



Northern States Power Company

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March 11, 1983

Director
Office of Nuclear Reactor Regulation
U S Nuclear Regulatory Commission
Washington, DC 20555

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket Nos. 50-282 License Nos. DPR-42
50-306 DPR-60

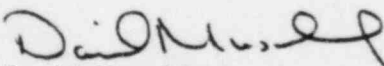
Request for Relief from the Requirements of 10 CFR Part 50,
Section 50.48(b) for Fire Areas No. 58, 59, 73 and 74

Reference (a) "Draft SER on Appendix R Exemption Request,"
Letter from Robert A. Clark to D M Musolf
dated January 12, 1983.

The purpose of this letter is to request in accordance with the provision of 10CFR Part 50, Section 50.12, an exemption from the requirements of 10 CFR Part 50 Section 50.48, paragraph (b). Specifically, Northern States Power Company requests relief from the requirements to install a fixed suppression system in Fire Areas No. 58, 59, 73 and 74 as identified and supported in the attached submittal. This information is being submitted pursuant to option two of reference (a) as committed in our letter dated February 17, 1983, "Review of Draft Safety Evaluation on Appendix R Exemption Request".

Requested exemptions from the requirements of this part of the regulations will not endanger life or property or the common defense and security and are otherwise in the public interest.

Please contact us if you have any questions related to this request, or if we can furnish additional information related to this issue.


David Musolf
Manager - Nuclear Support Services

DMM/KNC/bd

cc: Secretary of the Commission (orig + 2 copies)
Regional Admin-III, NRC
NRR Project Manager, NRC
Resident Inspector, NRC
G Charnoff

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Attachment
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PRAIRIE ISLAND NUCLEAR GENERATING PLANT

Red Wing, Minnesota

UNITS 1 AND 2



Request for Relief from the Requirement of
10 CFR Part 50, Section 50.48, paragraph (b)
for Fire Areas No. 58, 59, 73 and 74

NORTHERN STATES POWER COMPANY
MINNEAPOLIS, MINNESOTA

March 11, 1983

Request for Relief from the Requirement of
10 CFR Part 50, Section 50.48, paragraph (b)
for Fire Areas No. 58, 59, 73 and 74

Northern States Power Company

March 11, 1983

1.0 FIRE PREVENTION AND PROTECTION

A comprehensive program of administrative controls has been established at Prairie Island Nuclear Generating Plant to minimize the occurrence and consequences of any fire. These administrative controls are a part of the Operational Quality Assurance Program, and address the following:

- Fire Brigade qualification, training, and drills
- Use of fire fighting procedures and pre-fire strategies
- Control of ignition sources, combustible materials, and fire barrier penetration seals
- Inspection and testing of fire control equipment
- Design change control with respect to fire protection

1.1 Fire Brigade Qualification, Training and Drills

A plant fire brigade is established such that five members of the brigade are on site at all times in addition to the minimum shift crew required to safely shut down both units. Members are selected and qualified so as to be physically fit to perform strenuous fire fighting activities. Training for fire brigade members consists of practice sessions involving the use of fire fighting equipment, use of emergency breathing apparatus under strenuous conditions, actual extinguishment of a fire and use of pre-planned fire strategies.

Four unannounced fire drills are conducted with each shift each year to assess performance in accordance with instructions and to assess response times. In 22 drills conducted since May 1982, the response time required from brigade notification to the arrival on scene of either the Fire Brigade Chief for assessment and brigade direction, or a brigade member prepared to fight the fire, has been six minutes or less.

1.2 Fire Fighting Procedures and Pre-Fire Strategies

Fire fighting procedures are in force which give instructions to personnel for the discovery of a fire including notification of the Control Room and attempts to control the fire, actions of Control Room personnel, actions of fire brigade members, coordination with off-site fire departments, and actions of security and other plant personnel.

Pre-planned fire fighting strategies have been used at Prairie Island since May 1980 to guide fire fighting response both by fire fighters at the scene and by operations personnel in the Control Room and other areas. These fire strategies are currently under revision to incorporate the results of the safe shut-down review, revised fire hazards information, and plant modifications such as the addition of emergency

lights. An example is included as Enclosure 1 to illustrate their utilization in fire response.

1.3 Control of Ignition Sources, Combustible Materials and Fire Barrier Penetration Seals

The system for identifying and controlling work on equipment at Prairie Island, the Work Request and Work Request Authorization System, contains controls requiring a Fire Hazards Review of all planned work. The Fire Hazards Review identifies ignition sources and combustible materials required in the task and delineates appropriate fire protection measures. The review also identifies the potential breach of fire barrier structures and references barrier restoration techniques, and identifies other possible reductions in the effectiveness of fire protection systems. Three levels of review for fire hazards are employed prior to the authorization to begin work.

The use of any combustible fluids in maintenance activities must be identified in the Fire Hazards Review and a Hot Work/Flammable Material Use Permit must be issued before work is begun. If the required quantity of combustible fluid is greater than two gallons, then in addition to the permit, a special procedure is required which must be reviewed and

approved by the Plant Operations Review Committee. A Hot Work/Flammable Material Use Permit is also required for welding, burning, grinding or creation of other ignition source, and when the effectiveness of installed fire protection features must be compromised during maintenance activities. The permit delineates additional safety controls necessary such as fire watch, additional fire fighting equipment, and equipment protection.

1.4 Inspection and Testing of Fire Control Equipment

Plant Technical Specifications and NFPA codes govern inspection, testing, and checking of fire control equipment such as fire barriers and extinguishing systems. All areas containing safety-related equipment are visually surveyed each day by a member of the operations staff for the existence of fire hazards, and once per shift during periods of high maintenance or construction activities. These surveys verify that combustible materials are stored and used in accordance with the requirements of the operational quality assurance program.

1.5 Design Change Control with Respect to Fire Protection

Prior to implementation, all Design Changes are reviewed at two levels to assure that the proposed change will not degrade the existing plant fire protection features. The Responsible Engineer must consider the addition of combustibles both permanent and transient, the addition of ignition sources, possible obstruction of access or egress, obstruction of suppression systems or emergency lighting, change in fire barriers, and changes in ventilation. When the Responsible Engineer's evaluation is complete, the Design Change package is reviewed by a designated fire protection reviewer for concurrence with the implementation of the Design Change. If it is unclear how changes may affect fire protection systems or if the change creates a negative effect, the Design Change must be reviewed additionally by a qualified fire protection engineer and all concerns resolved prior to proceeding with the Design Change.

