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April 29, 1988

William G. Council
Executive Vice President

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
ADVANCE SUBMITTAL OF FSAR UPDATE

Gentlemen:

In order to inform the NRC Staff of CPSES FSAR changes at the earliest possible time, we have enclosed an advance copy of changes relating to Fire Protection that have been approved by TU Electric for incorporation into the CPSES FSAR. This advance copy of FSAR changes addresses the following general topics:

- Clarification of the use of Fire Hazards Analysis Evaluations.
- Direct references for the Fire Hazards Analysis and docketed deviations to the Fire Protection Report (FPR) (Section II and V, Appendix C of the FPR).
- Exceptions to BTP APCS 9.5-1 not previously noted in FSAR Section 9.5.1.6.2.

Please note that the enclosed advance copy of FSAR changes should not be inserted into your FSAR. Our formal submittal of these changes will be forthcoming in a future Amendment to the FSAR.

Very truly yours,

A handwritten signature in cursive script that reads "W. G. Council".

W. G. Council

JDS/grr
Attachment
Enclosure

c - Ms. Melinda Malloy, OSP-NRC
Mr. R. D. Martin, Region IV
Resident Inspectors, CPSES (3)

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FSAR CHANGE JUSTIFICATIONS

<u>Page</u>	<u>Description</u>
9.5-1, 2 9, 10, 11 61, 89, 91 106	Clarification: Changes reference from FHA to FPR because the FHA Report is part of the FPR. Also replaces the term train with the more precise less ambiguous concept of redundant fire safe shutdown equipment and components. (SA-88-402) Group 4
9.5-4	Editorial: Provide title for MPFL for consistency. (SA-88-402) Group 4
9.5-5	Correction: Establishes the definition of FHA Evaluations which describes a method used to demonstrate compliance with the guideline. (SA-88-402) Group 2 Correction: Deletes inconsistent information since FHA Evaluation demonstrates compliance instead of "meeting intent of guideline". (SA-88-402) Group 4 Clarification: Adds pertinent information as to where the demonstrated compliance is documented (in the FPR). (SA-88-402) Group 4
9.5-6	Clarification: Change "safety train" to "fire safe shutdown component" to better describe the redundant system for fire protection. (SA-88-402) Group 3 Correction: Adds reference to FPR for MPFL where isolated areas follow burning characteristic curves other than the standard time-temperature curve. (SA-88-402) Group 2
9.5-8	Clarification: Clarifies the description of automatic suppression system coverage. (SA-88-402) Group 4
9.5-8, 30	Clarification: Clarifies combustibles for 20' separation as being negligible. (SA-88-402) Group 4
9.5-11	Correction: Deletes reference to FHA figure for detailed detector coverage information. Detector coverage information is included in the Fire Protection Report. (SA-88-402) Group 3
9.5-12	Clarification: Deletes reference to ANI criteria and retains reference to NFPA 13 and BTP APCS 9.5-1. (SA-88-402) Group 4 Clarification: Clarifies the description of design criteria used for siting water storage capacity and for hydraulic analysis of suppression systems. (SA-88-402) Group 4

- 9.5-15, 23 Correction: Deletes discussion of suppression systems for large oil filled transformers. These systems are beyond the scope of the fire protection analysis addressed in the FSAR. Transformers located within 50 inches of Unit 1 and Common Buildings containing fire safe shutdown equipment are described in the Fire Protection Report. A transformer has been added to the site. It is located more than fifty feet from the west end of the Turbine Building. This transformer while not protected by automatic suppression does not represent a hazard to buildings containing fire safe shutdown equipment, and meets the requirements of BTP APCS 9.5-1, Appendix A.
(SA-88-402) Group 2
- 9.5-16 Editorial: Change "not be available" to "be unavailable".
(SA-88-402) Group 4
- Clarification: Clarifies the description of the pipe system that is supplied Fire Protection water.
(SA-88-402) Group 4
- 9.5-20 Addition: Adds reference to FPR for NFPA 14 code deviations.
(SA-88-402) Group 2
- 9.5-27 Clarification: Adds reference to Section 9.5.1.6.2 to describe protection provided by steel hatches.
(SA-88-402) Group 4
- 9.5-28 Correction: Deletes reference to FHA Drawings for door swing pattern and fire door ratings. Fire door rating compliance is described in FSAR Section 9.5.1.6.1 (D.1.j).
(SA-88-402) Group 2
- 9.5-30 Clarification: Changes "generally arranged to provide area coverage" to "provide coverage adequate for the hazards in the area" to be more descriptive of the coverage provided.
(SA-88-402) Group 4
- 9.5-53 Correction: Adds discussion of FHA Evaluations to demonstrate compliance for separation criteria.
(SA-88-402) Group 2
- 9.5-54 Clarification: References Fire Protection Report, (Reference 19) for docketed deviations. Deviations are included as Appendix C to the Fire Protection Report.
(SA-88-402) Group 4
- Clarification: Clarifies combustibles for 20' separation as being negligible.
(SA-88-402) Group 4
- Clarification: Provides clarification of descriptions of separation. This change is made to more clearly state the methods of separating redundant fire safe shutdown equipment (vice trains) and protecting them from a single fire hazard.
(SA-88-402) Group 4

- 9.5-65 Revision: Provides correction to CPSES Fire Protection Program for internal conduit seals.
(SA-88-402) Group 2
- 9.5-72 Clarification: This addition clarifies that fixed Emergency Lighting is provided in areas necessary to achieve hot standby.
(SA-88-402) Group 4
- 9.5-73 Clarification: Delete portion of the statement for 8 hour batteries since the statement is redundant within this section as clarified.
(SA-88-402) Group 4
- Correction: Insert reference to battery powered portable hand lights.
(SA-88-402) Group 2
- 9.5-82 Correction: Corrects the section of the FSAR which is being referred to.
(SA-88-402) Group 4
- 9.5-84, 85 Clarification: Clarifies NFPA status as a standard not guideline and clarifies how and where differences with NFPA standards is documented.
(SA-88-402) Group 4
- 9.5-88, 93, 102, 106, & 114 Correction: Deletes reference to engineering evaluations justifying noncompliances. Noncompliances to BTP APCSB 9.5-1, Appendix A are documented in deviations, Appendix C to the Fire Protection Report.
(SA-88-402) Group 2
- 9.5-103 Clarification: Clarifies that Safety Related Battery Rooms are separated in accordance with BTP APCSB 9.5-1, Appendix A.
(SA-88-402) Group 4
- Revision: Inserts information pertaining to exception as discussed in FSAR Section 9.5.1.6.
(SA-88-402) Group 2
- 9.5-112 Correction: Corrects the fire area and unit that are being referred to.
(SA-88-402) Group 3
- 9.5-114 Update: Adds referral to reference [19], Fire Protection Report, for additional deviations to BTP APCSB 9.5-1 Appendix A.
(SA-88-402) Group 2
- Revision: Deletes reference to Engineering Evaluations. Descriptions of Metal Hatch Covers and Penetration Seals installed in bus duct penetrations are included in this section as exceptions.
(SA-88-402) Group 2

- 9.5-115, 116 Revision: Descriptions of Metal Hatch Covers and Penetration Seals installed in bus duct penetrations are included in this section as exceptions.
(SA-88-402) Group 2
- 9.5-116, 117 Revision: Includes description of Tornado/Vent fire dampers and door frames as exceptions.
(SA-88-402) Group 2
- 9.5-118 Revision: Deletes reference to engineering evaluation and included description of flexible conduit penetrations as exceptions.
(SA-88-402) Group 2
- 9.5-120 Correction: Deletes reference to NEL-PIA because NEL-PIA criteria is beyond the scope of the fire protection analysis addressed in the FSAR.
(SA-88-402) Group 3
- Clarification: Clarifies plant shutdown as being due to fire inside Containment.
(SA-88-402) Group 4
- 9.5-134 Clarification: Makes addition as shown for clarity. This addition clarifies that fixed Emergency Lighting is provided in areas necessary to achieve hot standby.
(SA-88-402) Group 4
- Clarification: Add "at least" ahead of "4 hour rated battery packs" for the Turbine Building emergency lighting to establish agreement with FSAR Section 9.5.1.6.1.
(SA-88-402) Group 4
- 9.5-165 Update: Updates the document referenced for deviations.
(SA-88-402) Group 3

9.5.1 FIRE PROTECTION SYSTEM

9.5.1.1 General

This section is a description of the Fire Protection Program of the CPSES units 1 and 2. The evaluation of fire hazards is included in the CPSES Fire Protection Report (FPR) which follows the format of the U.S. Nuclear Regulatory Commission's "Supplementary Guidance on Information Needed for Fire Protection Program Evaluation" and the supplementary criteria in their September 30, 1976, letter.

