'	1-RB-30
	50'	1-RB-31
	50'	1-RB-32
	50'	1-RB-33
	50'	1-RB-34
	50'	1-RB-35
	80'	1-RB-36
	80'	1-RB-39
	80'	1-RB-41
	80'	1-RB-43
	80'	1-RB-44
	80'	1-RB-45
	117'	1-RB-46
	117'	1-RB-47
	117'	1-RB-48
	117'	1-RB-42
	117'	1-RB-40
	117'	1-RB-38
AOG Building	23'	2-AOG-57
	23'	2-AOG-58
	23'	2-AOG-59
	23'	2-AOG-60
	49'	2-AOG-61
Radwaste Building	-3'	RW-49
	-3'	RW-50
	-3'	RW-51
	23'	RW-52
	23'	RW-53
	23'	RW-54
	23'	RW-55
	23'	RW-56

3/4.7.8 PENETRATION FIRE BARRIERS

LIMITING CONDITIONS FOR OPERATION

3.7.8 All penetration fire barriers protecting safety related areas shall be functional.

APPLICABILITY: At all times.

ACTION:

a. With one or more of the above required penetration fire barriers non-functional, within one hour:

1. Establish a continuous fire watch on at least one side of the affected penetration, or

2. Verify the OPERABILITY of the fire detection instruments providing coverage for the fire detection zones on each side of the non-functional barrier(s) by performance of the surveillance requirements of Specifications 4.3.5.7.1 and 4.3.5.7.2, as applicable.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.8 Each of the above required penetration fire barriers:

a. Shall be verified to be functional by a visual inspection;

1. At least once per 18 months, and

2. Prior to declaring a penetration fire barrier functional following repairs or maintenance.

b. That performs a pressure sealing function shall be verified to be functional by performance of a local leakage test prior to declaring a penetration fire barrier functional following repairs or maintenance.

MONITORING INSTRUMENTATION (Continued)

3/4.3.5.5 CHLORIDE INTRUSION MONITORS

The chloride intrusion monitors provide adequate warning of any leakage in the condenser or hotwell so that actions can be taken to mitigate the consequences of such intrusion in the reactor coolant system. With only a minimum number of instruments available increased sampling frequency provides adequate information for the same purpose.

3/4.3.5.7 FIRE DETECTION INSTRUMENTATION

OPERABILITY of the fire detection instrumentation ensures that adequate warning capability is available for the prompt detection of fires. This capability is required in order to detect and locate fires in their early stages. Prompt detection of fires will reduce the potential for damage to safety related equipment and is an integral element in the overall facility fire protection program.

In the event that a portion of the fire detection instrumentation is inoperable, increasing the frequency of fire patrols in the affected areas is required to provide detection capability until the inoperable instrumentation is restored to OPERABILITY.

3/4.7.5 HYDRAULIC SNUBBERS (Continued)

To provide further assurance of snubber reliability, a representative sample of the installed snubbers will be functionally tested during plant shutdowns at 18 month intervals. These tests will include stroking of the snubbers to verify proper piston movement, lock-up and bleed. Observed failures of these sample snubbers will require functional testing of additional units. To minimize personnel exposures, snubbers installed in high radiation zones or in especially difficult to remove locations may be exempted from these functional testing requirements provided the OPERABILITY of these snubbers was demonstrated during functional testing at either the completion of their fabrication or at a subsequent date.

3/4.7.6 SEALED SOURCE CONTAMINATION

The limitations on sealed source removable contamination ensure that the total body or individual organ irradiation does not exceed allowable limits in the event of ingestion or inhalation of the source material. The limitations on removable contamination for sources requiring leak testing, including alpha emitters, is based on 10 CFR 70.39(c) limits for plutonium. Quantities of interest to this specification which are exempt from the leakage testing are consistent with the criteria of 10 CFR Part 30.11-20 and 70.19. Leakage from sources excluded from the requirements of this specification is not likely to represent more than one maximum permissible body burden for total body irradiation if the source material is inhaled or ingested.

3/4.7.7 FIRE SUPPRESSION SYSTEMS

The OPERABILITY of the fire suppression systems ensures that adequate fire suppression capability is available to confine and extinguish fires occuring in any portion of the facility where safety related equipment is located. The fire suppression system consists of the water system, spray and/or sprinklers, CO_2, and fire hose stations. The collective capability of the fire suppression systems is adequate to minimize potential damage to safety related equipment and is a major element in the facility fire protection program.

In the event that portions of the fire suppression systems are inoperable, alternate backup fire fighting equipment is required to be made available in the affected areas until the inoperable equipment is restored to service.

3/4.7.7 FIRE SUPPRESSION SYSTEMS (Continued)

In the event the fire suppression water system becomes inoperable, immediate corrective measures must be taken since this system provides the major fire suppression capability of the plant. The requirement for a twenty-four hour report to the Commission provides for prompt evaluation of the acceptability of the corrective measures to provide adequate fire suppression capability for the continued protection of the nuclear plant.

3/4.7.8 PENETRATION FIRE BARRIERS

The functional integrity of the penetration fire barriers ensures that fires will be confined or adequately retarded from spreading to adjacent portions of the facility. This design feature minimizes the possibility of a single fire rapidly involving several areas of the facility prior to detection and extinguishment. The penetration fire barriers are a passive element in the facility fire protection program and are subject to periodic inspections.

During periods of time when the barriers are not functional, a continuous fire watch is required to be maintained in the vicinity of the affected barrier until the barrier is restored to functional status unless the OPERABILITY of the fire detection instruments, providing coverage of the fire detection zones on each side of the non-functional barriers, has been demonstrated.

6.0 ADMINISTRATIVE CONTROLS

6.1 RESPONSIBILITY

6.1.1 The Plant Manager shall be responsible for overall facility operation and shall delegate in writing the succession to this responsibility during his absence.

6.2 ORGANIZATION

OFFSITE

6.2.1 The offsite organization for facility management and technical support shall be as shown on Figure 6.2-1.

FACILITY STAFF

6.2.2 The Facility organization shall be as shown on Figures 6.2-2 and 6.2-3 and:

a. Each on duty shift shall be composed of at least the minimum shift crew composition shown in Table 6.2-1.

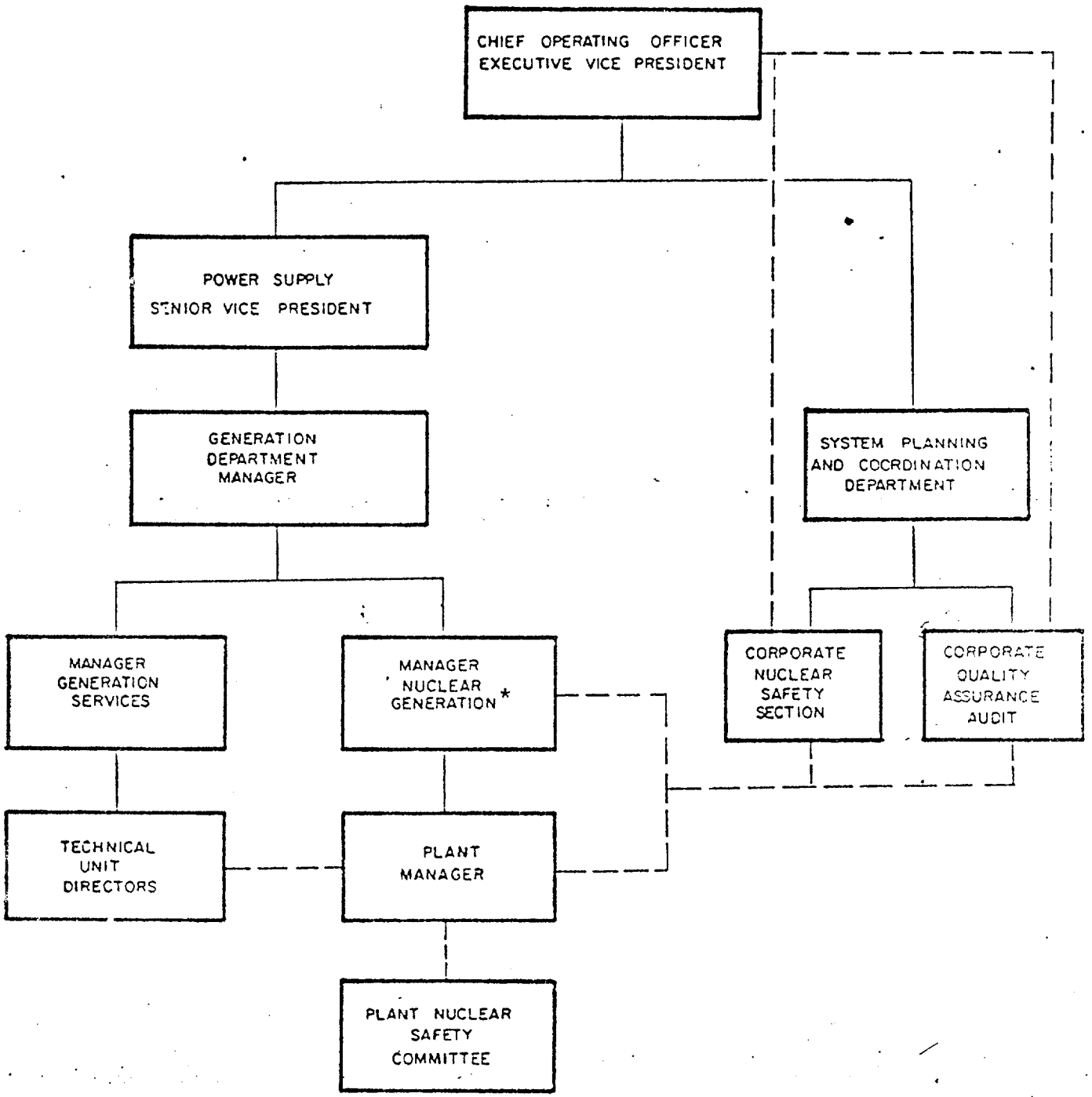
b. At least one licensed Operator shall be in the control room for each reactor containing fuel.

c. At least two licensed Operators shall be present in the control room during reactor start-up, scheduled reactor shutdown and during recovery from reactor trips.

d. An individual qualified to implement radiation protection procedures shall be on site when fuel is in either reactor.

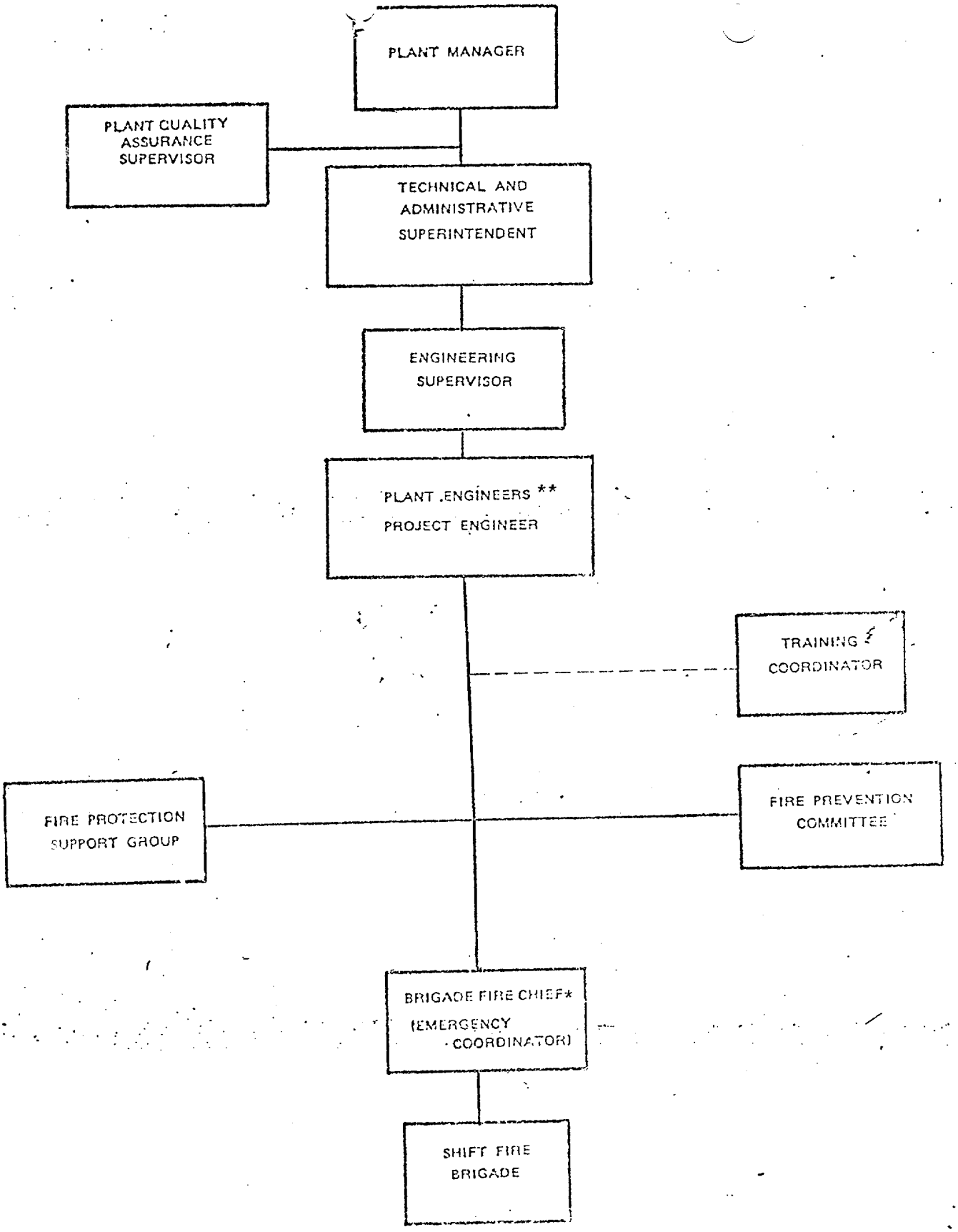
e. All CORE ALTERATIONS shall be directly supervised by either a licensed Senior Reactor Operator or Senior Reactor Operator Limited to Fuel Handling who has no other concurrent responsibilities during this operation.

f. A Fire Brigade of at least five members shall be maintained onsite at all times. The Fire Brigade shall not include the minimum shift crew shown in Table 6.2-1 or any personnel required for other essential functions during a fire emergency.