1.6 Conclusion

This integrated system of administrative controls involves all levels of plant personnel from the top to the bottom, and thereby creates a high degree of both involvement and awareness of personnel in fire protection at Prairie Island. As a part of the Operational


























Quality Assurance Program, proper adherence to the controls is under continuous review and misunderstandings of the requirements are quickly resolved. To illustrate, a USNRC Region III IE Inspection of March 1981 revealed no items of noncompliance or deviations in the fire protection related areas inspected. The subjects inspected are listed below:

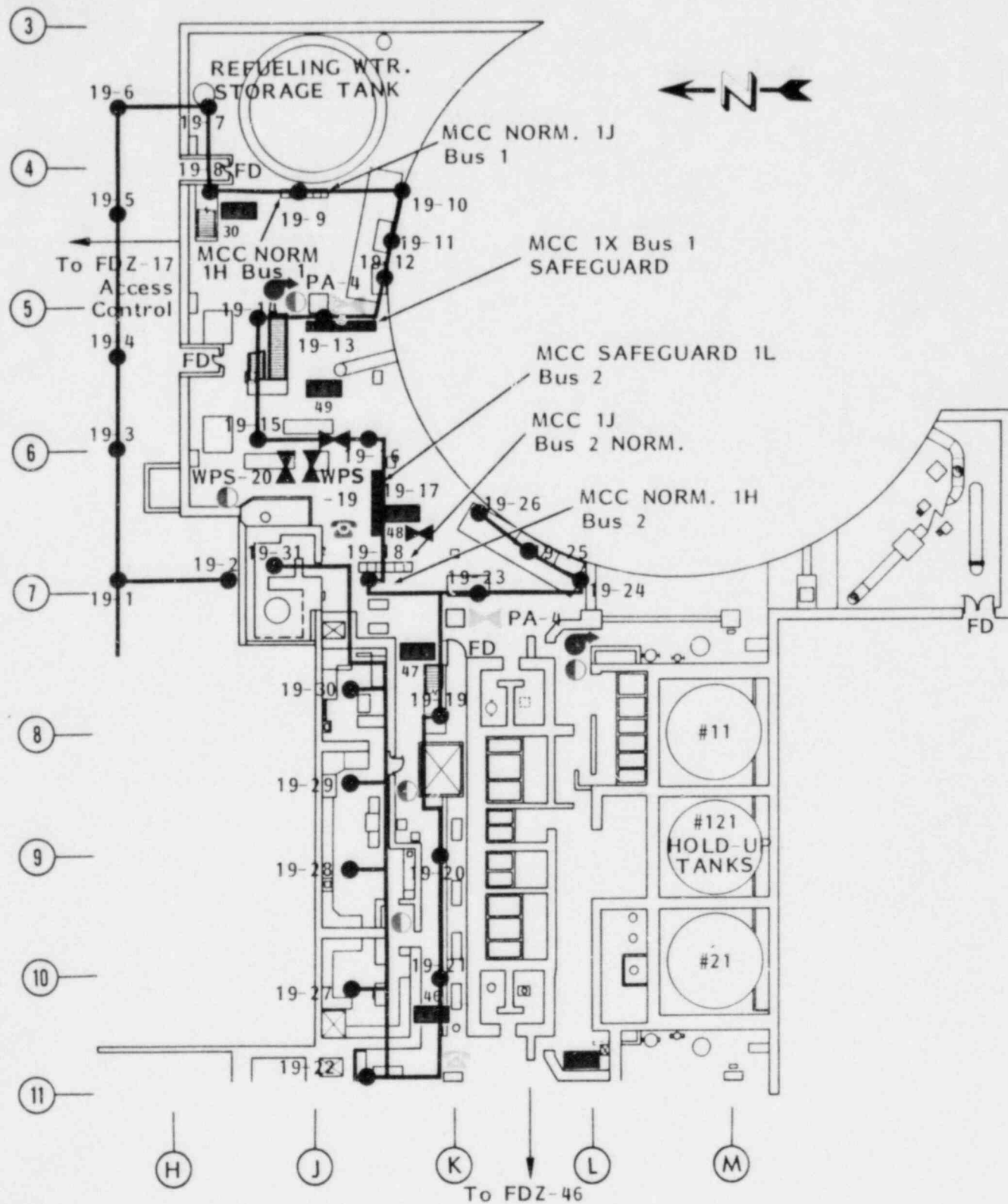
- Manual fire fighting equipment
- Automatic fire detection and suppression systems
- Procurement and control of fire protection equipment
- Fire emergency and fire fighting procedures
- Ignition source and combustible materials control
- Fire protection audits and inspection
- Fire protection and prevention training for general employees and contractors
- Fire brigade training and qualifications
- House keeping/cleanliness program

Hence, the combination of the existence of an excellent program of controls, and an excellent record of performance within the controls must be considered as a reliable protection feature of safe shutdown capability and, therefore, of the public health and safety.

ENCLOSURE 1
EXAMPLE FIRE STRATEGY

FIRE STRATEGIES
Drawing Symbols Legend

-
-  - Wet Pipe System
-  - Cross-Over Valve
-  - Deluge Valve
-  - Ventilation Switch
-  - Halon Actuator
-  - Halon Cylinder
- FD - Fire Door
-  - 100' Hose Station
-  - 75' Hose Station
-  - 100' Low Gallon Reel
-  - Wheel Type Extinguisher
-  - CO₂ Extinguisher
-  - Dry Extinguisher
-  - Portable H₂O 2.5 gal. (Pressurized)
-  - Sound Powered Phone
-  - Dial Phone
-  - Page Phone
-  - Emergency Lighting
-  - Shower & Eyewash
-  - Ionization Detector
-  - Flame Detector
-  - Thermal Detector
-  - Heat Actuated Device
-  - Cardox Thermal Detector
-  - Smoke Detector
-  - Hood Zone Detector



FIRE DETECTION ZONE 19
 Areas 59 & 84

2.0 EXEMPTION REQUESTS

2.1 FIRE AREA 58: AUXILIARY BUILDING, GROUND FLOOR LEVEL, UNIT 1

EXEMPTION REQUEST

Per the provisions of 10CFR 50.12, Northern States Power Company requests exemption from certain requirements of Appendix R Section III G.2., at the Prairie Island Nuclear Generating Plant. Specifically, exemption is requested from the requirement to install an automatic fire suppression system in this area. The technical bases which justify the exemption are summarized below, and the supporting area data are given in Table 2.1-1.

1. Redundant safe shutdown equipment in the area required for hot shutdown is separated by at least 20' with no intervening combustible, as required by Appendix R.
2. Redundant safe shutdown components in the area required for cold shutdown are installed in separate concrete pits with a 3-hour wall between them.
3. One division of cable trays containing redundant safe shutdown cables will be enclosed in a one-hour fire barrier as detailed in the proposed modifications.
4. Combustible loading in this area is low and is almost entirely composed of IEEE STD-383 qualified cable with ethylene propylene rubber insulation and chlorosulfurated polyethylene jacket (EPR-Hypalon) which has high fire

resistance and propagation retardancy. EPR-Hypalon cable is not considered to be an intervening combustible.

