



Commonwealth Edison
One First National Plaza, Chicago, Illinois 60690
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

October 1, 1982

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Zion Station Units 1 and 2
Fire Protection
NRC Docket Nos. 50-295 and 50-304

- References (a): July 30, 1982, letter from
F. G. Lentine to H. R. Denton.
- (b): August 10, 1982, letter from
F. G. Lentine to H. R. Denton.

Dear Mr. Denton:

Reference (a) provided Commonwealth Edison's report on associated circuits related to Zion Station's post fire shutdown capability. That report contained several requests for exemption from the provisions of 10 CFR 50, Appendix R, Section III.G.2. Those requests were extracted from the report and compiled in a single list, which was provided in reference (b). Following a September 17, 1982, conference call with Mr. R. Ferguson and others of your staff, those requests have been supplemented by certain additional information. The revised exemption requests are provided in the Attachment to this letter.

Five copies of this letter and the Attachment are provided for your use.

Please address questions regarding this matter to this office.

Very truly yours,

F. G. Lentine

F. G. Lentine
Nuclear Licensing Administrator

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Attachment

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PDR ADOCK 05000295
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REQUESTED EXEMPTIONS TO
10 CFR 50, APPENDIX R,
SECTION III.G.2.a

SEPTEMBER 1982

ZION STATION
UNITS 1 & 2

REQUESTED EXEMPTIONS TO
10 CFR 50, APPENDIX R,
SECTION III.G.2.a

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0.1 INTRODUCTION

The fire protection modifications required at Zion Station comply primarily with the alternate safe shutdown guidelines of 10 CFR 50 Appendix R, except where new instrumentation will be installed. These modifications include, in part, the rerouting of power cables and valve limit-switch cables for redundant trains of shutdown equipment. The criteria of this cable rerouting is to maintain at least 20 feet horizontal separation with intervening non-fire hazard obstacles.

This exemption request specifically states what the physical geometries, fire hazard and fire suppression systems are on a system basis for the five large floor areas in the auxiliary building, and the crib house. In addition, the majority of the cable reroutes require a 3-hour fire wrap for one of the redundant trains and these are discussed in the Fire Protection Associated Cable Report (Reference 1).

ZION 1

1.0 REQUESTED EXEMPTIONS FOR ZION STATION - UNIT 1

1.1 INSTRUMENTATION, AUXILIARY FEEDWATER FLOW TO STEAM GENERATOR

Exemption is requested in Subsection 2.1.2.1 of the Fire Protection Associated Cable Report (See Reference 1). In Fire Area 11.4-0, auxiliary building, floor elevation 592 feet, the transmitter cables for redundant auxiliary feedwater flow indication are not separated by a 3-hour fire-rated barrier. Only one channel of flow indication is required for hot shutdown of Unit 1. An exemption to Section III.G.2.a of 10 CFR 50, Appendix R is requested for transmitter cables in Fire Area 11.4-0 based on the following:

1.1.1 Fire Area 11.4-0; Auxiliary Building, Floor Elevation 592 feet; Fire Protection Figure 2.3-4, Sheet 1; Fire Protection SER Section 5.11

- a. Transmitter cable 45874 is separated from the other three redundant transmitter cables in this area by a minimum horizontal distance of 20 feet. This separation includes an elevator with 2-hour fire-rated walls.
- b. This area is a limited access area.
- c. This area is equipped with thirteen portable fire extinguishers and four manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of approximately 240 gallons of lube oil kept in small containers, 480 pounds of charcoal, 16.5 pounds of HEPA filters, and cable insulation having a combined loading of 18,700 Btu/ft².
- e. This area is equipped with smoke detectors in close proximity to transmitter cable 45874 and the other three transmitter cables.
- f. This area is equipped with a sprinkler system protecting the charcoal absorber bank at column/row L/25, which is surrounded by a partial concrete wall. The sprinkler system is initiated by temperature detectors located in the charcoal absorber bank. Transmitter cable 45874 and the other three transmitter cables are separated 80 feet horizontally from the charcoal absorber bank.
- g. This area is equipped with fire detectors over the approximately 240 gallons of lube oil kept in small containers in three metal UL-approved flammable liquid storage cabinets located at column/row L-M/21.

