

3.7 EMERGENCY LIGHTING

3.7.1 INTRODUCTION

The emergency lighting facilities at the Turkey Point Plant provide illumination in areas needed for operation of safe shutdown equipment, as well as access and egress routes thereto in the event that normal lighting is unavailable. In addition, the emergency lighting facilities have been designed to provide for personnel safety, based on prudent engineering judgement.

3.7.2 DESIGN BASES

The design of the Emergency Lighting facilities is based on the guidance/requirements set forth in 10 CFR 50 Appendix R, Section III.J and Appendix A to BTP 9.5-1. The following are specific design criteria:

- a) Lighting shall be provided for personnel safety and general access/egress.
- b) Sealed beam lighting units with eight hour minimum battery power supplies shall be provided for hot standby equipment requiring local operator action, and access/egress routes thereto.
- c) Dedicated portable sealed beam battery-operated lighting units, stored in fire cabinets outside the containment, shall be provided for containment entry if operation of valves in the containment is necessary to achieve or maintain cold shutdown.
- d) The Control Room Emergency Lighting shall be available and of sufficient intensity for safe shutdown from the Control Room with a fire in a single fire area coincident with a loss of offsite power.
- e) Dedicated portable battery-powered lighting units with an eight hour nominal rated battery supply shall be provided in designated storage lockers. These lights are to provide required lighting for access, egress and manual actions.

3.7.3 DESCRIPTION

The battery pack emergency lighting facilities are wired to the plant electrical lighting system and automatically maintain the battery in a ready state. In the event of a loss of AC power, the unit automatically turns the emergency lights on. Upon restoration of power the unit automatically turns off the emergency lights and places them on charge.

Equipment and access routes are illuminated to enable the operator to perform specific actions and negotiate the paths safely. In addition, other emergency lighting units are installed for personnel safety, based on prudent engineering judgement, and are not associated with Appendix R requirements. See Reference 20 for a tabulation of Appendix R - required emergency lighting units. Refer to Figures 9.6A-12 through 9.6A-15 for the locations of emergency lighting.

The emergency lighting units are installed in accordance with the vendor's instructions and the applicable design documents. The units are seismically mounted where required.

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Two independent sources of emergency lighting are provided for the Control Room. These emergency lights are battery-packed and will operate for at least 8 hours, and will ensure adequate lighting in areas required for safe operation. Each train of Control Room emergency lighting is powered from an independent battery source which meets the separation requirements of Appendix R Section III.G.2. Cables for the two independent lighting systems are routed through separate fire areas up to the control room fire boundary.

Four dedicated portable emergency lights are provided in a fire locker for use in either containment to facilitate containment lighting, if required, to reach cold shutdown.

Dedicated portable emergency lighting units are provided in designated storage lockers to use for access, egress and manual actions. Fixed emergency lights are provided at these manual action stations.

### 3.8 COMMUNICATIONS

#### 3.8.1 INTRODUCTION

Communication necessary with regard to fire protection at Turkey Point Units 3 and 4 is provided by the alternate shutdown and the fire brigade communication system.

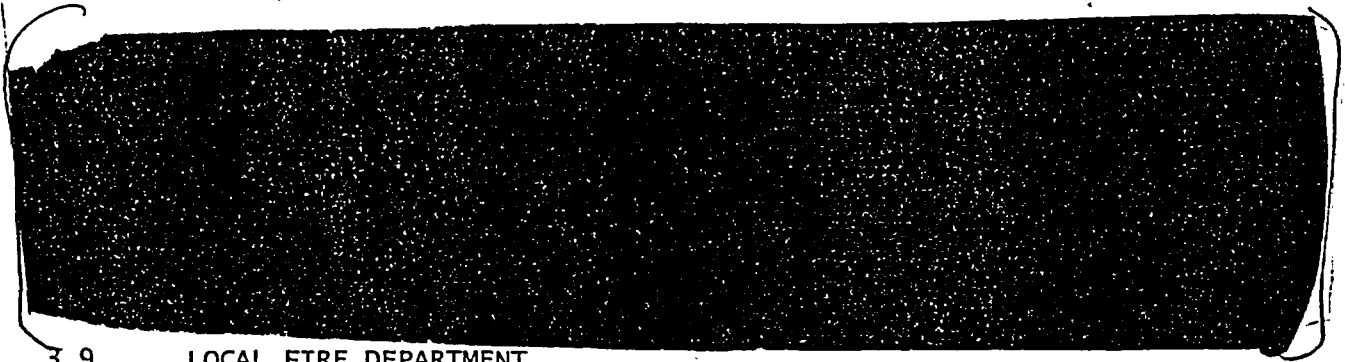
#### 3.8.2 DESIGN BASES

The design of the communications systems is based on standard good practice for communications systems and the guidance contained in Appendix A to BTP APCSB 9.5-1. This design guidance is summarized below:

- a) Communication systems shall be adequate to coordinate fire fighting and safe shutdown activities.
- b) Communications systems should be protected from exposure fire damage.

#### 3.8.3 DESCRIPTION





EXY

3.9 LOCAL FIRE DEPARTMENT

3.9.1 INTRODUCTION

The design of the plant and the strict control of combustibles considerably reduce the possibility of a fire that cannot be extinguished quickly by the on site fire brigade. Nevertheless, in case offsite assistance is ever needed, appropriate mutual aid agreements have been made.

3.9.2 DESIGN BASES

The design bases guidance for coordination with the local fire departments is provided in Appendix A to BTP-APCSB 9.5-1. This guidance is summarized below.

a) The public fire department response should be considered in the overall fire protection program.

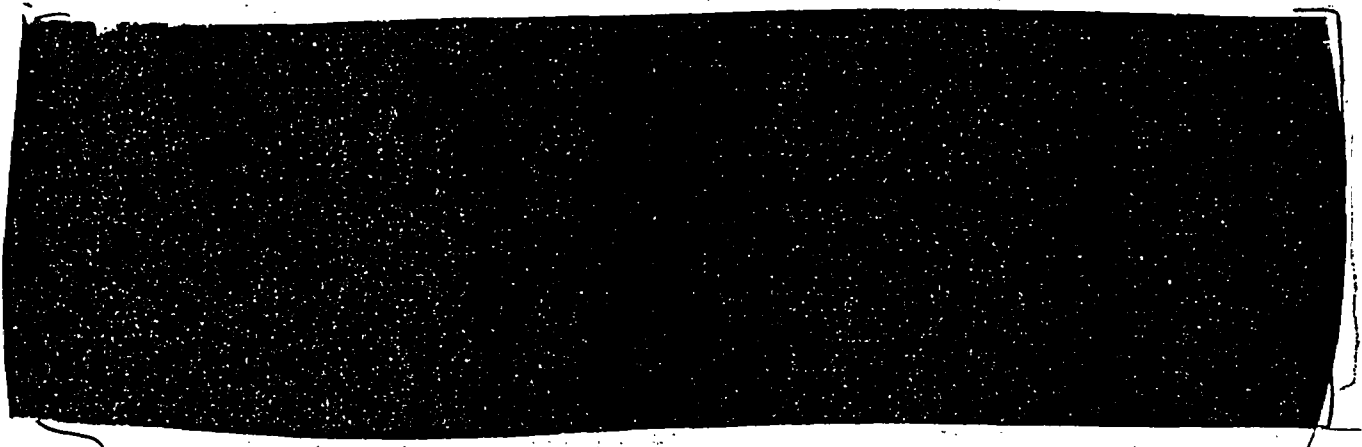
b)



EXY

c) Coordination with the local fire department should include training of the local fire department in precautions that need to be taken when fighting fires on nuclear plant sites such as radiation protection of personnel and other special hazards.

3.9.3 DESCRIPTION



EXY  
4

The 1-1/2 inch drain lines can accommodate a gravity induced flow rate in excess of 14 gpm. This flow rate exceeds the maximum expected leakage rate of 10 gallons per year for each pump (Reference 33) and exceeds the 10 gpm flow rate expected from an RCP lube oil lift pump discharge line break.

An exemption was granted from that portion of 10 CFR 50, Appendix R Section III.0, which requires an oil collection tank to be capable of containing the lube oil inventory of all three reactor coolant pump motors. (Refer to Section 4.0 of this Appendix.)

