



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

AUG 6 1984

Docket No.: 50-341

APPLICANT: Detroit Edison Company

FACILITY: Fermi-2

SUBJECT: SUMMARY OF MEETING ON JULY 11, 1984, REGARDING FIRE
PROTECTION MEASURES FOR THE FERMI-2 FACILITY

Introduction

Members of the NRC staff, including NRR and Region III personnel, met with representatives of the Detroit Edison Company in Bethesda, Maryland, on July 11, 1984, to discuss the acceptability of the fire protection measures of the as-built Fermi-2 facility. A list of those attending is contained in Enclosure 1. Copies of the slides presented at this meeting are contained in Enclosure 2.

Summary

The meeting was requested by DECo in order to respond to the staff's concerns raised during the previous meeting held on June 5, 1984, regarding fire protection measures at the Fermi-2 facility. (The summary for this meeting was issued on July 10, 1984.) DECo first presented a history of fire protection as it evolved on the Fermi-2 facility. (Pages 2 through 8 of Enclosure 2.) DECo then stated it would concentrate its discussion on its proposed resolution of our concerns regarding fire protection in the control room and relay room.

With respect to the relay room, the applicant discussed the measures and procedures already provided for fire protection (Page 9 of Enclosure 2.) The applicant then stated its position that with these existing fire protection measures and procedures plus the enhanced halon fire suppression system it was proposing (Page 10, Enclosure 2), it had provided "...a good basis for fire protection." DECo's justification for this position was then discussed in detail. (Pages 11 and 12, Enclosure 2.)

In response to this proposal for an enhanced, automatic halon fire suppression system and DECo's statement of its position on the acceptability of fire protection for the relay room, the staff stated that it disagreed with DECo's conclusion. The staff's disagreement was based on the following considerations:

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Following this discussion, DECo addressed the staff's concerns about fire protection measures in the area of the d-c motor control centers (DC MCC). Resolution of this issue was not achieved at the meeting. The staff agreed to conduct an expedited review of DECo's proposal for the DC MCC area when it is submitted on the docket. In this regard, the staff stated that it would only review that information which is formally docketed.

With regard to the adequacy of the one-hour fire wrap material for the safety-related cable trays, DECo indicated that it did not believe the test data available on the fire wrap material properly represented the capability of the fire wrap material presently being installed to protect the Fermi-2 safety-related electrical cables. The staff expressed its concern that the fire wrap material is not a qualified one-hour fire barrier and did not adequately protect some of the cables which were tested. Specifically, it appears that some of the test cables exhibited extreme damage during a test. The staff stated its position that any test data used to qualify fire wrap material should be obtained using appropriate test procedures in conjunction with samples of the actual safety-related cables installed at the Fermi-2 facility. DECo indicated that it understood the staff's position on this matter and would reevaluate the test data which would be submitted to qualify the fire wrap material.

LSI
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Enclosures:
As stated

cc: See next page

~~CONCURRENCES~~

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1. The proposed enhanced halon fire suppression is clearly better but does not provide the degree of reliability the staff seeks.
2. While the halon system will suppress a relay room fire, it will not remove the heat associated with a postulated fire. Accordingly, spraying water on the intervening combustibles may be required in the event of a relay room fire, thereby posing a threat to electrical components in the nearby safety-related panels. These intervening combustibles are the balance-of-plant (BQP) cables which in the Fermi-2 facility are placed between the redundant safety-related electrical divisions required to achieve a safe cold shutdown of the plant.
3. The temperature rise resulting from a postulated fire in the intervening combustibles could adversely affect the electrical components in the redundant electrical divisions.
4. The proposed enhanced halon system did not address the staff's concerns regarding DECo's approach to installing fire wrap on the cables in the relay room.

The most important consideration was that the staff did not believe that the Fermi-2 facility was built in compliance with the required fire protection procedures and measures. (Refer to Appendix E to 10 CFR Part 50 and Appendix A to BTP APCS 9.5-1). In light of these considerations, the staff stated its position that the proposed enhancement of the halon system did not adequately address its concerns regarding the relay room. The staff urged DECo to propose another approach to resolve its concerns about fire protection measures for the relay room.