1.2 POWER DISTRIBUTION SYSTEM

Exemption is requested in Subsection 3.1.2.5 of the Fire Protection Associated Cable Report. In Fire Area 11.2-0; auxiliary building, floor elevation 560 feet, the redundant 480-V Motor Control Centers (MCC's) power cables for safe shutdown equipment are not separated by a 3-hour fire-rated barrier. The 480-V MCC's of either Division 19 or Divisions 17 and 18 are required for hot shutdown of Unit 1. An exemption to Section III.G.2.a of 10 CFR 50, Appendix R is requested for MCC power cables in Fire Area 11.2-0 based on the following:

1.2.1 Fire Area 11.2-0; Auxiliary Building, Floor Elevation 560 feet; Fire Protection Figure 2.3-5, Sheet 1; Fire Protection SER Section 5.13

- a. The minimum horizontal separation between power cables for Division 18 MCC's and Division 19 MCC's is 37 feet.
- b. The minimum horizontal separation between a Division 18 MCC (1383A at column/row G-H/23) and a Division 19 MCC (1393A at column/row L/22) is 56 feet.
- c. This area is a limited access area.
- d. This area is equipped with five portable fire extinguishers and four manual hose stations. Portable ventilation equipment is available.
- e. The combustibles consist of cable insulation and a transient load having a combined fire loading of 13,000 Btu/ft².
- f. This area is equipped with ionization detectors located over the waste gas compressors and the component cooling pumps at column/row G-H/18-22, and in close proximity to safety-related cable trays.
- g. This area is equipped with an automatic overlapping CO₂ fire suppression system over the five component cooling pumps.

1.3 SERVICE WATER SYSTEM

Exemption is requested in Subsection 3.7.2.1 of the Fire Protection Associated Cable Report. In Fire Areas 11.2-0, 11.3-0 (auxiliary building, floor elevation 579 feet), and 11.4-0, Unit 1 service water pump power cables are not separated by a 3-hour fire-rated barrier from Unit 2 service water pump power cables. In Fire Zone 18.4A-0, crib house outer room, all six service water pumps are arranged 1C-1B-1A-2A-2B-2C in a straight line fashion. Any two out of six service water pumps are required for hot shutdown of both units. A 3-hour fire-rated barrier does not exist between the service water pump power cables. In Fire Zone 18.4B-0, crib house inner room, Unit 1 service water pump power cables are not separated by a 3-hour fire-rated barrier from Unit 2 service water pump power cables. An exemption to Section III.G.2.a of 10 CFR 50, Appendix R is requested for the service water pump power cables in Fire Areas 11.2-0, 11.3-0, and 11.4-0 and Fire Zones 18.4A-0 and 18.4B-0 based on the following:

1.3.1 Fire Area 11.2-0; Auxiliary Building, Floor Elevation 560 feet; Fire Protection Figure 2.3-5, Sheet 1; Fire Protection SER Section 5.13

- a. The minimum horizontal separation between Unit 1 service water pump power cables and Unit 2 service water pump power cables is 147 feet.
- b. This area is a limited access area.
- c. This area is equipped with five portable fire extinguishers and four manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of cable insulation and a transient load having a combined fire loading of 13,000 Btu/ft².
- e. This area is equipped with ionization detectors located over the waste gas compressors and the component cooling pumps at column/row G-H/18-22, and in close proximity to safety-related cable trays.
- f. This area is equipped with an automatic overlapping CO₂ fire suppression system over the five component cooling pumps.

1.3.2 Fire Area 11.3-0; Auxiliary Building, Floor Elevation 579 feet; Fire Protection Figure 2.3-8; Fire Protection SER Section 5.12

- a. The minimum horizontal separation between Unit 1 service water pump power cables and Unit 2 service water pump power cables is 147 feet.

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- b. This area is a limited access area.
- c. This area is equipped with three portable fire extinguishers and three manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of 22 gallons of lube oil, cable insulation, and a transient load having a combined fire loading of 6,700 Btu/ft².
- e. This area is equipped with smoke detectors above the remote shutdown panels at column/row I-J/23-25, and the AFW pumps at column/row G-H/21-24.
- f. This area is equipped with an automatic CO₂ puff fire suppression system over the AFW floor pumps.

1.3.3 Fire Area 11.4-0; Auxiliary Building, Floor Elevation 592 feet, Fire Protection Figure 2.3-4, Sheet 1; Fire Protection SER Section 5.11

- a. The minimum horizontal separation between Unit 1 service water pump power cables and Unit 2 service water pump power cables is 147 feet.
- b. This area is a limited access area.
- c. This area is equipped with thirteen portable fire extinguishers and four manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of approximately 240 gallons of lube oil, 480 pounds of charcoal, 16.5 pounds of HEPA filters, and cable insulation having a combined loading of 18,700 Btu/ft².
- e. This area is equipped with smoke detectors in the area of safety-related cable trays.
- f. This area is equipped with a sprinkler system protecting the charcoal absorber bank at column/row L/25 which is surrounded by a partial concrete wall. The sprinkler system is initiated by temperature detectors located in the charcoal absorber bank.
- g. This area is equipped with fire detectors over approximately 240 gallons of lube oil kept in small containers in three metal UL-approved flammable liquid storage cabinets at column/row L-M/21.
- h. There is more than 30 feet horizontal separation between the flammable liquid storage cabinets and any pump cable required for safe shutdown for a fire.