*Responsible for performance and monitoring of Fire Protection Program.

MANAGEMENT ORGANIZATION CHART
FIGURE 6.2-1



*NUMBER OF BRIGADE FIRE CHIEFS VARIES WITH SHIFT ORGANIZATION
**ONE ENGINEER IS ASSIGNED THE DUTIES OF THE PLANT FIRE CHIEF

FIGURE 6.2-3

Amendment No. 11

6.3 FACILITY STAFF QUALIFICATIONS

6.3.1 Each member of the facility staff shall meet or exceed the minimum qualifications of ANSI N18.1-1971 for comparable position, except for the Radiation Protection Supervisor who shall meet or exceed the qualifications of Regulatory Guide 1.8, September 1975.

6.4 TRAINING

6.4.1 A retraining and replacement training program for the facility staff shall be maintained under the direction of the Training Coordinator and shall meet or exceed the requirements and recommendations of Section 5.5 of ANSI N18.1-1971 and Appendix "A" of 10 CFR Part 55.

6.4.2 A training program for the Fire Brigade shall be maintained under the direction of the Plant Fire Chief and shall meet or exceed the requirements of Section 27 of the NFPA Code-1976.

6.5 REVIEW AND AUDIT

6.5.1 PLANT NUCLEAR SAFETY COMMITTEE (PNSC)

FUNCTION

6.5.1.1 The PNSC shall function to advise the Plant Manager on all matters related to nuclear safety.

COMPOSITION

6.5.1.2 The PNSC shall be composed of the:

Chairman:	Plant Manager
Vice Chairman:	Operations Maintenance or Technical-Administrative Superintendent Supervisor
Secretary:	Administrative Supervisor
Member:	Maintenance Supervisor
Member:	Engineering Supervisor
Member:	Environmental and Radiation Control Supervisor
Member:	Quality Assurance Supervisor
Member:	Operating Supervisor

ALTERNATES

6.5.1.3 All alternate members shall be appointed in writing by the PNSC Chairman to serve on a temporary basis; however, no more than two alternates shall participate as voting members in PNSC activities at any one time.

FOLLOW-UP ACTION (Continued)

b. Recommendations and concerns will be submitted to the Manager - Nuclear Generation within 14 days of determination.

c. A summation of Corporate Nuclear Safety Section recommendations and concerns will be submitted to the Company Chief Executive Officer; Company Chief Operating Officer; Senior Vice President - Power Supply; Department Head - System Planning and Coordination; Plant Manager and others, as appropriate on at least a bi-monthly frequency.

6.5.2.6 The Corporate Nuclear Safety Section review program shall be conducted in accordance with written, approved procedures.

6.5.3 INDEPENDENT OFF SITE QUALITY ASSURANCE AUDIT PROGRAM

PURPOSE

6.5.3.1 Audits of activities shall be performed under the cognizance of the Corporate Quality Assurance Audit (CQAA) Section. These audits shall encompass:

a. The conformance of facility operation to all provisions contained with the Technical Specifications and applicable license conditions at least once per 12 months.

b. The training and qualifications of the entire facility staff at least once per 12 months.

c. The results of actions taken to correct deficiencies occurring in facility equipment, structures, systems, or method of operation that affect nuclear safety at least once per 6 months.

d. The verification of compliance and implementation of the requirements of the Quality Assurance Program to meet the criteria of Appendis "B", 10 CFR 50, at least once per 24 months.

e. The Emergency Plan and implementing procedures at least once per 24 months.

f. The Security Plan and implementing procedures at least once per 24 months.

g. The Facility Fire Protection Program and implementing procedures at least once per 24 months.

h. Any other area of facility operation considered appropriate by the Corporate Quality Assurance Audit Section or the Senior Vice President - Power Supply.

RESPONSIBILITY

6.5.3.2 The Manager - Corporate Quality Assurance Audit is charged with the overall responsibility for the corporate quality assurance audit program as follows:

a. Selects auditors and

b. Has access to records and personnel necessary in performing the audits.

PERSONNEL

6.5.3.3

a. Audit personnel will be independent of the area audited. Selection for auditing assignments is based on experience or training which establishes that their qualifications are commensurate with the complexity or special nature of the activities to be audited. In selecting auditing personnel, consideration will be given to special abilities, specialized technical training, prior pertinent experience, personal characteristics, and education.

b. Qualified outside consultants or other individuals independent from those personnel directly involved in plant operation, but within the Operations Group, will be used to augment the audit teams when necessary.

REPORTS

6.5.3.4 Results of audit are approved by the Manager - Corporate Quality Assurance Audit and transmitted directly to the Company Chief Executive Officer and Company Chief Operating Officer, as well as to the Senior Vice President - Power Supply, Department Head - System Planning and Coordination and others, as appropriate within 30 days after the completion of the audit.

6.5.3.5 The Corporate Quality Assurance Audit program shall be conducted in accordance with written, approved procedures.

6.5.4 OUTSIDE AGENCY INSPECTION AND AUDIT PROGRAM

6.5.4.1 An independent fire protection and loss prevention program inspection and audit shall be performed at least once per 12 months utilizing an outside fire protection firm.

6.5.4.2 An inspection and audit of the fire protection and loss prevention program shall be performed by a qualified outside fire consultant at least once per 36 months.

6.6 REPORTABLE OCCURRENCE ACTION

6.6.1 The following actions shall be taken for REPORTABLE OCCURRENCES:

a. The Commission shall be notified and/or a report submitted pursuant to the requirements of Specification 6.9.

b. Each REPORTABLE OCCURRENCE requiring 24 hour notification to the Commission shall be reviewed by the PNSC and submitted to the CNSS and the Manager of Nuclear Generation.

6.7 SAFETY LIMIT VIOLATION

6.7.1 The following actions shall be taken in the event a Safety Limit is violated:

a. The facility shall be placed in at least HOT SHUTDOWN within two hours.

b. The Safety Limit violation shall be reported to the Commission, the Manager Nuclear Generation and to the Manager - Corporate Nuclear Safety within 24 hours.

c. A Safety Limit Violation Report shall be prepared. The report shall be reviewed by the PNSC. This report shall describe (1) applicable circumstances preceding the violation, (2) effects of the violation upon facility components, systems or structures, and (3) corrective action taken to prevent recurrence.

d. The Safety Limit Violation Report shall be submitted to the Commission, the Manager - Corporate Nuclear Safety and the Manager of Nuclear Generation within 14 days of the violation.

6.8 PROCEDURES

6.8.1 Written procedures shall be established, implemented and maintained covering the activities referenced below:

a. The applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, November, 1972.

b. Refueling operations.

c. Surveillance and test activities of safety related equipment.

d. Security Plan implementation.

e. Emergency Plan implementation.

f. Fire Protection Program implementation.

6.8.2 Each procedure and administrative policy of 6.8.1 above, and changes thereto, shall be reviewed by the PNSC and approved by the Plant Manager prior to implementation and reviewed periodically by the PNSC as set forth in plant procedures.

6.8.3 Temporary changes to procedures of 6.8.1 above may be made provided:

a. The intent of the original procedure is not altered.

b. The change is approved by two members of the plant management staff, at least one of whom holds a Senior Reactor Operator's License on the Brunswick Plant.

c. The change is documented, reviewed by the PNSC and approved by the Plant Manager within 14 days of implementation.

6.9 REPORTING REQUIREMENTS

6.9.1 ROUTINE REPORTS AND REPORTABLE OCCURRENCES

Information to be reported to the Commission, in addition to the reports required by Title 10, Code of Federal Regulations, shall be in accordance with the Regulatory Position in Revision 4 of Regulatory Guide 1.16, "Reporting of Operating Information - Appendix "A" Technical Specifications."

SPECIAL REPORTS

6.9.2 Special reports shall be submitted to the Director of the Office of Inspection and Enforcement Regional Office within the time period specified for each report. These reports shall be submitted covering the activities identified below pursuant to the requirements of the applicable reference specification:

a. Results of specific activity analysis specification 3.4.5.

b. Seismic event analysis, Specification 3.3.5.1 and 4.3.5.1.2

c. Sealed source leakage test results, Specification 4.7.6.3

6.10 RECORD RETENTION

Facility records shall be retained in accordance with ANSI-N45.2.9-1974.

6.10.1 The following records shall be retained for at least five years:

a. Records and logs of facility operation covering time interval at each power level.

b. Records and logs of principal maintenance activities, inspections, repair and replacement of principal items of equipment related to nuclear safety.

c. All REPORTABLE OCCURRENCE submitted to the Commission.

d. Records of surveillance activities, inspections and calibrations required by these Technical Specifications.

FIRE PROTECTION

SAFETY EVALUATION REPORT

BY THE

OFFICE OF NUCLEAR REACTOR REGULATION

U.S. NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF

CAROLINA POWER AND LIGHT COMPANY

BRUNSWICK STEAM ELECTRIC PLANT

UNITS 1 AND 2

DOCKET NOS. 50-325/324

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1.0 INTRODUCTION

Following a fire at the Brown's Ferry Nuclear Station in March 1975, the Nuclear Regulatory Commission initiated an evaluation of the need for improving the fire protection programs at all licensed nuclear power plants. As part of this continuing evaluation, the NRC, in February 1976, published the report by a special review group entitled, "Recommendations Related to Browns Ferry Fire," NUREG-0050. This report recommended that improvements in the areas of fire prevention and fire control be made in most existing facilities and that consideration be given to design features that would increase the ability of nuclear facilities to withstand fires without the loss of important functions. To implement the report's recommendations, the NRC initiated a program for reevaluation of the fire protection programs at all licensed nuclear power stations and for a comprehensive review of all new licensee applications.

The NRC issued new guidelines for fire protection programs in nuclear power plants which reflect the recommendations in NUREG-0050. These guidelines are contained in the following documents:

- "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," NUREG 75/087, Section 9.5.1, "Fire Protection," May 1976, which includes "Guidelines for Fire Protection for Nuclear Power Plants," (BTP-APCSB 9.5-1), May 1, 1976.

- "Guidelines for Fire Protection for Nuclear Power Plants," (Appendix A to BTP-APCSB 9.5-1), August 23, 1976.

- "Supplementary Guidance on Information Needed for Fire Protection Program Evaluation" September 30, 1976.

- "Sample Technical Specifications," May 12, 1977.

- "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance," June 14, 1977.

All licensees were requested to: (1) compare their fire protection programs with the new guidelines; and (2) analyze the consequences of a postulated fire in each plant area.

We have reviewed the licensee's analyses and have visited the plant to examine the relationship of safety-related components, systems and structures with both combustibles and the associated fire detection and suppression systems. Our review has been limited to the aspects of fire protection related to the protection of the public from the standpoint of radiological health and safety. We have not considered aspects of fire protection associated with life safety of on-site personnel and with property protection, unless they impact the health and safety of the public due to the release of radioactive material.

This report summarizes the results of our evaluation of the fire protection program at Carolina Power and Light Company's Brunswick Steam Electric Plant, Units 1 and 2. The chronology of our evaluation is summarized in Appendix A of this report.

By letter dated December 29, 1976, CP&L submitted their "Fire Protection Program Review," which was supplemented by letters dated May 10, June 23 (2 letters), August 23, 24 and September 20, 1977.

2.0 FIRE PROTECTION GUIDELINES

2.1 Overall Objectives

The overall objectives of the fire protection program in a nuclear power plant are to:

(1) reduce the likelihood of occurrence of fires;

(2) promptly detect and extinguish fires if they occur;

(3) maintain the capability to safely shut down the plant if fires occur; and

(4) prevent the release of a significant amount of radioactive material if fires occur.

2.2 General Design Criterion 3 - "Fire Protection"

The Commission's basic criterion for fire protection is set forth in General Design Criterion 3, Appendix A to 10 CFR Part 50, which states:

> "Structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions.
>
> "Noncombustible and heat resistant materials shall be used wherever practical throughout the unit, particularly in locations such as the containment and the control room.
>
> "Fire detection and protection systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety.
>
> "Fire fighting systems shall be designed to assure that their rupture or inadvertent operation does not significantly impair the safety capability of these structures, systems, and components."

Guidance on the implementation of General Design Criterion 3 for existing nuclear power plants is provided in Appendix A of Branch Technical Position 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants." We have used the guidance in Appendix A, where appropriate. We have also evaluated alternatives proposed by the licensee to assure that the overall objectives outlined in Section 2.1 are met for the actual relationship of combustibles, safety-related equipment, and fire protection features.

3.0 SUMMARY OF MODIFICATIONS AND INCOMPLETE ITEMS

3.1 Modifications

The licensee plans to make certain plant modifications to improve the fire protection program as a result of both his and the staff's evaluations. Such proposed modifications are summarized below. The sections of this report which discuss the modifications are noted in parentheses following each item. Further detail is contained in the licensee submittals. All modifications will be completed following refueling of Unit 1 for Cycle 2 and Unit 2 for Cycle 3 operation,presently scheduled for the fall of 1978. Certain items listed below are marked with an asterisk to indicate that the NRC staff will require additional information in the form of design details to assure that the design is acceptable prior to actual implementation of these modifications. The balance of the other modifications have been described in an acceptable level of detail.

3.1.1 Fire Barriers

Three-hour fire-rated walls will be added in the diesel generator building and the cable accessways to separate redundant safety-related cables which could be affected by a fire (5.1), (5.8). Three-hour walls will also be added to separate the control room from adjacent rooms (5.4).