5. Automatic fire detection is installed which alarms in the continuously manned Control Room.
6. The plant has strong and effective administrative control of fire protection activities and a well-equipped manual fire fighting brigade with demonstrated efficiency.
7. Addition of automatic fire suppression would not enhance the protection of safe shutdown functions provided by current configuration and proposed modifications. This is supported by the fact that the combustible loading presents a maximum fire severity of eight (8) minutes, and that safe-shutdown functions will be more than adequately protected by the addition of one-hour barriers and the existing 20' minimum separation, which ensure at least one train of safe-shutdown equipment will remain free of fire damage in the area.
8. The addition of a fire suppression system, necessarily water spray due to area size, could in fact cause water damage to safety related equipment from real or inadvertant actuation.

TABLE 2.1-1

FIRE AREA 58: AUXILIARY BUILDING GROUND LEVEL UNIT 1
AREA DATA

A. AREA CONSTRUCTION

1. Walls - See Area Drawing, Fire Area 58

North - 18-in concrete; 3-hour-rated with 3-hour-rated penetration seals.

South - 30-in concrete as defined by the containment building wall; 3-hour-rated with 3-hour-rated penetration seals.

East - 18-in concrete; 3-hour-rated with 3-hour-rated penetration seals.

West - Partial enclosure by 3-hour-rated walls and 18-in concrete unrated walls. The unenclosed portion of the boundary is shared with Fire Area 73. Component Cooling Pumps in Area 58 have their redundant counterparts in Fire Area 73. The pumps are separated by approximately 40' with no intervening combustibles; between the pumps are 4-5' diameter heat exchangers mounted 3' above the floor on pedestals with a 1' concrete wall below and a 2' concrete beam above providing an effective barrier to fire propagation.

2. Floor - 36-in concrete; 3-hour-rated
3. Ceiling - 12-in concrete; 3-hour-rated with 3-hour-rated penetration seals.
4. Ceiling height - 19 feet.
5. Room volume - approximately 276,000 ft³
6. Ventilation - 3000 cfm (shared with Fire Area 73); automatic dampers provided.
7. Congestion - Area essentially free of congestion; a fenced-off radiologically-controlled area exists in area but does not impede access. General access for manual suppression is considered good.

B. SAFE SHUTDOWN EQUIPMENT

1. Hot shutdown equipment located in this area includes MCC 1K1 and MCC 1K2 and 1KA2; #11 and #21 component cooling water pumps (redundant components in Area #73); #12 charging pump and #12 safety injection pump; and valves required for hot shutdown. All redundant hot-shutdown equipment is separated by at least 20' with no intervening combustibles.

2. Redundant hot and cold shutdown power and control cables.
3. Redundant cold shutdown equipment located in this area includes #11 and #12 residual heat removal pumps, installed in 30' deep concrete pits separated by a 36-in thick reinforced concrete wall.

C. COMBUSTIBLES

1. Installed - cables, IEEE-383 qualified EPR-Hypalon, flame retardant and propagation resistant with convective heat release rate of 160 kW/m² and radiative heat release rate of 139 kW/m² as determined by testing.
2. Transient - transient combustible storage is allowed in Area 58 in one NFPA Code 30 locker, located remote from any safe-shutdown equipment or cables. Storage of combustibles within the locker is limited to five-gallon capacities in original shipping containers, or two-gallon capacity approved containers of fluids otherwise delivered in bulk. Use of combustible fluids for maintenance is limited to two gallons of acetone; larger quantities require a special procedure approved by Operations Review Committee.
3. Other transients - no equipment in the area requires large amount of lubricants and no large quantities

of lubricants are allowed to pass through any safe-guards area. Use of any combustible materials for maintenance is controlled as described in Section 1.3. A spill of any quantity of combustible fluid would not create a significant fire hazard, as the area is equipped with floor drains and the floor is graded to provide drainage from all points.

4. Total combustible loading of 10,354 BTU/Ft² equates to ASTM E-119 equivalent fire severity of eight minutes.

D. FIRE PROTECTION

1. Fire Detection Systems
 - a. 46 Ionization Detectors
 - b. 1 Smoke Detector
 - c. 2 Thermal Detectors

2. Fire Extinguishing Systems and Equipment
 - a. Automatic Sprinkler Systems installed under open grate stairs

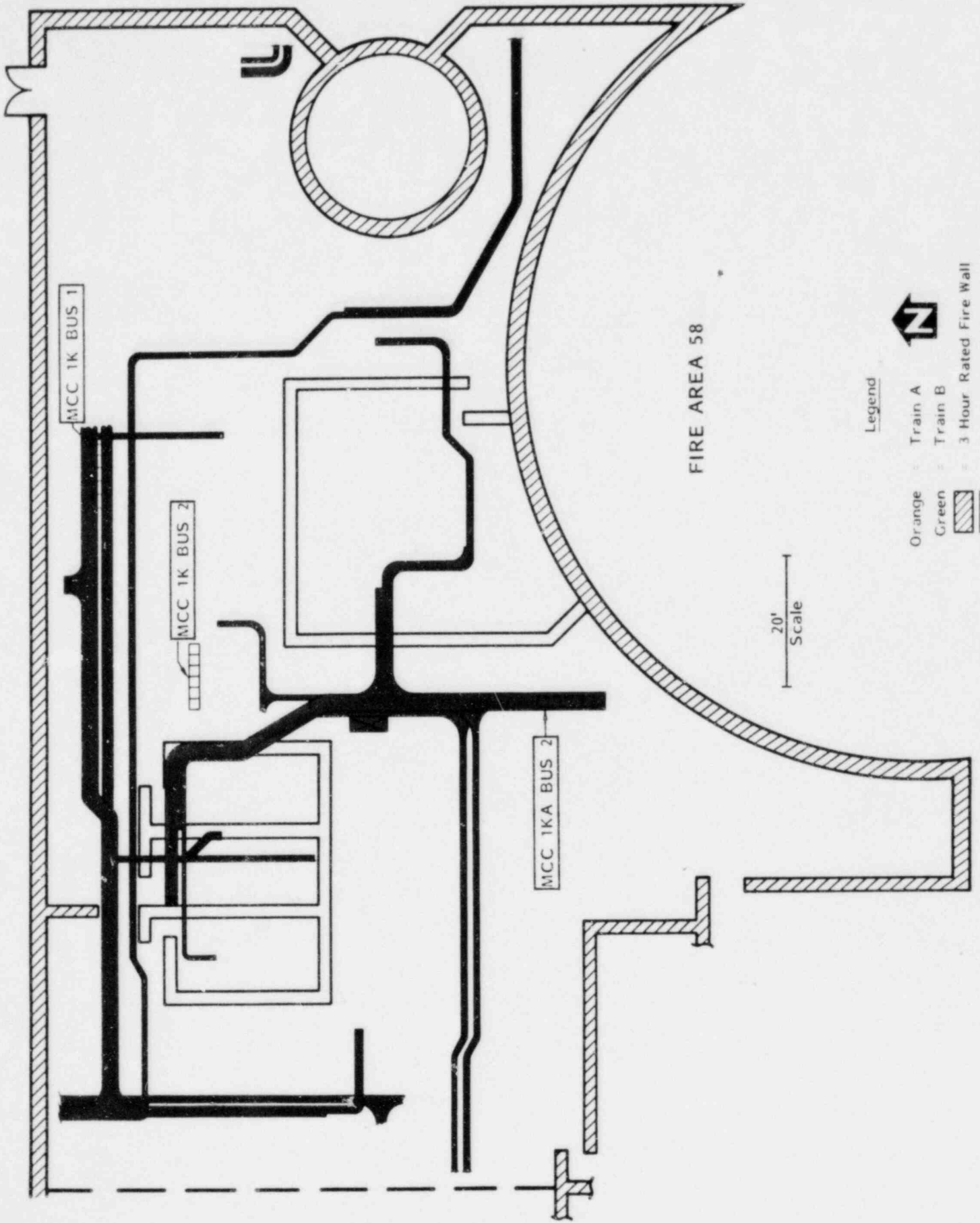
 - b. Two* 1½ inch manual hose stations with 100 foot hoses equipped with "no shock" electrical fog nozzles for Class C hazards and rated at 95 gpm nominal.

