NUCLEAR REGULATORY COMMISSION
DOCKET NO. 50-315
DOCKET NO. 50-316

SUPPLEMENTAL INFORMATION

SAFE-SHUTDOWN CAPABILITY ASSESSMENT AND PROPOSED MODIFICATIONS

10 CFR 50, APPENDIX R, SECTION IIIG

UNITS 1 & 2

DONALD C. COOK NUCLEAR PLANT

INDIANA & MICHIGAN ELECTRIC COMPANY

AMERICAN ELECTRIC POWER SYSTEM

AUGUST 1983

I&M

NUCLEAR REGULATORY COMMISSION
DOCKET NO. 50-315
DOCKET NO. 50-316

SUPPLEMENTAL INFORMATION

SAFE-SHUTDOWN CAPABILITY ASSESSMENT AND PROPOSED MODIFICATIONS

10 CFR 50, APPENDIX R, SECTION IIIG

UNITS 1 & 2

DONALD C. COOK NUCLEAR PLANT

INDIANA & MICHIGAN ELECTRIC COMPANY

AMERICAN ELECTRIC POWER SYSTEM

AUGUST 1983

Supplemental Information

SAFE SHUTDOWN CAPABILITY ASSESSMENT
AND PROPOSED MODIFICATIONS

Units 1 and 2

Donald C. Cook Nuclear Plant

TABLE OF CONTENTS

1. INTRODUCTION

Indiana and Michigan Electric Company transmitted to the Nuclear Regulatory Commission by cover letter AEP:NRC:0692E dated March 31, 1983 a report entitled, "Safe Shutdown Capability Assessment and Proposed Modifications 10 CFR 50, Appendix R, Section III.G Units 1 and 2 Donald C. Cook Nuclear Plant" (D.C. Cook Appendix R Report). A meeting was held on June 23, 1983 between the NRC and Indiana and Michigan Electric Company at the NRC's request, to review the D.C. Cook Appendix R Report and discuss various questions related to the report sections. As a result of the meeting, Indiana and Michigan Electric Company committed to providing additional supplemental information associated with seven specific technical areas. These areas were:

- Embedded Conduit
- Spurious Operation Methodology
- Post-Fire Spurious Operation Resolutions
- Alternative Shutdown Technical Specifications
- Exemption Request for Fire Zone 29G
- Exemption Request for Fire Zone 44S
- Exemption Requests for Unit 1 and 2 Containment Fire Zones

Sections 2 through 8 of this report provides this supplemental information.

2. SUPPLEMENTAL INFORMATION TO SUPPORT THE CONTENTION THAT CABLES IN CONDUIT EMBEDDED IN CONCRETE ARE NOT PART OF THE FIRE AREA

Section 2.3 of the D.C. Cook Appendix R Report stated that cables located in conduit embedded in concrete walls, floors, or ceilings were not considered as part of any fire zone until they exited the concrete. The supplemental information contained in this section provides the basis for this technical determination.

The technical basis which substantiates that four inches of concrete cover provides adequate protection for embedded cables considers the following:

- The fire hazard and level of fire detection and suppression which exists for each of the various areas of concern;
- The NFPA ratings for concrete fire barriers;
- The difference between the NFPA fire barrier configuration and the wall, floor, ceiling configurations at Donald C. Cook which contain embedded cable;
- The difference between the NFPA fire barrier cold side temperature criteria and the temperature failure criteria for typical nuclear plant cables.

Of the 80 fire areas at D.C. Cook Power Plant, those areas in excess of 13 minutes of fire severity have fixed or automatic fire suppression systems, except for Fire Areas 106 and 107 which do not contain embedded safe shutdown cables. All of these fire areas in excess of 13 minutes of fire severity have automatic

detection except for Fire Areas 28, 30, 83, 89 and 105, which do not contain embedded safe shutdown cables.

In accordance with the NFPA's 14th Edition of the Fire Protection Handbook, Table 6-7G of Section 6 concerning building construction and design criteria indicates that for normal weight concrete, which is the predominant type of concrete at D.C. Cook, a minimum solid thickness of 4.2 to 4.5 inches results in a two-hour fire rating while a one-hour fire rating requires only 2.8 to 3 inches of concrete. The range of these ratings is based on the two types of concrete aggregate that could potentially be used.

Although this would indicate that a 1-1/2 to 2-hour rating is achieved by a simple four in. concrete section, direct use of these ratings for the actual configuration of the concrete sections containing embedded cable at D.C. Cook should not be made.

Figure 2.1a depicts the typical construction for which the NFPA ratings directly apply, while Figure 2.1b indicates the typical construction of concrete at D.C. Cook containing embedded cables. It immediately becomes apparent, recognizing the typical values for thermal conductivity and heat capacity for concrete, that the additional barrier mass between the embedded cables and the cold side will function as a heat sink lowering the actual in-wall temperature at the embedded cable to a number substantially lower than the 322°F used for the standard NFPA barrier rating. The 322°F value in the NFPA ratings is based on a