### 3.11 FIRE RATED ASSEMBLIES - BARRIERS

#### 3.11.1 INTRODUCTION

Fire barriers at Turkey Point Units 3 and 4 are provided as part of the protection to ensure that the function of one set of redundant safety-related equipment necessary to achieve and maintain hot standby conditions remains free of fire damage. Fire barriers provide a means of limiting fire travel by compartmentalization and containment. In some cases written evaluations approved by a Fire Protection Engineer may be kept on file to demonstrate acceptability of a fire rated assembly or barrier. (Reference NRC Generic Letter 86-10 paragraph C.)

#### 3.11.2 WALLS, FLOORS AND CEILINGS

##### 3.11.2.1 Design Bases

- a) Pursuant to Appendix R Section III.G.2(a), walls, floors and ceilings separating Fire Areas shall be fire barriers with a minimum rating of three hours as defined by ASTM E-119 (e.g. six inch solid concrete or greater, 8 inch concrete filled concrete block or greater; Thermo-lag thickness per engineering design output).
- b) walls, floors and ceilings installed as fire barriers shall be designed to maintain the class of the structure (refer to FSAR Appendix 5A) and to preclude damage to nearby safety related equipment.
- c) FPL requested exemptions (Reference 4) from the NRC for fire rated doors and dampers in exterior wall penetrations in the Auxiliary Building, Control Building, Unit 3 Diesel Generator Building and Switchgear Buildings. The NRC determined (Reference 6) that since the exterior walls in question did not separate redundant safe shutdown equipment and no fire hazards existed within 50 feet of the buildings, no deviations were required. Therefore, exterior walls do not require openings to be protected by 3-hour rated fire doors, fire dampers or penetration seals provided those walls do not serve to separate redundant safe shutdown equipment or circuits and no exterior fire hazards exist within 50 feet of the building.

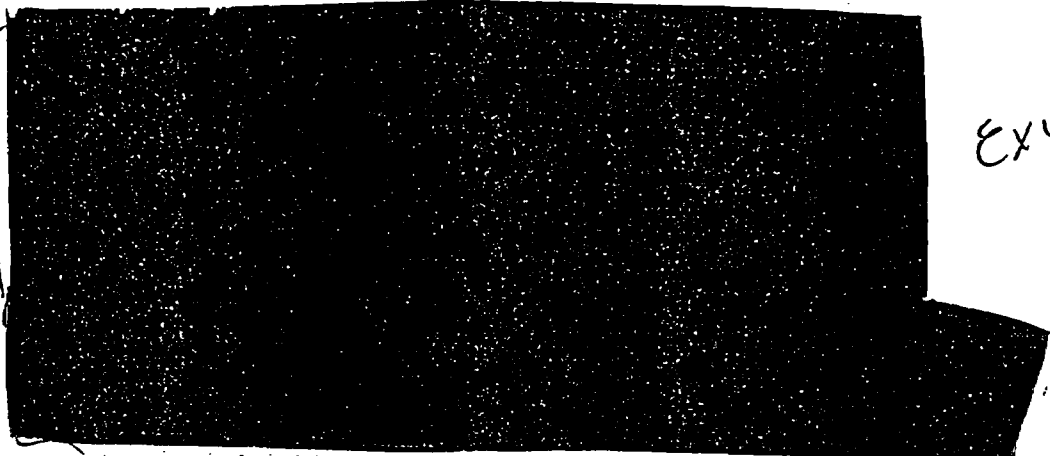
##### 3.11.2.2 Description

The plant is divided into fire zones, which are grouped into Appendix R Fire Areas. Fire Areas are separated from each other by rated fire barriers. These barriers are shown on Figures 9.6A-8 through 9.6A-11. The composition of these barriers is described for each fire zone in Section 4.0 of this Appendix.

Floor slabs which rest on soil foundations and earthbound walls may be designated as fire barriers but due to their underground nature will not be required to have a specific fire rating.

The Unit 3 or Unit 4 Containment wall forms a portion of the fire barrier for several fire areas. Although the containment wall is not a tested configuration for fire barriers, its construction is of such substantial integrity as to justify its use as a three hour rated fire barrier.

.4b



EXY

.4c Fire Protection Systems:

EXY

.4d Smoke Venting:

Smoke removal may be accomplished through the personnel doors with portable smoke ejectors available onsite for fire brigade use.

EXY  
4

4.S.2 APPENDIX R EXEMPTIONS

No exemptions were requested for this fire area.