In the diesel generator rooms and tank rooms, three-hour fire barriers will be provided around piping and conduit which are associated with a redundant division or with a redundant diesel generator (5.8).

The wall between diesel generators 1 and 2 will be upgraded to a three-hour fire rating (5.8). The stairwells to the diesel generator basement will be upgraded to a three hour fire rated enclosure (5.8).

3.1.2 * Fire Retardant Coating and Fire Proofing

Flame retardant coatings will be applied to PVC coated conduit in the cable accessways and to uncoated cable spreading room cables (5.1), (5.2). Three-hour fire proofing will be provided for the steel beams in the diesel fuel oil supply tank bunkers (5.8).

3.1.3 Hose Stations

Interior hose stations will be provided in control building stairwells (5.2), (5.4), control building mechanical equipment rooms (5.5); the intake structure (5.7); diesel generator building basement area (5.8); diesel generator rooms (5.8); diesel generator switchgear rooms (5.8); diesel generator building fan room (5.8); augmented off-gas building (4.3.1(4)); and in the reactor building (4.3).

*Prior to application of this coating, the licensee should submit information on the type of coating proposed, together with information concerning the effect of the coating on the electrical loading capability of affected cables.

3.1.4 Fire Detectors

Additional fire detectors will be installed to cover all areas containing combustibles in buildings which contain safe shutdown equipment (4.2), and in main control cabinets (5.4) and charcoal filter elements in the mechanical equipment room (5.5). The detection system annunciator will be modified to provide a unique alarm (4.2).

3.1.5* Remote Shutdown Capability

Keylock remote isolation switches will be installed at the local diesel generator control panel for local control of diesel generators, diesel generator breakers, and breakers feeding 480 volt "E" bus unit substation. These modifications will complete the changes required to provide a safe shutdown capability independent of the cable spreading room and control room (5.2).

3.1.6 Ventilation Dampers

Fire dampers will be added in all ventilation penetrations of fire barriers which do not presently have fire dampers installed (4.4).

3.1.7 Fire Doors

Three-hour fire-rated doors and frames will be installed (4.9.2) between: diesel generator rooms (5.8); diesel generator building basement area and switchgear rooms (5.9); cable spreading rooms and battery rooms (5.3); and cable spreading rooms (5.2). Doors between battery rooms will be one-hour fire-rated (5.3).

3.1.8 Hydrant and Hose House

Hydrants and hose houses will be installed in proximity to the intake structure, and in the area of the No. 1 diesel fuel oil storage tank (4.3.1.(3)).

3.1.9* Curbs and Barriers

Curbs will be provided to limit the spread of oil, and barriers added to prevent flame impingement on adjacent equipment for pumps at the intake structure (5.7).

3.1.10 Drain Systems

Backflow-prevention devices will be installed in the diesel generator room drains (4.5), (5.8).

3.1.11 Fixed Automatic Suppression Systems

Automatic water spray suppression systems will be installed at the intake structure and at the standby liquid control pumps (5.7), (5.12). The manual sprinkler in the diesel generator rooms will be made automatic and extended to provide complete coverage of the area (5.8).

An automatic aqueous film forming foam (AFFF) system will be installed in the diesel generator tank rooms (4.3.1(6)), (5.8).

An automatic sprinkler system will be installed in the core spray pump rooms (5.9), RHR pump rooms (5.9), diesel generator basement (5.8), and service water intake structure cable spreading area (5.7).

An automatic sprinkler system will be installed in the water treatment building. (4.3.1.(2)) Water flow alarms will be added to existing and proposed automatic water suppression systems (4.3.1.(5)).

3.1.12 Portable Extinguishers

Portable extinguishers will be provided at the diesel generator building basement area, control room, cable spreading rooms and battery rooms (4.3.3), (5.4).

3.1.13 Local Alarms

Local alarms for fire detection will be installed at each local detector panel (4.2).

3.1.14 Diesel Generator Exhaust

The diesel generator exhaust silencers will be removed from the fan room and relocated on the roof of the diesel generator building (5.8).

3.1.15 Gas-tight Doors

Gas-tight doors will be installed between the diesel generator tank rooms (5.8).

3.1.16 Pipe Penetrations

Gas tight seals will be added to pipe and trench penetrations in diesel generator tank room walls (5.8).

3.1.17* Communication Equipment

Additional sound-powered communication sets will be obtained for use at various control panels. Additionally, portable radio communication equipment will be provided for fire brigade use (4.7).

3.1.18 Reactor Building Combustible Storage Areas

A specific area in the reactor building will be designated for necessary combustible storage. A fixed automatic suppression system will be installed to protect this area (5.10).

A store room with a three-hour fire rating for storage of water treatment chemicals will be provided. This room will be monitored by a fire detection system (5.12).

Storage rooms and metal cabinets will be provided to store combustibles at the refueling floor level of the reactor building (5.10), (5.12).

3.1.19 Yard Loop Sectionalizing Valves

Additional sectionalizing valves will be installed in the yard line main system (4.3.1.(3)).

3.1.20 Fire Water Piping

A second connection to the yard loop will be provided for the diesel generator building suppression systems (5.8).

Valves in the fire water systems will be locked in the open position, with strict key control for the locks, or be provided with tamper proof seals and subjected to periodic inspection (4.3.1(3)).

Isolation valves and hose connections are being added to building standpipes to provide an alternate means of pressurization (4.3.1.(3)).

3.1.21 Portable Aqueous Film Forming Foam

Two portable aqueous film forming foam concentrate stations will be provided (5.8), (4.3.1.(6)).

3.1.22 Smoke Removal

Portable fans and ductwork will be provided for use in removing smoke from cable tunnels through manholes, and for use in other areas (4.4.1), (5.6).

A roof manhole for access and smoke venting will be installed in the diesel generator tank rooms. Additionally, a ventilation system will be provided for these rooms (4.4.1), (5.8).

A discharge cowl will be added to the control building exhaust ports (4.4.1).

A smoke removal capability will be provided for the control room (4.4.1), (5.4).

3.1.23 Emergency Breathing Apparatus

Four additional breathing units and twenty-one (21) additional spare air bottles will be provided. An air compressor will also be provided for the recharge of air bottles (4.4.3).

3.1.24* Battery Room Cables

One safety division of battery cables will be re-routed outside of the cable spreading room (5.2).

3.1.25 Fire Pump Isolation Valve

An isolation valve will be provided in the suction header between the fire pumps (4.3.1.(2)).

3.1.26 Reactor Building Deluge Valve

A deluge valve will be provided to replace the manual valve feeding reactor building hose stations (4.3.1.(4)).

3.1.27 Diesel Generator Air Filter Protection

An oil retainer system and an aqueous film forming foam (AFFF) system is being provided to protect the diesel generator air intake filters (5.1).

3.1.28* Water Damage Protection

Spray deflectors, shields and curbs are being provided to protect safety related equipment against water damage (4.3.1(7)).

3.1.29 Hose Replacement

Linen hose throughout the plant is being replaced with lined hose and suitable racks will be provided (4.3.1(4)).

3.1.30 Lube Oil Piping Barriers

A three-hour fire barrier is being provided to protect the lube oil piping in the turbine building heater bay (5.17).

3.1.31 Fuel Oil Impoundment

The size of the above-ground fuel oil storage tank impoundment is to be increased to a size in excess of the contents of the tank (5.16).

3.1.32 Portable Handlights

Portable handlights will be provided for fire brigade use (4.6).

3.1.33* Diesel Generator Bus Load

Modifications will be made to the diesel generator bus loads such that only two diesel generators are required to handle safe-shutdown loads in a fire situation (5.8).

3.1.34* Recirculation Pump Protection

Heat detectors and an oil collection system will be installed at the reactor recirculation pumps inside the drywell (5.14).

3.1.35 Battery Lighting Unit

A fixed sealed beam battery supplied lighting unit will be provided at elevation 20 feet of the service water intake structure.

3.2 Incomplete Items

In addition to the licensee's proposed modifications, several incomplete items remain, as discussed below. The licensee will complete the evaluations necessary to resolve these items in accordance with the schedule contained in Table 3.1. This schedule has been established such that should these evaluations require additional modifications, they will be implemented on a schedule consistent with completion of the modifications identified in Section 3.1. We will address the resolution of these incomplete items in a supplement to this report.

3.2.1 Fire Stop Qualification

The licensee has committed to test the cellular concrete and mineral wool with Flamemastic coating type firestops or provide information to demonstrate a three-hour rating consistent with the rating of the fire barriers (4.9).

3.2.2 Effects on Safe Shutdown Where Redundant Cables are in Proximity

The licensee has committed to evaluate the effects of fires on safe shutdown where redundant cables are susceptible to the same fire. In this evaluation, the cable will be considered as combustible and the conduit will be considered as not protecting cables from fires. In areas where the results of this evaluation show that safe shutdown is jeopardized, modifications will be required to assure that a fire in these areas will not affect safe shutdown of the plant. These modifications may include: moving cables, application of fire retardant coatings, use of water suppression systems, barriers, or some effective combination thereof (4.10).

3.2.3 Effects on Safe Shutdown for a Fire in Cable Tunnels

The licensee has committed to evaluate the importance of the few cables marked safety related in the cable tunnels to safe shutdown equipment. If a fire involving these cables could cause damage resulting in the loss of safe shutdown capability, modifications such as rerouting cables or providing fixed suppression systems in the cable tunnels will be required to assure that safe shutdown is not affected by fires in this area (5.6).

3.2.4 Administrative Controls

The administrative controls for fire protection should be improved with regard to the fire protection organization, fire brigade training, controls over combustibles and ignition sources, prefire plans, and quality assurance provisions for fire protection. The licensee has committed to review these areas and provide a revised description of his fire protection administrative controls (6.0).

3.2.5 Radwaste Fires

The licensee should evaluate the potential for fires in radwaste areas causing unacceptable releases. Where fires may cause unacceptable releases, modifications will be required to assure that fires will not cause unacceptable releases. The licensee has committed to evaluate the effects of such fires, and provide the results of the evaluation (4.14).

Table 3.1

LICENSEE SUBMITTAL DATES FOR INCOMPLETE ITEMS

Item		Date
3.2.1	Fire Stop Qualification	On or before September 30, 1978
3.2.2	Effects on Safe Shutdown Where Redundant Cables are in Proximity	On or before March 31, 1978
3.2.3	Effects on Safe Shutdown of a Fire in Cable Tunnels	On or before March 31, 1978
3.2.4	Administrative Controls	On or before March 31, 1978
3.2.5	Radwaste Fires	On or before March 31, 1978

4.0 EVALUATION OF PLANT FEATURES

4.1 Safe Shutdown Systems

There are several arrangements of safe shutdown systems which are capable of shutting down the reactor and cooling the core during and subsequent to a fire. The exact arrangement available in a fire situation will depend upon the effects of the fire on such systems, their power supplies, and control stations. To preclude a single event from affecting redundant systems these systems are separated into two safety divisions either of which are capable of achieving safe shutdown.

During or subsequent to a fire, safe shutdown could be achieved using safety-related equipment such as: the reactor trip system; the reactor core isolation cooling system or the high pressure coolant injection system; the depressurization system; condensate storage tank; and the residual heat removal system. Supporting systems and equipment such as the emergency diesel generators, engineered safety features batteries, service water system, diesel generator building ventilation system, and residual heat removal room coolers would also be required.

We have evaluated the separation between redundant safe shutdown systems and components to determine that they are either separated from each other or protected by suppression systems such that a fire will not affect redundant equipment, and therefore a sufficient number of systems and components will be available to perform the shutdown function following a fire. The adequacy of separation between redundant equipment is discussed in other sections of this report.

4.2 Fire Detection and Signaling Systems

The plant has a protective signaling system which transmits fire alarm and supervisory signals to the control room. In addition to fire detector signals, the system transmits signals concerning water flow in the deluge systems, manual pull boxes in the augmented off-gas building, fire pump running, fire pump trouble, low fire water tank level, low fire water system pressure, and carbon dioxide system actuation.

The signaling system is provided backup power by a connection to the emergency power supply system. The signaling system does not comply with National Fire Protection Association Code 72D in that the wiring from numerous local control panels to the control room is unsupervised and the system utilizes equipment and circuitry which has not been tested by a recognized testing laboratory for protective signaling system use. For those circuits which are not self supervising, an increased frequency of monthly testing will be required by the facility technical specifications.

Smoke detectors and heat detectors have been provided in selected areas of the plant; however, some areas containing or exposing safety-related systems are not monitored by fire detectors. In other areas, detectors are too sparsely

distributed to assure prompt response. In some locations, smoke detectors have been installed on the bottom of large beams which could delay their response if rising smoke has to fill the air pocket above the beam before reaching a significant concentration to actuate the detector. The licensee has proposed to install additional detectors in the areas which are presently either unprotected or inadequately covered.

The licensee has also proposed to provide audible alarms at the local alarm panels, and a unique audible alarm in the control room which will improve personnel fire notification. We conclude that, subject to implementation of the above described modifications, the fire detection and signaling system satisfies the objectives identified in Section 2.1 of this report and is, therefore, acceptable.

4.3 Fire Control Systems

4.3.1 Water Systems

(1) Water Supply

The fire protection water supply for both reactor units consists of two fire pumps taking suction from a single 300,000 gallon storage tank. As a backup supply, the pumps can also take suction from a 200,000 gallon demineralized water tank by manually operating a normally closed gate valve at the pumps.

The demineralized water tank is not reserved for fire protection but could be made available manually. The primary fire water tank is large enough to provide over two hours of fire flow for the largest expected demand and its water level is electrically supervised. In the unlikely event of a catastrophic leak in the primary tank, the secondary supply could provide an adequate supply of water for suppressing fires in safety-related areas. We conclude that the water supply for fire protection satisfies the objectives identified in Section 2.1 of this report and is, therefore, acceptable.