In response, DECo then proposed an alternative shutdown capability for an uncontrolled fire in either the relay room or in the control room. (Page 13 of Enclosure 2.) The staff expressed its confidence that the conceptual approach proposed by DECo, while preliminary in character, could be implemented in an acceptable manner based on the staff's experience with this approach on other nuclear power plants. The staff also agreed that this concept of an alternate shutdown capability would satisfactorily address its concerns regarding fire protection measures in the control room.

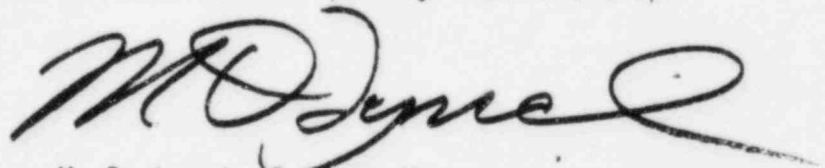
The staff stated and DECo understood that DECo would be required to submit a request for an exemption from General Design Criteria 3 (Fire Protection) of Appendix A to 10 CFR Part 50. This exemption would be required until the alternate shutdown capability proposed by DECo is reviewed and accepted by the staff and then implemented. It is anticipated that full implementation may not be achieved until the first outage for refueling which may be about late 1986. DECo understood that it must propose appropriate compensatory measures to support its exemption request. The staff stated that this exemption request will be evaluated by the Chemical Engineering Branch while the proposed alternate shutdown capability will be reviewed by the Auxiliary Systems Branch. The staff requested DECo to discuss this proposal with ASB at a future meeting so that the review of this matter could be expedited. In this regard, the staff requested DECo to expedite all phases of the fire protection measures at the Fermi-2 facility so that fire protection does not become an item pacing the operating license review.

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ENCLOSURE 1

ATTENDANCE LIST

July 11, 1984

NRC

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Paul Byron
Charles Ramsey
Robert L. Ferguson
R. Eberly
W. Johnston
Victor Benaroya
Dennis Kubicki
W. S. Little
Leon E. Whitney

DECo

O. Keener Earle
Wayne Jens
Willard Holland
William Fahrner
Roger Olson
Ev Lulis
Frank Suctkovich
Bill Colbert
L. E. Schuerman

Detroit Edison

Richard C. Anderson

Impell Corporation

Allen J. Thiel

Professional Loss Control, Inc.

K. W. Dungan

Bechtel Power

Bob Renuart

Int. Energy Assoc.

Steven Kurclziel

ENCLOSURE 2

AGENDA

- I. INTRODUCTION
- II. BRIEF FIRE PROTECTION HISTORY ON FERMI 2
- III. FERMI 2 POSITION ON RELAY/CONTROL ROOMS
- IV. DISCUSSION AND ISSUE RESOLUTION
- V. DC MCC'S
- VI. CONCLUSIONS

ORIGINAL DESIGN BASIS
FIRE PROTECTION AT FERMI 2

- Detroit Edison Corporate Policies on Fire Protection
- General Design Criteria #3
- Recommendations of Insurance Underwriter
- PSAR Commitments

BROWN'S FERRY FIRE - MARCH 22, 1975

- ° Edison formed preliminary review group
 - ° Issued operating improvements
- ° Edison formed a Fire Protection Task Group
 - ° Issued fire protection recommendations
- ° Fermi 2 reviewed and upgraded to BTP APCS 9.5-1 Appendix A

NRR FIRE PROTECTION AUDIT - MAY 11-15, 1981

- NRR Team reviewed all areas of the plant
- The equipment, trays, and some of the conduits were installed.
- A draft of response to 021.32 was presented
 - Corrective measures indicated.
- Agreement was reached with NRR staff for all areas except:
 - Control Room
 - Cable Spreading Room