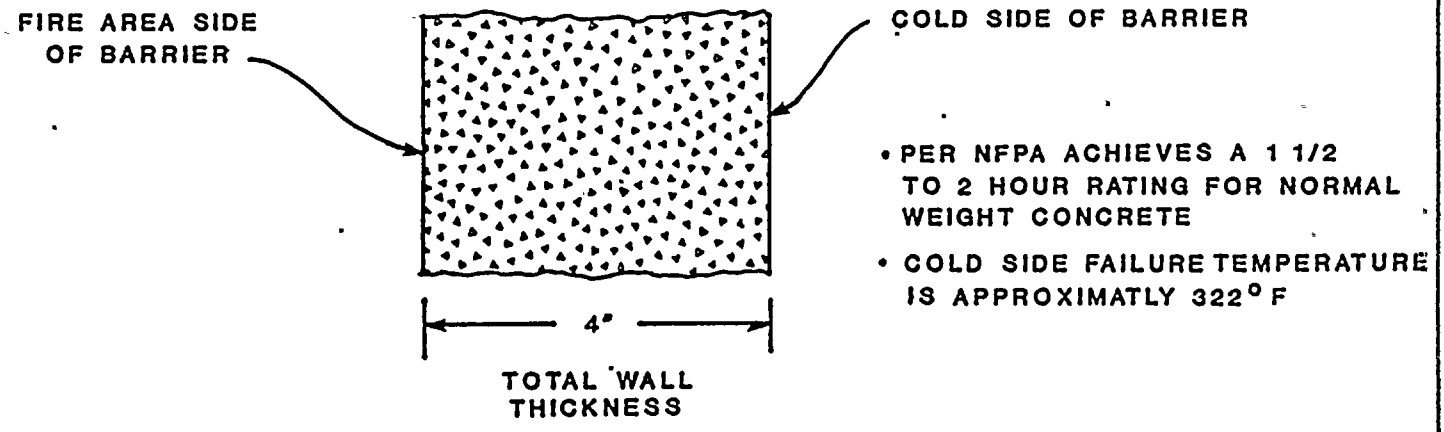


FIGURE 2.1-a

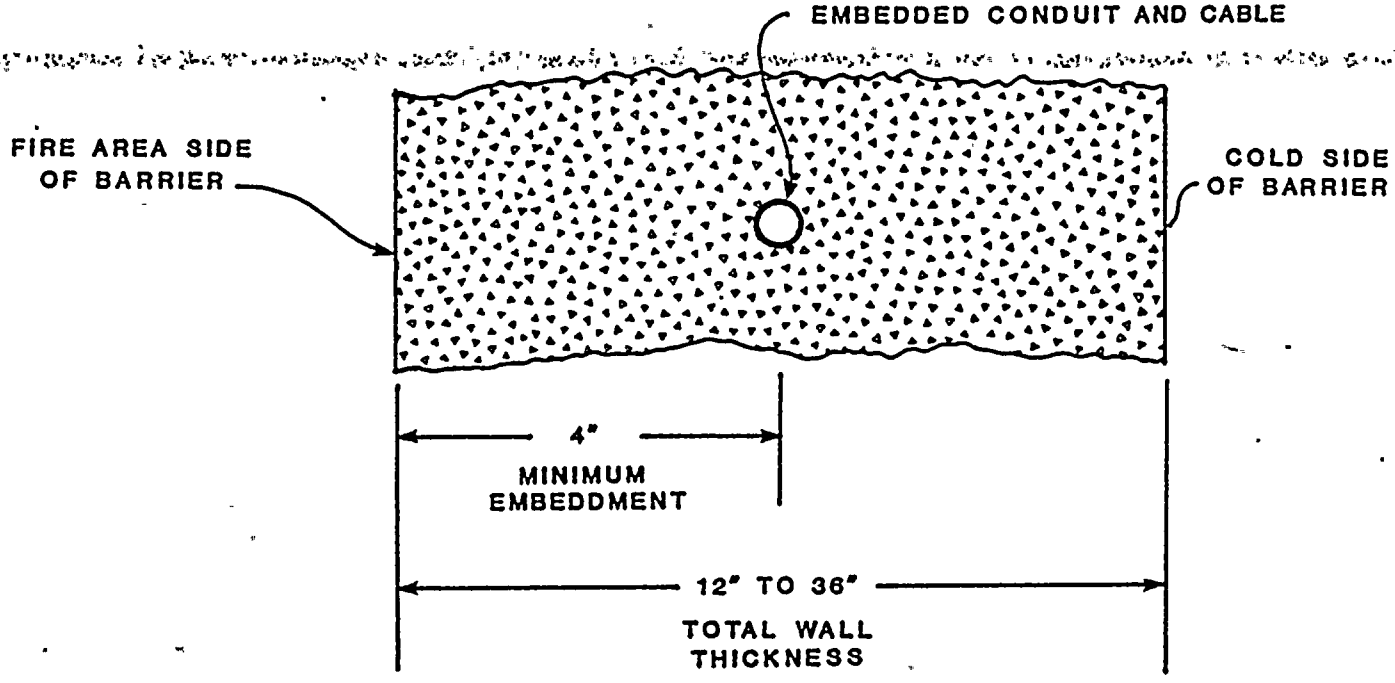


FIGURE 2.1-b

FIGURES 2.1-a AND 2.1-b EMBEDDED CONDUIT

limiting factor of 250°F plus an assumed ambient temperature of 72°F on the cold side of the concrete section.

In order to quantify this comparison, a finite difference thermal computer model was used which assumed a constant fire side heat flux of three-hour duration and measured the temperature variations at the four in. embedment for various section thicknesses. As a base case, a four in. concrete section was used with incident heat fluxes varied until a 322°F cold side temperature was achieved. Once determined, this base case heat flux was applied for 6.0, 8.0 and 12.0 inch concrete sections for a three-hour duration. In all cases the cold side wall was assumed adiabatic. The model results listed below indicate that at a distance from the hot side of four in., the concrete temperatures decrease dramatically as wall thickness increases.

Total Section Thickness (in.)	Temp. at 4 in. at 3 hours (°F)
4.0	322
6.0	216
8.0	197
12.0	196

Further support for the conclusion that embedded cable does not degrade is a report titled "A Study of Damageability of Electrical Cable in Simulated Fire Environments", prepared by Factory Mutual Research Corporation in March, 1981 for the Electric Power Research Institute. The report indicates that the

surface temperature for 11 cable samples (varying from PE/PVC to EPR/Hypalon), at the point where insulation degradation begins, ranges from 567°F to 993°F. This temperature at which insulation degradation begins is higher than the temperatures associated with the failure criteria for NFPA-rated fire barriers of 322°F. When a comparison is made between the onset of insulation degradation (567°F to 993°F) and the likely thermal profiles for concrete sections typical for D.C. Cook barriers, it is evident that no cable insulation degradation should occur for embedded cables.

Indiana and Michigan Electric Company's technical conclusion is that a minimum concrete cover of four in. protecting embedded conduit and cable provides sufficient protection to justify the exclusion of embedded conduit and cable in any fire area until it exits the concrete section.

3. SUPPLEMENTAL INFORMATION ON ASSOCIATED CIRCUIT SPURIOUS OPERATION METHODOLOGY

This section provides supplemental information on the associated circuit spurious operation methodology discussed in the Donald C. Cook Appendix R Report, Section 4.7.3.

3.1 Spurious Operation Circuits and Cables

Cables that are not part of hot safe shutdown circuits may be damaged by the effects of postulated fires. This cable damage may consequently prevent the correct operation of hot shutdown components, or result in the maloperation of other equipment which would directly prevent the proper performance of a hot shutdown system.

The effects of spurious operation may be conceptually divided as follows:

(1) Maloperation of hot shutdown equipment due to control circuit interlocks between hot shutdown circuits and other circuits. For example, the pressurizer heater automatic operation interlocks from non-safety process control and instrument circuits.

(2) Maloperation of equipment which is not defined as part of the hot shutdown systems, but which could prevent the accomplishment of a hot shutdown safety function. For example, inadvertent depressurization of the Reactor Coolant System or the Secondary System by spurious opening of boundary valves.

3.2 Identification of Circuits and Cables

A detailed review of the hot shutdown component circuit elementaries was performed with all electrical interlocks to

other circuits identified. A Failure Modes and Effects Analysis (FMEA) was performed to determine if maloperation of these interlocks (inadvertent opening of closed contacts or closing of open contacts) would prevent the proper operation of the hot shutdown equipment. If such a condition could occur, the potential spurious operation interlock and the non-hot shutdown circuit that actuated the interlock were identified.

A systems engineering review was performed to identify if non-SSS systems and equipment existed with the potential to defeat safe shutdown functions by their spurious operation. For SSS and non-SSS components whose operation had been identified as affecting SSS operations, a detailed review of control circuit elementaries and an FMEA was performed for the cables of these circuits to determine if conductor-to-conductor shorts, conductor open circuits or conductor grounds could result in a component transition to an unacceptable state. If such a condition could not occur, the component and its circuits were removed from the spurious operation category. For those that remained, the circuit cables with the potential to generate the maloperation were identified for further analysis.

For all circuits and cables identified, resolution was achieved by:

(1) Providing a means to isolate the equipment prior to the fire (i.e., remove power cables, open circuit breakers) or,

(2) Providing a means to detect spurious operations and then undertaking procedures to defeat the maloperation of equipment (i.e., opening of breakers to remove spurious operation, actuation of a master switch, etc.).

Reference TABLE 4-3 in the D.C. Cook Appendix R Report and Section 4 of the report for the methods of resolution provided.

3.3 Spurious Operation Assumptions

For the purpose of conducting these spurious operation analyses, the loss of instrument air or off-site power was assumed where such a loss caused unacceptable consequences. Alternatively, if the existence of instrument air or off-site power results in unacceptable consequences, then they were assumed available.

In order for cable faults which generate spurious operation to occur, various conditions must exist synergistically at the cable fault location:

- Sufficient energy must exist due to the fire to create failure of the cable jacket and insulating material.
- The failure of the jacket and insulating material must occur in a way which directly exposes the cable conductors.
- For each short two or more specific conductors must come into direct contact causing low impedence conductor-to-conductor connections.
- For certain types of spurious operation, multiple electrically independent shorts must occur.
- No additional conductors which would cause circuit fault currents and operation of circuit protective devices may participate in the short condition.

- o No ground faults which would cause operation of circuit protective devices must occur.

The spurious operation analysis performed for Donald C. Cook recognized the extremely low probability of certain types of these faulted conditions. The following cable short conditions causing spurious operation were considered of sufficiently low likelihood that they were assumed not to require additional analysis or modification.