(2) Fire Pumps

Two horizontal shaft centrifugal fire pumps are provided, each with a capacity of 2000 GPM at 125 PSI. One pump is diesel engine driven with a fuel day-tank provided adjacent to the pump house. The second pump is electric motor driven.

Two automatic electric jockey pumps maintain pressure on the fire water piping system. The fire pumps are arranged to start automatically if the pressure drops due to a large water demand. The capability to manually start or stop the fire pumps is provided at the pump house.

Because both fire pumps take suction from a single header, a break in this header could eliminate the fire water supply. The licensee has proposed to install a valve in the header between the two pumps to prevent loss of both pumps from a single piping failure.

Both fire pumps and their controllers are located in the water treatment building, and could be subject to damage by a fire in that structure. To preclude such an event, the licensee has proposed to provide automatic sprinklers, and barriers,

to prevent flame impingement between the pumps and between the pumps and the controllers, and three hour fire barriers between the building and the diesel fuel tank. A flow switch and cutoff valve to detect a rupture in the supply line and shut off fuel flow to the diesel driven fire will be provided.

We conclude that, subject to implementation of the above described modifications, the fire pumps satisfy the objectives identified in Section 2.1 of this report and are, therefore, acceptable.

(3) Fire Water Piping System

Each fire pump has a separate discharge line into the underground fire loop which encircles the plant. Valving is arranged so that a single break in the discharge piping will not remove both pumps from service.

All yard fire hydrants, fixed pipe water suppression systems, and interior fire hose lines are supplied by the fire loop. Sectionalizing valves of the post-indicator type are provided on the loop to allow isolation of various sections for maintenance. Additional sectionalizing valves are being added to allow isolation of sections of the yard loop without causing total loss of fire suppression capability for the safety-related areas. In addition, isolation valves will be provided on standpipes within buildings, and 2-1/2 inch hose connections will be provided in the standpipe system to permit pressurization of the standpipe system in the event of a failure in the underground supply line to the building.

The position of fire protection system valves will be controlled by locks or tamper proof seals and will be subject to periodic inspections.

Yard fire hydrants have been provided at approximately 250 foot intervals around the exterior of the plant. An auxiliary gate valve is provided on each lateral to permit hydrant maintenance without removing a portion of the fire loop from service. A hose house is provided at each fire hydrant and are equipped with 200 feet of 2½-inch hose, 200 feet of 1½-inch hose and other manual fire fighting tools. The hydrant hose threads are compatible with those of local public fire departments.

The licensee proposes to extend the fire loop to the service water intake structure to supply sprinklers and manual hose stations in this building. Two new hydrants will be provided on this extension of the fire loop improving coverage in this area.

We conclude that, subject to implementation of the above described modifications, the fire water piping system conforms to the provisions of Appendix A to BTP 9.5-1 and is, therefore, acceptable.

(4) Interior Hose Stations

Interior hose stations equipped with 1½-inch fire hose have been provided throughout the plant; however, some areas are beyond the reach of interior hose streams. The licensee proposes to add hose stations in these areas which include the reactor building, the diesel generator building, service water intake structure, control building and augmented offgas building.

The hose at some of the interior hose stations is made of unlined linen, which is unsuitable for industrial application. The licensee has proposed to replace this with lined fire hose, and to replace hose racks with equipment suitable for lined fire hose storage.

The water supply to hose stations inside the reactor buildings is controlled by a normally closed post-indicator valve in the yard. Before the hose can be used, personnel must be dispatched to open the valve. This could result in a significant delay in use of this equipment for fire fighting. The licensee has proposed to provide a valve which can be operated from the control room or by detectors in the area of the fire to avoid the delay.

The nozzles on the interior hose lines are of the adjustable type, approved for use on live electrical equipment.

We conclude that, subject to the implementation of these changes, the interior hose installation is acceptable.

(5) Sprinkler Systems

Automatic suppression systems are designed and maintained to NFPA 13 "Sprinkler Systems" and NFPA 15 "Water Spray Fixed Systems." Automatic deluge systems have been provided on the charcoal filters inside the reactor buildings. However, other automatic sprinkler systems have not been installed in areas containing or exposing safety-related equipment, although many of these areas contain significant amounts of combustibles, primarily in the form of electrical cables on trays and lubricants. Manually controlled sprinklers have been provided in each diesel generator room over the day-tank and drainage trenches. Manual operation of deluge valves on these systems is from the control room, where information from fire detectors located in the diesel generator rooms will be available.

Automatic water spray systems actuated by rate-compensation detectors have been provided on various nonsafety-related equipment including oil filled transformers in the yard area and major combustible liquid hazards in the turbine building (i.e., lube oil reservoir and conditioner, hydrogen seal-oil system, reactor feedwater pumps, and motor-generator sets).

Most installed sprinkler systems have water flow alarms. The licensee has committed to adding water flow alarms so that all installed and proposed sprinkler systems will have flow alarms.

The licensee has proposed to provide automatic sprinkler systems in: (1) certain areas of the reactor building containing safety-related pumps and combustible storage; (2) the first floor of the service water intake structure; (3) the diesel generator rooms; (4) the water treatment building; and (5) the basement of the diesel generator building and the service water intake structure. The adequacy of fire protection for these areas is addressed in Section 5 of this report.

We conclude that the general design of sprinkler systems conforms to the provisions of Appendix A to BTP 9.5-1 and is acceptable; however, other areas may require such protection depending on the results of an investigation being

performed by the licensee (see Section 4.10 of this report). Any additional changes required as a result of this investigation will be addressed in a supplement to this report.

(6) Foam

At present, the plant has no fire fighting foam; however, the licensee has proposed to provide automatic aqueous film forming foam suppression systems for the diesel generator fuel tank bunker and for the diesel generator oil bath air intake filters. These foam systems are designed to NFPA 11B, "Synthetic Foam and Combined Agents Systems." Also, two portable aqueous film forming foam units will be obtained. One of these will be located in the diesel generator building, and the other in the yard area. We conclude that the foam systems conform to the provisions of Appendix A to BTP 9.5-1 and are acceptable.

(7) Effects of Suppression Systems on Safety Systems

We have reviewed the effects of: (1) breaks in fire protection piping that may result in water flooding damage to safety-related equipment; (2) cracks in fire protection piping that may result in water spray damage to safety-related equipment, or that may impair suppression capability of both primary and backup means of suppression; and (3) inadvertent fire protection system actuation that may result in damage to safety-related equipment.

In most areas, curbs, drains and the mounting of equipment above floor level minimizes the potential for flooding damage. In other areas, water will drain out doors or through grating to lower elevations, such that the standing water would not affect safety-related equipment. In addition, valves are available to isolate sections of piping inside buildings to preclude the buildup of water and thus prevent equipment from being incapacitated due to flooding.

The only safety-related areas where standing water could collect at lower elevations and present a flooding damage potential are the rooms at elevation (-)17 feet of the reactor building, and in the basement of the diesel generator building. In the diesel generator building basement and the reactor building, (-)17 foot elevation, water from suppression system actuation in suppressing a fire would not accumulate to levels which would affect safety-related equipment because of the large surface area over which the water would spread. Additionally, any actuation of these systems will alarm in the control room so that suppression systems may be cut-off following extinguishment of the fire.

Automatic suppression systems in the diesel generator basement and reactor building will be preaction type systems. Breaks in piping for these systems, therefore, would not result in flooding.

Flows from postulated breaks in hose station piping in the diesel generator building would be less than flows from suppression system actuation. The likelihood for unacceptable flooding due to breaks in hose station piping in the diesel generator building is, therefore, remote.

The control valves on the fire suppression piping system supplying interior fire hose stations in the reactor building, are normally closed. The piping system is pressurized by a small bypass line and any water flow in the system transmits

a signal to the control room. In a fire situation someone must be dispatched to open the control valve to allow use of the water hose stations. While this feature reduces the potential for water damage due to pipe breaks, it can result in undesirable delays in fire fighting activities. As discussed in Section 4.3.1.(4), the licensee has proposed adding a control valve which can be actuated from the control room to reduce the delay. Since this valve would be normally closed, the likelihood for water damage due to pipe breaks in the reactor building remains acceptably remote.

The licensee has committed to add curbs, water shields, barriers or deflectors on sprinkler heads to minimize the possibility for damage to safety-related equipment from operation or inadvertent actuation of suppression systems.

There are no safety-related systems which could be disabled by direct interlock with the fire suppression system or as a result of the application of the extinguishing agent.

We conclude that with proper implementation of the changes proposed, the potential for damage by fire protection system actuation or failure is minimal and that the fire protection system will be adequate to assure against loss of protection by pipeline breaks and cracks.

4.3.2 Gas Fire Suppression Systems

A total flooding high-pressure carbon dioxide system has been provided in the high pressure coolant injection system pump room of each reactor building, primarily because of the presence of combustible lubricants. This CO_2 system is designed in accordance with NFPA 12 "Carbon Dioxide Systems."

High-pressure carbon dioxide systems supplying hose reels have been provided for the control building. The hose reels are distributed throughout the building for manual fire fighting in the cable spreading rooms, battery rooms, control room and adjacent areas. Because carbon dioxide has limited effectiveness in heat removal and preventing reignition, the licensee has proposed to provide water hose stations for backup manual suppression in these areas.

We find that the gas fire suppression systems satisfy the provisions of Appendix A to BTP 9.5-1 and, therefore, are acceptable.

4.3.3 Portable Fire Extinguishers

Dry chemical, carbon dioxide and pressurized water fire extinguishers have been distributed throughout the plant in accordance with NFPA guidelines. The licensee has stated that portable water-type extinguishers will be added in the control room, and portable extinguishers added in the cable spreading rooms and battery rooms. Extinguishers are not located in the drywell but are readily available from areas outside the drywell.

We conclude that with the above described additions, adequate portable fire extinguishers will be available throughout the plant for manual fire fighting.

4.4 Ventilation Systems and Breathing Equipment

4.4.1 Smoke Removal

The plant does not have exhaust systems designed specifically for smoke removal. The normal air handling systems in most areas can be used for smoke removal; however, their effectiveness may be limited by several factors. The fans and other equipment in the air handling systems are not designed to withstand high temperatures, and can be rendered inoperative by the heat from a significant fire. The capacity and configuration of the normal air handling systems may be inadequate for effective smoke removal.

For the control building, the licensee has proposed to modify the air handling system to provide for smoke removal capability in the control room. To exhaust smoke, dampers and doorways will be manually manipulated by personnel responding to a fire.

The motor control centers for the air handling system in the control building are located in the cable spreading room, creating the potential that a fire in a cable spreading room could render the system inoperative.

The normal air intakes and exhaust outlets for the control building are located such that smoke could be recirculated. The licensee proposes to provide a cowl over the discharge outlet to reduce this potential.

The licensee has proposed to install ventilation fans in each diesel fuel tank bunker for vapor and smoke removal. Dampers will be added at recirculation fans in the air plenum room of the diesel generator building.

In view of the potential limitations created by dependence solely on the normal air handling systems for smoke removal, the licensee has proposed to provide portable fans and ducts. Smoke exhausters will also be provided for smoke and heat removal capability for the cable tunnels.

We conclude that, subject to implementation of the above described modifications, smoke removal provisions for the plant satisfy the objectives identified in Section 2.1 of this report and are, therefore, acceptable.

4.4.2 Filters

Charcoal filters in the reactor building are protected by automatic deluge systems. Suppression systems are not required for turbine building filters since decay heat would be insufficient to cause ignition. Fire detectors are to be provided on the control building emergency ventilation system charcoal filters; automatic suppression is not considered necessary because the filters are normally isolated and decay heat from radioactive particles in the outside atmosphere would be insufficient to cause ignition. Accordingly, we find these provisions acceptable.

4.4.3 Breathing Equipment

A total of 12 self-contained breathing units (rated breathing time is 30 minutes per unit) and a few spare bottles have been provided. The licensee has committed

to providing four additional units and enough spare bottles so that each unit will have two spare air bottles. In addition, a breathing air compressor will be purchased and installed with sufficient capacity to provide an additional six-hour supply for each breathing unit. We conclude that, with these additions, portable breathing equipment will be adequate to support manual fire fighting activities.

4.5 Floor Drains

Floor drains from the diesel generator rooms extend to an oil-water separator; however, no provisions are made to preclude the spread of fire through the drain system between diesel generator rooms. The licensee has proposed to add backflow devices to diesel generator room drains to prevent spread of fire. These are the only safety-related areas with significant combustible liquid hazards that drain to this oil-water separator.

Adequacy of drains to remove fire suppression water is addressed in Section 4.3.1.(7).

We conclude that with the above described modifications, the drain system will be adequate to prevent the spread of fire through the drain system.

4.6 Lighting Systems

In addition to normal plant lighting, both AC and DC emergency lighting is provided. The AC lights are supplied from the emergency power supply; the DC lights are supplied from the plant batteries or static rectifiers connected to the emergency power supply. Portable hand lights are also to be provided for emergency use.

Because the plant lighting systems are divided into a number of circuits, a fire in an area could cause loss of both normal and emergency lighting in the fire area, but would not cause loss of lighting to areas served by other circuits. The only area where a fire in a safety-related area may also cause loss of lighting to the areas required to provide access to the fire is in the service water intake structure. The licensee has proposed to install fixed sealed beam battery powered lighting units with an eight hour supply at elevation 20 feet of the service water intake structure.

We conclude that, subject to implementation of the above described modifications, the lighting systems for the plant satisfy the objectives identified in Section 2.1 of this report and are, therefore, acceptable.

4.7 Communications Systems

Normal communication within the plant is provided by a four-channel, paging/call-back system. An additional communication method is provided by a sound powered phone system with jacks at various key locations throughout the plant. The licensee has proposed to provide sufficient additional headsets for this system to support remote shutdown and fire fighting activities.

A portable radio system is available for fire emergencies. The licensee has committed to implement necessary modifications to assure radio transmission in all areas of the plant.

We conclude that, subject to implementation of the above described modifications, the communication systems satisfy the objectives identified in Section 2.1 of this report and are, therefore, acceptable.