APPENDIX R PUBLISHED - NOVEMBER 19, 1980

- ° Edison received question 021.32 - March, 1981
- ° To develop the response to 021.32,
 - °The computerized cable routing program was used to identify shutdown circuits.
 - °Tray layout drawings were used to identify interaction areas
 - °One division must survive for shutdown

CLOSURE OF REMAINING PROBLEMS

- Meeting of May 27, 1981
- Simulated control panel fire test - June 24, 1981
- Telephone conversations - September 16, 17, 1981
- Evaluation Report, November, 1981
- Meeting of December 4, 1981
- SER - Supplement 2 - January, 1982

POST SER DEVELOPMENTS

- EF2 - 61,562, Dated - March 1, 1983
- June, 1983, meeting with NRR.
- Generic Letter 83-33
- April 3, 1984 meeting with NRR
- May 14-18, 1984 - Region III Inspection
 - Three problem areas

CONCLUSION

- ° Since the beginning of the Fermi 2 design, Edison has had our corporate Fire Protection Engineers involved.
- ° Edison reviewed the plant and made changes after Brown's Ferry fire.
- ° Based on the SSER, we proceeded to implement more than \$10 million of modifications.

RELAY ROOM

Appendix R - III G, Requires that one shutdown train survives a postulated fire

Appendix A to BTP 9.5.1 requires "defense in depth" for fire protection.

For the Relay Room, we have provided the following:

IEEE 383 cables (Hypalon jacketed)

Halon 1301 suppression system - automatic & manual.

Class A, cross zoned ionization smoke detection system.

Standpipes & hoses in areas.

Manual CO₂ hand hose reels for internal panel fires.

Trained fire brigade.

Administrative procedures for controlling combustibles and ignition sources.

These fire protection features when combined with the following relay room features provide a good basis for fire protection.

PROPOSE TO UPGRADE THE PRESENT AUTOMATIC SUPPRESSION SYSTEM TO FUNCTION WITH A FAILURE OF A SINGLE ACTIVE COMPONENT.

THEREFORE, A FIRE WHICH COULD JEOPARDIZE BOTH SHUTDOWN TRAINS WOULD BE DETECTED AND EXTINGUISHED AUTOMATICALLY DURING THE FIRE'S INCIPIENT STAGE AND BEFORE BOTH DIVISIONS ARE AFFECTED.

BOTTOM TRAYS LOCATED APPROXIMATELY 9 TO 10 FEET OFF FLOOR.

MINIMUM PANEL SEPARATION BETWEEN APPENDIX R DIVISION I PANELS AND APPENDIX R DIVISION II PANELS IS 22 FEET. GENERALLY 30 FEET SEPARATION IS MAINTAINED.

5-6 FEET AISLES SEPARATE ROWS OF RELAY ROOM PANELS AND THE EAST/WEST RUNS OF CABLE TRAYS.

VERTICAL TRAYS, FROM FLOOR TO WHERE TRAY TURNS TO HORIZONTAL, HAVE METAL COVERS.

APPENDIX R CABLES ARE BEING PROTECTED AS FOLLOWS:

- 10 FEET NORTH & SOUTH OF COLN 13.1 DIVISION I AND II APPENDIX R CABLES ARE PROTECTED WITH A ONE HOUR BARRIER.
- NORTH OF COLN 13.1 + 10 FEET IS A DIVISION I AREA. DIVISION II APPENDIX R CABLES ARE PROTECTED WITH A ONE HOUR BARRIER.
- SOUTH OF COLN 13.1 + 10 FEET IS A DIVISION II AREA: DIVISION I APPENDIX R CABLES ARE PROTECTED WITH A ONE HOUR BARRIER.

ACCESS TO AREA CONTROLLED, BECAUSE PART OF CONTROL ROOM COMPLEX

HOWEVER, APPENDIX R ASSUMES A FIRE TO OCCUR IN A FIRE ZONE.

REQUIREMENTS FOR EFFECTIVE AUTOMATIC SUPPRESSION

1. Threshold Fire Detection
2. System Initiation
3. Fire Control

Threshold Fire Detection

- Ionization Detection System
- Class "A" Cross Zone System
- Design a heat detection system to operate in conjunction with existing system.

System Initiation

- Concept of separation into "trains" to ensure operability of the halon system.
- Concept utilized for nuclear safety systems to accommodate a single failure.
- Backup power supply.
- Main and reserve banks of halon tanks.
- Containers are monitored.
- Each bank has a reserve tank which will discharge should any tank container within the bank fail.
- Redundant pairs of Halon release valves are provided.
- System flow, downstream of release valves monitored, so if one train fails to operate, redundant train will actuate.
- System is continuously monitored.
- System design is total single train discharge in 10 seconds with minimum concentration hold time of 10 minutes in accordance with NFPA 12.

Fire Control

- Halon 1301 compatible with electronic equipment.
- Provides rapid total area coverage
- Effectiveness of halon as a fire suppressant is well documented and proven.

Therefore - Halon system is designed with nuclear system design philosophy and achieves the objectives of Section III. G.

CONCEPTUAL APPROACH TO PROVIDE
ALTERNATIVE SHUTDOWN CAPABILITY
FOR A CONTROL ROOM OR RELAY ROOM FIRE

ASSUMPTION:

FIRE FULLY CONSUMES RELAY/CONTROL ROOM

POSSIBLE SPURIOUS CIRCUIT OPERATION

POSSIBLE LOSS OF DG'S DUE TO LOAD SEQUENCER PROBLEM

LOSS OF OFFSITE POWER

METHOD:

FOR A FIRE IN CONTROL/RELAY ROOM THAT THE FIRE BRIGADE LEADER HAS DETERMINED TO HAVE GOTTEN PAST THE INCIPIENT STAGE AND INTO THE INTERIOR STRUCTURAL FIRE STAGE

1. THE CTG'S (JETS) ARE GIVEN THE START SIGNAL (MULTIPLEXED CONTROL/DOES NOT GO THROUGH RELAY ROOM)
2. REACTOR IS SCRAMMED
3. SBFW SYSTEMS IS LINED UP AND STARTED FROM THE CONTROL ROOM
4. OPERATOR LOAD SHEDS VITAL AC/DC BUSES
5. OPERATOR TAKES UP STATION AT SBFW PANEL AND TRANSFERS ALL CONTROL FOR SBFW SYSTEMS TO THAT LOCATION AND MAINTAINS WATER LEVEL

INSTRUMENTS ON THAT PANEL INCLUDE:

- | | |
|----------------|------------------|
| A. RX PRESSURE | SBFW CONTROL |
| B. RX LEVEL | BREAKER CONTROLS |
| C. CST LEVEL | CTG'S |
| D. TORUS TEMP | |
| E. TORUS LEVEL | |
| F. SBFW FLOW | |
- 5.5. RX LEVEL IS MAINTAINED BY SBFW
RX PRESSURE IS MAINTAINED BY SRV/SAFETY FUNCTION
DISCHARGING TO SUPPRESSION POOL
 6. OPERATOR GOES TO LOCAL MCC'S "TURN OFF" NON
REQUIRED EQUIPMENT
TRANSFER OPERATION FOR SELECTED EQUIPMENT TO LOCAL
OPERATION AT THE MCC
WHEN ALL EQUIPMENT HAS BEEN ISOLATED, RESTORE POWER
TO THAT BUS (CTG'S)
 7. LOCALLY START DG'S
LINE UP FOR LONG TERM SD COOLING
 8. MAINTAIN #7 UNTIL DAMAGE IS REPAIRED (AFTER 72 HOURS
EQUIPMENT WILL BE POWERED FROM OFFSITE POWER)

Meeting Summary Distribution

Docket File

NRC PDR

Local PDR

PRC System

NSIC

LB #1 Reading File

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Project Manager MDLynch

M. Rushbrook

R. Hartfield*

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NRC PARTICIPANTS:

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*Caseload Forecast Panel Visits