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1.3.4 Fire Zone 18.4A-0; Crib House Outer Room, Floor Elevation 594 feet, and Lower Level; Fire Protection Figure 2.3-18; Fire Protection SER Section 5.17

- a. Service water pump power cables for pumps 1C and 1B are separated from power cables for pumps 2C and 2B by a minimum horizontal distance of 67 feet.
- b. This zone is a limited access area.
- c. This zone is equipped with one portable fire extinguisher and four manual hose stations.
- d. The combustibles consist of 63 gallons in each of the six service water pumps for a total of 378 gallons of lube oil, cable insulation, and a transient load having a combined fire loading of 7,500 Btu/ft².
- e. This zone is equipped with smoke detectors over safety-related cable trays.

1.3.5 Fire Zone 18.4B-0; Crib House Inner Room, Floor Elevation 594 feet; Fire Protection Figure 2.3-18; Fire Protection SER Section 5.17

- a. The minimum horizontal separation between power cables for Unit 1 service water pumps and Unit 2 service water pumps is 27 feet 6 inches.
- b. This zone is a limited access area.
- c. The combustibles consist of 13 gallons of lube oil, 250 gallons of diesel fuel oil in the fire pump diesel fuel oil day tank, cable insulation, and a transient load having a combined fire loading of 16,400 Btu/ft².
- d. This zone is equipped with a smoke detector, a flame detector, and an automatic water suppression system over the curbed diesel-driven fire pump, two manual hose stations, and two portable fire extinguishers. The motor-driven fire pump has a smoke detector over it and is in close proximity to the diesel-driven fire pump and its diesel fuel oil day tank.
- e. The 250-gallon diesel fuel oil day tank is surrounded by a partial concrete wall.

1.4 COMPONENT COOLING PUMPS

Exemption is requested in Subsection 3.8.2.1 of the Fire Protection Associated Cable Report. In Fire Area 11.2-0, all five component cooling pumps are arranged OE-OD-OC-OB-OA in a straight line fashion. Any two of five component cooling pumps are required for hot shutdown of Unit 1. A 3-hour fire-rated barrier does not exist between the component cooling pump power cables. An exemption to Section III.G.2.a of 10 CFR 50, Appendix R is requested for the component cooling pump power cables in Fire Area 11.2-0 based on the following:

1.4.1 Fire Area 11.2-0; Auxiliary Building, Floor Elevation 560 feet; Fire Protection Figure 2.3-5, Sheet 1; Fire Protection SER Section 5.13

- a. In the immediate area of the component cooling pumps at column/row G-H/18-22, the power cables for pumps OE and OD are separated from the power cables for pumps OB and OA by a minimum horizontal distance of 32 feet.
- b. This area is a limited access area.
- c. This area is equipped with five portable fire extinguishers and four manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of cable insulation and a transient load having a combined fire loading of 13,000 Btu/ft².
- e. This area is equipped with ionization detectors located over the waste gas compressors and component cooling pumps and in close proximity to safety-related cable trays.
- f. This area is equipped with an automatic overlapping CC fire suppression system over the five component cooling pumps.

1.5 CENTRIFUGAL CHARGING PUMPS

Exemption is requested in Subsection 3.9.2.1 of the Fire Protection Associated Cable Report. In Fire Areas 11.2-0, 11.3-0, 11.4-0, and 11.5-0 (auxiliary building, floor elevation 630 feet), the power cables to the centrifugal charging pumps 1A and 1B and their room unit coolers 1A and 1B are not separated by a 3-hour fire-rated barrier. Only one centrifugal charging pump is required for hot shutdown of Unit 1. An exemption to Section III.G.2.a of 10 CFR 50, Appendix R is requested for the power cables to the centrifugal charging pumps and room coolers in Fire Areas 11.2-0, 11.3-0, 11.4-0, and 11.5-0 based on the following:

1.5.1 Fire Area 11.2-0; Auxiliary Building, Floor Elevation 560 feet; Fire Protection Figure 2.3-5, Sheet 1; Fire Protection SER Section 5.13

- a. Power cables for centrifugal charging pump 1A are separated from power cables for room unit cooler 1B by a minimum horizontal distance of 93 feet.
- b. This area is a limited access area.
- c. This area is equipped with five portable fire extinguishers and four manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of cable insulation and a transient load having a combined fire loading of 13,000 Btu/ft².
- e. This area is equipped with ionization detectors located over the waste gas compressors and the component cooling pumps at column/row G-H/18-22, and in close proximity to safety-related cable trays.
- f. This area is equipped with an automatic overlapping CO₂ fire suppression system over the five component cooling pumps.