CASE 1) 3 phase-ac power circuit cable-to-cable faults. (4 kV, 600V and 480V)

CASE 2) 2 wire ungrounded-dc power circuit cable-to-cable faults. (250V)

CASE 3) 2 wire ungrounded-dc control circuit cable-to-cable faults. (250V)

CASE 4) 1 phase ungrounded-ac control circuit cable-to-cable faults. (220V)

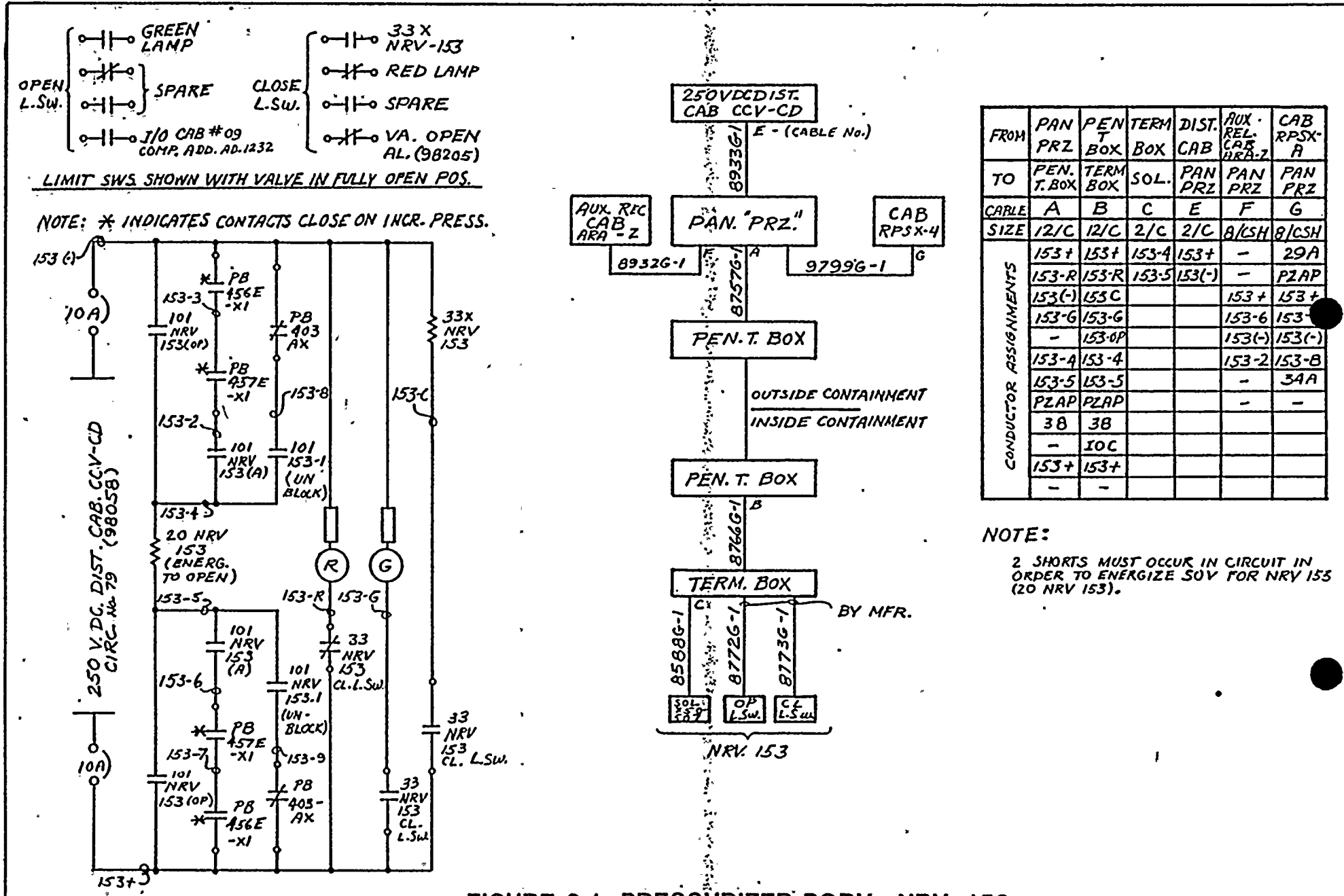
With respect to Cases 1) and 2) no conductor-to-conductor faults within the same power cable can cause spurious powering of the associated device. Only power cable-to-cable connections between one de-energized and one energized power circuit could permit operation. For the case of the three-phase-ac circuit, three electrically independent cable-to-cable shorts must occur without grounds in order to power the associated device. Similarly, for the two-wire ungrounded dc power circuit, two electrically independent cable-to-cable shorts without grounds must occur. The likelihood of such occurrences has been acknow-

ledged by the NRC Staff to be sufficiently low to permit excluding such faulted conditions from consideration. (Federal Register Vol. 48, No. 86 at 19963.)

The fundamental basis for excluding such shorts from consideration is based on the need to provide multiple cable-to-cable electrically independent faults in order for spurious operation to occur. With respect to Cases 3) and 4), Indiana and Michigan Electric Company has excluded such cable-to-cable faults causing spurious operation based on similar technical considerations.

Concerning Case 3), all dc control circuits at Donald C. Cook are ungrounded. In order for spurious operation to occur, due to circuit-to-circuit faults between dc circuits supplied from different sources, at a minimum, two electrically independent cable-to-cable shorts without grounds must occur. This is identical to the type of shorted conditions discussed in Case 2).

Furthermore, the same condition, two independent cable-to-cable shorts, must occur even for those dc circuits supplied from the same source. This is due to the Indiana and Michigan Electric Company design standard which in general requires that the control switch and relay contacts "double break" the positive and negative control leads for components whose spurious operation could affect safe shutdown (e.g., solenoid and motor-



FROM	PAN PRZ	PEN T BOX	TERM BOX	DIST. CAB	AUX. REL. CAB ARA-Z	CAB RPSX-A
TO	PEN. T. BOX	TERM BOX	SOL.	PAN PRZ	PAN PRZ	PAN PRZ
CABLE	A	B	C	E	F	G
SIZE	12/C	12/C	2/C	2/C	8/CSH	8/CSH
CONDUCTOR ASSIGNMENTS	153+	153+	153-4	153+	–	29A
	153-R	153-R	153-5	153(-)	–	PZAP
	153(-)	153C			153+	153+
	153-G	153-G			153-6	153-
	–	153-0P			153(-)	153(-)
	153-4	153-4			153-2	153-8
	153-5	153-5			–	34A
	PZAP	PZAP			–	–
	38	38				
	–	10C				
	153+	153+				
	–	–				

NOTE:

2 SHORTS MUST OCCUR IN CIRCUIT IN ORDER TO ENERGIZE 50V FOR NRV 155 (20 NRV 153).

FIGURE 3.1 PRESSURIZER PORV: NRV-153
ELECTRICAL SCHEMATIC, CABLE BLOCK DIAGRAM
AND CABLE CONDUCTOR ASSIGMENTS

operated valves) (see Figure 3.1). The implementation of this design standard for these control circuits (250V dc and 220V ac) at Donald C. Cook prevents single cable-to-cable faults from initiating spurious operation.

For the ungrounded ac control circuits in Case 4), the identical consideration exists. MCC transformer secondary 220V ac control circuits are ungrounded. Therefore, at a minimum, two cable-to-cable shorts must simultaneously occur in order for spurious operation to result for circuits supplied from different sources. In addition, for circuits supplied from the same source the "double break" Indiana and Michigan Electric Company design standard would require two cable-to-cable independent shorts to occur prior to device spurious operation.

The control circuit cable construction at D.C. Cook further decreases the probability of any cable-to-cable faults due to the extensive use of Asbestos jacketed control cable. Asbestos-braided cable jacketing prevents the intimate conductor-to-conductor contact required for hot shorts because the jacketing retains its physical integrity for the full spectrum of exposure fires postulated. In those installations where Asbestos jacketed cable is not used, only IEEE-383 qualified cable exists. These cabling jacket compounds, although not as structurally impervious to fire effects as asbestos, have extremely high softening temperatures and are not prone to the conductor breakthrough

phenomena which occur with lower temperature jacket materials - such as PVC.

4. SUPPLEMENTARY INFORMATION RELATED TO TABLE 4-3

This section provides supplementary information related to Table 4-3, "Potential Spurious Malfunctions That Could Affect Safe Shutdown - Resolution Statements Concerning Procedural Detection and Termination".

The concepts of procedural detection and isolation were used in the Resolution column of Table 4-3 to represent the fact that safe shutdown procedures would contain sufficient information to permit plant operating personnel to:

1) Assess the performance of safe shutdown functions using the safe shutdown instrumentation available;
2) Identify on a component basis those components whose spurious operation could be causing the safe shutdown instrumentation off-normal indications;
3) Identify on a component basis the specific operator actions which could be taken to mitigate the consequences of the component's spurious operation.

Example: ICM 305

For this component operator verification of system alignment and component availability will be procedurally required prior to cold shutdown initiations.

Please note that where it is called for in Table 4-3 for a circuit breaker, fuse or disconnect switch to be in an open position during normal operation, this will be true except for those times when the component will require operation as part of component testing.

5. SUPPLEMENTAL INFORMATION PERTAINING TO ALTERNATIVE SHUTDOWN SYSTEM TECHNICAL SPECIFICATIONS

Indiana and Michigan Electric Company has conducted an additional review of the technical specifications for Donald C. Cook Nuclear Plant to determine the impact on these technical specifications of the proposed Appendix R Alternative Shutdown System Design. Because the alternative shutdown system proposed by Indiana and Michigan Electric Company for D.C. Cook requires the use of various safety-related systems in the unit unaffected by the fire to achieve safe shutdown, this review focused on all the operating modes in the unit unaffected by hypothesized fires.