FIRE HAZARD ANALYSIS FOR FIRE AREA T

4.T DESCRIPTION OF FIRE AREA

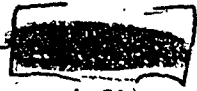
Fire Area T is the Unit 3 Reactor Control Rod Equipment Room, located on the [redacted] elevation of the [redacted]. The area is a single zone area comprised of Fire Zone 63. Pertinent fire zone details are provided below.

EXY

Fire Area T and the essential equipment and cables within have been evaluated with respect to protection and separation criteria of Appendix R Section III-G.2 to assure that the ability to safely shut down the plant is not adversely affected by a single fire event.

4.T.1 FIRE ZONE 63 - UNIT 3 REACTOR CONTROL ROD EQUIPMENT ROOM

Fire Zone 63 is bounded on the floor, ceiling and walls by a 3-hour rated fire barrier.



EXY

4.T.1.1 Essential Equipment within Fire Zone 63

See Appendix R Essential Equipment List, Reference 15.

4.T.1.2 Fire Zone 63 - Combustible Loadings

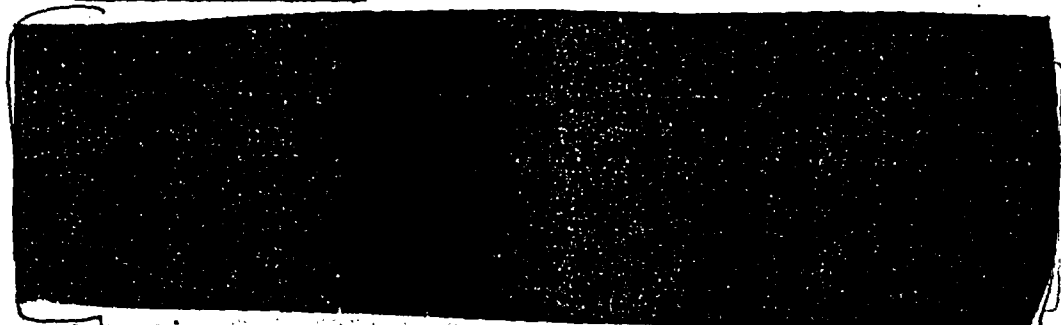
<u>SOURCE</u>	<u>QUANTITY</u>	<u>(BTU)</u>

EXY

4.T.1.3 Fire Control

.4a Physical Containment:

Fire Zone Boundary



EXY

.4b Detection:



.4c Fire Protection Systems:

1. Primary



EXY

2. Secondary



EXY

.4d Smoke Venting:

Smoke removal may be accomplished through the personnel doors with portable smoke ejectors available onsite for fire brigade use.

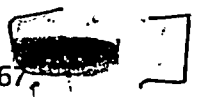
4.T.2 APPENDIX R EXEMPTIONS

See Section 3.11.2.1 c)

FIRE HAZARD ANALYSIS FOR FIRE AREA U

4.U DESCRIPTION OF FIRE AREA

Fire Area U is the Unit 4 4160V Switchgear 4B Room, located on the elevation. The area is a single zone area comprised of Fire Zone 67. Pertinent fire zone details are provided below.



EXY

Fire Area U and the essential equipment and cables within have been evaluated with respect to protection and separation criteria of Appendix R Section III-G.2 to assure that the ability to safely shut down the plant is not adversely affected by a single fire event.

4.U.1 FIRE ZONE 67 - 4160V SWITCHGEAR 4B ROOM



EXY

Fire Zone 67 is bounded on the ceiling and all walls by a 3-hour rated fire barrier. Equipment in this zone includes 4160V switchgear 4B.

4.U.1.1 Essential Equipment within Fire Zone 67

See Appendix R Essential Equipment List, Reference 15.