1.5.2 Fire Area 11.3-0; Auxiliary Building, Floor Elevation 579 feet; Fire Protection Figure 2.3-8; Fire Protection SER Section 5.12

- a. In this area, power cables for the centrifugal charging pump 1A are routed with power cables for its room unit cooler 1A. Power cables for centrifugal charging pump 1A and room unit cooler 1A are separated from power cables for room unit cooler 1B by a minimum horizontal distance of 20 feet. Power cables for charging pump 1A and room unit cooler 1A are separated from power cables for charging pump 1B by a minimum horizontal distance of 22 feet.
- b. This area is a limited access area.

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- c. This area is equipped with three portable fire extinguishers and three manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of 22 gallons of lube oil, cable insulation, and a transient load having a combined fire loading of 6,700 Btu/ft².
- e. This area is equipped with smoke detectors above the remote shutdown panels at column/row I-J/23-25 and the AFW pumps at column/row G-H/21-24.
- f. This area is equipped with an automatic CO₂ puff fire suppression system over the AFW pumps.

1.5.3 Fire Area 11.4-0; Auxiliary Building, Floor Elevation 592 feet; Fire Protection Figure 2.3-4, Sheet 1; Fire Protection SER Section 5.11

- a. Power cables for centrifugal charging pump 1A are separated from power cables for charging pump 1B by a minimum horizontal distance of 35 feet.
- b. This area is a limited access area.
- c. This area is equipped with thirteen portable fire extinguishers and four manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of approximately 240 gallons of lube oil, 480 pounds of charcoal, 16.5 pounds of HEPA filters, and cable insulation having a combined loading of 18,700 Btu/ft².
- e. This area is equipped with smoke detectors in close proximity to safety-related cable trays.
- f. This area is equipped with a sprinkler system protecting the charcoal absorber bank at column/row L/25 which is surrounded by a partial concrete wall. This sprinkler system is initiated by temperature detectors located in the charcoal absorber bank.
- g. This area is equipped with fire detectors over approximately 240 gallons of lube oil kept in small containers in three metal UL-approved flammable liquid storage cabinets at column/row L-M/21.
- h. There is more than 30 feet horizontal separation between the flammable liquid storage cabinets and any pump cable required for safe shutdown for a fire.

1.5.4 Fire Area 11.5-0; Auxiliary Building, Floor Elevation 617 feet; Fire Protection Figure 2.3-3, Sheet 1; Fire Protection SER Section 5.11

- a. Power cables for centrifugal charging pump 1A are separated from power cables for charging pump 1B by a minimum horizontal distance of 28 feet.
- b. This area is a limited access area.
- c. This area is equipped with fifteen portable fire extinguishers and four manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of 500 pounds of protective clothing, 1,140 pounds of ductwork insulation, 100 pounds of duct lining, 16 pounds of blanketing material, and cable₂ insulation having a combined fire loading of 8,600 Btu/ft².

1.6 AUXILIARY FEEDWATER SYSTEM

Exemption is requested in Subsection 3.10.2.1 of the Fire Protection Associated Cable Report. In Fire Area 11.3-0, redundant power and control cables, for auxiliary feedwater (AFW) pumps, are not separated by 3-hour fire-rated barriers. Only one of three AFW pumps is required for hot shutdown of Unit 1. An exemption to Section III.G.2.a of 10 CFR 50, Appendix R is requested for AFW pump power and control cables in Fire Area 11.3-0 based on the following:

1.6.1 Fire Area 11.3-0; Auxiliary Building, Floor Elevation 579 feet; Fire Protection Figure 2.3-8; Fire Protection SER Section 5.12

- a. In the immediate area of the AFW pumps at column/row G-H/21-24, power and control cables are separated by a minimum horizontal distance of 20 feet.
- b. This area is a limited access area.
- c. This area is equipped with three portable fire extinguishers and three manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of 22 gallons of lube oil, cable insulation and a transient load having a combined fire loading of 6,700 Btu/ft².
- e. This area is equipped with smoke detectors above the remote shutdown panels at column/row I-J/23-25 and the AFW pumps at column/row G-H/21-24.
- f. This area is equipped with an automatic CO₂ puff fire suppression system over the AFW pumps.

ZION 2

2.0 REQUESTED EXEMPTIONS FOR ZION STATION - UNIT 2

2.1 INSTRUMENTATION, AUXILIARY FEEDWATER FLOW TO STEAM GENERATOR

Exemption is requested in Subsection 4.1.2.1 of the Fire Protection Associated Cable Report. In Fire Area 11.4-0, transmitter cables for redundant auxiliary feedwater flow (AFW) indication are not separated by a 3-hour fire-rated barrier. Only one channel of flow indication is required for the hot shutdown of Unit 2. An exemption to Section III.G.2.a of 10 CFR 50, Appendix R is requested for transmitter cables in Fire Area 11.4-0 based on the following.