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The overall Fire Protection Program was developed utilizing the defense in depth concept. This concept is a combination of:

1. Preventing fires from starting
2. Quickly detecting and suppressing fires that do occur to limit the extent of damage
3. Designing plant safety systems so that a fire that becomes fully established and burns for a considerable time, in spite of the fire protection systems provided, will not prevent essential plant safety functions from being performed.

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The FPR quantifies potential fire hazards throughout the plant in terms of combustible heat release loading. The Fire Protection and Detection Systems are designed based on this heat release loading and on the nature of the transient and in situ combustible material in the area. A summary of this information is presented in tabular form in the FPR.

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9.5.1.2 Method of Analysis

9.5.1.2.1 Definitions

50 | Several terms with their definitions as they relate to the Fire
| Protection Program for CPSES are presented below. Unless the terms
22 | are noted below, the definitions are as stated in Section I of Branch
| Technical Position APCSB 9.5-1 Reference [2].

1. Fire area

ADV71 | The fire area is that section of a building or the plant that is
| separated from other areas of the plant by fire barriers with
| openings and penetrations protected by seals or closures having
| a fire resistance rating equal to the rating assigned to the
| barrier. The fire areas extend through more than one elevation
| where plant design requirements and low amounts of combustible
| material in a specific area allow. These areas are designated
| on FPR Figures.

2. Fire Barriers

50 | Fire barriers are those components of construction (walls,
| floors, or protective coverings) that are rated by approved
| laboratories or are constructed in accordance with the
| requirements stated by authorities having jurisdiction in hours
| of resistance to fire and used to prevent spread of fire.

3. Fire Zone

ADV71 | The fire zone is a subdivision or portion of a fire area that is
| designated on the FPR Figures.

8. Dry

The term "dry" indicates that the connecting piping between a deluge valve and the nozzles of a water system is not normally pressurized with water.

9. Wet

The term "wet" indicates that the connecting piping between the main loop and a hose station isolation valve or water nozzle is normally pressurized with water.

10. Radiation Zone

50 | Radiation zone is the classification of an area based on the
| expected dose equivalent rate (mrem/hr) within that area. See
| Section 12.3 for a detailed description.

65 | 11. Fire Safe Shutdown Essential System or Component

65 | An essential system or component is defined as a system or
| component which is required to be operational to safely shutdown
| the plant in the event of a fire.

ADV71 | 12. Maximum Permissible Fire Loading

65 | The Maximum Permissible Fire Loading (MPFL) is the maximum fire
| loading (BTU/sq ft) which can be expected to be contained within
| a fire area by the fire area boundaries without compromising
| safe shutdown capability.

13. Fire Hazards Analysis Evaluation

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A Fire Hazard Analysis Evaluation is an assessment of the impact of a single fire hazard on redundant components or systems used to provide fire safe shutdown functions for the plant. A Fire Hazards Analysis Evaluation is performed by a Fire Protection Engineer and, if required a Systems Engineer. The purpose of a Fire Hazards Analysis Evaluation is to demonstrate compliance with BTP APCSB 9.5-1 Appendix A based on the following considerations:

- potential transient and in situ combustible hazards are considered. | 66
- protection provided is commensurate with the hazards. | 66
- the consequences of a fire on the plant's ability to safely shutdown are considered. | 66
- The Fire Hazards Analysis Evaluation is written, organized and maintained to facilitate review by a person who is not involved in the evaluation. | ADV71
- The conclusions of the FHA Evaluations are summarized in the applicable sections of the Fire Protection Report. | ADV71

9.5.1.2.2 Assumptions

The FHA Evaluation is based on the following assumptions: | 50

1. Generally, the minimum fire barrier rating is three hours except for the barriers enclosing the stairwells and elevator shafts, which are rated at two hours, the cable tray/conduit fire barriers which are rated at 1-hour, and other special cases where a rating of less than three hours is adequate. | 65

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ADV71 Page 25 of 40 When it is determined that a fire involving a fire safe shutdown component or system will not affect its redundant counterpart, the redundant system is assumed to operate without failures.

ADV71 | 3. The Maximum Permissible Fire Loading for a fire zone assumes a fire burning in the area which follows the characteristics of the standard time-temperature curve, or as noted in the FPR, Reference [19].

65 | 4. A fire involving a combustibile loading, up to the Maximum Permissible Fire Loading for the fire zone, will be contained within the fire area by the passive and active/fire protection features (i.e. fire wall and sprinklers, etc.). Furthermore, it is assumed that if any of these passive or active fire protection features is inoperable and the compensatory actions required by Technical Specifications have been implemented then an equivalent level of protection is provided.

65 | 9.5.1.2.3 Methodology

65 | In order to evaluate potential fire hazards, provide adequate fire protection, ensure isolation of fire safe shutdown systems from these hazards, and prevent the release of radioactive material to the environment, the following method of design and analysis has been formulated and implemented for the entire plant:

54 | 1. The plant is divided into separate fire areas using plant walls
65 | and floors as barriers. Due consideration as-shown below is
| given to the separation of redundant fire safe shutdown
| components from each other, from non-fire safe shutdown
| components and from major concentrations of combustibile
66 | materials. Considerations were also given to other area
| characteristics such as electrical cable routing into and
| through the area, the ductwork supplying and exhausting the
| area, access and egress routes for the area, and vent area for
| depressurization during a tornado.

8. Fixed automatic water suppression systems will generally be installed in safety related plant areas where any of the following conditions exist:

a. A high fire hazard exists

65 | b. Redundant safe shutdown equipment or cabling outside the
| Containment Building is located in the same fire area and
| is not separated by a three hour fire barrier.

c. There is a congestion of cabling.

ADV71 | In areas where condition (a) and in areas where condition (b)
| described above exists, the type of protection that will be
| provided as a minimum will be a sprinkler system providing
| coverage adequate for the hazard in the area unless
| justification for deviations are provided per reference [19] and
| as described in 9.5.1.6.1. The water spray design density will
65 | be based on Section 9.5.1.6.1-E.3.c.

65 |
66 | Where the condition described in (c) exists, based on Section
| 9.5.1.D.3.c, sprinkler systems will be provided for cabling to
| augment other fire protection features in the area.

ADV71 | 9. Where redundant fire safe shutdown equipment cabling is located
| in the same fire area and is not separated by a three hour fire
| barrier or a horizontal distance of 20 feet with negligible
| intervening combustibles or fire hazard, one train of this
| cabling will be enclosed by a one-hour fire barrier (or radiant
| energy shield inside containment) unless an alternate shutdown
| path is utilized or justification for deviations are provided
| per reference [19] except as described in Section 9.5.1.6.1.

10. The Cable Spreading Room contains equipment and cables belonging to both safety trains. The following fire protection systems will be provided:
 - a. Hose stations for manual fire fighting
 - b. Fixed Halon primary suppression system | 50
 - c. Manual pre-action sprinkler system | 50
 - d. Automatic fire detection system | 50
 - e. An alternate shutdown system | 50

11. The plant will be capable of being safely shutdown in the event any of the fires postulated in the Fire Protection Report occurs. Alternate shutdown systems and procedures have been developed using shutdown paths available to the operator which are either free from fire damage or otherwise controllable in spite of such fire damage. | ADV71
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9.5.1.3 Fire Hazard Analysis Evaluation

See Reference [19], Fire Protection Report | ADV71

9.5.1.4 Fire Protection System Description

9.5.1.4.1 General

The Fire Protection System detects, alarms, and extinguishes fires. It is comprised of two subsystems: Fire Detection and Fire Suppression.

