INDIANA & MICHIGAN ELECTRIC COMPANY

P.O. BOX 16631
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March 20, 1987
AEP:NRC:0692AZ

Donald C. Cook Nuclear Plant Unit Nos. 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
FINAL SUBMITTAL OF REVISION 1 TO
"SAFE SHUTDOWN CAPABILITY ASSESSMENT, PROPOSED
MODIFICATIONS, AND EVALUATIONS"

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

ATTN: Mr. Harold R. Denton

Dear Mr. Denton:

In our submittal AEP:NRC:0692AW, dated February 12, 1987, we provided a final draft of Revision 1 to the report entitled "Safe Shutdown Capability Assessment, Proposed Modifications, and Evaluations" (SSCA). We also indicated in that letter that we would submit a final, approved version of Revision 1 to the SSCA by March 20, 1987. Attachment 1 to this letter contains replacement pages for the draft Revision 1 to the SSCA provided by the February 12, 1987 letter (AEP:NRC:0692AW). Following insertion of these replacement pages, Revision 1 to the SSCA should be considered final.

In addition, based on a request made by Mr. D. L. Wigginton during a teleconference with him and Mr. A. Singh of the NRC staff held on February 24, 1987, Attachment 2 to this letter is a summary of the substantial differences between Revision 1 and Revision 0 to the SSCA, which was submitted in our letter AEP:NRC:0692E, dated March 31, 1983. (Supplements were also submitted in our letter AEP:NRC:0692H, dated August 22, 1983, and AEP:NRC:0692U, dated August 13, 1984.) The changes that are not addressed in this summary are corrections of typographical or grammatical errors or clarifications of information submitted in Revision 0. These changes are indicated by margin bars in Revision 1.

We understand that NRC Region III, Office of Inspection and Enforcement, is planning an audit of D. C. Cook Nuclear Plant Appendix R compliance this summer. We request that the basis of this audit be the final, approved version of Revision 1 to the SSCA Report attached to this letter, rather than our March 1983 submittal and later supplements.

As stated in our submittal AEP:NRC:0692AM, dated May 30, 1986, we are conducting a review of the proposal to place the entire Fire Protection Program into the upcoming FSAR update. The attached SSCA will eventually be a part of that program if we elect to implement the options in Generic Letter 86-10 to remove fire protection related items from our Technical Specifications. As a first step in this process it is our intent to publish the appropriate portions of the attached SSCA as part of the 1987 Cook Plant Updated FSAR. For this reason we would greatly appreciate your review of the SSCA by June 30, 1987. If it is not practical for this review and approval to be accomplished by June 30, 1987, our intentions are to proceed with the incorporation of the SSCA into the FSAR. We would then indicate in the FSAR that NRC approval of this document is pending.

This document has been prepared following Corporate procedures which incorporate a reasonable set of controls to insure its accuracy and completeness prior to signature by the undersigned.

Very truly yours,

M. P. Alexich
Vice President

Attachments

MPA/mi

cc: John E. Dolan
W. G. Smith, Jr. - Bridgman
R. C. Callen
G. Bruchmann
G. Charnoff
NRC Resident Inspector - Bridgman (w/attachments)
A. B. Davis - NRC Region III (w/attachments)

Attachment 1 to AEP:NRC:0692AZ

This attachment contains replacement pages for the draft SSCA, Revision 1 submitted with AEP:NRC:0692AW, dated February 12, 1987. Following insertion of these replacement pages in the draft, Revision 1 to the SSCA should be considered final.

TABLE 2-2

FIRE PROTECTION FEATURES
FOR FIRE AREAS*

FIRE AREA*	EXISTING DETECTION	EXISTING SUPPRESSION	MINIMUM RATING OF FIRE AREA BOUNDARIES	EQUIVALENT FIRE SEVERITY (MINUTES)	FIRE LOAD BTU/FT^2	AREA FT^2	FIGURE NUMBER
UNIT 1 QUADRANT 2 CABLE TUNNEL EL. 612'-0" 38	7 IONIZATION 4 INFRARED	AUTOMATIC CO_2	1-1/2 (SEE NOTE 40)	31.0	41,288	2,650	2.2, 2.3, 2.8, 2.9
UNIT 2 QUADRANT 2 CABLE TUNNEL EL. 612'-0" 39	7 IONIZATION 4 INFRARED	AUTOMATIC CO_2	1-1/2 (SEE NOTE 40)	23.0	30,622	2,667	2.2, 2.3, 2.8, 2.9
UNIT 1 4kV SWITCHGEAR ROOMS EL. 609'-0"							
40A	2 IONIZATION 3 INFRARED	AUTOMATIC CO_2	1-1/2 (SEE NOTE 14)	15.5	20,616	1,476	2.2, 2.8
40B	2 IONIZATION 3 INFRARED	AUTOMATIC CO_2		13.6	18,144	1,440	2.2, 2.8
			TOTAL	14.6	19,394	2,916	
UNIT 1 ENGINEERED SAFETY SYSTEMS AND MCC ROOM EL. 609'-0" 41	9 IONIZATION (3 UNDER FLOOR) 5 INFRARED (2 UNDER FLOOR)	AUTOMATIC CO_2	1-1/2 (SEE NOTE 15)	20.7	27,614	3,096	2.2, 2.4, 2.8, 2.9