2.1.1 Fire Area 11.4-0; Auxiliary Building, Floor Elevation 592 feet; Fire Protection Figure 2.3-4, Sheet 3; Fire Protection SER Section 5.11

- a. Transmitter cable 35874 is separated from the other three transmitter cables by a minimum horizontal distance of 100 feet. This separation includes partial walls.
- b. This area is a limited access area.
- c. This area is equipped with thirteen portable fire extinguishers and four manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of approximately 240 gallons of lube oil, 480 pounds of charcoal, 16.5 pounds of HEPA filters, and cable insulation having a combined loading of 18,700 Btu/ft².
- e. This area is equipped with smoke detectors in close proximity to safety-related cable trays.
- f. This area is equipped with a sprinkler system protecting the charcoal absorber bank at column/row L/25 which is surrounded by a partial concrete wall. The sprinkler system is initiated by temperature detectors located in the charcoal absorber bank.
- g. This area is equipped with fire detectors over approximately 240 gallons of lube oil kept in small containers in three metal UL-approved flammable liquid storage cabinets at column/row L-M/21.
- h. There is at least 40 feet horizontal separation between the flammable liquid storage cabinets and the instrumentation cables required for safe shutdown for a fire.

2.2 POWER DISTRIBUTION SYSTEM

Exemption is requested in Subsection 5.1.2.5 of the Fire Protection Associated Cable Report. In Fire Areas 11.2-0, 11.3-0, and 11.4-0, redundant Motor Control Centers (MCC's for Divisions 27, 28, and 29) power cables for safe shutdown are not separated by a 3-hour fire-rated barrier. The 480-V MCC's of either Division 29 or Divisions 27 and 28 are required for hot shutdown of Unit 2. An exemption to Section III.G.2.a of 10 CFR 50, Appendix R is requested for these MCC power cables in Fire Areas 11.2-0, 11.3-0, and 11.4-0 based on the following:

2.2.1 Fire Area 11.2-0; Auxiliary Building, Floor Elevation 560 feet; Fire Protection Figure 2.3-5, Sheet 3; Fire Protection SER Section 5.13

- a. Power cables associated with Divisions 27 and 28 are separated from power cables associated with Division 29 by a minimum horizontal distance of 95 feet.
- b. This area is a limited access area.
- c. This area is equipped with five portable fire extinguishers and four manual hose stations.
- d. The combustibles consist of cable insulation and a transient load having a combined fire loading of 13,000 Btu/ft².
- e. This area is equipped with ionization detectors located over the waste gas compressors and the component cooling pumps at column/row G-H/18-22, and in close proximity to safety-related cable trays.
- f. This area is equipped with an automatic overlapping CO₂ fire suppression system over the five component cooling pumps.

2.2.2 Fire Area 11.3-0; Auxiliary Building, Floor Elevation 579 feet; Fire Protection Figure 2.3-8; Fire Protection SER Section 5.12

- a. Power cables associated with Divisions 27 and 28 are separated from power cables associated with Division 29 by a minimum horizontal distance of 95 feet.
- b. This area is a limited access area.
- c. This area is equipped with three portable fire extinguishers and three manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of 22 gallons of lube oil, cable insulation, and a transient load having a combined fire loading of 6,700 Btu/ft².

e. This area is equipped with smoke detectors above the remote shutdown panels at column/row I-J/14-16 and the AFW pumps at column/row G-H/16-19.

f. This area is equipped with an automatic CO₂ puff fire suppression system over the AFW pumps.

2.2.3 Fire Area 11.4-0; Auxiliary Building, Floor Elevation 592 feet; Fire Protection Figure 2.3-4, Sheet 3; Fire Protection SER Section 5.11

a. Power cables associated with Divisions 27 and 28 are separated from power cables associated with Division 29 by a minimum horizontal distance of 95 feet.

b. This area is a limited access area.

c. This area is equipped with thirteen portable fire extinguishers and four manual hose stations.

d. The combustibles consist of approximately 240 gallons of lube oil, 480 pounds of charcoal, 16.5 pounds of HEPA filters, and cable insulation having a combined loading of 18,700 Btu/ft².

e. This area is equipped with smoke detectors in close proximity to safety-related cable trays. Portable ventilation equipment is available.

f. This area is equipped with a sprinkler system protecting the charcoal absorber bank at column/row L/25 which is surrounded by a partial concrete wall. The sprinkler system is initiated by temperature detectors located in the charcoal absorber bank.

g. This area is equipped with fire detectors over approximately 240 gallons of lube oil kept in small containers in three metal UL-approved flammable liquid storage cabinets at column/row L-M/21.

h. There is more than 30 feet horizontal separation between the flammable liquid storage cabinets and any pump cable required for safe shutdown for a fire.