- c. Three 20-pound CO₂ fire extinguishers located throughout the area

* A Plant Design Criterion assures that a fire in any area can be reached by at least two fire hoses.

PROPOSED MODIFICATIONS

It is proposed that all "B" Division cable trays in Fire Area 58 containing functionally redundant safe shutdown cables will be protected by a one-hour fire barrier. The fire barrier to be used is described in Section 3.0 and is the same barrier that has been applied at Prairie Island in the past.



Legend

- Orange = Train A
- Green = Train B
- [Hatched Box] = 3 Hour Rated Fire Wall
- [Dotted Box] = Currently Wrapped Trays



20'
Scale

2.2 FIRE AREA 59: AUXILIARY BUILDING, MEZZAININE LEVEL, UNIT 1
EXEMPTION REQUEST

Per the provisions of 10CFR 50.12, Northern States Power Company requests exemption from certain requirements of Appendix R, Section III G.2., at the Prairie Island Nuclear Generating Plant. Specifically, exemption is requested from the requirement to install an automatic fire suppression system in this area. The technical bases which justify the exemption are summarized below, and the supporting area data is given in Table 2.2-1.

1. No redundant safe-shutdown equipment required for hot shutdown is located in this area.
2. Redundant safe-shutdown equipment in the area required for cold shutdown is separated by at least 20' with no intervening combustible, as required by Appendix R.
3. One division of cable trays containing redundant safe shutdown cables will be enclosed in one-hour fire barrier as detailed in the proposed modifications.
4. Combustible loading in this area is low and is almost entirely composed of IEEE STD-383 qualified cable with ethylene propylene rubber insulation and chlorosulfurated polyethylene jacket (EPR-Hypalon) which has high fire resistance and propagation retardancy. EPR-Hypalon cable is not considered to be an intervening combustible. The

only additional semi-fixed concentration of combustibles (anti-contamination clothing storage) is provided with automatic fire suppression.

5. Automatic fire detection is installed which alarms in the continuously manned Control Room.
6. The plant has strong and effective administrative control of fire protection activities and a well-equipped manual fire fighting brigade with demonstrated efficiency.
7. Addition of automatic fire suppression would not enhance the protection of safe shutdown functions provided by current configuration and proposed modifications. This is supported by the fact that the combustibles loading presents a maximum fire severity of fifteen minutes, and that safe-shutdown functions will be more than adequately protected by the addition of one-hour barriers and the existing 20' minimum separation, which ensure at least one train of safe-shutdown equipment will remain free of fire damage in the area.
8. The addition of a fire suppression system, necessarily water spray due to area size, could in fact cause water damage to safety related equipment from real or inadvertent actuation.

TABLE 2.2-1

FIRE AREA 59: AUXILIARY BUILDING MEZZANINE LEVEL UNIT 1
AREA DATA

A. AREA CONSTRUCTION

1. Walls - See Area Drawing, Fire Area 59

North - 18-in concrete; 3-hour-rated with 3-hour-rated penetration seals.

South - 24-in concrete as defined by the containment building wall; 3-hour-rated with 3-hour-rated penetration seals.

East - 18-in concrete; 3-hour-rated with 3-hour-rated penetration seals.

West - Partial enclosure by 18-in unrated concrete walls. The unenclosed portion consists of a corridor entrance. The corridor connects this area to Fire Area 74 and is approximately 90' long and 10' wide with very low combustible loading. No safe-shutdown cabling or components in Fire Area 59 have their redundant counterparts in Fire Area 74.

2. Floor - 12-in concrete; 3-hour-rated with 3-hour-rated penetration seals

3. Ceiling - 12-in concrete; 3-hour-rated with 3-hour-rated penetration seals.
4. Ceiling height - 19 feet.
5. Room volume - approximately 146,000 ft³
6. Ventilation - 1710 cfm; automatic dampers provided.
7. Congestion - Moderate congestion in the center of the area due to heat tracing for boric-acid system. General access for manual suppression is considered excellent.

B. SAFE SHUTDOWN EQUIPMENT

1. No redundant hot-shutdown equipment exists in this area.
2. Redundant hot and cold shutdown power, control, and instrumentation cables exist in this area.
3. Redundant cold-shutdown equipment located in this area includes motor control centers 1L1 and 1L2, separated by at least 28' with no intervening combustibles.

C. COMBUSTIBLES

1. Installed - Cables, IEEE-383 qualified EPR-Hypalon, flame retardant and propagation resistant with con-

vective heat release rate of 160 kW/m² and radiative heat release rate of 139 kW/m² as determined by testing.

2. Semi-Transient - Anti-contamination clothing storage area is located in the northeast corner of Area 59. Automatic sprinklers are installed above this storage area.
3. Transient - Combustible fluids are limited to two gallons of acetone for maintenance. Larger quantities require special procedure approved by Operations Review Committee. No equipment in the area requires large amounts of lubricants and no large quantities of lubricants are allowed to pass through any safeguard areas. Use of any combustible materials for maintenance are controlled as described in Section 1.3. A spill of any quantity of combustible fluid would not create a significant fire hazard as the area is equipped with floor drains and the floor is graded to provide drainage from all points.
4. Total combustible loading 20,243 BTU/Ft² which equates to E-119 equivalent fire severity of 15 minutes.