4.8 Electrical Cable Combustibility

Flame tests conducted on the electrical cables used in the Brunswick Plant were comparable to the combustibility test set forth in IEEE 383. The results show that in the configurations and with the ignition source used in the tests the cable insulation burns slowly. Nevertheless, we consider all cable insulation made of organic material as combustible and, therefore, we find that retest to the IEEE 383 procedures and criteria would not provide information that would alter our conclusions. Accordingly, we find the electrical cables used at the Brunswick Plant acceptable.

4.9 Fire Barrier Penetrations

Fire barriers are penetrated by doorways, ventilation ducts, electrical cables, piping and conduit. The licensee has proposed to upgrade penetrations in walls used as fire barriers in many areas of the plant to a rating equivalent to that required of the fire barrier. We conclude that, subject to implementation of the above described modifications, the fire barrier penetrations for the plant conform to the provisions of Appendix A to BTP 9.5-1 and are, therefore, acceptable.

4.9.1 Electrical Cable and Conduit Penetrations

Fire stops are provided where cables penetrate fire barriers. These are mainly grouted with Delta Maid One Shot insulating cement or cellular concrete; and a few are sealed with mineral wool coated with Flamemastic. The licensee stated that the insulating cement and cellular concrete type penetrations have been qualified to a three-hour fire rating in accordance with ASTM E-119, "Fire Tests of Building Construction and Materials."

We find that the tests on the fire barrier penetration fire stops constructed of Delta Maid One Shot demonstrate the adequacy of this type of firestop and that the firestops are acceptable. The cellular concrete is a material similar to the Delta Maid One Shot; however, information has not been provided to verify its capability or the capability of the mineral wool with Flamemastic type firestop. The licensee has committed to provide such information. We will address review the adequacy of these types of firestops in a supplement to this report.

4.9.2 Fire Doors

The licensee has committed to change: (1) nonrated doors between battery rooms to a one-hour rating; (2) doors between the cable spreading rooms to three-hour rating; and (3) doors between the battery and cable spreading rooms to three-hour rated to be adequate for the fire loads in these areas. Nonrated frames will be replaced with frames of the same rating as the fire doors. We conclude that, subject to implementation of the above described modifications, the fire doors for the plant conform to the provisions of Appendix A to BTP 9.5-1 and are, therefore, acceptable.

The proper position of fire doors protecting safety-related areas will be supervised by locking or alarming 67 fire doors in low personnel traffic areas, and by periodic inspection of 11 fire doors in heavily trafficked areas. These represent all doors protecting safety-related areas. The proper position for fire doors will be clearly posted at each location to facilitate cooperation of plant personnel. The alarm panel for fire doors will be located in a constantly manned location. We conclude that, subject to implementation of the above described modifications, the supervision of fire doors for the plant satisfies the objectives identified in Section 2.1 of this report and is, therefore, acceptable.

4.9.3 Ventilation Duct Penetrations

The licensee has proposed to install fire dampers in ventilation duct penetrations of fire barriers which do not presently have dampers.

We conclude that, subject to implementation of the above described modifications, the ventilation duct penetrations of fire barriers conform to the provisions of Appendix A to BTP 9.5-1 and are, therefore, acceptable.

4.10 Separation Criteria

The licensee has stated that in most cases the design meets the separation provisions of Regulatory Guide 1.75, "Physical Independence of Electric Systems," for spatial separation of safety-related circuits. Where this spatial separation was not met, the cable was covered with a flame retardant coating. Cables which were routed in raceways of one division remain in that division, and were not permitted to be routed into either the other division raceways or nonsafety-related raceways. Thus, direct pathways via the cables are not provided for fire to propagate between divisions.

In general there is good separation between redundant divisions such that a fire would not cause functional loss of redundant safe shutdown equipment. Areas where separation is of particular concern are the basement area of the diesel generator building and the similar area in the service water intake structure. These two areas are discussed in detail in Section 5 of this report. Additionally, the separation criteria used in the facility do not preclude the routing of redundant cables in trays or conduit over each other or over a common fire hazard. The licensee has been requested to identify such areas and the effects on safe shutdown on the loss of these cables, considering cables as a combustible load and that conduit does not provide protection against an exposure fire. If any area is found that may present problems in achieving safe shutdown, modifications will be performed such as rerouting of cables, adding barriers, or providing fire protection. We will address the adequacy of cable separation in a supplement to this report.

4.11 Fire Barriers

Fire areas are enclosed by floors, walls, and ceilings which have a three-hour rating with a few exceptions. In some areas walls are being upgraded to a three-hour rating. Areas not having a three-hour rating are found acceptable on the basis of a light combustible loading or that redundant safe shutdown equipment

will not be jeopardized. Further detail as to which walls will be upgraded can be found in Section 5.0 of this report.

4.12 Access and Egress

All safety-related areas are reasonably accessible for manual fire fighting; however, some delay may be encountered in entering the drywell to fight a fire manually. When operating at approximately 100 percent power, fire fighters would not be able to enter the drywell for about 30 minutes following a reactor trip. This delay is considered acceptable due to the ability to suppress fires with the containment sprays (see Section 5.14).

4.13 Toxic and Corrosive Combustion Products

The products of combustion of many polymers are toxic to humans and corrosive to metals. Prompt fire detection and extinguishment are relied on to minimize the quantity of such products. Additionally, means for smoke removal are provided or will be added as discussed in Section 4.4 of this report. The fire brigade will also be provided with and trained in the use of emergency breathing apparatus for fighting fires involving such materials. We conclude that, subject to implementation of the modifications described in this report and the satisfactory resolution of the incomplete items, the potential for development of toxic and corrosive combustion products satisfies the objectives identified in Section 2.1 of this report and is, therefore, acceptable.

4.14 Nonsafety-Related Areas

We have evaluated the separation by distance or by fire barriers of nonsafety-related areas to determine that fires in such areas will not adversely affect the ability to safely shutdown the plant. Nonsafety-related areas which potentially pose a fire hazard to safe shutdown equipment are addressed in Section 5 of this report.

The licensee has been requested to evaluate the potential for fires in radwaste areas causing unacceptable releases. Where fires may cause unacceptable releases, modifications such as barriers, fire retardant coatings, fire detection, and fire suppression systems should be added to assure that fires will not cause unacceptable releases.

4.15 Instrument Air

The noninterruptible air supply is required to operate certain equipment, including main steam isolation valves and main steam manual blowdown valves. The air supply is provided by redundant compressors and air lines. Air lines are routed such that they are in separate areas, with a few exceptions. The areas where they are in proximity are where they come together at the accumulator serving each valve, and at one location on elevation 20 feet of the reactor building. Because there are no significant combustibles in these areas, we find the separation of noninterruptible air systems acceptable.

5.0 EVALUATION OF SPECIFIC PLANT AREAS

The licensee has performed a fire hazards analysis of the facility to determine the fire loading of various plant areas, to identify the consequences of fires in safety-related and adjoining nonsafety-related areas, and to evaluate the adequacy of existing and proposed fire protection systems.

The results of the fire hazards analysis, other docketed information, and site visit observations were used in the staff's evaluation of specific plant areas. The staff's evaluation is discussed in the following sections.

5.1 Cable Access Ways - Control Building

5.1.1 Safety-Related Equipment

Cables from redundant safe shutdown equipment pass through these areas. The cables are all in conduit.

5.1.2 Combustibles

About 20 percent of the conduit is flexible greenfield type with a polyvinyl-chloride (PVC) covering. This is the only exposed combustible material located here.

5.1.3 Consequences if no Fire Suppression

It is unlikely that a fire would involve both divisions due to the wide separation of divisional cables in these areas. It is probable that a fire would involve one division of cables for safe shutdown equipment.

5.1.4 Fire Protection Systems

Manual hose reel CO_2 stations are available outside the area within access to fight fires in the access ways. One ionization smoke detector is provided.

5.1.5 Adequacy of Fire Protection

There is reasonably good access available to fight fires manually. The smoke detection in these areas is inadequate in that only one detector is provided. The CO_2 system may not be adequate to extinguish and cool sufficiently to prevent reignition of fires in polyvinyl-chloride.

5.1.6 Modifications

The licensee has proposed to:

(1) Install a fire wall having a three-hour rating between the redundant division conduits to assure that a single fire will not involve redundant safe shutdown systems.

(2) Coat the polyvinyl-chloride covered conduit with a flame retardant coating to limit the consequences of a fire.

(3) Provide water hose stations within easy access to these areas for additional suppression capability.

(4) Provide additional detectors for the new areas created by the addition of walls so that at least two detectors are in each fire area.

We conclude that, subject to implementation of the above described modifications, fire protection for the cable accessways satisfies the objectives identified in Section 2.1 of this report and is, therefore, acceptable.

5.2 Cable Spreading Rooms

5.2.1 Safety-Related Equipment

The cable spreading rooms for both units are located at elevation 23 feet, each directly below its respective control room area. The cable spreading rooms contain redundant cabling associated with safe shutdown and other safety-related equipment. The rooms also contain motor control centers which are supplied from redundant Class IE power sources.

5.2.2 Combustibles

The combustibles in these areas consist of a large quantity of organic cable insulation. These cables have been tested to meet or exceed the criteria of the IEEE 383 flame test. A large part of the cables are in conduit with the remainder in cable trays. Much of the exposed cabling is covered with a flame retardant coating.

5.2.3 Consequences if no Fire Suppression

An unmitigated fire in this area could become large enough to involve redundant divisions due to heat generation and potentially due to combustible materials in the separation space between the trays of redundant divisions. The complete loss of the cable spreading room presently would cause loss of control of certain safe shutdown equipment.

5.2.4 Fire Protection Systems

The primary method of fire suppression in these areas is provided by manual CO_2 hose reels located in the rooms. Detection of incipient fires is provided by 15 ionization smoke detectors located at ceiling level throughout the rooms.

5.2.5 Adequacy of Fire Protection

There are four entryways into each of the cable spreading rooms, and reasonably good access is available to fight fires manually. However, the existing manual CO_2 system is not sufficient to assure that redundant safe shutdown equipment will not be lost in a fire. CO_2 may not be able to extinguish a large fire due to its limited capability to remove heat and prevent reignition. Some of the cables are not presently covered with a flame retardant coating, which exposes a

substantial amount of combustible material, and may cause fire fighting efforts to be hampered by the generation of smoke and heat.

5.2.6 Modifications

The licensee has proposed the following modifications:

(1) The provision of a remote shutdown capability independent of the cable spreading room. This capability will make it possible to bring the plant to a cold shutdown without depending upon any control room or cable spreading room equipment or cables. We will be further reviewing the details of the modifications required to provide this capability as the detailed design is developed.

(2) Changes to assure that an unmitigated cable spreading room fire will not cause loss of redundant safety-related batteries.

(3) The installation of two manual water hose stations, one in each stairwell with sufficient hose to reach all areas of the cable spreading rooms and battery rooms.

(4) Replacement of doors between the cable spreading rooms and between the cable spreading rooms and battery rooms with doors having a three-hour fire-rating.

(5) Coating of the remaining cable in cable trays and PVC covered conduit with a flame retardant.

(6) Provision of portable smoke removal equipment.

Upon implementation of these modifications, considerable assurance is provided that manual fire suppression will be able to prevent a fire from involving redundant divisions. Additionally, in the very unlikely event a larger fire should occur, safe shutdown of the plant can still be accomplished using the remote shutdown capability. Accordingly, we find that fire protection for this area will be acceptable.

5.3 Battery Rooms

5.3.1 Safety-Related Equipment

Each of the two units has two redundant safety-system batteries. These redundant batteries are in separate rooms which are located adjacent to the cable spreading room and to each other.

5.3.2 Combustibles

The significant amount of combustibles in the battery rooms are the plastic battery cases and a small amount of electrical cable insulation.

Hydrogen buildup is precluded by continuously operating supply and exhaust ventilation fans for each battery room either of which provide sufficient ventilation to maintain hydrogen concentration below 2 percent (by volume). In

addition, ventilation flow monitoring devices are installed which provide control room alarm on loss of battery room ventilation flow.

5.3.3 Consequences if no Fire Suppression

An unsuppressed fire in a battery room could cause the loss of one of the redundant batteries, but would not affect the redundant battery room when the barrier between the battery rooms is upgraded (see Section 5.3.6 below).

5.3.4 Fire Protection Systems

There are no automatic fire suppression systems in the battery rooms. Two ionization smoke detectors are provided for each room. CO_2 hose reels are within access of the battery rooms.

5.3.5 Adequacy of Fire Protection

Considering the limited quantity of combustible material, manual fire suppression is adequate to extinguish fires in these rooms; however, manual water hose stations should be provided as backup to the CO_2 hose reels, and doors with a one-hour fire rating should be installed between the battery rooms.

5.3.6 Modifications

The licensee has proposed to replace the doors between adjacent battery rooms with doors having a one-hour fire-rating, and the doors between the battery rooms and the cable spreading rooms with doors having a three-hour fire-rating. The licensee also proposes to install manual water hose stations within easy access of the battery rooms. We conclude that, subject to implementation of the above described modifications, fire protection for the battery rooms conforms to the provisions of Appendix A to BTP 9.5-1 and is, therefore, acceptable.

5.4 Control Room

5.4.1 Safety-Related Equipment

The control room contains safety-related control cabinets and cables in overhead cable trays. At the present time, certain of these cables and control cabinets would be required for safe shutdown of both reactors. However, the licensee has proposed to provide remote shutdown capability independent of the control room so that safe shutdown can be achieved from a remote location, even if the control room is functionally lost due to a postulated fire.

5.4.2 Combustibles

The combustibles in the area consist of electrical cable insulation, electrical components in panels and consoles, and a small amount of Class A combustibles such as log books, drawings, operating procedures and computer printouts.