2.3 SERVICE WATER SYSTEM

Exemption is requested in Subsection 5.7.2.1 of the Fire Protection Associated Cable Report. An exemption to Section III.G.2.a of 10 CFR 50, Appendix R is requested for the six service water pump power cables in Fire Areas 11.2-0, 11.3-0, and 11.4-0, and Fire Zones 18.4A-0 and 18.4B-0 based on the discussion given in Zion Unit 1 exemption 1.3 of this report. Any two of six service water pumps are required for hot shutdown of both units.

2.4 COMPONENT COOLING PUMPS

Exemption is requested in Subsection 5.8.2.1 of the Fire Protection Associated Cable Report. An exemption to Section III.G.2.a of 10 CFR 50, Appendix R is requested for the five component cooling pump power cables in Fire Area 11.2-0 based on the discussion given in Zion Unit 1 exemption 1.4 of this report. Any two of five component cooling pumps are required for hot shutdown of Unit 2.

2.5 CENTRIFUGAL CHARGING PUMPS

Exemption is requested in Subsection 5.9.2.1 of the Fire Protection Associated Cable Report. In Fire Areas 11.2-0, 11.3-0 and 11.4-0, power cables to centrifugal charging pumps 2A and 2B and room unit coolers 2A and 2B are not separated by a 3-hour fire-rated barrier. Only one centrifugal charging pump is required for hot shutdown of Unit 2. An exemption to Section III.G.2.a of 10 CFR 50, Appendix R is requested for power cables to centrifugal charging pumps and their room unit coolers in Fire Areas 11.2-0, 11.3-0, and 11.4-0 based on the following:

2.5.1 Fire Area 11.2-0; Auxiliary Building, Floor Elevation 560 feet; Fire Protection Figure 2.3-5, Sheet 3; Fire Protection SER Section 5.13

- a. Power cables for centrifugal pump room unit cooler 2A are separated from power cables for room unit cooler 2B by a minimum horizontal separation of 100 feet.
- b. This area is a limited access area.
- c. This area is equipped with five portable fire extinguishers and four manual hose stations.
- d. The combustibles consist of cable insulation and a transient load having a combined fire loading of 13,000 Btu/ft².
- e. This area is equipped with ionization detectors located over the waste gas compressors and the component cooling pumps at column/row G-H/18-22, and in close proximity to safety-related cable trays.
- f. This area is equipped with an automatic overlapping CO₂ fire suppression system over the five component cooling pumps.

2.5.2 Fire Area 11.3-0; Auxiliary Building, Floor Elevation 579 feet; Fire Protection Figure 2.3-8, Fire Protection SER Section 5.12

- a. Power cables for charging pump 2B and its room unit cooler 2B are routed together. Power cables for charging pump 2B and room unit cooler 2B are separated from power cables for room unit cooler 2A by a minimum horizontal distance of 26 feet. The power cables for charging pump 2B and room unit cooler 2B are separated from power cables for charging pump 2A by a minimum horizontal distance of 40 feet. Power cables for pump 2A are around a corner from power cables for pump 2B and room unit cooler 2B; this separation includes two closed doors and a continuous concrete wall.

- b. This area is a limited access area.
- c. This area is equipped with three portable fire extinguishers and three manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of 22 gallons of lube oil, cable insulation and a transient load having a combined fire loading of 6,700 Btu/ft².
- e. This area is equipped with smoke detectors above the remote shutdown panels at column/row I-J/14-16 and the AFW pumps at column/row G-H/16-19.
- f. This area is equipped with an automatic CO₂ puff fire suppression system over the AFW pumps.

2.5.3 Fire Area 11.4-0; Auxiliary Building, Floor Elevation 592 feet; Fire Protection Figure 2.3-4, Sheet 3; Fire Protection SER Section 5.11

- a. Power cables for charging pump 2A are separated from power cables for charging pump 2B by a minimum horizontal distance of 100 feet.
- b. This area is a limited access area.
- c. This area is equipped with thirteen portable fire extinguishers and four manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of approximately 240 gallons of lube oil, 480 pounds of charcoal, 16.5 pounds of HEPA filters, and cable insulation having a combined fire loading of 18,700 Btu/ft².
- e. This area is equipped with smoke detectors in close proximity to safety-related cable trays.
- f. This area is equipped with a sprinkler system protecting the charcoal absorber bank at column/row L/25 which is surrounded by a partial concrete wall. The sprinkler system is initiated by temperature detectors located in the charcoal absorber bank.
- g. This area is equipped with fire detectors over the approximately 240 gallons of lube oil kept in small containers in three metal UL-approved flammable liquid storage cabinets at column/row L-M/21.
- h. There is more than 30 feet horizontal separation between the flammable liquid storage cabinets and any pump cable required for safe shutdown for a fire.