D. FIRE PROTECTION

1. Fire Detection Systems
 - a. 31 Ionization Detectors

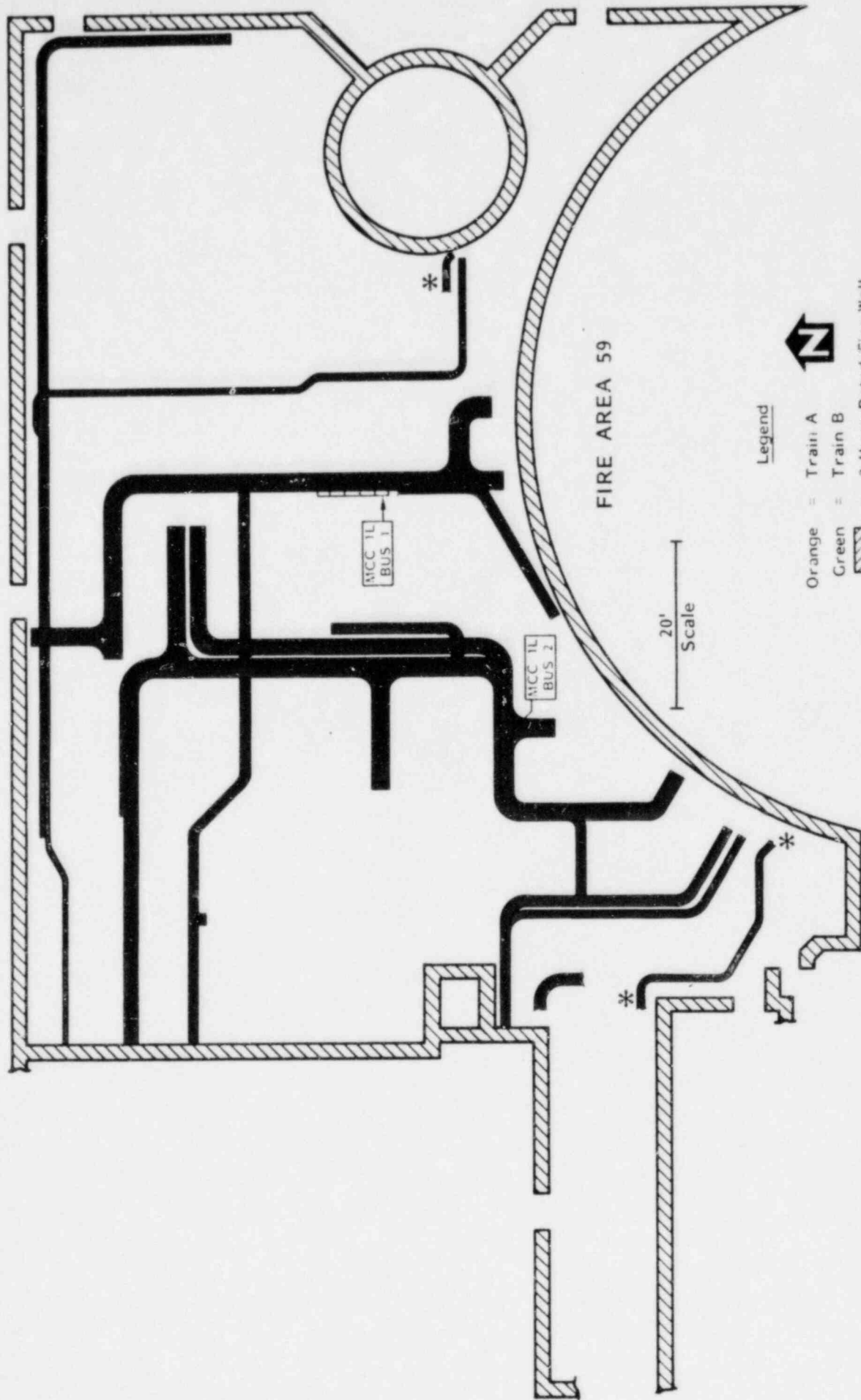
2. Fire Extinguishing Systems and Equipment
 - a. Automatic Sprinkler System installed over anti-contamination clothing area.
 - b. Automatic Sprinkler Systems installed under open grate stairs
 - c. Two^{*} 1½ inch manual hose stations with 100 foot hose equipped with "no shock" electrical fog nozzle for Class C hazards and rated at 95 gpm nominal.
 - d. Two 20-pound CO₂ and three dry-chemical extinguishers located throughout the area. Four spare CO₂ extinguishers are also stored in this area.

PROPOSED MODIFICATIONS

It is proposed that all "B" Division cable trays in Fire Area 59 containing functionally redundant safe-shutdown cables will be protected by a one-hour fire barrier with the following exception:

Tray number 1AM-TR2 (green) located in the southwest corner of the area is marked on the Area Drawing with asterisks at either end of the portion not to be wrapped with fire barrier material. Its redundant "A" Train (orange) tray is on the east side of the area separated by approximately 80'; it is marked with a single asterisk. 1AM-TR2 carries cable for "B" Train Reactor Coolant System Pressure Instrumentation.

* A Plant Design Criterion assures that a fire in any area can be reached by at least two fire hoses.



2.3 FIRE AREA 73: AUXILIARY BUILDING, GROUND FLOOR LEVEL, UNIT 2
EXEMPTION REQUEST

Per the provisions of 10CFR 50.12, Northern States Power Company requests exemption from certain requirements of Appendix R, Section III G.2., at the Prairie Island Nuclear Generating Plant. Specifically, exemption is requested from the requirement to install an automatic fire suppression system in this area. The technical bases which justify the exemption are summarized below, and the supporting area data is given in Table 2.3-1.

1. Redundant safe shutdown equipment in the area required for hot shutdown is separated by at least 20' with no intervening combustible, as required by Appendix R.
2. Redundant safe-shutdown components in the area required for cold shutdown are installed in separate concrete pits with a three-hour wall between them.
3. One division of cable trays containing redundant safe shutdown cables will be enclosed in a one-hour fire barrier as detailed in the proposed modifications.
4. Combustible loading in this area is low and is almost entirely composed of IEEE STD-383 qualified cable with ethylene propylene rubber insulation and chlorosulfurated polyethylene jacket (EPR-Hypalon) which has high fire

resistance and propagation retardancy. EPR-Hypalon cable is not considered to be an intervening combustible.