Two adjacent office areas contain typical office combustibles and are separated from the control room by fire retardant wood partitions. The two computer rooms, a small shop, kitchen, washroom and janitor closet are located adjacent to the control room and are separated from the control room by noncombustible partitions.

A visitor gallery, which is presently being used as an office, is separated from the control room by a large viewing window.

There are two equipment access openings covered with metal plates in the concrete floor of the control room which open into the cable spreading room below. These openings could permit smoke and heat from a fire in the cable spreading room to extend into the control room.

5.4.3 Consequences if no Fire Suppression

A postulated fire in the control room has the potential for damaging significant amounts of safety-related equipment within a single division. In addition, a postulated fire in certain control room cabinets or cabling may affect redundant systems.

5.4.4 Fire Protection Systems

Smoke detectors have been provided at the ceiling level throughout the room. In the center of the room, the main operating control cabinets are located under a drop-ceiling, and detectors are provided only in the concealed space above the ceiling.

There is no automatic fire suppression in this area. Manual carbon dioxide hose reels are provided.

5.4.5 Adequacy of Fire Protection

Until the proposed modifications to permit safe shutdown without the control room have been completed, fire protection for this area is judged to be inadequate to prevent functional loss, in the event of a postulated fire, of redundant safe shutdown systems. The fire detectors above the suspended ceiling will not respond quickly to a fire in the main control cabinets underneath. The carbon dioxide hoses may not provide effective suppression for certain electrical insulation or Class A combustible fires.

5.4.6 Modifications

In addition to the proposed modifications to permit safe shutdown with functional loss of the control room, the licensee proposes the following improvements in fire protection for this area:

(1) A three-hour fire barrier will be provided between the control room and the adjacent offices, computer rooms and stairwells. This barrier will also separate the control room from the floor hatches into the cable spreading room below. A fire damper will be installed in the ventilation duct between the control room and an adjacent washroom.

(2) Combustibles will be removed from the visitor gallery.

(3) Fire detectors will be installed in the main control cabinets. Additional fire detectors will be provided in the adjacent areas containing offices, repair shop, washroom, visitor gallery, kitchen and janitor closet.

(4) Fire water standpipes and interior hose stations will be installed in the stairwells for manual fire fighting in the control room.

(5) The ventilation system will be modified to improve smoke removal capability (see Section 4.4).

(6) Water-type portable fire extinguishers will be installed in this area.

We conclude that, subject to implementation of the above-described modifications, including provisions for remote shutdown capability, fire protection for the control room conforms to the provisions of Appendix A to BTP 9.5-1 and is, therefore, acceptable.

5.5 Mechanical Equipment Room - Elevation 70 Feet - Control Building

5.5.1 Safety-Related Equipment

The mechanical equipment room contains ventilation equipment for the control room, cable spreading rooms and battery rooms.

5.5.2 Combustibles

Combustibles in this area are contained in metal housings and consist of charcoal filters and dirt and lint on filters. The loading is light.

5.5.3 Consequences if no Fire Suppression

In an unmitigated fire, loss of capability to shut the plant down is not expected to occur. A postulated fire would not cause loss of more than a single ventilation system.

5.5.4 Fire Protection Systems

Three ionization smoke detectors are located in the room. A manual hose reel CO_2 is provided for extinguishing fires.

5.5.5 Adequacy of Fire Protection

Considering the limited amount of combustibles in this area and the provision of detectors for prompt detection, manual means to suppress fires in this area will be adequate.

5.5.6 Modifications

The licensee proposes to augment the present fire detection capability by adding detectors at the air filters and increasing the number of room detectors to assure complete area coverage. A manual water hose station will also be added. We conclude that, subject to implementation of the above described modifications, fire protection for the mechanical equipment room satisfies the objectives identified in Section 2.1 of this report and is, therefore, acceptable.

5.6 Electrical Cable Tunnels

5.6.1 Safety-Related Equipment

It appeared, during the NRC staff's site visit, that the only safety-related cables in the tunnels ran into the radwaste area for use with radwaste equipment and as such they would not be required for safe shutdown.

5.6.2 Combustibles

A large quantity of organic cable insulation is located in open cable trays.

5.6.3 Consequences if no Fire Suppression

A large amount of plant equipment could be lost; however, it did not appear from the staff's site visit that safe shutdown equipment would be involved. The licensee has been requested to evaluate the effect of the loss of those few cables which were marked as being associated with a safety division.

5.6.4 Fire Protection Systems

The area contains 44 ionization type smoke detectors distributed throughout the tunnels. Automatic suppression systems are not provided. Cables are covered every 50 feet with a flame retardant coating for a length of approximately 10 feet. Manual hose stations are provided outside the area for fighting fires in the tunnels.

5.6.5 Adequacy of Fire Protection

A fire in this area would affect a considerable number of nonsafety systems; however, it does not appear that a fire in this area would affect plant safe shutdown. The adequacy of fire protection will be reviewed upon submittal of certain information by the licensee specifically addressing the subject of the effect on safe shutdown equipment by fires in this area (see Section 3.2.3).

5.6.6 Modifications

We will address the adequacy of fire protection for the electrical cable tunnels in a supplement to this report.

5.7 Intake Structure

5.7.1 Safety-Related Equipment

The intake structure contains nuclear and conventional service water pumps for both units, and the electrical cabling associated with these pumps. The nuclear service water header provides cooling water for equipment required for safe shutdown. Any of the nuclear or conventional service water pumps may be aligned to the nuclear service water header. There are five service water pumps for each unit only one of which is necessary for safe shutdown and decay heat removal for a single unit.

5.7.2 Combustibles

The significant combustibles in this building include the lube oil associated with the service water, screenwash, and lubricating water pumps and the electrical cable insulation. Fire retardant coatings have been applied to some of the electrical cable in open trays.

5.7.3 Consequences if no Fire Suppression

An unsuppressed fire in the cable trays located in the lower level could affect all of the service water pumps, jeopardizing the safe shutdown capability for both units.

An unsuppressed pump lube oil fire could affect one or more pumps and related valves, depending on the quantity and location of the oil spill.

5.7.4 Fire Protection Systems

Smoke detectors have been provided in this building. The building is within reach of hose lines from one yard hydrant.

5.7.5 Adequacy of Fire Protection

We consider the present reliance on manual fire control to be inadequate to assure that significant fire damage to the safety-related water pumps and associated electrical cabling will not occur. The below-grade level contains a considerable amount of electrical cable in open trays, and presents a very difficult situation for manual fire control because of poor visibility from smoke, and limited access.

5.7.6 Modifications

The licensee proposes to add an automatic sprinkler system in the basement and a water spray system, barriers, and curbs at the service water pumps to prevent a fire in one pump from causing damage to adjacent units. The addition of interior hose stations, a nearby yard hydrant and hose house, and necessary drainage modifications to remove water are also proposed by the licensee.

We conclude that, subject to implementation of the above described modifications, fire protection for the intake structure conforms to the provisions of Appendix A to BTP 9.5-1 and is, therefore, acceptable.

5.8 Diesel Generator Building

5.8.1 Safety-Related Equipment

The diesel generator building contains the four emergency diesel generators, which are shared between the two units, and the 4160-volt switchgear associated with each generator. The building also contains the four 480-volt switchgear rooms for the two redundant channels of each reactor, and the associated electrical cables for each channel. Offsite power for both units also extends to the 4160-volt switchgear. Diesel fuel supply tanks, one for each generator, are located in an underground bunker adjacent to the building.

5.8.2 Combustibles

Significant combustibles include diesel fuel, electrical insulation on cables, and material in electrical gear.

Each diesel generator has an integral "day-tank" containing 1100 gallons of fuel, and each has a supply tank in the adjacent bunker containing 23,300 gallons.

The electrical cables are contained in both open trays and conduit. In the basement cable spreading area, cables in open trays have been covered with a fire retardant coating.

5.8.3 Consequences if no Fire Suppression

A large fire in the basement of the diesel generator building is highly improbable due to the total coverage of all the cables with a flame retardant coating. However, if such a fire were to occur, there is a remote possibility that it could result in the loss of all AC power to safety-related equipment including safe shutdown equipment for both units.

Each diesel generator, redundant switchgear and supply tank is contained in a separate room. Therefore, an unsuppressed fire in any of these rooms could result in loss of function to the equipment in that room, but in most cases, would not affect adjacent areas containing redundant equipment due to the fire barriers between areas. The fire barriers themselves are of reinforced concrete construction and appear to be capable of withstanding a severe fire exposure. The fire doors in the building are rated for three-hour fire resistance; however, the frames are not labeled to indicate a three-hour rating. Ventilation ducts are provided with fire dampers at some barrier penetrations, but not all. There is one electrical box penetration between two of the diesel generator rooms which is not of fire-rated construction and is considered vulnerable.

Electrical cables extend vertically through the diesel generator rooms from the cable spreading area below to the switchgear units above. In some cases, the electrical cables in a generator room are not associated with the generator in that room. Therefore, an unsuppressed fire in a generator room could affect both that generator and wiring associated with other generators.

All four of the diesel generators share a common fan room and air supply plenum. The fan room also contains an oil-filled air filter and an exhaust silencer for each generator. A fire or explosion involving an air filter or a silencer will produce smoke and heat that would be drawn into all four diesel generator rooms and engine air intakes, possibly resulting in the loss of function of redundant generator units.

The drain lines for the four diesel generator rooms extend to a common header. No traps or backflow devices are provided to prevent the spread of fire from one room to the other.

An unsuppressed fire in one of the underground bunkers containing a supply tank could result in loss of function of the generator supplied by that tank. The roof of the underground bunker is supported by unprotected steel, which could

collapse from severe fire exposure. Piping for diesel engine cooling service water passes through the bunkers. If this piping were damaged it could result in loss of all four diesel generators. The drain header serving all four generator rooms passes through the bunkers which, if breached, could result in the spread of smoke and heat to all four generator rooms. Wiring for fuel pumps at the supply tanks passes through the bunkers. Fire in one bunker could damage the wiring and preclude transfer of additional fuel from the supply tank involved in the fire and in some cases supply tanks associated with other diesel generators. The piping used to transfer fuel oil from one of the supply tanks to the day tank passes through one of the other tank bunkers. In this case, a fire could cause loss of two diesel generators.

5.8.4 Fire Protection System

Smoke detectors are provided in the diesel generator rooms, switchgear rooms, basement cable spreading area, and loading dock. Heat detectors are provided in the supply tank bunkers. Thermal fire detectors are located above the trenches in each diesel generator room.

The day tank and drainage trenches at each diesel generator are protected by closed-head manually operated water spray systems. The water spray is actuated manually either from the control room or locally.

Yard hydrants could be used for manual fire fighting. Portable fire extinguishers are available in the building.

5.8.5 Adequacy of Fire Protection

The basement cable spreading area has poor access and total reliance should not be placed on manual fire suppression, even though the potential for a serious fire is reduced by the use of fire retardant coating on the cables.

In the diesel generator rooms, partial coverage by manual sprinklers is inadequate to assure rapid fire control and minimize the potential for functional loss of one diesel generator.

The lack of automatic fire suppression in the supply tank bunkers could result in unnecessary damage to one tank, and there is a potential that other diesel generators would be affected by loss of cooling water or fuel supply or by structural damage due to heat from an unmitigated fire.

Manual fire suppression efforts in this building will be delayed by the lack of interior fire hoses, and in some areas, the lack of adequate fire detection coverage.

5.8.6 Modifications

The licensee has proposed a number of significant modifications to this building. They are identified below:

(1) An automatic sprinkler system will be provided to protect the cable in the diesel generator basement cable spreading area.

(2) Labeled three-hour fire doors and frames will be provided in all fire barriers. A three-hour fire-rated enclosure and fire door will be provided for each of the two stairways into the basement.

(3) Fire dampers will be installed in certain ventilation ducts to preclude fire extension from one area to another via the supply air plenum. Dampers will also be installed in four recirculation air openings to prevent heat and smoke from entering the fan room.

(4) The electrical box which penetrates the fire wall between the two generator rooms will be enclosed by a three-hour fire barrier. Three-hour fire barriers will be provided around electrical wiring and piping in the diesel generator rooms and the supply tank bunkers where the consequences of a fire could affect redundant safe shutdown systems.

(5) Additional fire detectors will be installed to provide complete coverage of safety-related areas, and local audible alarms will be provided on the detection system to alert personnel in the immediate area to a fire emergency.

(6) An automatic water suppression system will be provided in the diesel generator rooms. A two-way feed will be provided for the header to the sprinkler systems, and water flow alarms will be installed.

(7) The exhaust silencers in the fan room will be relocated to the roof of the building.

(8) An automatic aqueous film forming foam system and oil retainer system will be added to the oil bath air intake filters.

(9) Three-hour fireproofing will be provided on the steel beams supporting the roof of the supply tank bunkers. A roof manhole for access and smoke venting, and an exhaust ventilation system will be provided for each bunker. Doors and other penetrations between bunkers will be made gas-tight.

(10) Interior hose stations will be provided throughout the buildings, and portable fire extinguisher coverage will be improved.

(11) An automatic aqueous film forming foam system is to be provided to protect the fuel tank bunkers.

(12) Modifications are being performed so that only two diesel generators are required to handle the loads associated with safe shutdown in a fire situation.

(13) Backflow prevention devices will be installed in the diesel generator room drains to prevent spread of fire through the drain system.

We conclude that, subject to implementation of the above described modifications, fire protection for the diesel generator building satisfies the objectives identified in Section 2.1 of this report and is, therefore, acceptable.

5.9 Reactor Building Elevation (-)17 Feet

5.9.1 Safety-Related Equipment

The safety-related equipment includes the core spray pumps, residual heat removal pumps, high pressure coolant injection pumps, and associated cabling. The residual heat removal heat exchangers at elevation 20 feet are in a room that is open to this elevation. The equipment required for normal safe shutdown in the event of a fire emergency includes the residual heat removal pumps and heat exchangers, the high pressure coolant injection pump or reactor core isolation cooling pump, and associated electrical cabling.