2.6 AUXILIARY FEEDWATER PUMPS

Exemption is requested in Subsection 5.10.2.1 of the Fire Protection Associated Cable Report. In Fire Zone 3.1-2 (outer cable spreading room, floor elevation 630 feet) and Fire Areas 11.2-0, 11.3-0, and 11.4-0, power cables for auxiliary feedwater (AFW) pumps 2A, 2B, and 2C, and valves required for safe shutdown are not separated by a 3-hour fire-rated barrier. Only one of three AFW pumps is required for hot shutdown of Unit 2. An exemption to Section III.G.2.a of 10 CFR 50, Appendix R is requested for AFW pumps and valves required for safe shutdown in Fire Zone 3.1-2 and Fire Areas 11.2-0, 11.3-0, and 11.4-0 based on the following:

2.6.1 Fire Zone 3.1-2; Auxiliary Building, Outer Cable Spreading Room, Floor Elevation 630 feet; Fire Protection Figure 2.3-7; Fire Protection SER Section 5.2

- a. Power cables for motor-driven AFW pumps 2B and 2C are separated from power cables for turbine-driven AFW pump 2A steam supply valves by a minimum horizontal distance of 20 feet.
- b. This zone is a limited access area.
- c. This zone is equipped with two portable fire extinguishers, two manual hose stations, and smoke detectors. Portable ventilation equipment is available.
- d. The combustibles consist of cable insulation having a fire loading of 50,900 Btu/ft².
- e. This zone is equipped with automatic Halon and manual CO₂ fire suppression systems.

2.6.2 Fire Area 11.2-0; Auxiliary Building, Floor Elevation 560 feet; Fire Protection Figure 2.3-5, Sheet 3; Fire Protection SER Section 5.13

- a. Power cables for motor-driven AFW pumps 2B and 2C are separated from power cables for turbine-driven AFW pump 2A steam supply and header isolation valves by a minimum horizontal distance of 41 feet.
- b. This area is a limited access area.
- c. This area is equipped with five portable fire extinguishers and four manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of cable insulation and a transient load having a combined fire loading of 13,000 Btu/ft².

- e. This area is equipped with ionization detectors located in close proximity to the waste gas compressors and the component cooling pumps at column/row G-H/18-22 and above safety-related cable trays.
- f. This area is equipped with an automatic overlapping CO₂ fire suppression system over the five component cooling pumps.

2.6.3 Fire Area 11.3-0; Auxiliary Building, Floor Elevation 579 feet; Fire Protection Figure 2.3-8; Fire Protection SER Section 5.12

- a. Power cables for turbine-driven AFW pump 2A header isolation valve are separated from power cables for motor-driven AFW pump 2B by a minimum horizontal distance of 15 feet.
- b. Power cables for motor-driven AFW pumps 2B and 2C suction valves are separated from power cables for turbine-driven AFW pump 2A suction valves by a minimum horizontal distance of 20 feet.
- c. Power cables for motor-driven AFW pumps 2B and 2C are separated from power cables for turbine-driven AFW pump steam supply valves by a minimum horizontal distance of 41 feet.
- d. This area is a limited access area.
- e. This area is equipped with three portable fire extinguishers and three manual hose stations. Portable ventilation equipment is available.
- f. The combustibles consist of 22 gallons of lube oil, cable insulation and a transient load having a combined fire loading of 6,700 Btu/ft².
- g. This area is equipped with smoke detectors above the remote shutdown panels at column/row I-J/14-16 and the AFW pumps at column/row G-H/16-19.
- h. This area is equipped with an automatic CO₂ puff fire suppression system over the AFW pumps.

2.6.4 Fire Area 11.4-0; Auxiliary Building, Floor Elevation 592 feet; Fire Protection Figure 2.3-4, Sheet 3; Fire Protection SER Section 5.11

- a. Power cables for motor-driven AFW pumps 2B and 2C are separated from power cables for turbine-driven AFW pump 2A steam supply valves by a minimum horizontal distance of 112 feet.

ZION 2

- b. This area is a limited access area.
- c. This area is equipped with thirteen portable fire extinguishers and four manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of approximately 240 gallons of lube oil, 480 pounds of charcoal, 16.5 pounds of HEPA filters, and cable insulation having a combined fire loading of 18,700 Btu/ft².
- e. This area is equipped with smoke detectors in close proximity to safety-related cable trays.
- f. This area is equipped with a sprinkler system protecting the charcoal absorber bank at column/row L/25 which is surrounded by a partial concrete wall. The sprinkler system is initiated by temperature detectors located in the charcoal absorber bank.
- g. This area is equipped with fire detectors over approximately 240 gallons of lube oil kept in small containers in three metal UL-approved flammable liquid storage cabinets at column/row L-M/21.
- h. There is more than 30 feet horizontal separation between the flammable liquid storage cabinets and any pump cable required for safe shutdown for a fire.