4.U.1.2 Fire Zone 67 - Combustible Loadings

SOURCE	QUANTITY	(BTU)

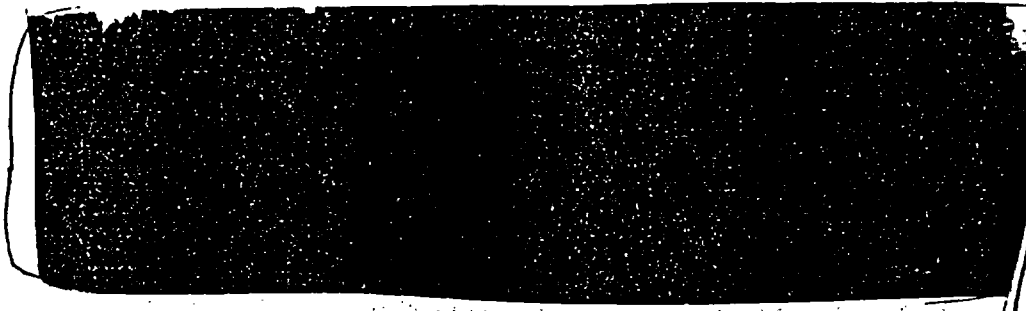
EXY



4.U.1.3 Fire Control

.4a Physical Containment:

Fire Zone Boundary



EXY

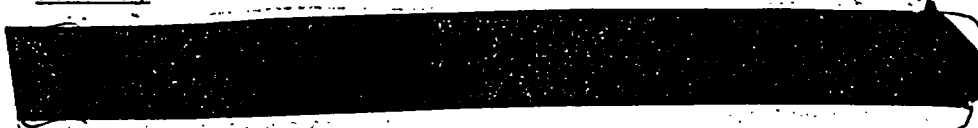
.4b Detection:



EXY

.4c Fire Protection Systems:

1. Primary



2. Secondary



EXY

.4d Smoke Venting:

No positive exhaust is provided in this Fire Zone. Smoke may be vented through personnel doors with portable smoke ejectors available onsite for fire brigade use.

4.U.2 APPENDIX R EXEMPTIONS

See Section 3.11.2.1 c)

FIRE HAZARD ANALYSIS FOR FIRE AREA V

4.V DESCRIPTION OF FIRE AREA

Fire Area V is the Unit 4 416V Switchgear 4A Room, located on the elevation. The area is a single zone area comprised of Fire Zone 66. Pertinent fire zone details are provided below.



EXY

4.LL.2 APPENDIX R EXEMPTIONS

No exemptions were requested for this fire area.

FIRE HAZARD ANALYSIS FOR FIRE AREA MM

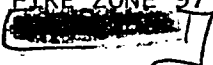
4.MM DESCRIPTION OF FIRE AREA

Fire Area MM is the Unit 3 and 4 Control Room located on the [redacted] elevation of [redacted]. The area is comprised of fire Zones 106, 106R, and 97. Pertinent fire zone details are provided below. Refer to Section 5.0 of this Appendix for a discussion of the Alternate Shutdown Capabilities provided for this fire area.

EXY

Fire Area MM and the essential equipment and cables within have been evaluated with respect to protection and separation criteria of Appendix R Section III-G.2 to assure that the ability to safely shut down the plant is not adversely affected by a single fire event.

4.MM.1 FIRE ZONE 97 - UNITS 3 AND 4 CONTROL ROOM MECHANICAL EQUIPMENT ROOM -



EXY

Fire Zone 97 is bounded on the floor and walls by a 3-hour rated fire barrier, with the exception of the west and south walls which contain non-rated dampers. Equipment in this zone includes 3 Air Handling Units and the [redacted] filter unit.

4.MM.1.1 Essential Equipment Within Fire Zone 97

See Appendix R Essential Equipment List, Reference 15.

4.MM.1.2 Fire Zone 97 - Combustible Loadings

SOURCE	QUANTITY	(BTU)
[Redacted Table Content]		

EXY

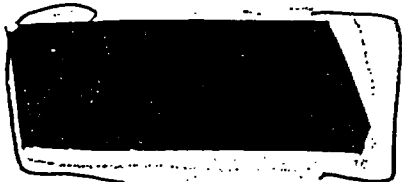
4.MM.1.3 Fire Control

.4a Physical Containment:

Fire Zone Boundary

walls

- North:
- South:
- East:
- West:



EXY

[REDACTED]

EX4

.4b Detection:

[REDACTED]

.4c Fire Protection Systems:

1. Primary

[REDACTED]

EX4

2. Secondary

[REDACTED]

.4d Smoke Venting:

Portable smoke ejectors available onsite may be used to vent smoke.

EX4

4.MM.2 FIRE ZONE 106 - UNITS 3 AND 4 CONTROL ROOM COMPLEX

[REDACTED]

Fire Zone 106 is bounded on the ceiling, floor and all four walls by a 3-hour rated fire barrier. An exception to this barrier integrity includes non-rated Door D106-2. However, this door has an equivalent 3-hour fire rating. Equipment in this zone includes the Unit 3 and 4 control and monitoring equipment.