Based on this review, the existing technical specifications for operating modes 1, 2 and 3 presently appear adequate. The review did indicate that modifications to the technical specifications are required when the unaffected unit is in operating modes 4, 5 or 6. The following information outlines the general approach to be taken by Indiana and Michigan Electric Company in modifying the technical specifications for each of the alternative shutdown systems which would be required during these modes. This form of technical specification modification will be provided for the Chemical and Volume Control System, .cp3
Essential Service Water System, Component Cooling Water System, and the Motor-Driven Auxiliary Feedwater System.

Limiting Condition for Operation

Sufficient system equipment must be available to permit the system to be operable and capable of supporting this unit's operation in the existing mode (4, 5 or 6) and capable of providing alternative shutdown to the opposite unit while that unit is in operating mode 1, 2 or 3.

ACTION: With insufficient system equipment available to maintain this unit in its existing operating mode and support safe shutdown in the opposite unit, restore such minimum capability within 72 hours or:

(1) Establish a daily fire inspection of the following areas in the opposite unit requiring the alternative shutdown system;

- o Auxiliary Building - elev. 587'-0"
- o Auxiliary Building - elev. 609'-0"
- o Transformer Room - elev. 591'-0"
- o Control Room
- o Switchgear Room
- o Engineering Safety System and MCC Room
- o EPS Equipment Rooms
- o Charging Pump Room
- o ESW Pump Room

(2) Initially verify by inspection the OPERABILITY of fire detection, automatic fire suppression and manual fire fighting equipment for those areas requiring this alternative shutdown system.

If minimum capability cannot be restored within 30 days, submit to the NRC a report outlining the cause of the inoperable equipment, the actions taken, and the plans and schedules for restoring the system to operable status.

6. SUPPLEMENTAL INFORMATION TO SUPPORT EXEMPTION REQUEST 7.7 FOR FIRE ZONE 29G

This section provides supplemental information concerning the proposed hatch construction and other fire hazards analysis considerations which support the III.G.2 suppression exemption request in the D. C. Cook Appendix R. Report, Section 7.7

An open stairway entering from the Unit 1 West ESW pump cubicle, Fire Zone 29B, and a ladder and a hatch opening from the Unit 2 East ESW pump cubicle, Fire Zone 29C, provide a common connection between the Unit 1 and 2 ESW pumps via Fire Zone 29G. As stated in the D. C. Cook Appendix R. Report, Section 8.11.3, the hatch opening from the Unit 2 East Pump cubicle will be provided with a hinged hatch for emergency egress from Fire Zone 29G which will prevent propagation of fire effects into the pump area. The hatch will be coated with materials to provide an equivalent three-hour fire rating. The hatch will ensure that hot combustible gases resulting from a fire in Fire Zone 29G will not affect the Unit 2 ESW pumps.

The Unit 1 West pump cubicle is provided with 10,000 cfm of ducted supply air. All cabling for the supply fans is embedded in concrete from the MCC in Fire Zone 29E to the fan motors, with none of the cabling existing in Fire Zone 29G. Two supply fans are provided, with only one required as each provides 100% of the required air flow for the cubicle. Air is exhausted from this cubicle through the screen mesh security gate in the north wall.

Due to the low combustible loading in Fire Zone 29G and these natural exhaust air flow paths out of the Unit 1 West pump cubicle, hot gases or other products of combustion from a fire in Fire Zone 29G which would flow up the stairway will flow directly out of the cubicle and prevent the formation of a stratified layer of hot gases with sufficient depth to damage the Unit 1 ESW pumps.

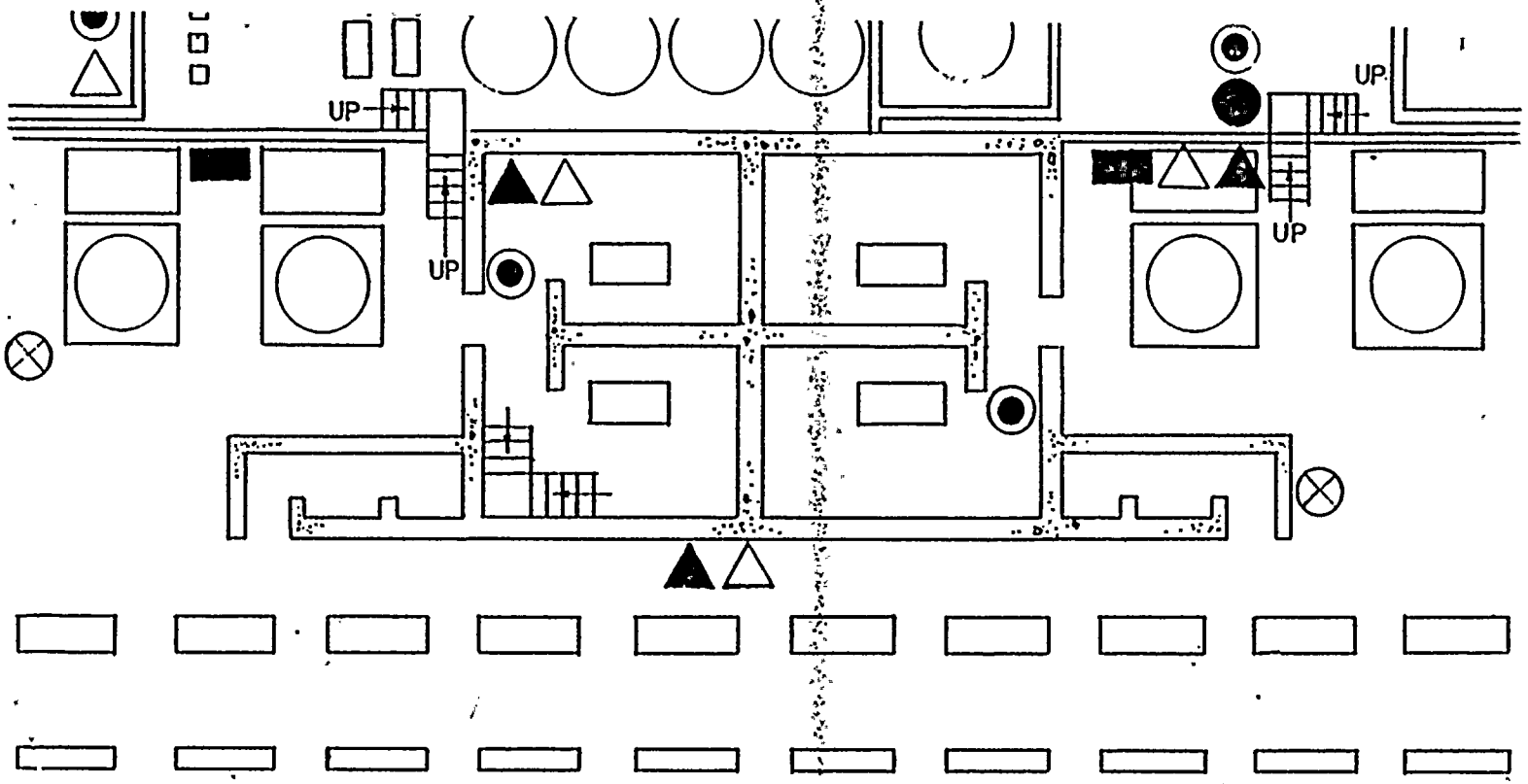
At the NRC Staff's request, we have reviewed the Fire Hazard Analysis to determine if three-hour raceway barriers for two of the four ESW pump trains would be preferable to one-hour barriers for all four ESW trains. Based on the low in-situ combustible loadings and a lack of major activity in the zone, Indiana and Michigan Electric Company believes that the previously proposed one-hour barriers for all four trains achieves an equivalent or superior level of fire protection for the zone configuration. In addition, the design and installation issues associated with the three-hour raceway barriers suggest that implementation of that alternative is not preferred.

Based on these considerations, both the east and west trains of ESW for both Units 1 and 2 will be protected from the effects of fires in Fire Zone 29G. In the highly unlikely event that a fire in Fire Zone 29G should cause failure of both Unit 1 ESW pumps, alternate shutdown capability for Unit 1 is available through the use of the Unit 2 ESW pumps.