2.7 RESIDUAL HEAT REMOVAL SYSTEM

Exemption is requested in Subsection 5.13.2.1 of the Fire Protection Associated Cable Report. In Fire Areas 11.1-0, 11.2-0, 11.3-0, and 11.4-0, power cables for residual heat removal (RHR) pumps 2A and 2B and room unit coolers 2A and 2B are not separated by a 3-hour fire-rated barrier. Only one RHR pump is required for cold shutdown of Unit 2. An exemption to Section III.G.2.a of 10 CFR 50, Appendix R is requested for RHR pumps and room unit coolers in Fire Areas 11.1-0, 11.2-0, 11.3-0, and 11.4-0 based on the following:

2.7.1 Fire Area 11.1-0; Auxiliary Building, Floor Elevation 542 feet; Fire Protection Figure 2.3-9; Fire Protection SER Section 5.14

- a. Power cables for RHR pump 2A and room unit cooler 2A are routed together. Power cables for the RHR pump 2A are separated from power cables for RHR pump 2B by a minimum horizontal separation of 20 feet 6 inches.
- b. This area is a limited access area.
- c. This area is equipped with six portable fire extinguishers and three manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of cable insulation and a transient load having a combined fire loading of 4,000 Btu/ft².

2.7.2 Fire Area 11.2-0; Auxiliary Building, Floor Elevation 560 feet; Fire Protection Figure 2.3-5, Sheet 3; Fire Protection SER Section 5.13

- a. Power cables for RHR pump 2A and room unit cooler 2A are separated from power cables for RHR pump 2B by a minimum horizontal distance of 121 feet. Also, power cables for RHR pump 2A and room unit cooler 2A are separated from power cables for RHR room unit cooler 2B by a minimum horizontal separation of 145 feet.
- b. This area is a limited access area.
- c. This area is equipped with five portable fire extinguishers and four manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of cable insulation and a transient load having a combined fire loading of 13,000 Btu/ft².
- e. This area is equipped with ionization detectors located over the waste gas compressors and the component cooling pumps at column/row G-H/18-22, and in close proximity to safety-related cable trays.

- f. This area is equipped with an automatic overlapping CO₂ fire suppression system over the five component cooling pumps.

2.7.3 Fire Area 11.3-0; Auxiliary Building, Floor Elevation 579 feet; Fire Protection Figure 2.3-8; Fire Protection SER Section 5.12.

- a. Power cables for RHR pump 2A are separated from power cables for RHR pump 2B by a minimum horizontal distance of 121 feet.
- b. This area is a limited access area.
- c. This area is equipped with three portable fire extinguishers and three manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of 22 gallons of lube oil, cable insulation and a transient load having a combined fire loading of 6,700 Btu/ft².
- e. This area is equipped with smoke detectors above the remote shutdown panels at column/row I-J/14-16 and the AFW pumps at column/row G-H/14-16.
- f. This area is equipped with an automatic CO₂ puff fire suppression system over the AFW pumps.

2.7.4 Fire Area 11.4-0; Auxiliary Building, Floor Elevation 592 feet; Fire Protection Figure 2.3-4, Sheet 3; Fire Protection SER Section 5.11

- a. In this area power cables for RHR pump 2A are separated from power cables for RHR pump 2B by a minimum horizontal distance of 121 feet.
- b. This area is a limited access area.
- c. This area is equipped with thirteen portable fire extinguishers and four manual hose stations. Portable ventilation equipment is available.
- d. The combustibles consist of approximately 240 gallons of lube oil, 480 pounds of charcoal, 16.5 pounds of HEPA filters, and cable insulation having a combined loading of 18,700 Btu/ft².
- e. This area is equipped with smoke detectors in close proximity to safety-related cable trays.
- f. This area is equipped with a sprinkler system protecting the charcoal absorber bank at column/row L/25 which is surrounded by a partial concrete wall. The sprinkler system is initiated by temperature detectors located in the charcoal absorber bank.

ZION 2

- g. This area is equipped with fire detectors over approximately 240 gallons of lube oil kept in small containers in three metal UL-approved flammable liquid storage cabinets at column/row L-M/21.
- h. There is more than 30 feet horizontal separation between the flammable liquid storage cabinets and pump cable required for safe shutdown for a fire.

3.0 REFERENCES

1. Fire Protection Associated Cable Report, Zion Station, Units 1 and 2, Commonwealth Edison Company, July 1982.
2. Fire Protection Report, Zion Station, Units 1 and 2, Commonwealth Edison Company, April 1977.
3. Fire Protection Safety Evaluation Report, Zion Station, Units 1 and 2, Nuclear Regulatory Commission, March 1978.