4.MM.2.1 Essential Equipment Within Fire Zone

See Appendix R Essential Equipment List, Reference 15.

4.MM.2.2 Fire Zone 106 - Combustible Loadings

SOURCE

QUANTITY

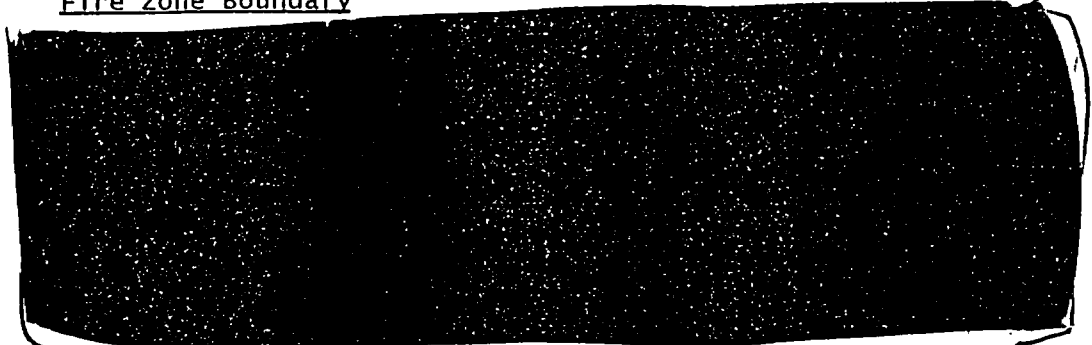
(BTU)

[REDACTED]

EX4

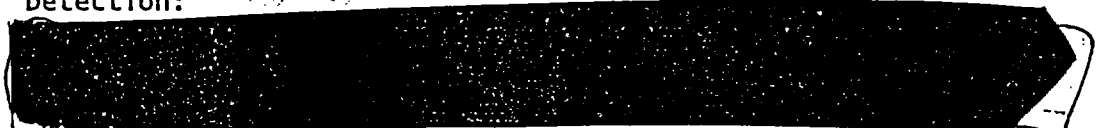
4.MM.2.3 Fire Control

- .4a Physical Containment:  
Fire Zone Boundary



EXY  
4

- .4b Detection:



- .4c Fire Protection Systems:

1. Primary



EXY

2. Secondary




- .4d Smoke Venting:

Ventilation in this fire zone is provided by Exhaust Fans EF-9 and EF-20. Also, portable smoke ejectors are available onsite for fire brigade use.

|

4.MM.3 FIRE ZONE 106R - UNITS 3 AND 4 CONTROL ROOM ROOF - 

EXY

Fire Zone 106R is "tar and gravel" built-up roofing on a concrete base. The area is completely open to the atmosphere and contains the 

4.MM.3.1 Essential Equipment Within Fire Zone 106R

See Appendix R Essential Equipment List, Reference 15.

4.MM.3.2 Fire Zone 106R - Combustible Loadings

	<u>SOURCE</u>	<u>QUANTITY</u>	<u>(BTU)</u>
.2a	Cable Insulation	---	---
.2b	Oils	---	---
.2c	Others	---	---
		TOTAL	---

Heat load (BTU/sq. ft.): Negligible

4.MM.3.3 Fire Control

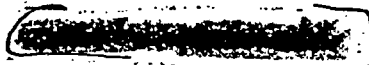
.4a Physical Containment:

Fire Zone Boundary

walls

North: Open  
South: Open  
East: Open  
West: Open

Ceiling: Open

Floor: 

EXY

.4b Detection:

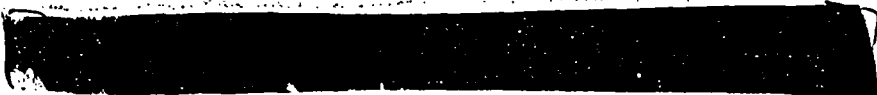
None

.4c Fire Protection Systems:

1. Primary



2. Secondary



EXY

.4d Smoke Venting:

This fire zone is open to the atmosphere.