The alternative shutdown capability is described in the D. C. Cook Appendix R. Report, Section 5.2.3.

Manual hose stations are provided in the Screen House for fighting fires in Fire Zone 29G. The hose stations are located such that all portions of Fire Zone 29G can be covered with 75 feet of hose and 30 feet of water stream. Figures 6.1 and 6.2 indicate the locations of manual hose stations and portable extinguishers for fighting fires in Fire Zone 29G.

Based on this supplemental information and the analysis contained within the March 1983 Appendix R submittal for D. C. Cook, the exemption from providing an automatic suppression system in Fire Zone 29F should be granted.

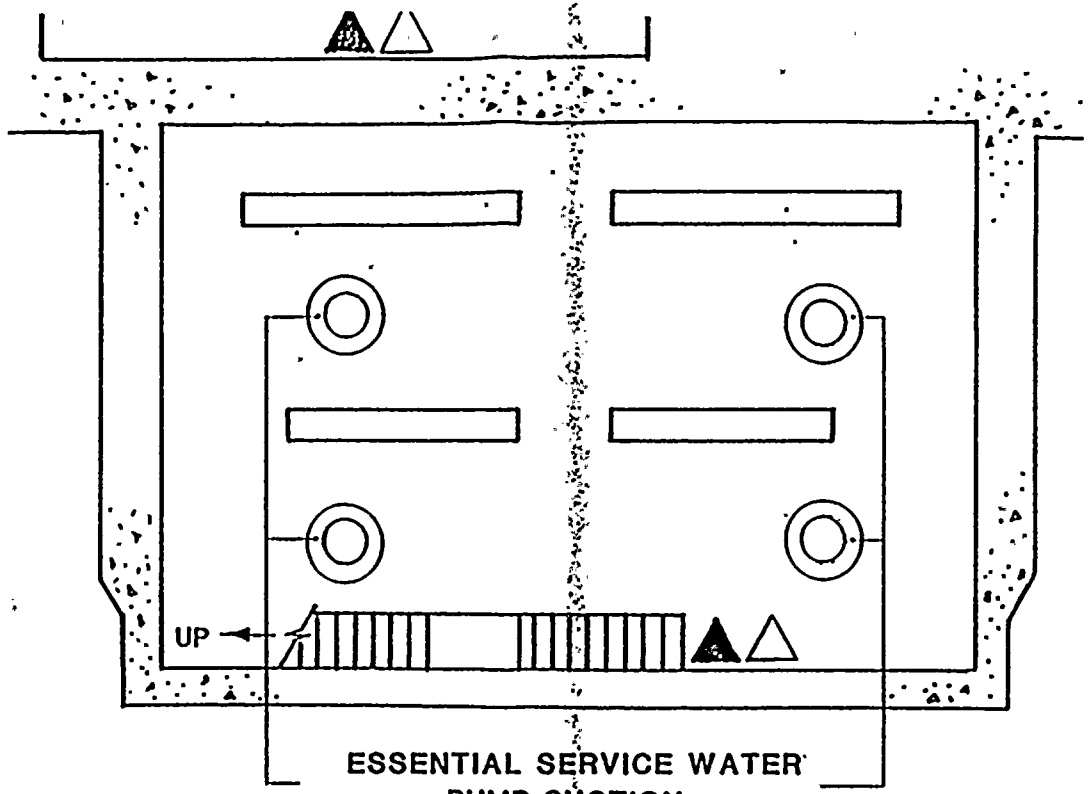


PART PLAN SCREENHOUSE EL. 591

LEGEND

- △ DRY CHEMICAL FIRE EXTINGUISHER
- ▲ CO_2 FIRE EXTINGUISHER
- ⊗ 150 LB. WHEELED DRY CHEMICAL EXTINGUISHER
- ● TELEPHONE
- ◉ GAITRONICS
- ▬ HOSE STATION

FIGURE 6.1 MANUAL FIREFIGHTING EQUIPMENT (LOCATED IN THE SCREEN HOUSE) AVAILABLE FOR ZONE 29G



PART PLAN SCREENHOUSE EL. 573

LEGEND

△ DRY CHEMICAL FIRE EXTINGUISHER

▲ CO_2 FIRE EXTINGUISHER

FIGURE 6.2 MANUAL FIREFIGHTING EQUIPMENT LOCATED IN ZONE 29G

7. SUPPLEMENTAL INFORMATION TO SUPPORT EXEMPTION REQUEST 7.10, FIRE ZONE 44S

This section provides supplemental information concerning the construction of the proposed barrier between the Component Cooling Water Pumps, the proposed modification to the area detection and suppression systems in the vicinity of the pumps, and other considerations which support the III.G.2 exemption previously requested in the March 1983 D. C. Cook Appendix R Report, Section 7.10.

A three-hour rated fire barrier will be provided to separate redundant component cooling water pumps. Figures 7.1 and 7.2 are draft plan and elevation views of the proposed barrier. The barrier will be seismically qualified and constructed of TSI Thermolag panels. The TSI panels will be overlapped to provide protection for the bolts attaching the panels to the metal studs (see Figure 7.3).

Additional automatic suppression and detection capability will be provided for the component cooling water pump area. Suppression will consist of ceiling-mounted sprinklers in addition to sprinklers located for direct water application onto the pumps. Detection will consist of pilot head heat detectors also located directly over the pumps.

Figures 7.4 and 7.5 are plan and elevation views, respectively, of the suppression and detection system locations. The ceiling-mounted sprinklers cover approximately 65 sq ft per head and will provide a design density on the order of 0.4 gpm/ft2.

Drainage capability in the vicinity of the pumps consists of drain openings on each of the five pump pedestals and a grid of 4-in. diameter drains covering the entire floor area of Fire Zone 44S. Adequate capacity is provided for drainage of suppression water resulting from a fire in this zone.

Two ceiling elevations exist in Fire Zone 44S. The clear floor to ceiling height over the component cooling water pumps is 10-ft 11-in., with that over the rest of the fire zone being 20-ft 4-in. Figure 7.6 is a plan and elevation view of the ceiling heights in the vicinity of the component cooling water pumps. Due to the change in ceiling elevations, the products of combustion from a fire in the vicinity of the pumps would tend to flow up into the 20-ft 4-in, high ceiling space. This will prevent a stratified layer of hot gases from forming to a depth sufficient to damage the component cooling water pumps unaffected by the direct results of the fire.

Open stairways provide access from the 591-ft and 633-ft elevations to Fire Zone 44S on the 609-ft elevation. Access to the component cooling water area of Fire Zone 44S is open and unobstructed, thereby ensuring adequate fire brigade response for manual fire fighting purposes should the need arise.

Based on this supplemental information and the analysis contained within the March 1983 Appendix R submittal, the exemption from enclosure of cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a one-hour rating should be granted.