* EACH FIRE AREA IS SEPARATED BY A SOLID HORIZONTAL LINE WITH SOME FIRE AREAS CONSISTING OF MULTIPLE FIRE ZONES.

TABLE 2-2

FIRE PROTECTION FEATURES
FOR FIRE AREAS*

FIRE AREA*	EXISTING DETECTION	EXISTING SUPPRESSION	MINIMUM RATING OF FIRE AREA BOUNDARIES	EQUIVALENT FIRE SEVERITY (MINUTES)	FIRE LOAD BTU/FT^2	AREA FT^2	FIGURE NUMBER
UNIT 1 EMERGENCY POWER SYSTEMS AREA EL. 609'-0"							
42A	2 IONIZATION 2 INFRARED	AUTOMATIC CO_2	1-1/2	3.7	5,080	1,209	2.2, 2.4, 2.8
42B	2 IONIZATION 1 INFRARED	AUTOMATIC CO_2		7.3	9,712	922	2.4, 2.8
42C	3 IONIZATION 2 INFRARED	AUTOMATIC CO_2		1.8	2,392	530	2.2, 2.4, 2.8
42D	1 IONIZATION	NONE		33.5	44,583	503	2.2, 2.4, 2.8
			TOTAL	9.2	12,258	3,164	
UNIT 2 ENGINEERED SAFETY SYSTEMS AND MCC ROOM EL. 609'-0"							
45	9 IONIZATION (3 UNDER FLOOR) 5 INFRARED (2 UNDER FLOOR)	AUTOMATIC CO_2	1-1/2 (SEE NOTE 16)	17.6	23,443	2,884	2.2, 2.5.2.8,2.9

* EACH FIRE AREA IS SEPARATED BY A SOLID HORIZONTAL LINE WITH SOME FIRE AREAS CONSISTING OF MULTIPLE FIRE ZONES.

TABLE 2-2

FIRE PROTECTION FEATURES
FOR FIRE AREAS*

FIRE AREA*	EXISTING DETECTION	EXISTING SUPPRESSION	MINIMUM RATING OF FIRE AREA BOUNDARIES	EQUIVALENT FIRE SEVERITY (MINUTES)	FIRE LOAD BTU/FT^2	AREA FT^2	FIGURE NUMBER
UNIT 2 EMERGENCY POWER SYSTEMS AREA EL. 609'-0"							
46A	2 IONIZATION 2 INFRARED	AUTOMATIC CO_2	1-1/2	3.5	4,793	1,209	2.2, 2.6, 2.8
46B	2 IONIZATION 1 INFRARED	AUTOMATIC CO_2		8.3	11,150	922	2.5, 2.8
46C	3 IONIZATION 2 INFRARED	AUTOMATIC CO_2		4.0	5,502	530	2.2, 2.5, 2.8
46D	2 IONIZATION**	NONE		30.0	39,973	503	2.2, 2.5, 2.8
			TOTAL	9.2	12,356	3,164	
UNIT 2 4kV SWITCHGEAR ROOMS EL. 609'-0"							
47A	2 IONIZATION 3 INFRARED	AUTOMATIC CO_2	1-1/2 (SEE NOTE 17)	14.4	19,158	1,476	2.2, 2.8
47B	2 IONIZATION 3 INFRARED	AUTOMATIC CO_2		12.9	17,136	1,440	2.2, 2.8
			TOTAL	13.6	18,159	2,916	

* EACH FIRE AREA IS SEPARATED BY A SOLID HORIZONTAL LINE WITH SOME FIRE AREAS CONSISTING OF MULTIPLE FIRE ZONES.

** A second ionization detector was added after the 1986 Unit 2 refueling outage.

extensive fire protection modifications are being proposed in the Control Rooms and in the area of the component cooling water pumps. The following sections provide the details of the safe shutdown systems and fire protection analyses performed; these sections also demonstrate that strict compliance with Section III.G of Appendix R would not enhance fire protection safety above that which is provided by the proposed commitments.

The following exemption requests are contained in this section:

Subsection	Description	Page
7.2	Automatic suppression exemption request for Fire Zones 1, 1A through 1H, 136, 137, 138A through 138C, RHR/CTS pump area, Auxiliary Building, el 573 ft	7-7
7.3	Fixed suppression exemption request for Fire Area 14, Transformer Room, el 591 ft, Unit 1	7-19
7.4	Fixed suppression exemption request for Fire Area 20, Transformer Room, el 591 ft, Unit 2	7-24
7.5	Fixed suppression exemption request for Fire Zones 29A,B,E, Unit 1 ESW pumps and MCCs	7-29
7.6	Fixed suppression exemption request for Fire Zones 29C,D,F, Unit 2 ESW pumps and MCCs	7-36
7.7	Automatic suppression exemption request for Fire Zone 29G, Screenhouse Auxiliary MCC Room, el 575 ft, both units	7-43

7.8	Fixed suppression exemption Fire Zones 33, 33A, 33B, and 105, Unit 1 East Main Steam Valve Enclosure and Contractor Access Control Building	7-52
7.9	Fixed suppression exemption Fire Zones 34, 34A, 34B, Unit 2 East Main Steam Valve Enclosure	7-58
7.10	One-hour-rated enclosure exemption request for Fire Zone 44S, Auxiliary Building South, el 609 ft, both units	7-64
7.11	Fixed suppression exemption request for Fire Area 53, Unit 1 Control Room	7-75
7.12	Fixed suppression exemption request for Fire Area 54, Unit 2 Control Room	7-82
7.13	Fire-rated damper exemption request for Auxiliary Building HVAC Duct Penetrations for Fire Zones 1, 6N, 6S, 44N, 44S, 49, 50, 52 and 69	7-89
7.14	Fire-rated seal exemption request for Containment Building seismic gaps for Fire Zones 7, 8, 9, 10, 11, 12, 22, 23, 24, 25, 26, 27, 33B, 34B, 38, 39, 49, 50, 69, 108 and 109	7-107

B. Safe Shutdown Equipment

MPP-210, 211, 212, 240, 241, 242 - SG Pressure Transmitters
MRV-213, 243 - SG Power Operated Relief Valves
SV-1, 2, 3, - Safety Valves
FMO-211, 212, 241, 242 - SG Supply MOVs
LSI-1 - Local Shutdown Station

C. Fire Hazards

1. Type of combustibles in area -

Cable insulation
Charcoal
Cellulosics
Class B solvents
Plastics
Rubber

2. Total fixed combustible loading considered for the purpose of the analysis - 27,000 Btu/ft^2

3. Actual quantity of fixed combustibles -

Cable - 25,446,125 Btu

Charcoal - 2,145,000 Btu

Cellulosics - 31,019,871 Btu

Class B solvents - 3,102,000 Btu

Plastics - 18,486,386 Btu

Rubber - 3,259,875 Btu

TOTAL - 11,533 Btu/ft^2

D. Existing Fire Protection

1. Fire Detection Systems -

Thermistor heat detection for the charcoal filter unit

2. Fire Extinguishing Systems -

Manual deluge water spray for the charcoal filter unit
Manual hose stations and portable extinguishers (ABC, Purple-K and CO_2) available
Automatic wet pipe sprinklers in Fire Zone 105

7.9 Fire Area 34, 34A, 34B, Unit 2 East Main Steam Valve Enclosure

EXEMPTION REQUEST

Per the provisions of 10 CFR 50.48(c)(6) and 10 CFR 50.12 Indiana and Michigan Electric Company requests exemptions from the specific requirements of Appendix R, Section III.G.3, i.e., a fixed fire suppression system shall be installed in the fire area.

7.9.1 Fire Area Description

Fire Area 34, 34A, 34B is located immediately outside the Containment Building of Unit 2 at an elevation of 612 ft. This fire area is the Unit 2 counterpart to Fire Area 33, 33A, 33B. The area includes the south area around containment that contains main steam lines and also includes the nonessential service water valve gallery on the west side directly opposite the East Main Steam Valve Enclosure. Pertinent dimensional data is contained in Table 7.9-1, Fire Area 34, 34A, 34B. Evaluation Parameters Summary and Figure 7.9.

7.9.2 Safe Shutdown Equipment

Fire Area 34, 34A, 34B contains all main steam pressure transmitters for steam generators 1 and 4, the electro-pneumatic transmitters for all four Unit 2 generator power operated relief valves, steam generators 1 and 4 auxiliary feedwater inlet valves (FMO-211, 212, 241, 242), the local shutdown indication panel (LSI-1) and the power operated relief valves and safety for steam generators 1 and 4. The main steam valves for steam generators 1 and 4 are also in the area.

Fire Protection Equipment

Fire Zones 79 and 85 are protected by automatic detection and wet pipe sprinklers systems. Automatic wet pipe sprinkler systems are provided in Fire Zones 77 through 94 and Fire Zones 96 through 99. Automatic thermistor, detection and CO_2 suppression are provided in Fire Zones 83, 88, 95 and 100, with dry pilot preaction sprinkler systems provided in Fire Zones 95 and 100. The turbines in Fire Zones 129 and 130 are provided with automatic thermistor detection and manual closed head water spray suppression under the appearance lagging, and dry chemical suppression for the turbine bearings. Fire Zone 124, 125, 126, and 127 contain various levels of automatic detection and suppression capabilities.

Fire Hazards Analysis

In order to resolve both the inconsistencies between previously identified fire areas and the impact of the NFZ's, an Appendix R safe shutdown analysis has been performed with respect to combining these locations into a single fire area. The results are the following:

(a) When Unit 1 Main Steam Pipe Tunnel Area (Fire Zones 108 and 110) is combined with Turbine Building Area, Unit 1 can be safely shut down by using Unit 2 East Auxiliary Feedwater Pump. This alternate shutdown action will be required when a fire propagates between Fire Zones 108 and 79. For a fire to propagate between these fire zones, the fire would have to be of sufficient duration and intensity to engulf Fire Zones 110 and 80 (Fire Zone 80 is protected by an automatic sprinkler system).

(b) When Unit 2 Main Steam Pipe Tunnel Area (Fire Zones 109 and 111) is combined with Turbine Building Area, Unit 2 can be safely shut down by using Unit 1 East Auxiliary Feedwater Pump. This alternate shutdown action will be required when a fire propagates between Fire Zones 109 and 85. For a fire to propagate between these fire zones, the fire would have to be of sufficient duration and intensity to engulf Fire Zones 111 and 84 (Fire Zone 84 is protected by an automatic sprinkler system).

(c) When both Unit 1 and Unit 2 Main Steam Pipe Tunnel areas are combined together with the Turbine Building into one fire area, safe shutdown is not impacted for either unit. In the highly unlikely event of a fire involving all of the above mentioned fire zones, both units can be safely shut down using opposite units Auxiliary Feedwater Pumps. For this fire scenario, one train of the other safe shutdown systems will be available for each unit. Required manual actions are (1) opening of the AFW Cross-Connect Valves and (2) isolation of the steam supply paths to Unit 1 Turbine-Driven AFW Pump. There would be no requirement for one or three hour barriers, additional detection or suppression systems, or exemption requests in order to meet the criteria of Appendix R to 10 CFR 50.

As such, the following fire zones are now considered to be part of a single fire area: 2, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 108, 109, 110, 111, 112, 113, 114, 115, 124, 125, 126, 127, 128, 129, 130 and 131.

Conclusion

Based on the previous evaluation, the ten fire areas in the Unit 1 and Unit 2 Turbine Buildings, the entirety of the Service/Office Building, the main turbine deck, and the Unit 1 and Unit 2 main steam pipe tunnels can be combined into a single fire area. In addition, this evaluation does not adversely impact on other evaluations or exemption requests contained in this report. The bases for this conclusion are summarized as follows:

591 ft elevation. The trench opens directly to Fire Area 116 along the north wall of Fire Area 12. A distance in excess of 250 ft separates the openings from Fire Area 116 to Fire Area 12 and Fire Zone 33.

Safe Shutdown Equipment

Fire Area 116 contains no safe shutdown equipment. Fire Zone 33 contains the following valves and associated cabling for Steam Generators 1 and 4:

- Safety valves
- AFW feed regulation valves
- Pressure transmitters
- MSIVs
- PORVs
- LSI panel

Fire Zone 12 contains the following valves and associated cabling for Steam Generators 2 and 3:

- AFW feed regulation valves
- Containment sump to RHR pump suction valve
- LSI panel

Should a fire involve both Fire Zone 33 and Fire Area 12, the potential exists to lose power to control the position of the AFW feed regulation valves for all four steam generators. However, the valves are normally open. Should fire damage the cables to these valves, they fail as is, which is in the open position.

Fire Protection Equipment

Automatic suppression and automatic detection are not provided in Fire Area 116 or Fire Area 12. Automatic detection was proposed for the fire area containing Fire Zone 33 in the March 1983 Appendix R Submittal to support the fixed area suppression exemption request for alternate shutdown. Manual suppression capabilities in the form of portable extinguishers are available for use in these locations with hose station also available for use in Fire Zones 33A, 33B and Fire Area 12. Two hose stations are installed in Fire Area 12.

Fire Hazards Analysis

Fire Area 116 has a fixed combustible loading and resulting equivalent fire severity of under 13,000 Btu/ft^2 and 10 minutes respectively. (The actual combustible loading and equivalent fire severity existing at this time are 437 Btu/ft^2 and 0.2 minutes, respectively.) Transient combustibles are not postulated in this area as it is a radiation area with access controlled by Health Physics, and access to the area is via ladders. Maintenance activities are minimal in this area, and it is not a normal access route to any other plant locations. Reasonable assurance is provided that a fire in Fire Area 116 would not propagate out into either Fire Zone 33 or Fire Area 12. Therefore, the two manway openings do not adversely impact on the capabilities of the boundaries of Fire Area 116.

Fire Zone 22 contains the valves and associated cabling for steam generators 2 and 3:

- o AFW feed regulation valves
- o Containment sump to RHR pump suction valve
- o LSI panel

Should a fire involve both Fire Zone 34 and Fire Area 22, the potential exists to lose power to control the position of the AFW feed regulation valves for all four steam generators. However, the valves are normally open. Should fire damage the cables to these valves, they fail as is, which is in the open position.

Fire Protection Equipment

Automatic suppression and automatic detection are not provided in Fire Area 117 or Fire Area 22. Automatic detection was proposed for the fire area containing Fire Zone 34 in the March 1983 Appendix R submittal to support the fixed area suppression exemption request for alternate shutdown. Manual suppression capabilities in the form of portable extinguishers are available for use in these locations, with hose stations also available for use in Fire Zone 34A, 34B and Fire Area 22. Two hose stations are installed in Fire Area 22.

Fire Hazards Analysis

Fire Area 117 has a fixed combustible loading of under 13,000 Btu/ft^2 with a resultant equivalent fire severity of less than 10 minutes. (The actual combustible loading and equivalent

fire severity existing at this time are 515 Btu/ft^2 and 0.4 minutes, respectively.) Transient combustible are not postulated in this area as it is a radiation area with access controlled by Health Physics, and access to the area is via ladders. Maintenance activities are minimal in this area, and it is not a normal access route to any other plant locations. Reasonable assurance is provided that a fire in Fire Area 117 would not propagate out into either Fire Zone 34 or Fire Area 22. Therefore, the two manway openings do not adversely impact on the capabilities of the boundaries of Fire Area 117.

Fire Area 22 has a combustible loading of under 13,000 Btu/ft^2 for an equivalent fire severity of under 10 minutes. (The actual combustible loading and equivalent fire severity existing at this time are 1,022 Btu/ft^2 and 0.6 minutes respectively.) Maintenance activities are minimal in this area, and it is not a normal travel route to any other plant locations. As such, minimal transient combustibles are postulated in Fire Area 22. Should a fire occur in this area, the products of combustion would tend to rise to ceiling level. As the manway opening to Fire Area 117 is accessed via a ladder to a trench below the normal floor level of Fire Area 22, reasonable assurance is provided that a fire in Fire Area 22 would not

Fire Protection Equipment

Fire Areas 106 and 107 are each provided with an automatic heat detector. Automatic detection or suppression capability is not provided in Fire Areas 31, 35, 106, 107, and 146.

Fire Zones 32, 48, and 69 are provided with ionization smoke detectors and partial detection coverage is provided in Fire Zone 3. Dry pilot preaction suppression systems are provided in Fire Zone 32 and partial coverage is provided in Fire Zone 3. In addition, Fire Zone 69 is provided with an automatic thermistor detection system and manual deluge system for the HVAC charcoal filter units. Fire Zone 49, 50, 51, and 52 are provided with automatic fire protection features, specifically area ionization smoke detection and each charcoal filter unit is provided with a manual deluge system with an automatic thermistor detection system. An automatic dry pilot preaction suppression system is provided in the normally accessible area of Fire Zones 51 and 52.

Fire Hazards Analysis

The safe shutdown compliance method for the combined fire areas will not change from that identified in the 1983 Appendix R submittal for the fire area containing Fire Zones 3, 31, 32, 35, 36, 48, 49, 50, 51, 52, 69, 106, 107 and 146 since the safe shutdown cables in Fire Areas 106 and 107 also are contained in Fire Zones 50 and 52.

Conclusion

Based on the results of the previous evaluation, Fire Areas 31, 35, 106, 107, and 146 can be combined with Fire Zones 3, 32, 36, 48, 49, 50, 51, 52, and 69 to form a larger fire area. This evaluation does not adversely impact on other evaluations or exemption requests contained in this report. The basis for this conclusion is that only Fire Areas 106 and 107 contain safe shutdown cables and these cables are also located in the fire area defined by Fire Zones 3, 32, 36, 48, 49, 50, 51, 52 and 69.

(4) Steam generators 2 and 3 safety relief valves; and

(5) Unit 1 turbine driven AFW pump steam supply isolation valves.

Fire Zone 109 contains the following safe shutdown equipment and their associated cables:

(1) Unit 2 steam generators 2 and 3 PORVs;

(2) Pressure transmitters for steam generators 2 and 3;

(3) Steam generators 2 and 3 main steam stop valves (MSSVs);

(4) Steam generators 2 and 3 safety relief valves; and

(5) Unit 2 turbine driven AFW pump steam supply isolation valves.

Redundant safe shutdown capability is available for Fire Zones 108, 109 and 69 outside of the fire area in which they are located. Therefore, fire could involve Fire Zones 69, 108, and 109 without impacting on redundant safe shutdown capability.

Fire Protection Equipment

Fire Zone 69 is provided with automatic detection capability and manual water spray suppression for the AHVs in the zone. Neither Fire Zone 108 or 109 contain automatic detection or suppression capability.

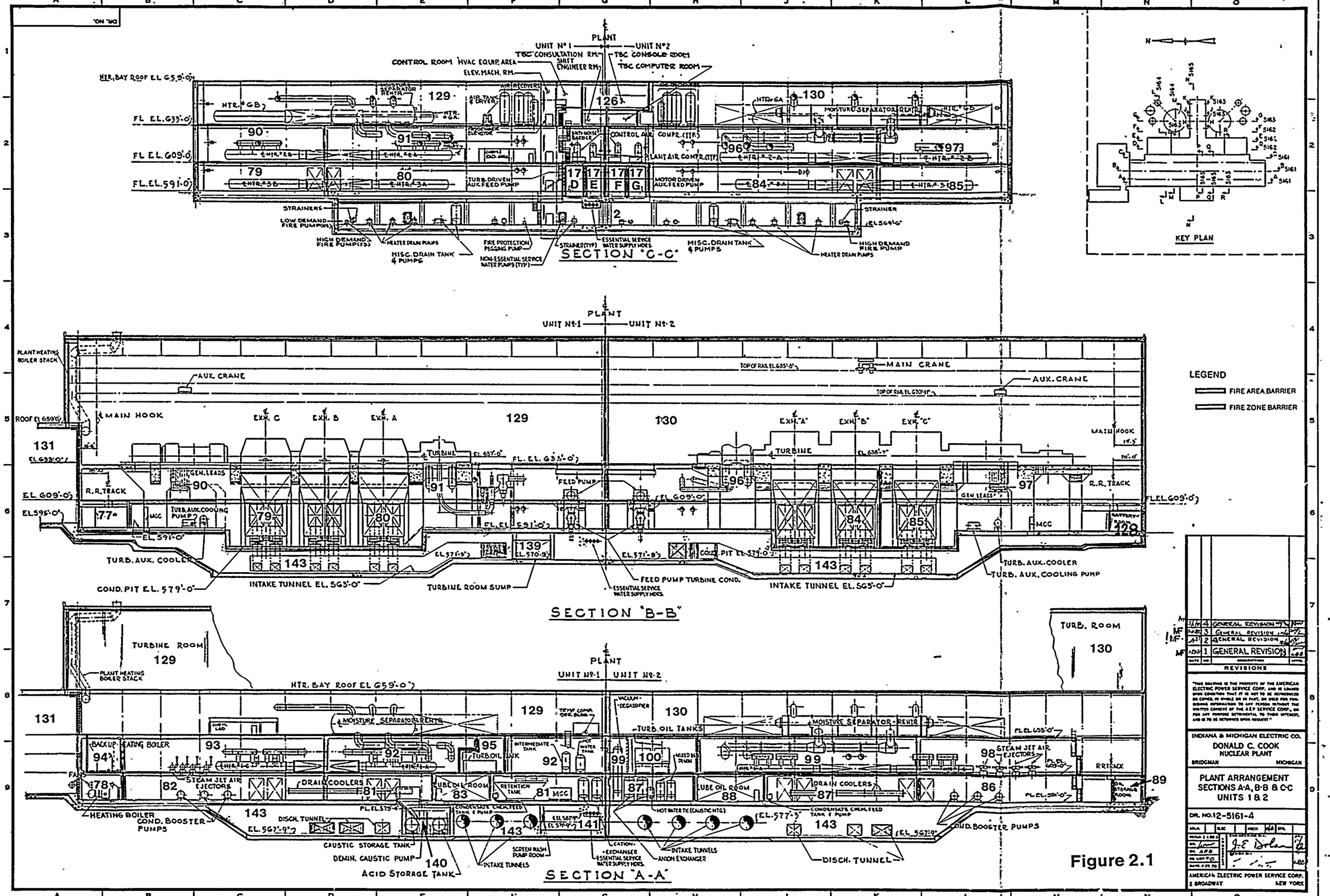
Fire Hazards Analysis

Fire Zones 108 and 109 have a combustible loading of under 27,000 and 33,000 Btu/ft^2 for an equivalent fire severity of under 20 and 25 minutes, respectively. (The actual combustible loading and equivalent fire severity existing at this time are 10,187 Btu/ft^2 and 7.6 minutes for Fire Zone 108, and 15,872

Btu/ft^2 and 11.8 minutes for Fire Zone 109, respectively.) Should transient combustibles be brought into the zone, the combustible loading could increase to 40,000 Btu/ft^2 for Fire Zone 108, and 47,000 Btu/ft^2 for Fire Zone 109. This could result in an equivalent fire severity of 30 and 35 minutes, respectively.

Fire Zone 69 has a combustible loading of under 20,000 Btu/ft^2 for an equivalent fire severity of under 15 minutes. (The actual combustible loading and equivalent fire severity existing at this time is less than 2998 Btu/ft^2 and 2.2 minutes, respectively). The area in which this zone is located has an average combustible loading of less than 33,000 Btu/ft^2 for an equivalent fire severity of 25 minutes. (The actual combustible loading and equivalent fire severity existing at this time are 17,283 Btu/ft^2 and 12.9 minutes, respectively).

The seismic gap exemption request contained in Section 7.14 of this report demonstrated that fire could involve Fire Zones 49 and 108 or Fire Zones 50 and 109 without impacting on redundant safe shutdown capability. The evaluation contained in Section 9.9 of this report combined Fire Zones 49, 50, 51, and 52 into a larger fire area that included Fire Zones 3, 32, 36, 48, and 69. The combination of the seismic gap exemption request and the evaluation contained in Section 9.9 of this report show that a fire originating from Fire Zones 49, 50, 108, or 109 will not jeopardize redundant safe shutdown capability. This is in part due to the modifications that were completed in Fire Zones 51 and



NO.	BY	DESCRIPTION	APPD.
4		GENERAL REVISION	
3		GENERAL REVISION	
2		GENERAL REVISION	
1		GENERAL REVISION	

REVISIONS

INDIANA & MICHIGAN ELECTRIC CO.
DONALD C. COOK NUCLEAR PLANT
BRIDGMAN MICHIGAN

PLANT ARRANGEMENT SECTIONS A-A, B-B & C-C UNITS 1 & 2

DR. NO. 12-5161-4

AMERICAN ELECTRIC POWER SERVICE CORP.
2 BROADWAY NEW YORK

Figure 2.1

N

EL 595'-0'

FILE ROOM, CHART AND RECORDS (3) ⊘ AND
SECURITY EQUIPMENT ROOM (2) ⊘ AND
REMAINING FLOOR AREAS (10) ⊘
REMAINING FLOOR AREAS (3) ⊗
SERVICE BLDG. ||||||
OFFICE BLDG. GAS & BOTTLE STORAGE, AND ROADWAY OVERHANG - DELUGE SYSTEMS
OFFICE BLDG. MECH. EQUIP. ROOMS ||||||

LEGEND
80-FIRE ZONE NUMBER
⊘ - IONIZATION DETECTOR
- INFRARED DETECTOR
- THERMISTOR DETECTOR
⊗ - HEAT DETECTOR
- WET PIPE SUPPRESSION SYSTEM
- HALON SUPPRESSION SYSTEM
- CO2 SUPPRESSION SYSTEM
- PREACTION SPRINKLER SUPPRESSION SYSTEM
- STAIRWAY SUPPRESSION SYSTEM

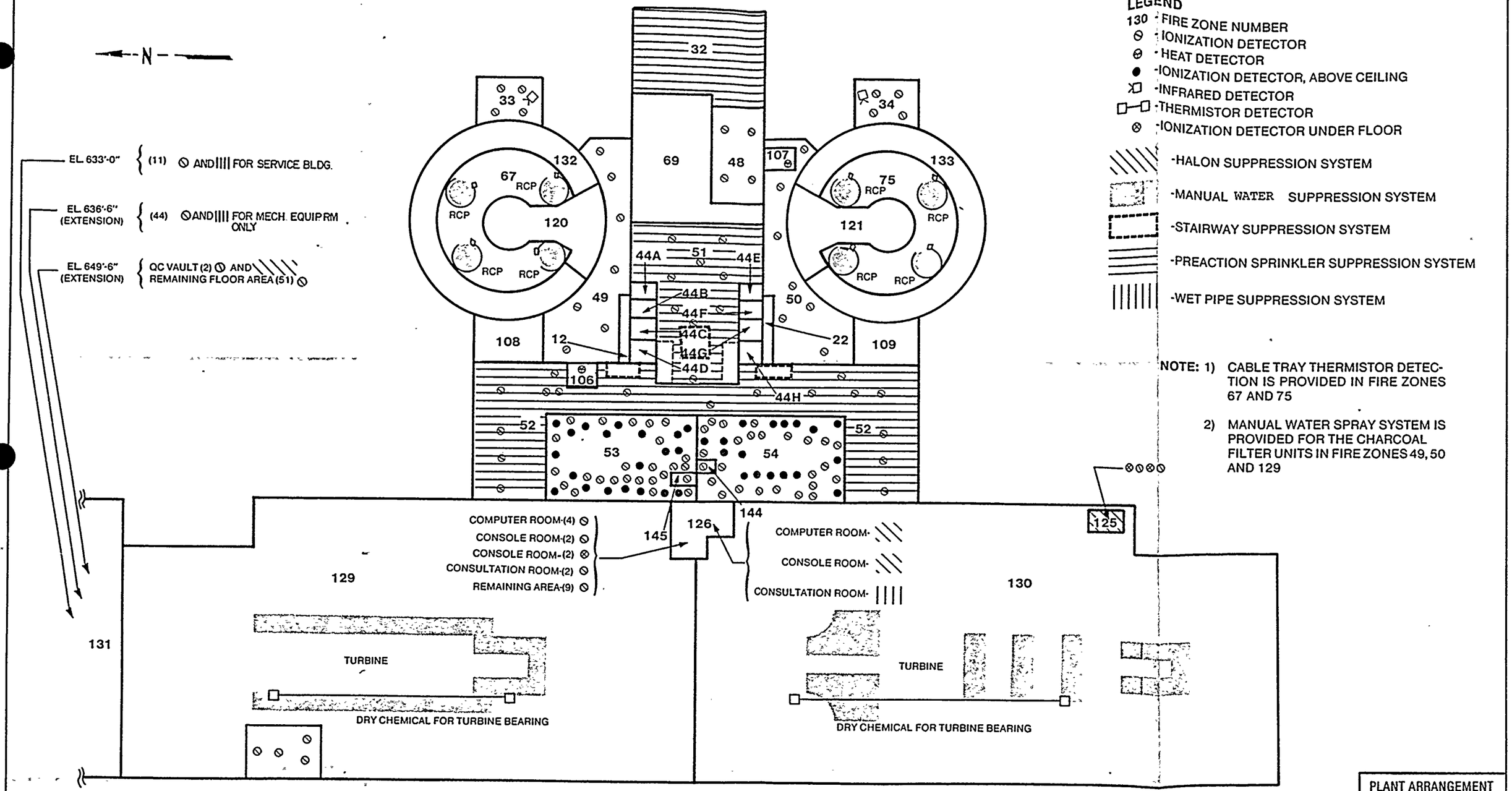
NOTE: 1) CABLE TRAY THERMISTOR DETECTION IS PROVIDED IN FIRE ZONES 66, 67, 74, 75, 103 AND 104

2) MANUAL WATER SPRAY SYSTEM IS PROVIDED FOR THE CHARCOAL FILTER UNITS IN FIRE ZONE 5

PLANT ARRANGEMENT
BASEMENT PLAN
EL 591' & 587'
UNITS 1 & 2

FIGURE 3-2

DETECTION AND SUPPRESSION SYSTEMS



LEGEND

130 - FIRE ZONE NUMBER
⊘ - IONIZATION DETECTOR
⊖ - HEAT DETECTOR
● - IONIZATION DETECTOR, ABOVE CEILING
⊠ - INFRARED DETECTOR
⊓—⊓ - THERMISTOR DETECTOR
⊗ - IONIZATION DETECTOR UNDER FLOOR

- HALON SUPPRESSION SYSTEM
- MANUAL WATER SUPPRESSION SYSTEM
- STAIRWAY SUPPRESSION SYSTEM
- PREACTION SPRINKLER SUPPRESSION SYSTEM
- WET PIPE SUPPRESSION SYSTEM

NOTE: 1) CABLE TRAY THERMISTOR DETECTION IS PROVIDED IN FIRE ZONES 67 AND 75

2) MANUAL WATER SPRAY SYSTEM IS PROVIDED FOR THE CHARCOAL FILTER UNITS IN FIRE ZONES 49, 50 AND 129

PLANT ARRANGEMENT
TURBINE BUILDING
MAIN FLOOR
EL 633'
UNITS 1 & 2

DETECTION AND SUPPRESSION SYSTEMS

FIGURE 3-5