Exemption MM.1

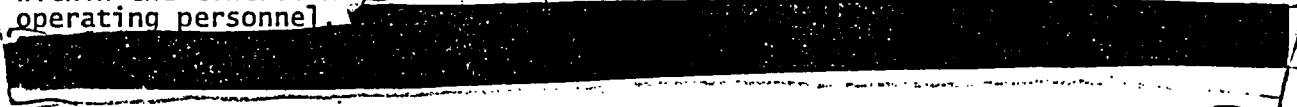


Exemption MM.2

See Section 3.11.2.1 c)

Justification for Exemption

The Control Room is an area that is continuously manned in accordance with existing technical specifications. This assures that any fire occurring within the Control Room will be quickly detected and extinguished by operating personnel.



In accordance with the requirements of 10 CFR Part 50 Appendix R Sections III.L, alternate shutdown remote from the Control Room will be provided.

The in situ combustibles in the Control Room consist of cables and components located within control boards, panels and control consoles and miscellaneous paper in the form of books, manuals and computer printouts.

A review of potential transient combustibles for this fire area was conducted by the Factory Mutual Research Corporation for FPL. The results of this review indicate that there are no expected transient combustibles for this fire area.

Fire protection features existing for this fire area are active and passive in nature. Passive fire protection is provided by the steel cabinets and control consoles which serve to contain in situ combustibles in discrete quantities and the spatial separation between consoles and cabinets.

Active fire protection is provided by the installed fire detection system which will provide early warning of any fire in this area allowing the operators to respond before significant development occurs, and by the continuous presence of operators in this area.

In conclusion, it is FPL's position that the alternate shutdown system and the existing fire protection features combined with the continuous manning of this area provide a level of fire protection consistent with the fire hazards, both in situ and transient identified for this fire area and that these features provide assurance that at least one train of safe shutdown equipment and cables will be free of fire damage.

Exemption MM.3

Deleted

Exemption MM.4

Deleted

Exemption MM.5

FPL requested (Reference 38) and was granted (Reference 41) exemption from that portion of Appendix R to 10 CFR 50 Section III.G.2.a which requires the enclosure of cables and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 3-hour rating. Specifically, exemption is requested to provide separation by a 25-minute rated fire barrier until a horizontal distance of 10' is attained.

Justification for Exemption

This fire zone is an open, roof-top outdoor area, which prevents the stratification of hot gases or other products of combustion from affecting redundant cables should a fire occur. The roof is [REDACTED] construction with a built-up tar and gravel cover. Redundant safe shutdown equipment are separated by a horizontal distance greater than 10'. Circuit protection for this area is provided by 25-minute rated fire barrier until a horizontal distance of 10' is attained. Intervening in situ combustible loading is negligible.

EX4

FIRE HAZARD ANALYSIS FOR FIRE AREA NN

4.NN DESCRIPTION OF FIRE AREA

Fire Area NN is the Unit 3 and 4 Train "A" DC Equipment Room, located on the [REDACTED] elevation of the [REDACTED]. The area is comprised of Fire Zone 108A. Fire Zone 108 was subdivided as a result of Appendix R into Fire Zones 108A and 108B by the installation of a two hour rated fire barrier. This separation created Fire Area NN (Fire zone 108A) and Fire Area OO (Fire Zone 108B). Fire Area OO contains "B" train equipment and Fire Area NN contains "A" train equipment. Pertinent fire zone details are provided below.

Fire Area NN and the essential equipment and cables within have been evaluated with respect to protection and separation criteria of Appendix R Section III-G.2 to assure that the ability to safely shut down the plant is not adversely affected by a single fire event.

4.NN.1 FIRE ZONE 108A - UNIT 3 AND 4 A DC EQUIPMENT ROOM [REDACTED]

Fire zone 108A is bounded on the floor, ceiling and walls by a 3-hour rated fire barrier except for the dividing wall between Fire Zones 108A and 108B, which is a 2-hour rated fire barrier and non-rated door D106-1. An evaluation has been performed that determined that the present configuration of door D106-1 is acceptable. [REDACTED]

EX4

4.NN.1.1 Essential Equipment within Fire Zone 108A

See Appendix R Essential Equipment List, Reference 15.

4.NN.1.2 Fire Zone 108A - Combustible Loadings

<u>SOURCE</u>	<u>QUANTITY</u>	<u>(BTU)</u>
[REDACTED]		

EX4