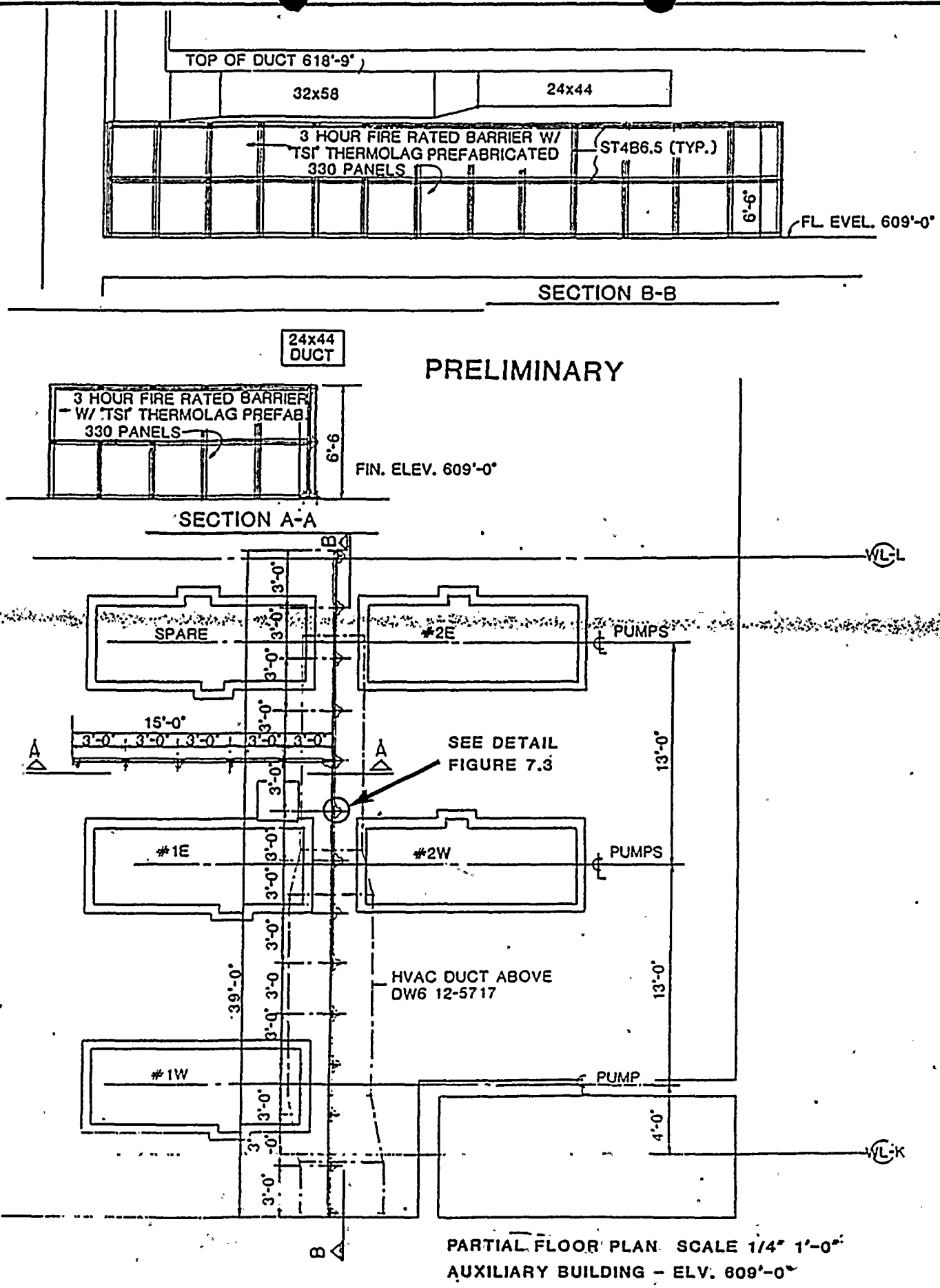


FIGURE 7.1 FIRE BARRIER BETWEEN COMPONENT COOLING WATER PUMPS

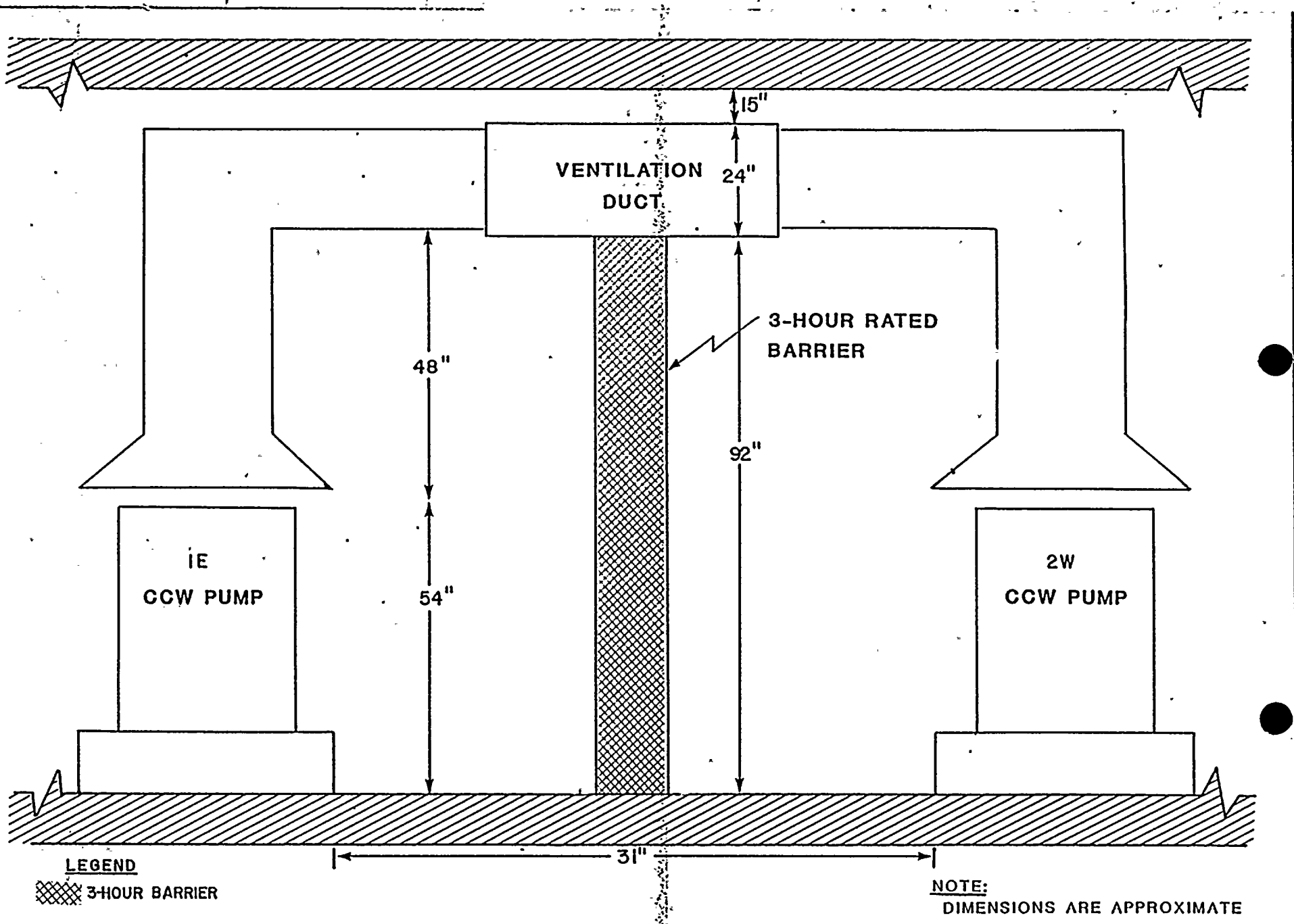


FIGURE 7.2 ELEVATION OF CCW PUMP FIRE BARRIER

PRELIMINARY

D.C. COOK PLANT - PUMPS FIRE BARRIER DETAIL

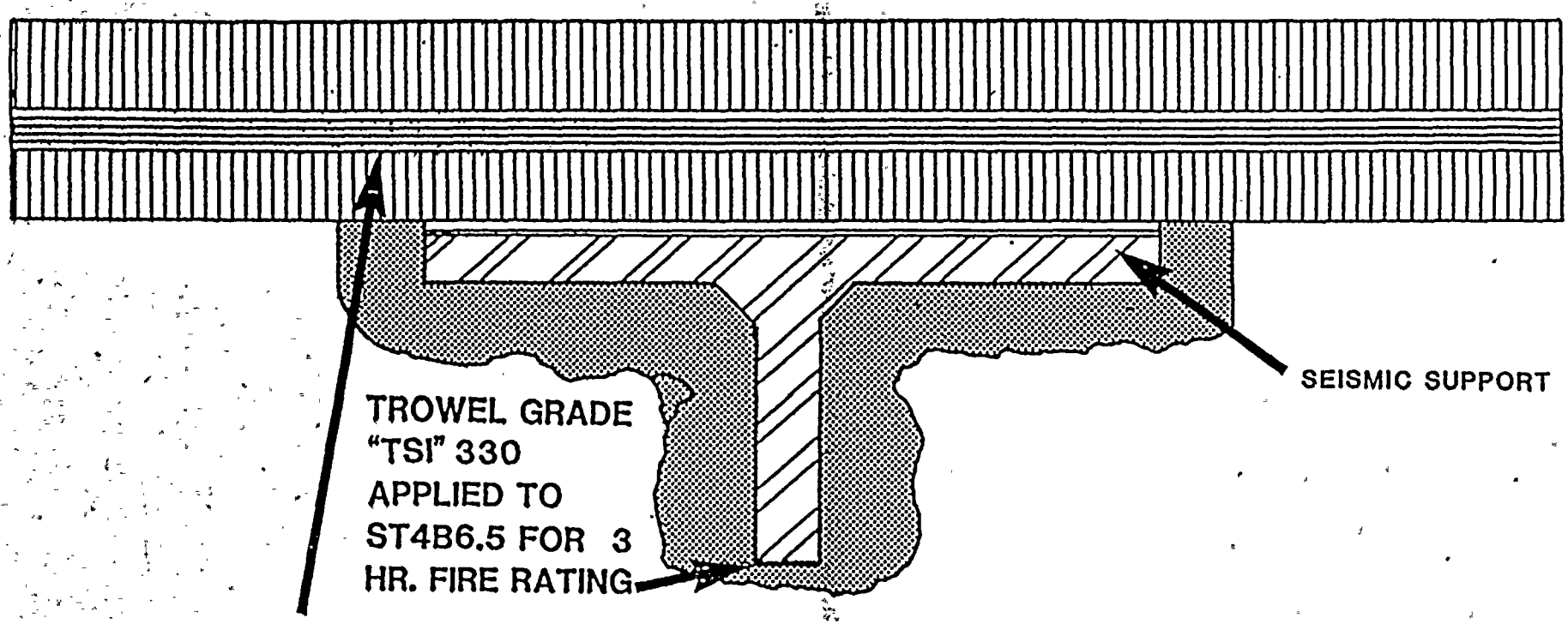


FIGURE 7,3 FIRE BARRIER BETWEEN COMPONENT COOLING WATER PUMPS

PRELIMINARY

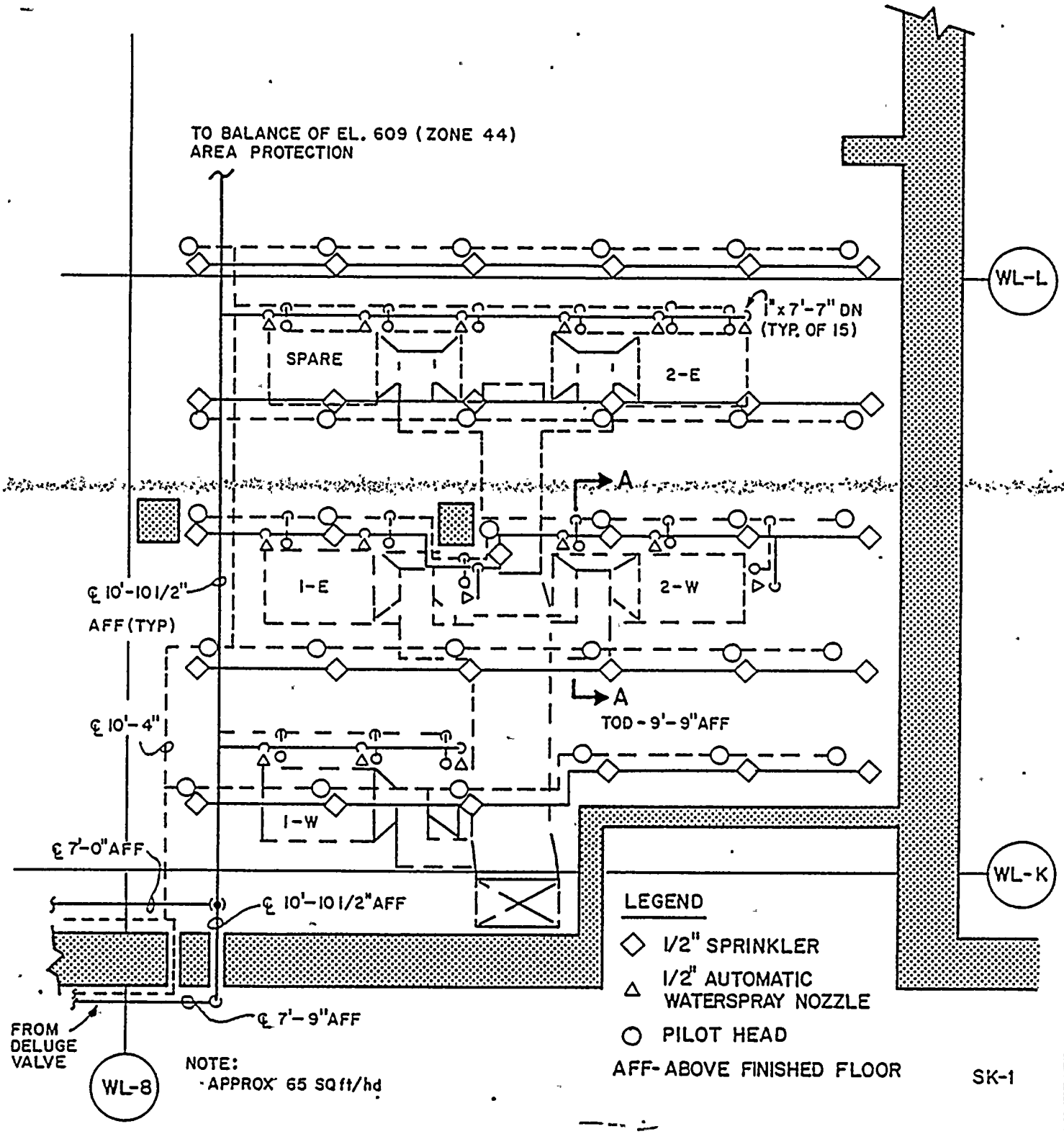
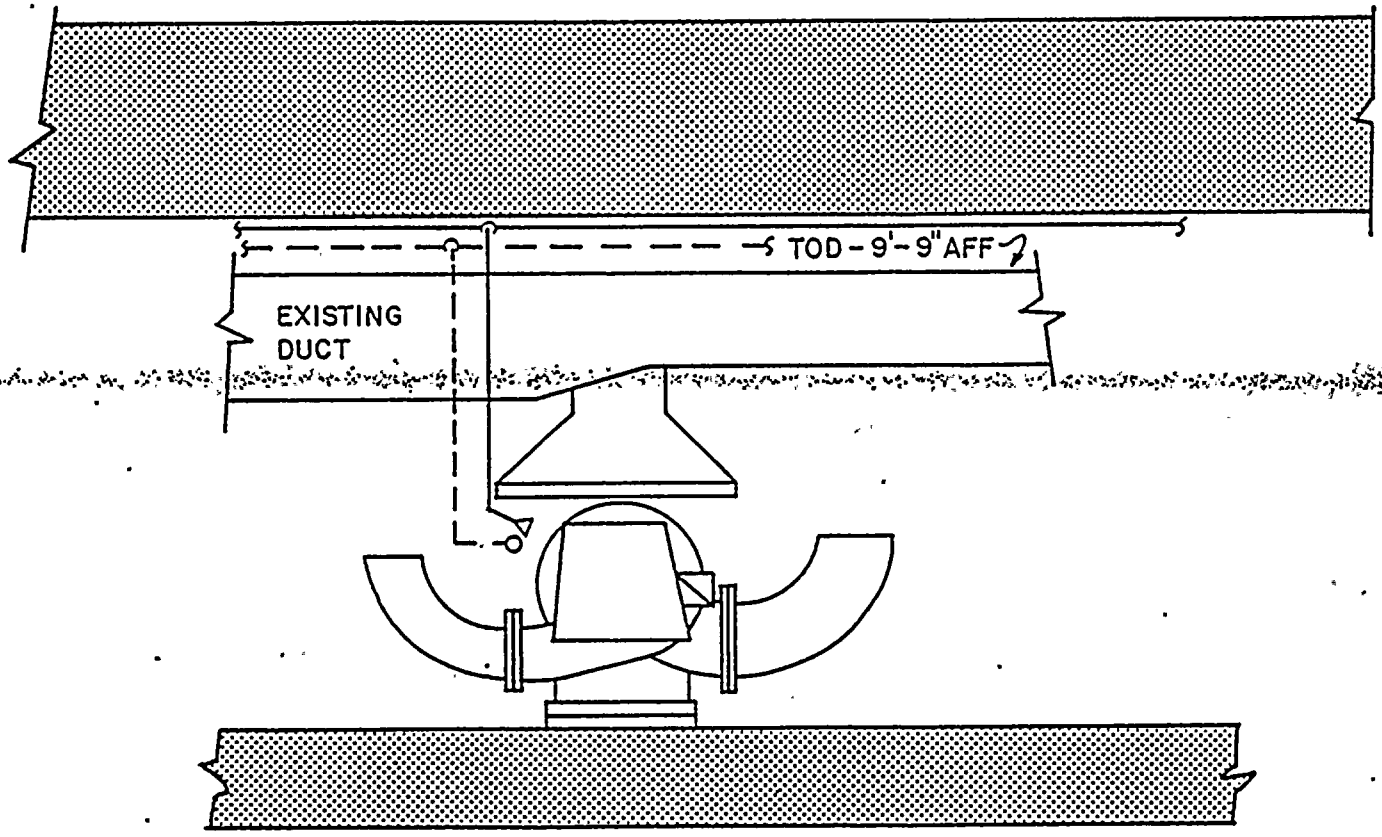


FIGURE 7.4 PLAN LAYOUT OF SUPPRESSION AND DETECTION SYSTEMS

PRELIMINARY



SECTION A-A
SEE SK-1

LEGEND
△ 1/2" AUTOMATIC WATERSPRAY NOZZLE
○ PILOT HEAD

SK-2

FIGURE 7.5. SCHEMATIC ELEVATION VIEW OF DETECTION AND SUPPRESSION SYSTEMS

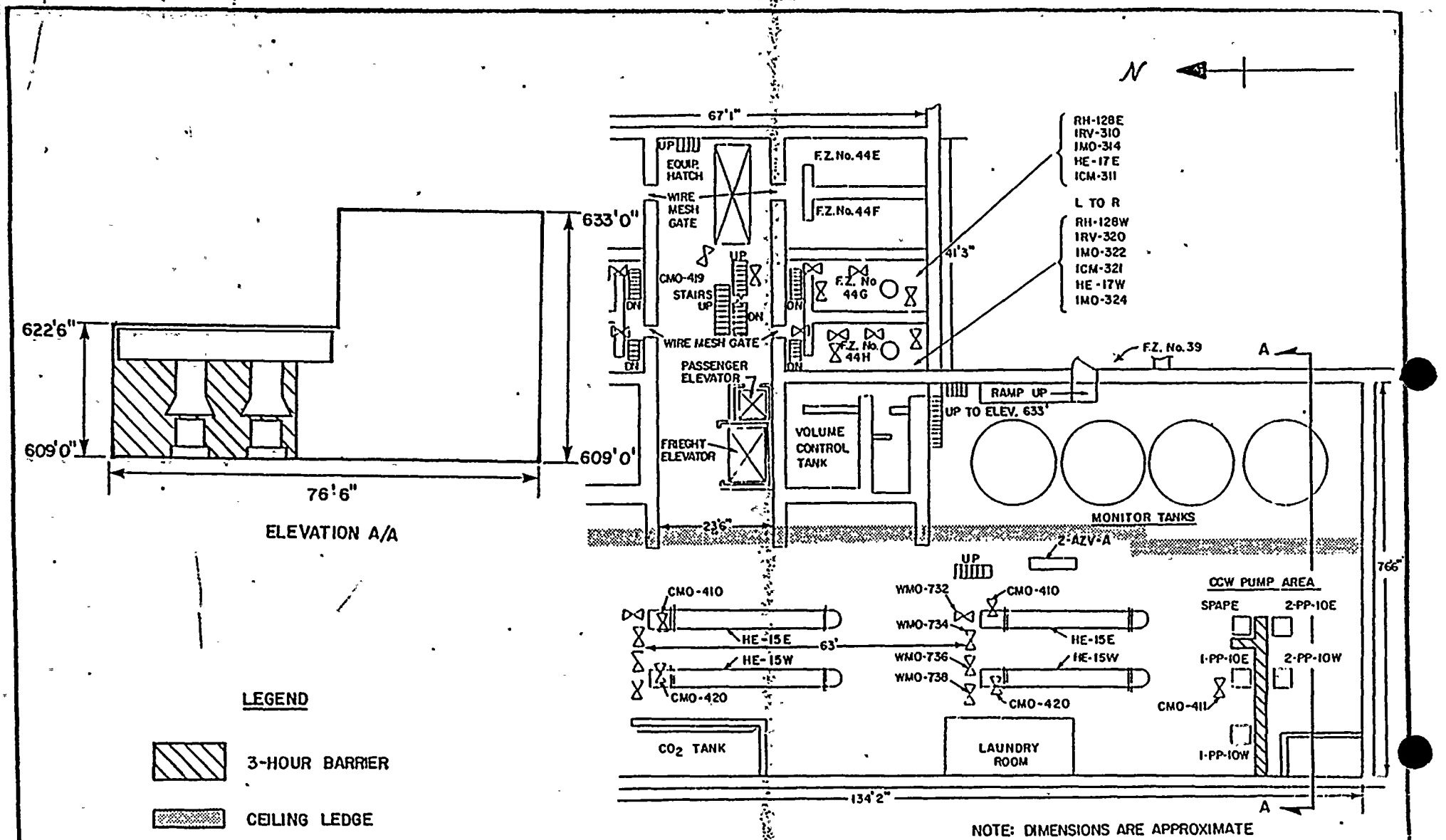


FIGURE 7.6 PLAN AND ELEVATION OF CEILING LEDGE IN FIRE ZONE 44S

8. SUPPLEMENTAL INFORMATION AND WITHDRAWAL OF EXEMPTION REQUESTS 7.13 THROUGH 7.20 FOR CONTAINMENT FIRE ZONES 66, 67, 74, 75, 120, 121, 122 and 123

In the previously submitted D.C. Cook Appendix R Report, Section 1 Table 1.1 Appendix R Summary Compliance Table identified the applicable Appendix R provisions for Fire Zones 66, 67, 74, 75, 120, 121, 122, and 123 as being Section III.G.3. Section 5 Table 5-1 identified Alternative Shutdown Method AS5 "Th and Tc Monitoring (LCI-3) only" as applying to these zones. Sections 7.13 through 7.20 of the Report requested exemptions from the fixed suppression system requirements of Section III.G.3 for these referenced containment fire zones. Sections 8.27, 8.28 and 8.29 proposed as modifications for these zones the installation of automatic detection systems per the fire detection requirements of Section III.G.3.

Based on further discussion with the NRC Staff and their clarifications of the III.G.2 and III.G.3 provisions, Indiana and Michigan Electric Company formally withdraws the exemption requests for these zones. It is Indiana and Michigan Electric Company's present understanding that the fire hazards analysis previously conducted and modifications proposed (with the exception of the detection system) will achieve for these zones compliance with the fire protection provisions of Appendix R Section III.G.2(d), and (f). The proposed modification to install automatic detection systems is therefore withdrawn since such

detection is not necessary to achieve adequate fire protection compliance with the provisions of Section III.G.2(d) or (f).

Indiana and Michigan Electric Company's previous classification of these fire zones as III.G.3 was based on the installation of additional Reactor Coolant System T-Hot and T-Cold instrument channels for each loop. Once installed and operable, these channels would be available to provide alternative shutdown indication for various fire areas outside containment. In addition, this instrumentation would be used to provide safe shutdown system information in the event of containment fires. The new instrumentation would require the installation of additional cable in containment which will be in compliance with the separation requirements of III.G.2(d) or (f).

Indiana and Michigan Electric Company previously identified these fire zones as III.G.3 based on the use of these new systems as alternative shutdown for various fire areas. Indiana and Michigan Electric Company's present interpretation of Appendix R Sections III.G.2 and III.G.3, based on staff clarifications, is that the installation of these new systems in accordance with the fire protection separation criteria of III.G.2(d) or (f) constitutes compliance and classification of these areas as III.G.2(d) or (f) . This classification recognizes that the installation of the new instrumentation provides, from a systems perspective, compliance with the provisions of Section III.G.3. Indiana and Michigan Electric Company notes that the design and separation

criteria and scope of modifications necessary to install the new instrumentation channels remains unchanged.

Indiana and Michigan Electric Company had also previously proposed the installation of an automatic detection system in these fire zones in order to achieve compliance with the fire detection requirement of Section III.G.3. As previously stated, this proposed modification is withdrawn since such fire detection is not required to achieve compliance with Section III.G.2(d) or (f). In addition, Indiana and Michigan Electric Company's Fire Hazards Analysis of these zones indicates that the installation of such detection systems would not substantially increase the fire protection provided in these zones. Existing thermistor detection for containment cable trays, reactor coolant pumps (RCP) and charcoal filter units provides adequate detection for the principal combustible sources in the zones. Manual preaction RCP suppression, automatic charcoal filter unit suppression systems and the seismically qualified RCP oil collection system minimize the probability of and ensure the rapid extinguishment of fires should they occur.