5. Automatic fire detection is installed which alarms in the continuously manned Control Room.
6. The plant has strong and effective administrative control of fire protection activities and a well-equipped manual fire fighting brigade with demonstrated efficiency.
7. Addition of automatic fire suppression would not enhance the protection of safe shutdown function provided by current configuration and proposed modifications. This is supported by the fact that the combustible loading presents a maximum fire severity of six (6) minutes, and that safe-shutdown function will be more than adequately protected by the addition of one-hour barriers and the existing 20' minimum separation, which ensure at least one train of safe-shutdown equipment will remain free of fire damage in the area.
8. The addition of a fire suppression system, necessarily water spray due to area size, could in fact cause water damage to safety related equipment from real or inadvertant actuation.

TABLE 2.3-1

FIRE AREA 73: AUXILIARY BUILDING GROUND LEVEL, UNIT 2
AREA DATA

A. AREA CONSTRUCTION

1. Walls - See Area Drawing, Fire Area 73

North - 18-in concrete; 3-hour-rated with 3-hour-rated penetration seals.

South - 30-in concrete as defined by the containment building wall; 3-hour-rated with 3-hour-rated penetration seals.

East - Partial enclosure by 3-hour-rated walls and 18-in concrete unrated walls. The unenclosed portion of the boundary is shared with Fire Area 58. Component Cooling Pumps in Area 73 have their redundant counterparts in Fire Area 58. The pumps are separated by approximately 40' with no intervening combustibles; between the pumps are 4-5' diameter heat exchangers mounted 3' above the floor on pedestals with a 1' concrete wall below and a 2' concrete beam above providing an effective barrier to fire propagation.

- West - 18-in concrete; 3-hour-rated with 3-hour-rated penetration seals.
2. Floor - 36-in concrete; 3-hour-rated with 3-hour-rated penetration seals.
 3. Ceiling - 12-in concrete; 3-hour-rated with 3-hour-rated penetration seals.
 4. Ceiling height - 19 feet.
 5. Room volume - approximately 235,600 ft³
 6. Ventilation - 3000 cfm (shared with Fire Area 58); automatic dampers provided.
 7. Congestion - Area essentially free of congestion; a fenced-off radiologically-controlled area exists in area but does not impede access. General access for manual suppression is considered good.

B. SAFE SHUTDOWN EQUIPMENT

1. Hot shutdown equipment located in this area includes MCC 2K1 and MCC 2K2 and 2KA2; #12 and #22 component cooling water pumps (redundant components in Area #58); #22 charging pump and #22 safety injection pump; and

valves required for hot shutdown. All hot-shutdown equipment is separated by at least 20' with no intervening combustibles.

2. Redundant hot and cold shutdown power and control cables are located in this area.
3. Redundant cold shutdown equipment located in this area includes #21 and #22 residual heat removal pumps installed in 30' deep concrete pits separated by a 36-in thick reinforced concrete wall.

C. COMBUSTIBLES

1. Installed - Cables, IEEE-383 qualified EPR-Hypalon, flame retardant and propagation resistant with convective heat release rate of 160 kW/m² and radiative heat release rate of 139 kW/m² as determined by testing.
2. Transient - Transient combustible storage is allowed in Area 73 in three NFPA Code 30 lockers, located remote from any safe-shutdown equipment or cables. Storage of combustibles within the locker is limited to five-gallon capacities in original shipping containers, or two-gallon capacity approved containers of fluids otherwise delivered in bulk. Use of combustible fluids for maintenance is

limited to two gallons of acetone; larger quantities require special procedure approved by Operations Review Committee.

3. Other transients - No equipment in the area requires large amount of lubricants and no large quantities of lubricants are allowed to pass through any safeguards area. Use of any combustible materials for maintenance is controlled as described in Section 1.3. A spill of any quantity of combustible fluid would not create a significant fire hazard, as the area is equipped with floor drains and the floor is graded to provide drainage from all points.
4. Total combustible loading of $8,029 \text{ BTU/Ft}^2$ equates to E-119 equivalent fire severity of six (6) minutes.

D. FIRE PROTECTION

1. Fire Detection Systems
 - a. 14 Ionization Detectors
2. Fire Extinguishing Systems
 - a. Automatic Sprinkler Systems installed under open grate stairs
 - b. Two* $1\frac{1}{2}$ inch manual hose station with 100 foot hose equipped with "no shock" electrical fog

nozzle for Class C hazards and rated at 95 gpm nominal.

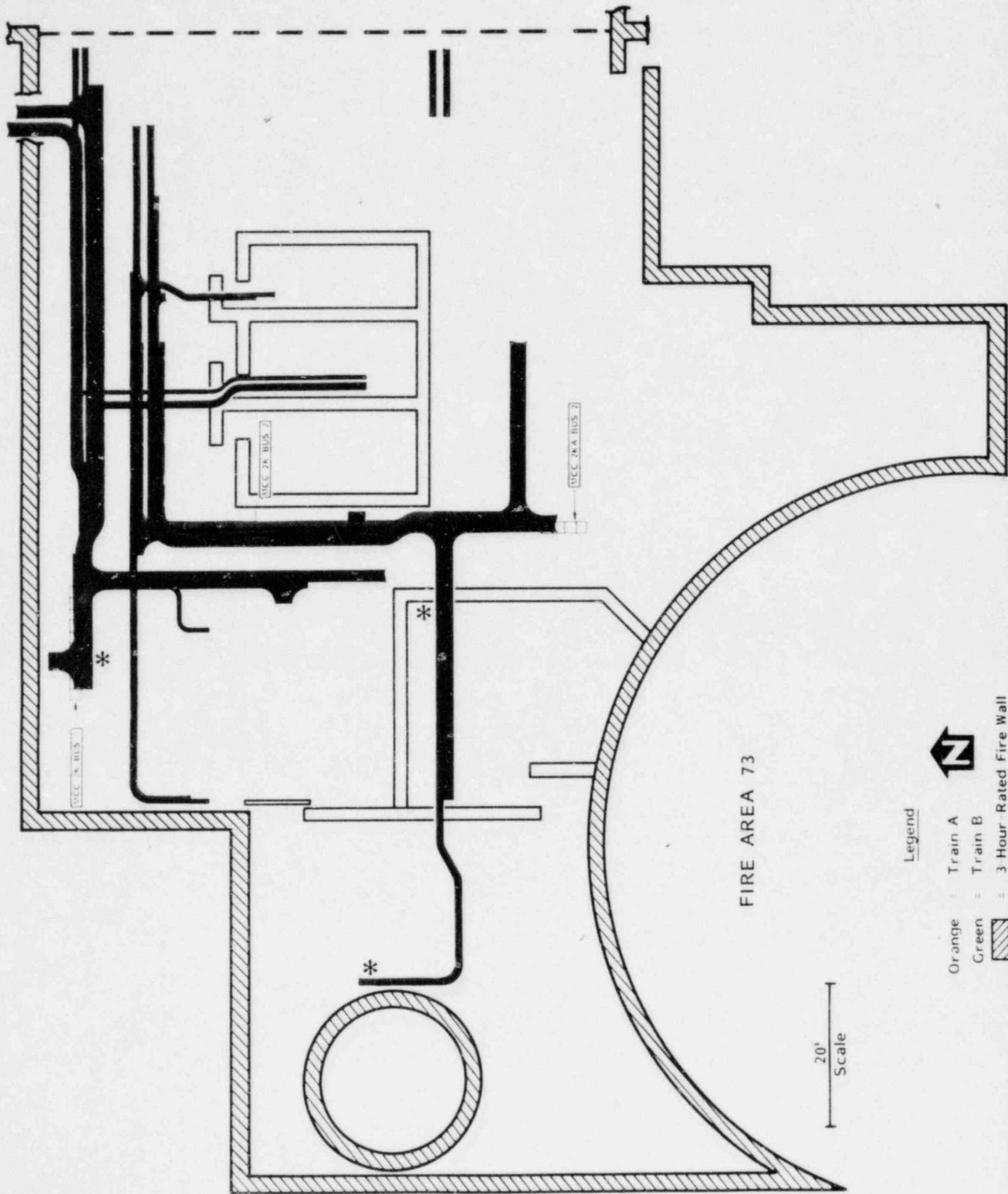
- c. Two 20-pound CO₂ extinguishers located in this area.

PROPOSED MODIFICATIONS


It is proposed that all "B" Division cable trays in Fire Area 73 containing functionally redundant safe-shutdown cables will be protected by a one-hour fire barrier with the following exceptions:

Tray numbers 2AG-LB 18, 2AG-LB 19, 2AG-TB 19, and 2AG-TB 20, (green) located on the west side of the area are marked on the Area Drawing with asterisks at either end of the portion not to be wrapped. The redundant "A" Division (orange) trays located along the north wall and marked with a single asterisk are separated by approximately 40' and an unrated concrete shield wall with a sliding door. These "B" Division trays carry power and control circuits for the safety injection pump and its suction motor valve.

* A Plant Design Criterion assures that a fire in any area can be reached by at least two fire hoses.



Legend

- Orange = Train A
- Green = Train B
-  = 3 Hour Rated Fire Wall

2.4 FIRE AREA 74: AUXILIARY BUILDING, MEZZAINE LEVEL, UNIT 2
EXEMPTION REQUEST

Per the provisions of 10CFR 50.12, Northern States Power Company requests exemption from certain requirements of Appendix R, Section III G.2., at the Prairie Island Nuclear Generating Plant. Specifically, exemption is requested from the requirement to install an automatic fire suppression system in this area. The technical bases which justify the exemption are summarized below, and the supporting-area data is given in Table 2.4.1.

1. No redundant safe-shutdown equipment required for hot shutdown is located in this area.
2. Redundant safe-shutdown equipment in the area required for cold shutdown is separated by at least 20' with no intervening combustible, as required by Appendix R.
3. One division of cable trays containing redundant safe shutdown cables will be enclosed in one-hour fire barrier as detailed in the proposed modifications.
4. Combustible loading in this area is low and is almost entirely composed of IEEE STD-383 qualified cable with ethylene propylene rubber insulation and chlorosulfurated polyethylene jacket (EPR-Hypalon) which has high fire resistance and propagation retardancy. EPR-Hypalon cable is not considered to be an intervening combustible.

5. Automatic fire detection is installed which alarms in the continuously manned Control Room.
6. The plant has strong and effective administrative control of fire protection activities and a well-equipped manual fire fighting brigade with demonstrated efficiency.
7. Addition of automatic fire suppression would not enhance the protection of safe shutdown functions provided by current configuration and proposed modifications. This is supported by the fact that the combustible loading presents a maximum fire severity of 14 minutes, and that safe-shutdown functions will be more than adequately protected by the addition of one-hour barriers and the existing 20' minimum separation, which ensure at least one train of safe-shutdown equipment will remain free of fire damage in the area.
8. The addition of a fire suppression system, necessarily water spray due to area size, could in fact cause water damage to safety related equipment from real or inadvertant actuation.

TABLE 2.4.1

FIRE AREA 74: AUXILIARY BUILDING MEZZANINE LEVEL UNIT 2
AREA DATA

A. AREA CONSTRUCTION

1. Walls - See Area Drawing, Fire Area 74

North - 18-in concrete; 3-hour-rated with 3-hour-rated penetration seals.

South - 24-in concrete as defined by the containment building wall; 3-hour-rated with 3-hour-rated penetration seals.

West - 18-in concrete; 3-hour-rated with 3-hour-rated penetration seals.

East - Partial enclosure by 18-in unrated concrete walls. The unenclosed portion consists of a corridor entrance. The corridor connects this area to Fire Area 59 and is approximately 90' long and 10' wide with very low combustible loading. No safe-shutdown cabling or components in Fire Area 74 have their redundant counterparts in Fire Area 59.

2. Floor - 12-in concrete; 3-hour-rated with 3-hour-rated penetration seals

3. Ceiling - 12-in concrete; 3-hour-rated with 3-hour-rated penetration seals.
4. Ceiling height - 19 feet.
5. Room volume - approximately 196,800 ft³
6. Ventilation - 4800 cfm; automatic dampers provided.
7. Congestion - Area is essentially free of any congestion; a large filter train is situated in the center of the fire area. Access for manual fire fighting is considered very good.

B. SAFE SHUTDOWN EQUIPMENT

1. No redundant hot-shutdown equipment exists in this area.
2. Redundant hot and cold shutdown power, control, and instrumentation cables exist in this area.
3. Redundant cold-shutdown equipment located in this area includes motor control centers 2L1 and 2L2, separated by at least 28' with no intervening combustibles.

C. COMBUSTIBLES

1. Installed - Cables, IEEE-383 qualified EPR-Hypalon, flame retardant and propagation resistant with con-

vective heat release rate of 160 kW/m² and radiative heat release rate of 139 kW/m² as determined by testing.

2. Transient - Combustible fluids are limited to two gallons of acetone for maintenance. Larger quantities require special procedure approved by Operations Review Committee. No equipment in the area requires large amounts of lubricants and no large quantities of lubricants are allowed to pass through any safeguard areas. Use of any combustible materials for maintenance is controlled as described in Section 1.3. A spill of any quantity of combustible fluid would not create a significant fire hazard as the area is equipped with floor drains and the floor is graded to provide drainage from all points.
3. Total combustible loading 18,111 BTU/Ft² which equates to E-119 equivalent fire severity of 14 minutes.

D. FIRE PROTECTION

1. Fire Detection Systems
 - a. 22 Ionization Detectors
2. Fire Extinguishing Systems and Equipment
 - a. Automatic Sprinkler Systems installed under open grate stairs

- b. Two^{*} 1½ inch manual hose stations with 100 foot hoses equipped with "no shock" electrical fog nozzles for Class C hazards and rated at 95 gpm nominal.

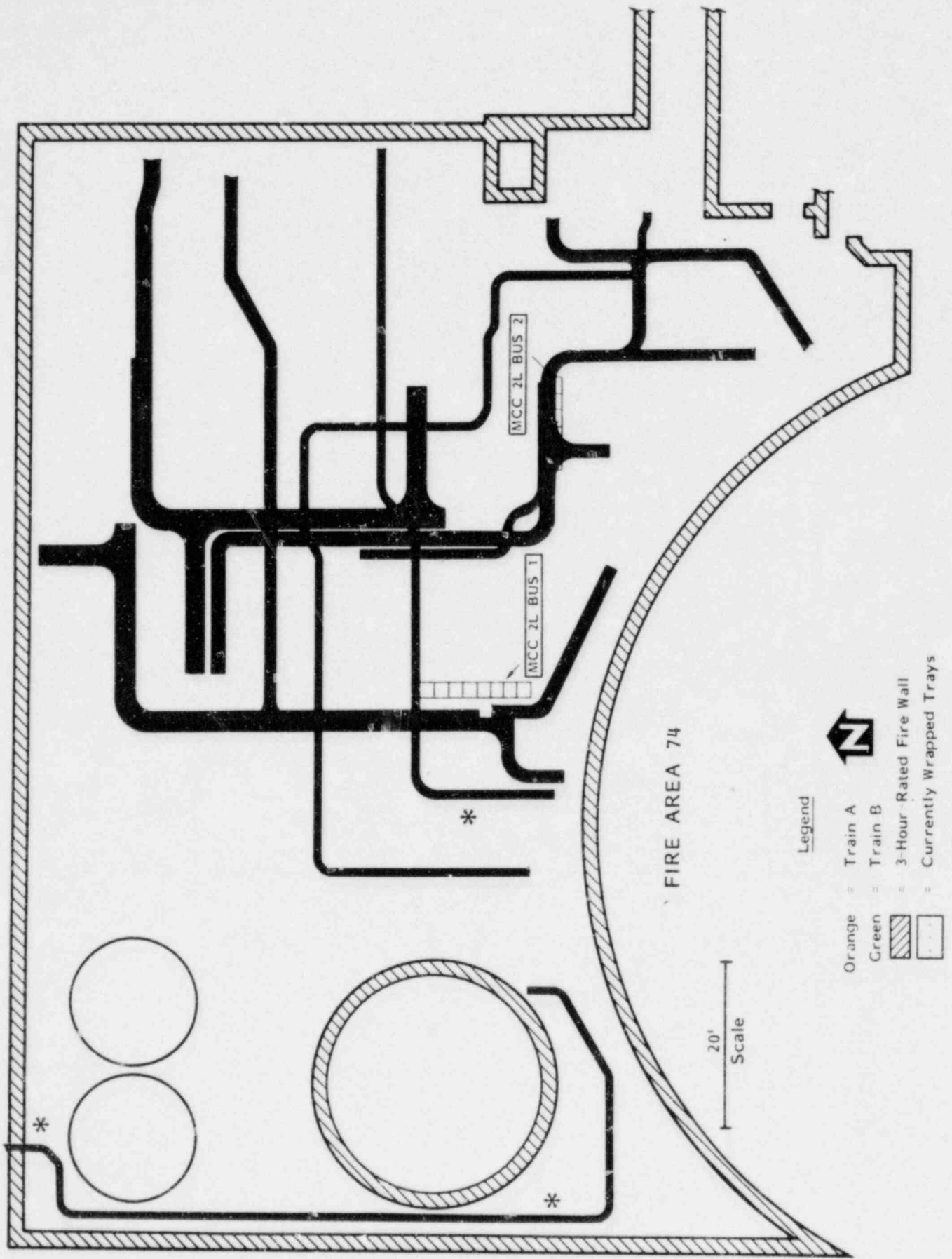
- c. Two 20-pound CO₂ extinguishers located in the area.

* A Plant Design Criterion assures that a fire in any area can be reached by at least two fire hoses.

PROPOSED MODIFICATIONS

It is proposed that all "B" Division cable trays in Fire Area 74 containing functionally redundant safe-shutdown cables will be protected by a one-hour fire barrier with the following exceptions:

Tray number 2AM-T83I (green), located near the west wall, is marked on the Area Drawing with asterisks at either end of the portion not to be wrapped with fire barrier material. Its redundant "A" Division (orange) tray is in the center of the area and is marked with a single asterisk. The combination of separation by greater than 50' and shielding by the refueling water storage tank and steam generator blowdown tanks provides an effective protection from mutual damage by fire. 2AM-T83I carries cable for "B" Division Pressurizer Level Instrumentation



FIRE AREA 74

20' Scale



Legend

- Orange = Train A
- Green = Train B
- [Hatched Box] = 3-Hour Rated Fire Wall
- [Dotted Box] = Currently Wrapped Trays

MCC 2L BUS 2

MCC 2L BUS 1

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3.0 Justification of "Kaowool" as a Fire Barrier for Cable Trays

Tests on "Kaowool" used as a fire barrier for cable trays have been performed to ASTM E119-79 in June 1979, by the Construction Technology Laboratories of the Portland Cement Association (Reference 1). Prior tests had been witnessed by Underwriters Laboratories, Inc., at the Babcock & Wilcox facility in Augusta, Georgia, in September 1978 (Reference 2). These tests were used as a basis for evaluating "Kaowool" as a fire barrier for cable trays by G. Harrison (NRC), B. Cohn (GBA), and R. Barnes (GBA) in testimony before the Atomic Safety and Licensing Board on the William H. Zimmer Nuclear Power Plant on October 30, 1979 (Reference 3).

In that testimony, all three witnesses concluded that a two-inch layer of "Kaowool" wrapped around a cable tray will provide a sixty-minute effective fire-resistant barrier; meaning that the cables contained in the cable tray will be able to perform their function without failure for the quoted time period. For this reason, a two-inch thick layer of "Kaowool" is intended to be used as a one-hour-rated fire barrier at Prairie Island. The "Kaowool" barrier will be applied to applicable cable trays in accordance with an existing plant procedure that is based on the configuration as tested.

REFERENCES

- (1) Melvin S. Abrams, "Fire Protective Cable Tray Fire Test," Construction Technology Laboratories; Skokie, Illinois, June 1979.
- (2) Babcock & Wilcox, "Report on Cable Raceway Protection Systems Fire Test Investigation," Underwriters Laboratories, Inc.; Chicago, Illinois, 1978.
- (3) G. A. Harrison, B. M. Cohn and R. D. Barnes, "Regarding Contention No. 17, Kaowool As A Fire Barrier For Cable Trays," Nuclear Regulatory Commission; Washington, DC, October 1979.