5.9.2 Combustibles

The significant combustibles are limited to the lube oil associated with the pumps. There is also a small amount of electrical cable insulation. Each of the residual heat removal and core spray pump rooms contain approximately 28 gallons of lube oil. The high pressure coolant injection pump room contains approximately 155 gallons of lube oil.

5.9.3 Consequences if no Fire Suppression

Postulated fires in electrical cables or lube oil could cause loss of certain equipment within one division, but in most cases, would not affect the redundant division since redundant pumps and cables are located in separate enclosures. As discussed in Section 4.10, the licensee is evaluating the effects on safe shutdown where redundant division cables are in proximity with each other.

5.9.4 Fire Protection Systems

Fire protection is provided by fire detectors, water hose stations, and portable extinguishers. The high pressure coolant injection pump room is provided with an automatic total flooding CO_2 system.

5.9.5 Adequacy of Fire Protection

A fire would be limited to one division, although it may not be promptly extinguished. This delay in extinguishment could result from fire brigade response time and difficulty in fighting fires manually in the core spray and residual heat removal pump rooms.

5.9.6 Modifications

The licensee has proposed to install fixed automatic fire suppression systems in the core spray pump rooms and residual heat removal pump rooms. Additional fire detectors will be installed in the rooms at this elevation. We conclude that, subject to implementation of the above described modifications, fire protection for the (-)17-foot elevation of the reactor building conforms to the provisions of Appendix A to BTP 9.5-1 and is, therefore, acceptable.

5.10 Reactor Building - Elevation 20 Feet

5.10.1 Safety-Related Equipment

The safety-related equipment at the 20 feet elevation includes the remote shutdown panel, motor control centers, and electrical cabling. Much of this equipment would be required for safe shutdown.

Redundant safety-related equipment are, in most cases, on opposite sides of the reactor building, separated by the drywell or physical separation. Some areas contain cables from both redundant divisions.

5.10.2 Combustibles

The significant combustible at this elevation is the electrical cable insulation.

5.10.3 Consequences if no Fire Suppression

Postulated fires in electrical cabling would cause loss of certain equipment within one division. The licensee has been requested to evaluate the effects on safe shutdown of the loss of cables where redundant divisions cross each other or cross a common hazard in proximity (4.10). The licensee has also been requested to evaluate the effects on safe shutdown of a fire at the remote shutdown panel.

5.10.4 Fire Protection Systems

Fire protection is provided by fire detectors, water hose stations, and portable extinguishers.

5.10.5 Adequacy of Fire Protection

The existing manual fire suppression would be adequate to suppress fires which occur, however the number and spacing of detectors provided may not afford prompt detection.

5.10.6 Modifications

The licensee has proposed to install additional fire detectors. An area at the entrance to the reactor building equipment access lock will be designated as a combustible storage area. This area will have a fixed automatic water suppression system. We conclude that, subject to implementation of the above described modifications, the fire protection for the 20-foot elevation of the reactor building satisfies the objectives identified in Section 2.1 of this report and is, therefore, acceptable.

5.11 Reactor Building - Elevation 50 Feet

5.11.1 Safety-Related Equipment

The safety-related equipment at this elevation includes the service water booster pumps for the residual heat removal system, standby gas treatment filter units, two motor control centers, and electrical cabling in open trays and conduit.

The service water booster pumps for the residual heat removal system, some of the electrical cabling and the motor control centers would be used for safe shutdown.

5.11.2 Combustibles

The significant combustibles at this elevation are the standby gas treatment charcoal filter elements, lube oil in the four service water booster pumps for the residual heat removal system, and three reactor building closed cooling water pumps, and electrical cable insulation.

5.11.3 Consequences if no Fire Suppression

In general, the effects of fires would be limited to one division. Redundant cables and motor control centers are located on opposite sides of the reactor building; however, in some cases, redundant division cabling in conduit passes over a common fire hazard (e.g., open cable tray). In these areas, the licensee has been requested to evaluate the effects on safe shutdown of the loss of these cables due to a fire.

Lube oil fires at the service water booster pumps for the residual heat removal system would be limited to one division. The pumps are diked, and redundant pumps separated by a barrier.

Safety-related equipment is not located in proximity to the standby gas treatment charcoal filter units or the reactor building closed cooling water pumps and therefore would not be affected by fires in charcoal filters or reactor building closed cooling water pumps.

5.11.4 Fire Protection Systems

Fire protection is provided by fire detectors, water hose stations, and portable extinguishers. Deluge systems are provided for the standby gas treatment charcoal filters.

5.11.5 Adequacy of Fire Protection

Some damage could occur to safety-related equipment, but fire suppression would be adequate to limit involvement to a minimum amount of equipment in one division, provided certain licensee proposed modifications are implemented as discussed in Section 4.10. The number and location of existing detectors may not afford prompt detection.

5.11.6 Modifications

The licensee has proposed to add additional fire detectors to assure faster response to fires. Additionally, modifications will be made as discussed in Section 4.10 to assure redundant safe shutdown cables are not involved in a fire. We conclude that, subject to implementation of the above described modifications, fire protection for the 50-foot elevation satisfies the objectives identified in Section 2.1 of this report and is, therefore, acceptable.

5.12 Reactor Building - Elevation 80 Feet

5.12.1 Safety-Related Equipment

The safety-related equipment at the 80 feet elevation of the reactor building is primarily electrical cable from both divisions, some of which would be required for safe shutdown.

5.12.2 Combustibles

The significant combustibles include water treatment chemicals, lube oil associated with standby liquid control pumps, and electrical cable insulation.

5.12.3 Consequences if no Fire Suppression

Fires at this elevation would be limited to one division, except for some areas where cables from redundant divisions are routed in proximity. As discussed in Section 4.10, the licensee is evaluating the effects on safe shutdown of the loss of these cables.

5.12.4 Fire Protection Systems

Fire protection at this elevation includes detectors, water hose stations, and portable extinguishers.

5.12.5 Adequacy of Fire Protection

The existing fire protection would be adequate to control fires in this area. However, storage of combustible water treatment chemicals in this area may present an exposure hazard to safety-related cabling.

5.12.6 Modifications

The licensee has proposed to add additional fire detectors to assure faster response to fires. The licensee has proposed providing a three-hour fire-rated store room for storage of water treatment chemicals. This room will have fire detectors. A fixed automatic water spray will be installed at the standby liquid control pumps. Other modifications may also be made as discussed in Section 4.10.

We conclude that, subject to implementation of the above described modifications, the fire protection for the 80-foot elevation of the reactor building satisfies the objectives identified in Section 2.1 of this report and is, therefore, acceptable.

5.13 Reactor Building - Elevation 117 Feet

5.13.1 Safety-Related Equipment

There is minimal safety-related equipment at the 117 feet elevation of the reactor building other than the new fuel and spent fuel pools.

5.13.2 Combustibles

Combustibles at this elevation include lube oil associated with fuel handling equipment, and plastic sheeting and other materials used during refueling operations.

5.13.3 Consequences if no Suppression

Postulated fires at this elevation would not affect safe shutdown; however, undesirable combustion products would result.

5.13.4 Fire Protection Systems

Fire protection in this area includes some fire detectors, water hose stations, and fire extinguishers. There are no automatic suppression systems in this area.

5.13.5 Adequacy of Fire Protection

The existing manual fire suppression equipment would be adequate for fires in this area; however, fires may not be promptly detected due to the minimal number of detectors in this area.

5.13.6 Modifications

The licensee has proposed to install additional detectors in this area and storage rooms and metal cabinets to store combustibles. We conclude that, subject to implementation of the above described modifications, fire protection for the 117-foot elevation conforms to the provisions of Appendix A to BTP 9.5-1 and is, therefore, acceptable.

5.14 Reactor Containment Drywell

5.14.1 Safety-Related Equipment

The safety-related equipment in the drywell includes valves, piping, reactor vessel, and cabling. Much of this equipment would be required for effecting safe shutdown.

5.14.2 Combustibles

The significant combustibles in the drywell are electrical cable insulation and lube oil for the reactor recirculation pumps. Each of the two recirculation pumps contains approximately 60 gallons of lube oil. Most electrical cables are run in conduit.

5.14.3 Consequences if no Fire Suppression

An unmitigated lube oil fire in the drywell could generate sufficient heat to damage equipment and impair the capability to safely shutdown the plant.

As discussed in Section 4.10 the licensee has been requested to evaluate the effects on safe shutdown where cables from redundant divisions are routed in proximity of each other or over a common fire hazard.

5.14.4 Fire Protection Systems

For periods when operating with a nitrogen inerted containment drywell, the inerting serves as protection by preventing the initiation of fires.

For fire protection during operations with a de-inerted containment, the suppression capability currently provided by hose stations and portable extinguishers outside the area or by containment sprays will be relied on; however, fire detectors are not provided.

5.14.5 Adequacy of Fire Protection

The lack of fire detection capability will not permit rapid detection and suppression of a fire, and may allow involvement of redundant divisions. The containment sprays would be adequate to suppress fires in the drywell.

5.14.6 Modifications

The licensee has proposed installing thermocouples in the recirculation pump cooling air inlets and exhausts to detect lube oil fires. To minimize the size of lube oil fires, an oil collection system is being installed. Further modifications may be required as a result of the evaluation described in Section 4.10. We conclude that, subject to implementation of these modifications, fire protection for the drywell conforms to the provisions of Appendix A to BTP 9.5-1 and is, therefore, acceptable.

5.15 Pipe and Valve Vaults - Reactor Building - Elevation 20 Feet

5.15.1 Safety-Related Equipment

The safety-related equipment in the pipe and valve vaults of the reactor building consists of residual heat removal piping and valves in the east valve vault, main steam isolation valves, non-interruptible air lines and accumulators, and electrical cables in the feedwater and steam pipe vault. All of this equipment may be required for safe shutdown.

5.15.2 Combustibles

The combustibles in these areas include valve grease and a minimal amount of electrical cable insulation.

5.15.3 Consequences if no Suppression

An unmitigated valve grease or cable insulation fire would cause loss of equipment within one safety division, but would not likely affect the redundant division due to physical separation and the small amount of combustibles.

5.15.4 Fire Protection Systems

There is no fire detection or suppression capability in this area; however, water hose stations are available in adjacent areas which can service the pipe and valve vaults.

5.15.5 Adequacy of Fire Protection

Manual suppression with hoses brought in from adjacent areas would adequately suppress fires which may occur in these areas. However, significant damage may occur to safety-related equipment due to lack of fire detectors in this area.

5.15.6 Modifications

The licensee has proposed the installation of detectors in this area. We conclude that, subject to implementation of the above described modifications, fire protection for the pipe and valve vault satisfies the objectives identified in Section 2.1 of this report and is, therefore, acceptable.

5.16 Yard Areas

5.16.1 Safety-Related Equipment

The safety-related equipment in the yard area includes underground power cables to the service water pumps at the intake structure and the demineralized water tank.

5.16.2 Combustibles

The combustibles which were considered for their potential for exposure to safety-related systems included several oil-filled transformers, two above ground diesel fuel tanks, an oil-fired auxiliary boiler, a rail unloading station for fuel oil delivery, and two turbine lube oil storage tanks.

5.16.3 Consequences if no Fire Suppression

In general, an unsuppressed fire in the yard area would not present a significant fire exposure to safety-related systems because of intervening distance or barriers. One diesel fuel storage tank is located in the east yard area and is surrounded by buildings and equipment, making manual fire control difficult. The dikes for both fuel oil storage tanks are not sized large enough for the tank contents, which could result in overflow. There is a valve near the tank which can be opened to drain the dike, but under adverse wind conditions the valve may be inaccessible. One tank is near the diesel generator building and the augmented offgas building; however, the heavy concrete construction of these structures should preclude any serious fire exposure damage to them. The other fuel oil storage tank is remote from safety-related areas. We conclude that the location and installation of these tanks does not present a significant threat to safety-related systems.

The diesel fire pump day-tank is near the demineralized water tank. However, the limited amount of diesel oil involved and the large heat sink provided by the water in the tank would prevent any significant damage to the water tank itself.

The oil-filled transformers and turbine lube oil storage tanks are located along the west wall of the turbine building. A fire in any of these would not expose safety-related systems because safety systems are separated by fire barriers and distance.

5.16.4 Fire Protection Systems

Yard hydrants and hose lines stored in hose houses are available for manual fire suppression as discussed in Section 4.3.1.(3). The oil-filled transformers are protected by automatic water spray systems.

5.16.5 Adequacy of Fire Protection

The protection provided for the yard area is adequate to prevent fire damage to safety-related systems, however the inadequacy of the fuel-oil tank dike could allow unnecessary spread of fire.

5.16.6 Modifications

The licensee has proposed increasing the volume of the dike to hold a volume which is in excess of the contents of the tank in the event of a tank rupture. We conclude that, subject to implementation of the above described modifications, fire protection for the yard area conforms to the provisions of Appendix A to BTP 9.5-1 and is, therefore, acceptable.

5.17 Turbine Buildings

5.17.1 Safety-Related Equipment

The two turbine buildings do not house any safety-related equipment. Moreover, these buildings are separated from safety-related equipment in other areas by substantial fire barriers.

5.17.2 Combustibles

The significant combustibles in the turbine buildings include cable insulation, lubricating oils, hydrogen seal oil and hydrogen.

5.17.3 Consequences if no Fire Suppression

A major fire could occur in the turbine buildings, especially as a result of a leak in the oil piping system. The turbine buildings are separate, free standing structures and major structural damage to these buildings from a fire should have no effect on the integrity of the adjacent reactor and control buildings. The licensee has stated that safety-related systems are separated from the turbine building hazards by three-hour rated walls and doors.