The Fire Detection System is a plant-wide system designed to detect fires in the plant, alert the Control Room operators, and alert the plant fire brigade of the fire and its location.

ADV71 | The Fire-Suppression System is designed to extinguish any fire
| postulated to occur in the Fire Protection Report. It is comprised
50 | of a water supply system, fixed water sprinkler and spray systems,
| Halon systems, fire hose stations, and portable extinguishers.

9.5.1.4.2 System Design Parameters

1. Fire Detection System

The Fire Detection System consists of the following components:

50 | 1) Fire Detectors

50 | a) Ionization smoke detectors

50 | b) Thermal heat detectors

50 | c) Ultraviolet detectors

50 | d) Thermistor line detectors

50 | 2) Fire Detection Local Control Panels

50 | These panels provide local indication of the status of the
| protected area. Indication provided is annunciation of alarms
| and system trouble status. These panels also provide automatic
| initiation of fire suppression where applicable.

50 | 3) Fire Detection Main Control Panel

50 | This panel is located in the control room. Any fire alarm that
| is detected in the plant will alarm on this panel in the control
| room. Trouble circuits of each local panel are also monitored.

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The fire detectors are strategically located throughout the plant to detect, annunciate, and indicate in the Control Room, the location of a fire. | 50

The power supplies for the Plant Fire Detection system meets the requirements of NFPA 72D Section 2220. The Plant Fire Detection system can be provided power from any one of the following eight (8) sources: two (2) main generators, two (2) offsite power supplies, and four (4) standby diesel generators (plant emergency power supply). Each train of standby diesel generators consists of two diesel generators each is associated with its respective unit and is operational upon completion of that unit. | 46
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The fire detection system is electrically supervised for a wiring break in the detection and alarm circuits. Loss of supervision causes an audible and visual trouble indication on the main fire detection control panel, located in the Control Room, in accordance with NFPA 72D requirements. Thermistor-line fire detection systems are supervised for a break or short circuit of the sensing element. Ground fault supervision is provided except as noted in Section 9.5.1.6.1-E.1. | 65

Ionization detectors are of the two-chamber-type design. The first chamber is a reference chamber to compensate for sensitivity changes caused by temperature, barometric pressure, and humidity variations. The second chamber is a sensing chamber open to the outside elements through a protective screen which permits combustion products to enter, while preventing insects and foreign matter from entering and causing false alarms.

- 66 | Thermal detectors are of the fixed-temperature, rate compensation
| types or continuous strip thermistor line type.
- 50 | Ultraviolet detectors respond directly to the presence of flame by
| sensing the ultraviolet radiation emanating from the flame.

2. Fire Suppression Systems

a. Water Supply Systems

- ADV71 | The water supply system was designed using NFPA Codes and
| BTP 9.5-1 Appendix A. The water supply network and the
66 | arrangement of the water extinguishing systems are shown
| on Figures 9.5-43 through 9.5-48 and Figures 9.5-61 and
ADV71 | 9.5-62. The water extinguishing systems are designed to
| operate with the shortest portion of the Fire Protection
| yard-loop out of service. The water storage capacity is
| based on supplying water to the largest fixed extinguishing
| system and the manual hose stream requirements of Appendix
| A.
- 66 | Three 50 percent pumps (one electric motor-driven, two
| diesel engine-driven; each rated at 2000 gpm at a Total
| Dynamic Head of 370 ft) are provided for protection of both
| units. In addition, a jockey pump (rated at 60 gpm at a
| Total Dynamic Head of 330 ft) maintains the required water
| pressure throughout the system at all times.

2) Automatic Water Spray Systems | 66

When a fire is detected its location is annunciated on the local fire detection control panel and in the control room. The Fire Detection Local Control Panel, transmits a signal to open the proper deluge valve. A water-flow alarm sounds locally and in the control room indicating water flowing through the piping network. The deluge valves operate | 66
automatically as described above, or can be manually |
operated locally. Once actuated, deluge valves can |
only be reset manually. |

Water spray systems are provided for the following: | 65

- Diesel Fuel Oil Day Tank Rooms | 66
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- Turbine Building Hazards (i.e. Lube Oil, | 65
Feedwater Turbines, Hydrogen Seal Oil) |

Water spray systems are also provided for the | 66
following atmospheric cleanup units charcoal absorber |
beds: |

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- a. Four Containment preaccess units
- b. Sixteen controlled access exhaust units
- c. Two hydrogen purge exhaust units
- d. Two Control Room emergency filtration units
- e. Two Control Room emergency pressurization units

Each charcoal absorber bed is equipped with strip thermistor heat type detectors.

66 | Upon detection of an abnormally high temperature in any one of the charcoal absorber beds, a high temperature signal is generated locally and in the control room. If the temperature of the charcoal bed continues to rise, the detection system will generate a high-high temperature signal which will automatically open the deluge type valve in the atmospheric cleanup unit and initiate water spray on the charcoal bed. When the temperature of the charcoal bed drops below the high-high set point, the deluge valve will close automatically. Deluge type valves for atmospheric cleanup units can only be operated automatically.

56 | A high temperature signal detected in any of the four
66 | containment pre-access units will also initiate a
ADV71 | Demineralized Water Transfer Pump. This pump serves
| as part of the automatic water spray system for these
| units. Should demineralized water be unavailable,
| the operator is alerted in the control room and he
| can manually route fire protection water through the
| demineralized water pipe supplying these water spray
| systems.

d. Fire Hose Stations

50 | Fire hose stations are located strategically throughout the
| plant for manual fire fighting operations.

54 | The fire hose stations located on the operating deck of the
| Turbine Building are equipped with 100 ft of 2-1/2 in.
ADV71 | hose using NFPA 14 as a guideline for Class 1 service
| except as noted in Reference [19].

50 | All other fire hose stations throughout the plant are
| equipped with 100 ft of 1-1/2 in. hose and a nozzle
ADV71 | compatible with the type of fire hazard in the area. The
| respective standpipes which supply water to these hose
| stations are sized and located throughout the plant using
| NFPA 14 for class 1I service as a guideline except as noted
| in 9.5.1.6.1 and Reference [19].

65 | The Hose stations for the Containment Building, Control
| Room and the cable spreading rooms are dry pipe with manual
| charging required.

56 | The hose stations inside the containment are fed from the
| Demineralized Water System via a transfer pump. This pump
| is initiated by hand pull stations inside the containment.
| Should demineralized water not be available or the system
| malfunctions, additional hand pull stations are provided
| inside the containment which allows for the normal fire
| protection water to be used for fire fighting purposes.
| The use of demineralized water will minimize the
| possibility of introduction of chlorides inside the
| containment.

a fire truck or a portable auxiliary pump. This fill is used as a backup to the pumps. As required by NFPA No. 24, a check valve and a ball drip valve are provided at the connection of the siamese to the main loop. The siamese connection is located adjacent to the Service Water Intake Structure.

65 | As shown in Figure 9.5-44, the Turbine Building has an internal loop
| which supplies the standpipes and water spray systems. This internal
50 | loop has connections to the underground loop in Unit 1 and connections
| in Unit 2. A tie-line is provided inside the construction cutoff of
| the Unit 1 to facilitate construction of Unit 2 and to isolate
| sections of the loop. Valves are provided in accordance with NFPA 14
65 | to isolate the system. The water spray systems and automatic
| sprinkler systems are connected to the outside loop via isolation
| valves located in the fire protection valve rooms in the basement of
| the Turbine Building. The valve rooms are accessible from inside and
| outside the Turbine Building, as required, to control the water flow
| to the suppression systems.

50 | As shown on Figure 9.5-46, the water suppression systems protecting
| the diesel generators are independently supplied from the main yard
| loop. Actuation of the wet-pipe sprinkler system protecting one of
| the diesel generators will not affect the operation of the other
65 | diesel generator. Each diesel generator compartment is provided with
| a watertight door to prevent flooding of the adjacent areas.

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66 | The fire pump house structure is divided into five rooms with three
| hour rated fire barriers. The structure is protected by an automatic
66 | wet-pipe sprinkler system. Water flow and valve tamper alarms are
| provided at the pump house location and in the Control Room. Each
| room in the fire pump house is provided with detection which
| announces locally and in the Control Room.

The automatic wet pipe, manual preaction, manual deluge, hose stand pipe and water spray systems are supplied by the respective safety related building interior supply loop. | 66
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Yard post indicator valves are located in supply lines to permanent plant auxiliary buildings in accordance with NFPA 24 to shut off the water supply to these buildings. The hose stations are wet up to the shutoff valves at each station. A fire extinguisher is located adjacent to each hose station in these buildings. | 54
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Each Halon system consists of a detection system, main and reserve storage cylinders, manifold and header assembly, control valves, piping, nozzles, and local control panels. The main Halon charge is released automatically after receipt of a fire signal from cross zoned ionization detectors located in the respective area. Each system incorporates a time delay which provides a warning for personnel evacuation of the area. The reserve charge of Halon is provided for automatic protection of the areas during the time the main cylinders are being refilled following a discharge. Halon can also be released manually. | 65
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Page 16 of 148 Superior finishes such as gypsum plaster, ceramic tile, and

acoustical ceiling materials are noncombustible. The acoustical tiles are mineral fiber board with a flame spread rating of less than 25 in accordance with ASTM E-84, Surface Burning

Characteristics of Building Materials. Protective coatings used throughout the primary plant are in accordance with the requirements of ANSI N101.2, Protective Coatings for Light Water Nuclear Reactor Containment Facilities, and ANSI N512, Protective Coatings for the Nuclear Industry. All other paints (such as enamel undercoat, alkyd gloss enamel, latex emulsion, and alkyd enamel) conform to the requirements of Factory Mutual, Occupational Safety and Health Act (OSHA) and Steel Structures Painting Council (SSPC) for the service intended. Vinyl

asbestos floor tiles, located in the Control Room, various corridors, and in the office areas in the Turbine Building, have a flame propagation index of less than four. The flame propagation index is in accordance with UL 992, Test Method for Measuring the Flame Propagating Characteristics of Flooring and Floor Covering Materials. Carpeting installed in the Control Room is discussed in Section 9.5.1.6.2.

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Steel checker plate hatch covers and removeable concrete hatches are provided in floor openings required for equipment removal.

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In floors designated as fire barriers, the steel checker plate hatch covers are coated with an approved fire-resistant coating. Protection provided by steel hatch covers has been demonstrated through analysis, in lieu of providing a tested configuration, as described in 9.5.1.6.2. Concrete hatches are constructed such that the designated fire rating of the barrier is maintained.

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The reflective piping insulation is composed of stainless steel sheets and foil and the thermal piping insulation is composed of hydrous calcium silicate. Both are 100-percent inorganic and will not burn or support combustion. Anti sweat piping insulation is composed of fiberglass and has been tested by UL to the requirements of ASTM E-84 with a flame spread of 25, a fuel contribution of 25, and a smoke development of 50.

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2. Penetration Seals

50 | Penetrations in designated fire barriers are sealed with an
| approved fire stop material except as noted in Subsection
| 9.5.1.6.2. The penetration seals have fire resistance ratings
66 | that meet or exceed the rating designated for the barrier. The
| majority of the penetrations are sealed with approved silicone
| materials tested in accordance with the requirements of ASTM E
| 119 and, in the case of electrical seals, tested in accordance
| with IEEE 634.

3. Fire Door Assemblies

50 | Door openings in designated fire barriers are provided with
| approved labeled fire door assemblies except as noted in
| Subsection 9.5.1.6.2.

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9.5.1.5.4 Ventilation System Characteristics

1. Fire Dampers

66 | All ductwork that penetrates a designated fire barrier of two
| hours or greater is equipped with an approved damper with a
| rating at least equivalent to that designated for the barrier.
50 | Most fire dampers are equipped with heat-responsive elements
| which automatically release the fire damper blade when the air
| temperature in the ductwork exceeds the predetermined element
| operating temperature. Where appropriate, fire dampers are
| equipped with electro-thermal links. Fire dampers are normally
| open, but they close during a fire condition. Where
| applicable, fire dampers located in ductwork are seismically
| qualified to ensure that the dampers will not close during a
| seismic event (see Section 9.4.5).

9.5.1.5.5 Electrical Cable and Cable Tray Design - Characteristics

50 | Generally, electrical cables are flame-retardant, noncombustible, and
| nonpropagating in nature and conform to the criterion of IEEE 383-
| 1974. They will not support combustion in the absence of a sustained
| ignition source. The cable construction will allow wetting down
| without structural damage or electrical faulting. All cable trays,
| conduits, and their supports are constructed of noncombustible
| materials.

ADV71 " | Outside the Containment buildings, where cable trays containing
| cabling related to both redundant trains of equipment required to
| bring the plant to a hot standby condition, and where both trains are
| located in the same fire area, and are not separated by a negligible
| combustible horizontal distance of greater than or equal to 20 feet,
| one train of cabling will be protected by at least a one hour rated
| fire barrier. Where this situation exists, automatic sprinklers are
| arranged to provide coverage adequate for the hazards in the area.

66 | Sprinklers are also provided for cabling where there is a congestion
| of cable trays see Section 9.5.1.6.1d. Fire stops are provided
| within the cable trays whenever the cables penetrate walls or floors
| designated as fire barriers. Fire stops are not provided at
| intermediate points in vertical or horizontal cable runs, except in
| long vertical runs. In such instances, fire stops are located at

65 | intervals equivalent to floor spacings. It is a general installation
| practice that vertical tray runs are provided with solid, sheet steel
| covers for a minimum distance of 4 feet above the floor where
| necessary for physical protection of the cable. Fire stops are not
| provided in cable trays inside the Containment Buildings. Conduit
| fire stops are provided when the conduit penetrates a designated fire
| barrier and is not run continuously through the fire area.

9.5.1.5.6 Transformers

All interior transformers are of the air-cooled dry type and do not contain any insulating oil. The main, unit auxiliary, and startup

9.5.1.6 Conclusions

9.5.1.6.1 Comparison with Appendix A of Branch Technical
Position APCSB 9.5-1 of Standard Review Plan 9.5.1

As requested by the NRC in their September 30, 1976, letter, the following is a comparison of the CPSES fire protection program with the guidelines in Appendix A to the above branch technical position.

- (1) All buildings of the plant are divided into fire areas. The criteria used to develop this arrangement are discussed in Subsection 9.5.1.2.2, 9.5.1.2.3 and 9.5.1.5.1. | 50

APCSB 9.5-1 Appendix A

- (2) Separate redundant safety related systems from each other so that both are not subject to damage from a single fire hazard.

(2) Alternatives:

- (a) Redundant safety-related systems that are subject to damage from a single fire hazard should be protected by a combination of fire retardant coatings and fire detection and suppression systems, or
- (b) a separate system to perform the safety function should be provided.

CPSES Fire Protection Program

- (2) (a): Where redundant fire safe shutdown systems, required to bring the plant to a hot standby condition, are located within the same fire area and are subject to damage from a single fire hazard a Fire Hazards Analysis Evaluation demonstrates and documents compliance to that recommended in the guideline by protecting the function with one of the following: | ADV71

65 | For systems located outside the Containment Building the
| following is provided:

ADV71 | 1) A one-hour fire barrier on one set of required fire
| safe shutdown cabling and, based on the fire hazards
| of the area, automatic fire suppression and fire
| detection are provided.

2) Alternate shutdown capability

ADV71 | 3) Fire detection and suppression, adequate for the
| hazards of the area, accompanied by 20 feet of
| horizontal separation with negligible intervening
| combustibles or fire hazards, unless justified per
| Reference [19].

ADV71 | 4) Separation of redundant required sets of fire safe
| shutdown systems and components by a fire barrier
| having a 3 hour rating, unless justified per
| Reference [19].

65 | For systems located inside the Containment Building the
| following is provided:

ADV71 | 1) Fire detection in combination with radiant energy
| shields protecting one set of required fire safe
| shutdown systems and components unless justified per
| Reference [19].

ADV71 | 2) Fire detection accompanied by 20 feet of horizontal
| separation with negligible intervening combustibles
| or fire hazards, unless justified per Reference
| [19].

(b) Where a redundant system required to bring the plant to a cold shutdown condition is subject to damage from a single fire hazard, the following will be provided:

- 1) Fire detection system
- 2) procedure to repair at least one train of the damaged system within 72 hours.

APCSB 9.5-1 Appendix A

D.1.b In order to accomplish 1.(a) above, safety related systems and fire hazards should be identified throughout the plant. Therefore, a detailed fire hazards analysis should be made. The fire hazards analysis should be reviewed and updated as necessary.

CPSES Fire Protection Program

The CPSES Fire Protection Program is based on detailed fire hazard evaluations which satisfy this guideline. | 50

APCSB 9.5-1 Appendix A

D.1.c For multiple reactor sites, cable spreading rooms should not be shared between reactors. Each cable spreading room should be separated from other areas of the plant by barriers (walls and floors) having a minimum fire resistance of three hours. Cabling for redundant safety divisions should be separated by walls having three hour fire barriers.

Alternative guidance for constructed plants is shown in Section F.3, "Cable Spreading Room".

CPSES Fire Protection Program

Two cable spreading rooms are included in the design of CPSES, one for each unit. These rooms are separated by three hour rated fire barriers except as noted in Reference [19]. See Section F.3 for the design description. | 66

construction capable of withstanding and containing a fire that consumes all combustibles present. Examples of such combustible materials that may not be separable from the remainder of its system are:

- (1) Emergency diesel generator fuel oil day tanks
- (2) Turbine-generator oil and hydraulic control fluid systems
- (3) Reactor coolant pump lube oil system.

CPSES Fire Protection Program

The Fire Protection Program is in compliance with the guideline. | 52
Separation and protection of required fire safe shutdown systems are | ADV71
discussed for each fire area in the Fire Protection Report. |

APCSB 9.5-1 Appendix A

D.2.b Bulk gas storage (either compressed or cryogenic), should not be permitted inside structures housing safety related equipment. Storage of flammable gas such as hydrogen, should be located outdoors or in separate detached buildings so that a fire or explosion will not adversely affect any safety related systems or equipment.

Care should be taken to locate high pressure gas storage containers with the long axis parallel to building walls. This will minimize the possibility of wall penetration in the event of a container failure. Use of compressed gases (especially flammable and fuel gases) inside buildings should be controlled. (Refer to NFPA 6, "Industrial Fire Loss Prevention.")

Alternate criteria: Where installed penetration seals are deficient with respect to fire resistance, these seals may be protected by covering both sides with an approved fire retardant material. The adequacy of using such material should be demonstrated by suitable testing.

CPSES Fire Protection Program

For conduits which are greater than four (4) inches nominal size, internal seals are installed either at the barrier or on both sides of the barrier at the first opening in the direction of the barrier. These internal seals have a fire rating equal to or greater than that of the fire barrier rating. | ADV71

For conduits which are less than or equal to four (4) inches nominal size, and automatic suppression and detection are provided on both sides of the barrier, internal seals are installed in the barrier, or at the first opening on either side of the barrier with a fire rating equivalent to that of the barrier, unless individually evaluated and documented in Section 9.5.1.6.2. For conduits which are less than or equal to four (4) inches nominal size, and automatic suppression and detection are not provided on both sides of the barrier, internal seals are installed at the barrier with a fire rating equivalent to that of the barrier, or gas and smoke seals are installed at the first opening on both sides of the barrier, except as described in 9.5.1.6.2. | ADV71

APCSB 9.5-1 Appendix A

- D.3.e Fire breaks should be provided as deemed necessary by the fire hazards analysis. Flame or flame retardant coatings may be used as a fire break for grouped electrical cables to limit spread of fire in cable ventings. (Possible cable derating owing to use of such coating materials must be considered during design.)

CPSES Fire Protection Program

The Fire Protection Program complies with the guideline. Fire breaks are provided as described in Subsection 9.5.1.5.5.

APCSB 9.5-1 Appendix A

D.3.f Electric cable constructions should as a minimum pass the current IEEE No. 383 flame test. (This does not imply that cables passing this test will not require additional fire protection).

CPSES Fire Protection Program

50 | The Fire Protection Program is in compliance with this guideline
| except as noted in section 9.5.1.6.2. Electrical cable construction
is described in Section 9.5.1.5.5.

APCSB 9.5-1 Appendix A

D.3.g To the extent practical, cable construction that does not give off corrosive gases while burning should be used.

CPSES Fire Protection Program

The Fire Protection Program is in compliance with the guidelines to the extent practical with present day cable insulation and jacket material.

APCSB 9.5-1 Appendix A

D.3.h Cable trays, raceways, conduit, trenches, or culverts should be used only for cables. Miscellaneous storage should not be permitted, nor should piping for flammable or combustible liquids or gases be installed in these areas.

CPSES Fire Protection Program

The Fire Protection Program complies with the guideline.

APCSB 9.5-1 Appendix A

D.3.i The design cable tunnels, culverts and spreading rooms should provide for automatic or manual smoke venting as required to facilitate manual fire fighting capability.

CPSES Fire Protection Program

The Fire Protection Program provides for manual smoke venting to enable manual fire fighting. See Subsection 9.5.1.5.4 for criteria on smoke venting.

APCSB 9.5-1 Appendix A

D.3.j Cables in the control room should be kept to the minimum necessary for operation of the control room. All cables entering the control room should terminate there. Cables should not be installed in floor trenches or culverts in the control room.

CPSES Fire Protection Program

The cables in the Control Room are the minimum necessary for operation of the plant. There are no cables routed in floor trenches in the Control Room. There is, however, a small amount of cabling enclosed in steel conduit, routed above the suspended ceiling in the Control Room. Fire detection is provided for this concealed area.

APCSB 9.5-1 Appendix A

D.4 Ventilation

- D.4.a The products of combustion that need to be removed from a specific fire area should be evaluated to determine how they will be controlled. Smoke and corrosive gases should generally be automatically discharged directly outside to a safe location. Smoke and gases containing radioactive materials should be monitored in the fire area to determine if release to the environment is within the permissible limits of the plant Technical Specifications.

CPSES Fire Protection Program

The Fire Protection Program is in compliance with the guideline. See Section 9.5.1.5.4 for further information.

APCSB 9.5-1 Appendix A

- D.4.b Any ventilation system designed to exhaust smoke or corrosive gases should be evaluated to ensure that inadvertent operation or single failures will not violate the controlled areas of the plant design. This requirement includes containment functions for protection of the public and maintaining habitability for operations personnel.

CPSES Fire Protection Program

Ventilation of smoke or corrosive gases, resulting from a fire will be accomplished manually as required, and subsequent to monitoring for radioactivity and evaluating the products of combustion.

APCSB 9.5-1 Appendix A

- D.4.c The power supply and controls for mechanical ventilation systems should be run outside the fire area served by the system.

APCSB 9.5-1 Appendix A

- D.4.i Where total flooding gas extinguishing systems are used, area intake and exhaust ventilation dampers should close upon initiation of gas flow to maintain necessary gas concentration. (See NFPA 12, "Carbon Dioxide Systems", and 12A, "Halon 1301 Systems.")

CPSES Fire Protection Program

The Fire Protection Program complies with the guideline. See Subsection 9.5.1.5.4 for description of fire dampers.

APCSB 9.5-1 Appendix A

D.5 Lighting and Communication

Lighting and two way voice communication are vital to safe shutdown and emergency response in the event of fire. Suitable fixed and portable emergency lighting and communication devices should be provided to satisfy the following requirements:

- (a) Fixed emergency lighting should consist of sealed beam units with individual 8-hour minimum battery power supplies.
- (b) Suitable sealed beam battery powered portable hand lights should be provided for emergency use.

CPSES Fire Protection Program

ADV71 | Areas containing fire safe shutdown equipment required to achieve hot
| standby, and primary interior egress and access routes between these
| areas, are provided with

DC Emergency Lighting supplied by 8 hour sealed beam or fluorescent lamp battery power pack units (except in the Control Room). DC Emergency Lighting in the Control Room is supplied power from the non-class 1E dedicated 8-hour batteries. (See FSAR Section 9.5.3.2.1 and 9.5.1.6.2). Supplemental lighting is provided from battery-powered hand held portable lights.

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APCSB 9.5-1 Appendix A

- D.5 (c) Fixed emergency communication should use voice powered head sets at pre-selected stations.

CPSES Fire Protection Program

The Fire Protection Program provides intra plant portable radio with page-party/public address system backup for use in emergency conditions instead of voice powered head sets. For additional description of the communication systems, see Subsection 9.5.2.2.

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APCSB 9.5-1 Appendix A

- D.5 (d) Fixed repeater installed to permit use of portable radio communication units should be protected from exposure to fire damage.

CPSES Fire Protection Program

The Fire Protection Program is in compliance with this guideline by providing radio to radio "talkaround" and plant page party/public address system capability in the event of fire damage to the repeater.

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Each sprinkler and standpipe system should be equipped with OS&Y (outside screw and yoke) gate valve, or other approved shut off valve, and water flow alarm. Safety related equipment that does not itself require sprinkler water fire protection, but is subject to unacceptable damage if wetted by sprinkler water discharge should be protected by water shields or baffles.

CPSES Fire Protection Program

ADV71 | The Fire Protection Program is in compliance with the guideline except
| as noted in Section 9.5.1.6.2. The connection of each automatic
| sprinkler system and hose station is described in Subsection 9.5.1.4.

50 | Also see guideline D.3.c.

APCSB 9.5-1 Appendix A

E.3.b All valves in the fire water systems should be electrically supervised. The electrical supervision signal should indicate in the control room and other appropriate command locations in the plant (See NFPA 26, "Supervision of Valves").

53 | Automatic sprinkler systems comply with requirements of NFPA 13 and
66 | NFPA 15. Water spray systems for the charcoal filters are designed
ADV71 | to the requirements of Regulatory Guide 1.52. Design densities for
| cable tray suppression systems located in congested cable areas meet
| the applicable NFPA Standards (Reference 24). Specific differences
| with the applicable NFPA standards are identified and justified in
| Reference [19].

APCSB 9.5-1 Appendix A

E.3.d Interior manual hose installation should be able to reach any location with at least one effective hose stream. To accomplish this, standpipes with hose connections, equipped with a maximum of 75 feet of 1-1/2 inch woven jacket lined fire hose and suitable nozzles should be provided in all buildings, including containment, on all floors and should be spaced at not more than 100 foot intervals. Individual standpipes should be of at least 4-inch diameter for multiple hose connections and 2-1/2-inch diameter for single hose connections. These systems should follow the requirements of NFPA 14 for sizing, spacing and pipe support requirements (NELPIA).

Hose stations should be located outside entrances to normally unoccupied areas and inside normally occupied areas. Standpipes serving hose stations in areas housing safety related equipment should have shut off valves and pressure reducing devices (if applicable) outside the area.

CPSES Fire Protection Program

NFPA 14 was used as guidance for installation of Class II service interior manual hose stations. Each hose station is equipped with 100 feet of 1-1/2 inch woven jacket lined fire hose and a nozzle compatible with the type of fire postulated. The spacing of the hose stations ensures that at least one effective hose stream can reach any location in safety-related areas of the plant except where identified and justified in the Fire Protection Report, Reference [19]. NFPA 14 was used as guidance for sizing of Class II type standpipes and hose systems. For a further description of the interior hose stations see Subsection 9.5.1.4. | ADV71 | 66

APCSB 9.5-1 Appendix A

E.3.e The proper type of hose nozzles to be supplied to each area should be based on the fire hazard analysis. The usual combination spray/straight-stream nozzle may cause unacceptable mechanical damage (for example, the delicate electronic equipment in the control room) and be unsuitable. Electrically safe nozzles should be provided at locations where electrical equipment or cabling is located.

CPSES Fire Protection Program

FOG type nozzles are provided in hose cabinets inside plant buildings. Outside hose houses are provided with combination nozzles. | 50

APCSB 9.5-1 Appendix A

E.3.f Certain fires such as those involving flammable liquids respond well to foam suppression. Consideration should be given to use of any of the available foams for such specialized protection application. These include the

people are present in an area so protected. Areas entered frequently (even though duration time for any visit is short) have often been found with CO₂ systems shut off.

CPSES Fire Protection Program

The Fire Protection Program does not use fixed carbon dioxide suppression systems.

APCSB 9.5-1 Appendix A

E.6 Portable Extinguishers

Fire extinguishers should be provided in accordance with guidelines of NFPA 10 and 10A, "Portable Fire Extinguishers Installation, Maintenance and Use." Dry chemical extinguishers should be installed with due consideration given to cleanup problems after use and possible adverse effects on equipment installed in the area.

CPSES Fire Protection Program

ADV71 | The Fire Protection Program is in compliance with the guideline. See Subsection 9.5.1.4.2 for description of portable fire extinguishers.

APCSB 9.5-1 Appendix A

F. Guidelines for Specifics Plant Areas

F.1 Primary and Secondary Containment

F.1.a Normal Operation

Fire protection requirements for the primary and secondary containment areas should be provided on the basis of specific identified hazards. For example:

- o Lubricating oil or hydraulic fluid system for the primary coolant pumps
- o Cable tray arrangements and cable penetrations
- o Charcoal filters

CPSES Fire Protection Program

The Fire Protection Program is in compliance with this guideline except as noted in Section 9.5.1.6.2. The Fire Protection Report identifies specific hazards inside containment. Fire detection and suppression are provided accordingly.

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APCSB 9.5-1 Appendix A

F.1.a Fire suppression systems should be provided based on the fire hazards analysis.

Fixed fire suppression capability should be provided for hazards that could jeopardize safe plant shutdown. Automatic sprinklers are preferred. An acceptable alternate is automatic gas (Halon or CO₂) for hazards identified as requiring fixed suppression protection.

capability should be provided as backup for the above described hazard detection. To accomplish this, suitable smoke detection (e.g., visual obscuration, light scattering and particle counting) should be installed in the air recirculation system ahead of any filters.

Automatic fire suppression capability need not be provided in the primary containment atmospheres that are inserted during normal operation. However, special fire protection requirements during refueling and maintenance operations should be satisfied as provided below.

CPSES Fire Protection Program

Fire detection is provided throughout the Containment in accordance with the results of Fire Hazard Analysis Evaluations, which are summarized in the Fire Protection Report. The type, quantity, and general location of each detector are shown on the FHA drawings. Alarms are provided in the Control Room to annunciate a fire condition via the plant public address (PA) system.

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APCSB 9.5-1 Appendix A

F.1.b Refueling and Maintenance

Refueling and maintenance operations in containment may introduce additional hazards such as contamination control materials, decontamination supplies, wood planking, temporary wiring, welding and flame cutting (with portable compressed fuel gas supply). Possible fires would not necessarily be in the vicinity of fixed detection and suppression systems.

Management procedures and controls necessary to assure adequate fire protection are discussed in Section 3a.

F.2 Control Room

The Control Room is essential to safe reactor operation. It must be protected against disabling fire damage and should be separated from other areas of the plant by floors, walls and roofs having minimum fire resistance ratings of three hours.

- (b) Exposure fire involving combustibles in the general room area.

CPSES Fire Protection Program

The Fire Protection Program is in general compliance with the guideline, except as noted in FSAR Section 9.5.1.6.2. The Control Room is separated from other areas of the plant by three hour rated fire barriers, except as noted in Reference [19].

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APCSB 9.5-1 Appendix A

F.2 Control Room cabinets and consoles are subject to damage from two distinct fire hazards:

- (a) Fire originating within a cabinet or console; and
- (b) Exposure fire involving combustibles in the general room area.

Manual fire fighting capability should be provided for both hazards.

CPSES Fire Protection Program

- 50 | Manual fire fighting capability employing portable water and Halon
| extinguishers and hose stations are provided inside the Control Room.

APCSB 9.5-1 Appendix A

F.2 Hose stations and portable water and Halon extinguishers should be located in the control room to eliminate the need for operators to leave the control room. An additional hose piping shut off valve and pressure reducing device should be installed outside the control room.

Hose stations adjacent to the control room with portable extinguishers in the control room are acceptable.

Nozzles that are compatible with the hazards and equipment in the control room should be provided for the manual hose station. The nozzles chosen should satisfy actual fire fighting needs, satisfy electrical safety and minimize physical damage to electrical equipment from hose stream impingement.

Fire detection in the control room cabinets, and consoles should be provided by smoke and heat detectors in each fire area. Alarm and annunciation should be provided in the control room. Fire alarms in other parts of the plant should also be alarmed and annunciated in the control room.

CPSES Fire Protection Program

- 66 | Manual fire fighting capability employing portable water and Halon
| extinguishers, as well as hose stations, is provided in the Control
| Room.

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| A fire detection system which alarms at the local detection panel and
| in the control room is provided for both safety-related switchgear
| areas. Electrical equipment which could be damaged by direct water
| spray was considered. See Guideline D.3.c.

APCSB 9.5-1 Appendix A

F.6 Remote Safety Related Panels

The general area housing remote safety related panels should be provided with automatic fire detectors that alarm locally and alarm and annunciate in the control room. Combustible materials should be controlled and limited to those required for operation. Portable extinguishers and manual hose stations should be provided.

CPSES Fire Protection Program

ADV71

| The general area, housing safety related equipment, is provided with
| automatic detectors that alarm at the local control panel and
| annunciate in the Control Room as determined in the Fire Protection
| Report. Administrative procedures have been developed to control
| combustible materials. Portable extinguishers and manual hose
| stations are provided.

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APCSB 9.5-1 Appendix A

F.7 Station Battery Rooms

Battery rooms should be protected against fire explosions. Battery rooms should be separated from each other and other areas of the plant by barriers having a minimum fire rating of three hours inclusive of all penetrations and openings. (See NFPA 69, "Standard on Explosion Prevention

Systems.") Ventilation systems in the battery rooms should be capable of maintaining the hydrogen concentration well below 2 percent volume hydrogen concentration.

Standpipe and hose and portable extinguishers should be provided.

CPSES Fire Protection Program

The Fire Protection Program is in compliance with the guideline. Safety related battery rooms are separated from each other and other areas of the plant by three hour fire barriers. The ventilation system is capable of maintaining the hydrogen concentration well below two percent by volume. | ADV71

Hose stations and portable extinguishers are located in the corridors serving the battery rooms.

APCSB 9.5-1 Appendix A

F.8 Turbine Lubrication and Control Oil Storage and Use Areas

A blank fire wall having a minimum resistance rating of three hours should separate all areas containing safety related systems and equipment from the turbine oil system.

CPSES Fire Protection Program

Walls separating safety related areas from the Turbine Building have a minimum fire rating of three hours. All penetrations in these walls also have three hour ratings, except for bus duct penetrations which are discussed in D.1.j of Section 9.5.1.6.2. | 52
| ADV71
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other areas of the plant by fire barriers having at least three hour ratings. These rooms should be protected by automatic sprinkler protection unless a fire hazards analysis can demonstrate that a fire will not endanger other safety related equipment required for safe plant shutdown. Early warning fire detection should be installed with alarm and annunciation locally and in the control room. Local hose stations and portable extinguishers should also be provided.

Equipment pedestals or curbs and drains should be provided to remove and direct water away from safety related equipment.

Provisions should be made for manual control of the ventilation system to facilitate smoke removal if required for manual fire fighting operation.

CPSES Fire Protection Program

- ADV71 | The Fire protection Program provides protection in accordance with the
| guideline for fire safe shutdown components, for required separation
| criteria see D.1.a of Section 9.5.1.6.1.
- 66 | Fire areas containing required fire safe shutdown pumps are separated
| from other fire areas of the plant by three hour fire rated barriers.
- ADV71 | The Fire Protection Report demonstrates that an adequate level of fire
| protection is provided to separate redundant equipment used for safe
| plant shutdown in the event of a fire. Automatic detection is
| provided in these areas except where a Fire Hazards Analysis
| Evaluation has concluded that an equivalent level of protection is
| provided.

50 | The Fire Protection Program complies with this guideline except as
 | noted in section 9.5.1.6.2. Dry ion exchange resins are not stored
 50 | in or adjacent to areas containing safety-related systems. Storage
 | areas for dry ion exchange resins are protected by fire detectors,
 | portable extinguishers, and manual hose stations.

APCSB 9.5-1 Appendix A

G.3 Hazardous Chemicals

Hazardous chemicals should be stored and protected in accordance with the recommendations of NFPA 49, "Hazardous Chemicals Data." Chemical storage areas should be well ventilated and protected against flooding conditions since some chemicals may react with water to produce ignition.

CPSES Fire Protection Program

65 | The Fire Protection Program is in compliance with the guideline except
 | as noted below. Hazardous chemicals are stored in tanks approved for
 50 | such service and in areas not containing safety-related components and
 | systems, with the exception of the chemical additive tank in the
 ADV71 | Safeguards Building. The chemical additive tanks are located in
 | partially enclosed alcoves in fire area SB4. These tanks are not
 50 | open the atmosphere and are inerted with nitrogen. The locations of
 | the tanks are not considered hazardous.

APCSB 9.5-1 Appendix A

G.4 Materials Containing Radioactivity

Materials that collect and contain radioactivity such as spent ion exchange resins, charcoal filters, and HEPA

A to Branch Technical Position APCSB 9.5-1

The following statements are justification for items of noncompliance to Appendix A to Branch Technical Position APCSB 9.5-1 of Standard Review Plan 9.5.1, Revision 1, as stated in the applicable items of

ADV71 | Subsection 9.5.1.6.1. Any additional deviations have been included in
| Appendix C of Reference [19].

Guideline D.1.d

- 50 | Guideline D.1.d limits the flame spread, smoke and fuel contribution
| to a maximum of 25 for interior wall and structural components,
| thermal insulation materials and sound proofing.
- 50 | Owens Corning fiberglass pipe insulation is used in various areas of
| the plant. This insulation is rated as Flame Spread-25, Fuel
| Contribution-25, and Smoke Development-50.
- 53 | Carpet, installed in the Control Room as soundproofing, was tested to
| ASTM E 84 yielding flame spread 30, fuel contribution 30 and smoke
| developed 100.
- 52 | Thermal insulation for ducts have ASTM E 84 rating of 25, 50, 50.
- 53 | Thermal insulation for chiller unit heat exchangers and piping have
| ASTM E 84 rating less than flame spread 25, fuel contribution 30 and
| smoke developed 150.
- 65 |
- 50 | Guideline D.1.j
- 50 | Guideline D.1.j address 3-hour rated floors, walls and ceilings
ADV71 | separating fire areas. The following justifications are provided
| where installations are shown to be adequate through analysis in lieu
| of providing a tested configuration.

1. Floors, walls and ceilings | 50

Stair tower walls are constructed of two hour rated of design. | 50
Justification is provided in subsection 9.5.1.6.2, guideline |
D.4.f. |

Removable concrete block walls are not fire tested design. |
Justification is provided in reference [19]. This | 50
justification applies to all applications. |

Protection provided by metal hatch covers installed in three (3) | ADV71
hour rated floors has been demonstrated through analysis in lieu |
of providing a tested configuration. The combustible loading |
below the hatches is less than 15 minutes with automatic |
suppression and detection above and below the hatches. The |
hatches are coated with a layer of fire resistive material to |
provide a three (3) hour structural steel resistance. Based on |
the combustible loading, automatic suppression and detection, |
and fire resistive coating, a one hour fire could occur without |
breaching the fire barrier through the metal hatches. |
2. Penetration Seals | 50

Containment electrical seals are not a fire tested |
configuration. Justification is provided in reference [19]. | 50

Containment mechanical seals are not a fire tested |
configuration. Justification is provided in reference [19]. | 65

Protection provided by the penetration seals installed in bus | ADV71
duct penetrations installed in three (3) hour rated barriers has |
been demonstrated through analysis in lieu of providing a tested |
configuration. The penetration seal design is similar to one |
currently used in the plant which has a three (3) hour fire |
rating. The seal maintains the thickness and continuity of the |
barrier. The barrier's purpose is unchanged by the bus duct |

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penetration. The fire protection features in the vicinity of bus duct penetrations are adequate for the hazards of the area. Based on the fire protection features and a review by a Fire Protection Engineer, bus duct penetrations are expected to survive a fire severity of three (3) hours without breaching the barrier.

3. Non-Rated Fire Doors

Missile resistant doors are not fire tested assemblies.

65 | Justification is provided per reference [19].

50 | Watertight doors are not fire tested assemblies. Justification is provided per reference [19] for redundant safe shutdown related separation barriers. The justifications are also applicable for doors in fire barriers that do not separate redundant safe shutdown systems.

65 | Bullet resistant and penetration resistant doors are not fire rated assemblies. The door assemblies are of a construction similar to units tested and listed by Underwriters' Laboratory subsequent to procurement and installation of the CPSES assemblies except for the Cable Spreading Room (BR/PR) door. This door is justified per reference [19].

50 | Containment Air-Locks for personnel and emergency escape use are
65 | not fire tested assemblies. Justification is provided per
reference [19].

ADV71 | Protection provided by the tornado vent/fire dampers installed in fire rated barriers with frames mounted outside the concrete walls on steel angles has been demonstrated through analysis in lieu of providing a tested configurations. The support frames of the assemblies are protected with an approved coating to yield a fire resistance equal to that of the barrier.

Fire damper support frames are more substantial than those used | ADV71
in standard sleeve installations. UL 555 gives the acceptance |
criteria which specifies that a damper assembly must remain in |
the opening during the fire, and during hose stream application |
and that no through openings be created. Based on the |
substantial support frames, the high probability of the dampers |
remaining in the opening, and the UL test acceptance criteria, |
the dampers are expected to provide a tortuous path for fire |
propagation and meet the conditions of acceptance in a fire |
test. |

Fire door frames are mounted in a frame of steel angles. These | ADV71
angles are then coated with Thermo-lag fire proofing material in |
accordance with U.L. Design No. X-611. These fire door |
assemblies are not be expected to compromise the integrity of |
their host 3 hour fire barriers when exposed to a postulated |
fire. |

Guideline D.2.b

Guideline D.2.b addresses bulk gas storage and tank orientation with | 50
relations to building walls. |

The CPSES bulk gas storage tanks are located 350 feet from the nearest | 50
safety-related building (Electrical and Control Building). The |
spacial separation between the tanks and nearest primary plant |
building is well in excess of the NFPA requirements and therefore the |
tank orientation is considered acceptable. |

66 | Guideline D.3.d:

ADV71 | Protection provided by the penetration seals installed in flexible
| conduit penetrations installed in fire rated barriers which separate
| buildings has been demonstrated through analysis in lieu of providing
| a tested configuration. Flexible conduits are sealed on both sides
| of a barrier, which is similar to a tested configuration. The
| combustible loading is low in the areas of flexible conduit
| penetrations, and fire protection features adequate for the hazards in
| the area have been provided. Based on the similarity of the
| configurations to tested configurations, detection, automatic
| suppression, and manual fire fighting capability, any fire zone which
| has a flexible conduit could have a fire severity of 3 hours without
| breaching the barrier through any of the flexible conduit
| penetrations.

Guideline D.3.f

50 | Guideline D.3.f requires electric cable construction to meet as a
| minimum the current IEEE-383 Flame Test.

65 | A small portion of low capacitance non IEEE-383 cable is installed in
| the Control Room cable spreading room and computer room for Unit 1.

65 | This cable is associated with the ERF computer system. Justification
| is provided in item 5a of reference [19].

52 | Another small amount of cable is used in association with the
| radiation monitoring and security systems. These cables are all
| routed in conduit (except for short flexible connectors to the
| detectors) and are designed for low power service. They do not
50 | present a fire hazard in the areas where they are installed.

50 | Guideline D.4.f

65 | Guideline D.4.f addresses the fire rating of elevator towers and
| stairwells outside containment. Barriers enclosing the elevator
| shafts are rated at two hours with 1 1/2 hour UL labeled fire door
| assemblies at openings to the elevator shaft. The elevators are not
| used during fire emergencies. Stairwells used for egress routes have
9.5-118

- 50 | 2. The control valves are closed automatically if the circulating
| water pump system demand occurs concurrently with a fire main
| system demand, resulting in low fire main system pressure.
- 50 | 3. The total demand when the system operates is small, and
| operation occurs infrequently only when the circulating water
| pumps are operating and all offsite power is unavailable.
- 66 | 4. Two fire pumps can supply the most limiting single suppression
| system actuation, a 500 gpm hose stream and the 75 gpm required
| by the inter-tie with a significant reserve margin.
- 66 |

Guideline E.2.e

- 50 | Guideline E.2.e requires that the water supply be sized assuming all
| sprinkler heads in the largest designed fire area operating, plus a
| 1000 GPM hose station allowance. This guideline is overconservative.
- ADV71 | The CPSES water supply is sized following the requirements of NFPA
| Code 13 with 1000 GPM hose stations allowance.

50 | Guideline E.3.a

- 50 | Guideline E.3.a requires water flow alarms for standpipe systems.
| This guideline is not justified because standpipe systems are manual
| systems requiring plant personnel to be aware of the fire condition
| prior to the operation of hose stations.

53 |

50 | Guideline F.1.a

- ADV71 | Guideline F.1.a addresses fixed fire protection for hazards that could
| jeopardize safe plant shutdown due to a fire inside the Containment
| Building. An analysis was performed to demonstrate that sufficient
| equipment is available in at least one shutdown path to safely
| shutdown CPSES in the event of an exposure fire in the Containment
| Building. Radiant Energy Shields were added to resolve interactions
| as a result of this analysis, and justifications for other
| interactions present were provided in References [19].
- 65 |

3. Emergency illumination levels provided by AC essential lighting for personnel safety, evacuation, and operation of safe shutdown work stations will meet or exceed the requirements as described under DC Emergency Lighting System in this section. | 66
| Q040.14
- Outside of the Containment and Fuel Building, AC Essential Lighting is provided in primary plant areas required for safe shutdown and in major interior access/egress routes between these areas. Inside the Containment, AC lighting is provided for emergency egress. This AC lighting is supplied power from the standby diesel generators during a loss of off-site power but is shed during a LOCA. AC Essential Lighting is not provided in the Fuel Building, Service Water Intake Structure or Turbine Building. | 41
| Q040.14
- The non-Class 1E DC Emergency Lighting System consists of lights connected to the dedicated batteries or individual battery packs. DC Emergency Lighting is provided in all areas needed for the operation of fire safe shutdown equipment necessary to achieve hot standby and in the primary interior access/egress routes between these areas. This lighting is provided by 8-hour rated battery packs except in the control room where the lighting is provided by dedicated 8-hour batteries. DC Emergency Lighting is also provided for safe egress in other areas of the plant which include the Containment, Fuel Building, Service Water Intake Structure, Turbine Building, and non-safety related areas of the Auxiliary Building. Power is supplied from the station batteries or individual battery packs. The battery pack rating is 8 hours except for the Turbine Building which has at least 4 hour rated battery packs. Battery pack lights are fluorescent or sealed beam type. | 66
| ADV71
| 41
| ADV71
| 66
| Q040.14
- The DC Emergency Lights in the Control Room are normally deenergized. The contactor in the DC Emergency Lighting panels is normally held open by a feed from the AC Lighting System. DC Emergency Lights are activated by the loss of power to the AC Lighting Systems. | 66
| 41