5.17.4 Fire Protection Systems

Major sources of combustible material such as the turbine lube oil reservoir and conditioner, hydrogen seal oil unit, motor generator sets and main feedwater pumps are protected by automatic water spray systems actuated by rate-compensation type detectors. The pressurized sections of the turbine lube oil system with the exception of the attachment at the turbine generator are designed with a guard pipe around the primary pipe to protect against leaks. The automatic suppression systems have been designed and maintained in accordance with NFPA 13 and NFPA 15. Manual hose stations are located throughout the turbine buildings.

5.17.5 Adequacy of Fire Protection

Since the major sources of combustibles are protected with automatic suppression systems and because fires in the turbine buildings would not prevent safe shutdown of the plant, we conclude that the fire protection for the turbine buildings satisfies the objectives identified in Section 2.1 of this report, and is acceptable.

5.17.6 Modifications

To further assure that major fires do not occur, the licensee proposes to protect the lube oil piping in the heater bay with a three-hour fire barrier. We find this acceptable.

6.0 ADMINISTRATIVE CONTROLS

General

The administrative controls for fire protection consist of the fire protection organization, the fire brigade's training, the controls over combustibles and ignition sources, the prefire plans and procedures for fighting fires, and the quality assurance provisions for fire protection. The licensee has provided a description of the elements of his administrative controls for fire protection, as detailed in the following sections. Various improvements needed in his administrative controls are also detailed in the following sections. By letter dated September 20, 1977, the licensee submitted a response to staff comments. We are continuing to review this information and the acceptability of measures proposed by the licensee to implement the incomplete items identified below.

6.1 Organization

The licensee's fire protection organization contains the organizational responsibilities and the lines of communication between the various positions involved in the fire protection program; the qualification requirements of key positions involved in the fire protection program; and the composition of the fire brigade.

The licensee has proposed a fire brigade of at least five members to be maintained on site at all times. The fire brigade will not include the minimum shift crew shown in Table 6.2-1 of the Technical Specifications or any personnel required for other essential functions during a fire emergency. The composition and size of the proposed fire brigade meets the NRC staff's requirements, and is acceptable.

The fire protection organization contains positions extending from the Executive Vice-President and Operating Officer down to the Plant Manager and the Plant Fire Chief. These management and staff positions are responsible for formulation, implementation, and assessment of the fire protection program. The organizational responsibilities are delineated for design, installation, testing, maintenance, modification, and review of fire protection systems and for fire brigade training. Qualification requirements have been established for fire brigade members, training instructors, and the position responsible for formulating and implementing the fire protection program.

We find the fire protection organization acceptable, except that fire brigade requirements do not require physical examinations to perform strenuous activity. The fire brigade member qualification requirements should include the satisfactory completion of a physical examination for performing strenuous activity.

We find that, subject to implementation of the above described change, the fire protection organization conforms to the provisions of Appendix A to BTP 9.5-1 and is, therefore, acceptable. We will address the acceptability of measures proposed to implement the above in a supplement to this report.

6.2 Fire Brigade Training

The fire brigade training program consists of classroom instructions, fire drills, practice in fire fighting and self-study information packages.

The fire brigade training program contains the following essential elements: use of fire fighting equipment, fire fighting principles and techniques, use of prefire plans, periodic practice in actual fire fighting, and periodic fire drills to assess brigade effectiveness. These drills also provide practice in use of equipment, use of prefire plans, and brigade leadership. We find the licensee's training program to be acceptable, with the exception that regular planned meetings are not provided for repeating the classroom instruction program over a two-year period. The licensee should make provisions for refresher training of fire brigade personnel in regular planned meetings so that brigade members receive retraining every two years.

We find that, subject to implementation of the above, the fire brigade training program conforms to the provisions of Appendix A to BTP 9.5-1 and is, therefore, acceptable. We will address the acceptability of measures proposed by the licensee to implement the above in a supplement to this report.

6.3 Control of Combustibles

The controls currently in effect and those under development minimize the amount of combustibles that a safety-related area may be exposed to.

These controls limit the use and storage of combustibles in safety-related areas; establish work controls and required additional fire protection where transient fire loads are introduced; assure the removal of waste, debris, and scrap materials following work activities; and provide for periodic housekeeping inspections.

These controls are acceptable, with the exception that all work requests involving plant equipment or systems currently are reviewed by the cognizant shift foreman who authorizes the work to be performed. The shift foreman may consult the Plant Fire Chief. Work requests involving plant systems in safety-related areas should be reviewed for fire protection impact by the Plant Fire Chief or an equally qualified individual. This review should assure the incorporation of proper fire protection provisions, such as the control of ignition sources and combustibles and provisions for additional fire suppression capability if appropriate.

We find that subject to implementation of the above described staff recommendation, the control of combustibles conforms to the provisions of Appendix A to BTP 9.5-1 and is, therefore, acceptable. We will address the acceptability of licensee measures to implement the above in a supplement to this report.

6.4 Control of Ignition Sources

The control of ignition sources minimizes the potential for fire resulting from work involving ignition sources such as welding, cutting, grinding, and open flame work or smoking. The controls on ignition sources require: use of a work permit authorized by a qualified individual prior to performing cutting, welding, grinding, or other flame work; removal of moveable combustible material; use of trained and equipped fire watches; and restrictions on smoking in safety-related areas. Use of open flames or combustion generated smoke for leak detection has been prohibited, and provisions for protection by curtains or covers when cutting, welding, grinding, or performing open flame work have been provided.

We find that the control of ignition sources conforms to the provisions of Appendix A to BTP 9.5-1 and is, therefore, acceptable.

6.5 Fire Fighting Procedure

The licensee has provided an adequate description of its current fire fighting procedures, those under development and those planned to be developed in the near future. The fire fighting procedures will identify the actions to be taken by the individual discovering the fire, actions to be taken by the control room operator, fire brigade actions, and strategies for fighting fires in various areas. These strategies identify, for each area, combustibles, methods of fighting fires in the area, access, ventilation and smoke removal equipment operation, and radiological and toxic hazards. This description is adequate except that a procedure has not been established for including offsite fire fighting organizations in fire brigade drills at least once per year. Procedures should be established and implemented to assure that, where practicable, the offsite fire fighting units are included in the fire brigade drills at least once per year.

We find that, subject to implementation of the above, the fire fighting procedures conform to the provisions of Appendix A to BTP 9.5-1 and are, therefore, acceptable. We will address the acceptability of licensee measures proposed to implement the above in a supplement to this report.

6.6 Quality Assurance

The quality assurance provisions for fire protection in safety-related areas control the design, procurement, installation, testing, and maintenance of fire protection equipment. The fire protection quality assurance provisions include: review of design and procurement documents to assure inclusion of appropriate fire protection requirements; establishment of procedures to implement the fire protection program; evaluation of potential suppliers and inspection of equipment on receipt; inspection and testing of fire protecton equipment following maintenance and modification; installation and periodic inspection of penetration seals and fire retardant coatings; periodic testing of fire protection equipment; identification and evaluation of nonconforming fire protection equipment; corrective action for failures, deviations, and defective materials; records of fire protection activities; and audits to verify proper implementation of the fire protection program.

We find that the fire protection quality assurance provisions conform to the guidelines of Appendix A to BTP 9.5-1 and are, therefore, acceptable.

6.7 Implementation of Administrative Control Procedures

The licensee has committed to implement the procedures which incorporate the fire protection administrative controls described in the January 1, 1977 and June 23, 1977 submittals by October 1977. We find this schedule to be acceptable, and Technical Specifications requiring procedures for implementation of the Fire Protection Program have ben included with the Technical Specifications issued with this Safety Evaluation Report.

7.0 TECHNICAL SPECIFICATIONS

The Technical Specifications will be modified to incorporate interim Technical Specifications which include limiting conditions for operation and surveillance requirements for existing fire protection systems and administrative controls. Following the implementation of the modifications of fire protection systems and administrative controls resulting from this review, the Technical Specifications will be similarly modified to incorporate the limiting conditions for operation and surveillance requirements for these modifications.

8.0 CONCLUSIONS

The licensee has performed a fire hazards analysis and has proposed certain modifications to improve the fire protection program. Additional modifications have been proposed by the licensee during the course of our review of the fire hazards analysis and our onsite evaluation of the fire protection program. These proposed modifications are summarized in Section 3.1. In addition, we have concluded that the licensee should implement certain evaluations or improvements related to the fire protection program. These are summarized in Section 3.2.

In summary, significant steps are being taken to provide additional assurance that safe shutdown can be accomplished and the plant maintained in a safe condition during and following potential fire situations. Upon favorable resolution of the incomplete items identified in Section 3.2, and upon implementation of the licensee's proposed modifications summarized in Section 3.1, we find that the fire protection program at Brunswick Steam Electric Plant is acceptable and that:

(1) Combustibles in safety-related areas are limited to the extent practicable;

(2) Fire detection and suppression systems will minimize the effects of fire on safety-related systems and will not in themselves significantly impair the capability of safety-related systems;

(3) Redundant safe shutdown systems are separated from each other and, where practicable, from significant combustibles by barriers or distances, or are adequately protected by fire suppression systems, such that a fire in any fire area will not prevent safe shutdown of the plant;

(4) A fire in any fire area will not damage safety-related structures such that they cannot perform their safety function;

(5) The fire protection organization has the professional qualifications to implement the fire protection program, and administrative controls are adequate to maintain control of combustibles, ignition sources, and the fire protection organization;

(6) A fire in any fire area will not cause the release of amounts of radioactive material in excess of those considered in previous safety evaluations; and

(7) The proposed modifications described herein are acceptable both with respect to the improvements in the fire protection program that they provide and with respect to safe operation of the facilities.

We have determined that the license amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR 51.5(d)(4) that an environmental statement, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

We have concluded, based on the considerations discussed above, that: (1) because the changes do not involve a significant increase in the probability or consequences of accidents previously considered and do not involve a significant decrease in a safety margin, the changes do not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Date: November 22, 1977

APPENDIX A

CHRONOLOGY

In February 1976 the report by the NRC Special Review Group was issued as NUREG-0050, "Recommendations Related to the Browns Ferry Fire."

On May 1, 1976, Standard Review Plan 9.5.1 "Fire Protection" was issued, incorporating the various recommendations contained in NUREG-0050.

By letter dated May 11, 1976, Carolina Power and Light Co. (CP&L) was requested to compare the existing fire protection provisions at their facilities with new NRC guidelines as set forth in Standard Review Plan 9.5.1 "Fire Protection" dated May 1, 1976 and to describe (1) the implementation of the guidelines met, (2) the modifications or changes underway to meet the guidelines that will be met in the near future, and (3) the guidelines that will not be met and the basis therefor.

By letters of September 30, 1976 and October 1, 1976, Carolina Power and Light Co. was requested to provide the results of a fire hazards analysis and propose Technical Specifications pertaining to fire protection. CP&L was also provided a copy of Appendix A which includes acceptable alternatives to the guidelines of SRP 9.5.1.

By letter of December 1, 1976 we provided model Technical Specifications and requested submittal of fire protection Technical Specifications.

On December 29, 1976, Carolina Power and Light Co. provided a submittal responding to our requests of May 11 and October 1, 1976 including proposed Technical Specifications for fire protection.

On May 10 to 13, 1977, the DOR fire protection review team visited the Brunswick Unit 1 and 2 facility. On May 13, 1977, a meeting was held at the Brunswick facility at which the review team presented positions and requests for additional information.

On June 7, 1977, a meeting to discuss review group concerns and positions, and to discuss items not resolved at the May 13, 1977 meeting was held in Bethesda, Maryland.

On June 23, 1977 Carolina Power and Light Co. submitted the additional information requested and responses to staff positions taken during the site visit and June 7, 1977 meeting. Additionally, on June 23, 1977 CP&L submitted additional information describing their administrative controls for fire protection.

On August 10, 1977 a meeting was held in Bethesda, Maryland to discuss the status of the cable study being performed by United Engineers and Constructors

for CP&L to identify effects on safe shutdown of loss of various electrical cables.

On August 23, 1977, the licensee submitted an application for License Amendment to add Technical Specifications for fire protection.

On August 24, 1977, the licensee submitted further additional information requested by the NRC staff, and furnished responses to staff positions.

On September 20, 1977, the licensee submitted responses to NRC positions regarding administrative controls.

Several telephone conversations were held between NRC staff members and CP&L personnel during the course of the evaluation.

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NOS. 50-325 AND 50-324

CAROLINA POWER AND LIGHT COMPANY

NOTICE OF ISSUANCE OF AMENDMENTS TO FACILITY OPERATING LICENSES

The U.S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 11 to Facility Operating License No. DPR-71 and Amendment No. 37 to Facility Operating License No. DPR-62, issued to Carolina Power and Light Company (the licensee), which revised the licenses and Technical Specifications for operation of Brunswick Steam Electric Plant, Unit Nos. 1 and 2 (the facility) located in Brunswick County, North Carolina. The amendments are effective as of the date of issuance.

These amendments add license conditions relating to the completion of facility modifications for fire protection. Amendment No. 11 also revises the Unit No. 1 Appendix A-Prime Technical Specifications for operating and surveillance requirements for existing fire protection systems and administrative controls. Similar requirements will be added to the Unit No. 2 Technical Specifications prior to the restart of this unit from its present refueling outage on or about November 26, 1977. Additional operating and surveillance requirements for the modifications being performed will be added to the Technical Specifications for both units after the modifications are completed.

The applications for the amendments comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendments. Prior public notice of these amendments was not required since the amendments do not involve a significant hazards consideration.

The Commission has determined that the issuance of these amendments will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of these amendments.

For further details with respect to this action, see (1) the licensee's submittals dated December 29, 1976, June 23, August 23, August 24, and September 20, 1977, (2) Amendment No. 11 to License No. DPR-71, (3) Amendment No. 37 to License No. DPR-62, and (4) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, NW., Washington, D.C. and at the Southport-Brunswick County Library, 109 West Moore Street Southport, North Carolina 28461. A copy of items (2), (3) and (4) may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 22nd day of November 1977.

FOR THE NUCLEAR REGULATORY COMMISSION

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors