

August 27, 1985

Docket Nos. 50-315
and 50-316

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Mr. John Dolan, Vice President
Indiana and Michigan Electric Company
c/o American Electric Power Service Corporation
1 Riverside Plaza
Columbus, Ohio 43216

Dear Mr. Dolan:

By letters dated March 8 and June 15, 1984, the Indiana and Michigan Electric Company (IMEC) requested three technical exemptions from the requirements of Appendix R to 10 CFR 50. By letters dated June 15, June 27, and August 13, 1984, the IMEC provided additional information. Enclosed is our evaluation.

These three technical exemption requests concern hatch covers, seismic gaps, and ventilation duct penetrations located in fire area boundaries. Our acceptance criteria for fire area boundaries are set forth in Appendix A to BTP APCSB 9.5-1, not in Appendix R to 10 CFR 50. Because deviations from our Appendix A guidelines do not require exemptions, we have reviewed the fire area boundary penetrations identified in the exemption requests as deviations from our guidelines, rather than exemptions from Appendix R to 10 CFR 50.

Based on our evaluations, we conclude that the following are acceptable deviations from the guidelines of Appendix A to BTP APCSB 9.5-1:

1. Auxiliary Building Ventilation Duct Penetrations (Fire Areas A, B, C, D and E)
2. Containment and Auxiliary Buildings Seismic Gaps (Numerous Fire Areas)

We also conclude that the following is not an acceptable deviation from our guidelines:

1. Non-Fire Rated Hatch Covers (Numerous Fire Areas)

It is our understanding that IMEC will provide an additional fire hazards analysis and/or provide additional information to resolve the concern on the fire hatches. Please let us know if you have any questions on this matter.

Sincerely,

/s/SVarga

Steven A. Varga, Chief
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Enclosure:
As stated

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

SAFETY EVALUATION OF FIRE PROTECTION REQUESTS
DONALD C. COOK NUCLEAR PLANT
UNIT NOS. 1 AND 2
DOCKET NOS. 50-315 AND 50-316

1.0 Introduction

The licensee's March 1983 report entitled, "Safe-shutdown Capability Assessment and Proposed Modifications," identified the safe-shutdown systems requirements relative to Appendix R to 10 CFR 50, included 19 requests for technical exemptions from Appendix R, and identified modifications required to bring fire areas into compliance with Section III.G of Appendix R.

By letter dated March 8, 1984, the licensee requested one additional technical exemption from the requirements of Section III.G of Appendix R to 10 CFR 50 to the extent that it requires the separation of redundant safe-shutdown components by 3-hour fire rated barriers and requested relief from their commitment to provide fire rated hatch covers in the Control Room, the access control area, the switchgear rooms, and the cable vault rooms. By letters dated June 15 and 27, 1984, the licensee provided additional information.

By another letter dated June 15, 1984, the licensee requested technical exemptions from the requirements of Section III.G of Appendix R to 10 CFR 50 for unsealed seismic gaps between the containment and the auxiliary buildings, and for 17 undampened duct penetrations. By letter dated August 13, 1984, the licensee requested exemptions for 5 additional undampened duct penetrations. By Supplement 2 to their March 1983 report, the licensee provided additional information on the seismic gap and duct penetration exemption requests.

These three technical exemption requests concern fire area boundaries. Our acceptance criteria for fire area boundaries are set forth in Appendix A to BTP APCS 9.5-1, not in Appendix R to 10 CFR 50. Because deviations from our Appendix A guidelines do not require exemptions, we have reviewed the fire area boundaries identified in the exemption requests as deviations from our guidelines, rather than exemptions from Appendix R to 10 CFR 50.

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2.0 Non-Fire Rated Hatch Covers (Numerous Fire Areas)

2.1 Discussion

In the March 1983 report, the licensee committed to install fire rated hatch covers in the Control Room, the access control area, the switchgear rooms, and the cable spreading rooms. By letter dated March 8, 1984, the licensee requested relief from this commitment because fire-rated hatch covers are not commercially available. By letters dated June 15 and 27, 1984, the licensee proposed to install a fire barrier material on nine hatch covers to achieve the required fire resistance ratings and to justify this rating by analysis rather than test.

Exemptions previously granted for the Control Rooms and the Circulating Water Pump Motor Control Room were based in part on the licensee's commitment to provide 3-hour fire-rated hatch covers in these rooms.

2.2 Evaluation

The guidelines of Section D.1.(j) of Appendix A to BTP APCS 9.5-1 are not met because there are hatch covers in fire barriers that do not provide a fire resistance rating equal to the fire barrier itself.

We are concerned that a fire in any of the fire areas with a non-fire rated hatch cover will spread through the hatch resulting in loss of safe shutdown capability.

The information provided by the licensee does not contain sufficient information for us to perform an independent evaluation of the proposed modifications.

The results of the licensee's heat transfer calculations show that the fire resistance ratings to meet our requirements will not be achieved by the modified hatch covers. The analysis also does not address hose stream testing of the hatch covers.

The licensee has not provided adequate justification as to why hatch covers with fire resistance ratings less than those of the fire barrier for which they are installed are acceptable deviations from our guidelines.

2.3 Conclusion

Based on our review, we conclude that the modifications proposed for the nine hatch covers do not provide reasonable assurance that the hatch covers will provide a level of fire protection equivalent to Section D.1.(j) of Appendix A to BTP APCS 9.5-1. Therefore, the non-fire rated hatch covers are not an acceptable deviation from our guidelines. The licensee should provide test results for the modified hatch covers demonstrating that their fire resistance ratings are equivalent to the barriers in which they are installed. The licensee may, however, re-evaluate the fire hazards analysis or propose other options as may be reasonable and acceptable.

3.0 Auxiliary Building Ventilation Duct Penetrations (Fire Areas A, B, C, D and E)

3.1 Discussion

These fire areas are the 573, 587, 609, 633 and 650 foot elevations of the Auxiliary Building. There are 22 undampened ventilation duct penetrations in the floor/ceiling assemblies separating these fire areas. The penetrations are shown in Figures 1 through 8 of Supplement 2 to the March 1983 Report.

Several ducts penetrate the floor and/or ceiling of Fire Area C, but are continuous through the area. Similarly, several ducts penetrate the floor/ceiling assembly separating Fire Areas D and E, but are continuous through both fire areas. Other ducts communicating between fire areas have exhaust or supply registers open to the fire areas.

Fire Areas A, B, C and D contain safe shutdown components. There are no safe-shutdown components in Fire Area E. The fuel loads in these fire areas are uniformly distributed throughout and yield estimated equivalent fire severities ranging from one to 10 minutes.

All of the fire areas containing safe-shutdown components are equipped with ionization type fire detection systems. Fire Areas B, C and D are equipped with automatic preaction sprinkler systems such that each duct penetration through the fire area floor is provided with sprinkler coverage.

The stairway connecting Fire Areas A and B is provided with an automatic water suppression system. An exemption from the requirements to provide automatic suppression in Fire Area A has been granted previously.

3.2 Evaluation

The guidelines of Section D.1.(j) of Appendix A to BTP APCSB 9.5-1 are not met because there are undampened ventilation duct penetrations through floor/ceiling assemblies enclosing fire areas.

We were concerned that a fire in any of the fire areas of concern would spread through the vertical undampened ducts resulting in loss of safe-shutdown capability.

Because the individual fuel loads are low and uniformly distributed, we do not expect a fire of significant magnitude or duration to occur in any of the fire areas. If a fire does occur, it would be detected by the ionization detectors and extinguished by the plant fire brigade before spreading to another fire area through any of the ventilation ducts.

Because of the low fire loads, we do not expect a fire of sufficient intensity to breach any of the ventilation ducts. However, should this occur, the sprinklers positioned around the ducts in Fire Area B, C or D would operate and prevent the fire from spreading from the duct into the fire area.

Automatic suppression is not installed throughout Fire Area E. However, all of the ducts in this area are continuous through the area. Therefore, we

do not expect damage in this area as a result of a fire in any of the fire areas below. Moreover, there are no safe-shutdown components located in Fire Area E. Therefore, if fire or smoke spread into the area it would not affect safe-shutdown.

Automatic suppression is not installed throughout Fire Area A. However, the combustible loading in this area is low. Therefore, if a fire occurred in this area, it is our opinion that it would not be of sufficient intensity or duration to damage safe-shutdown components in any of the fire areas above.

3.4 Conclusion

Based on our evaluation, we conclude that we have reasonable assurance that the 22 Auxiliary Building undampened ventilation duct penetrations will not affect safe-shutdown in the event of a fire in Fire Area A, B, C, D or E. The lack of fire dampers in these 22 ventilation duct penetrations is, therefore, an acceptable deviation from the guidelines of Section D.1.(j) of Appendix A to BTP APCSB 9.5-1.

4.0 Containment and Auxiliary Buildings Seismic Gaps (Numerous Fire Areas)

4.1 Discussion

A seismic gap exists around the Containment Building of each unit which leaves an opening of approximately 6 inches between containment and the adjacent structures. The licensee's March 1983 report did not address these seismic gaps when defining fire area boundaries. Supplement 2 to the Report lists the fire areas that contain seismic gaps and provides an analysis of the potential effects on safe-shutdown capability in the event of postulated fire spread through the gaps.

The licensee's analysis methodology assumes that a postulated fire will damage the safe-shutdown components in the area of origin and in the areas to the left, right, and above as a result of fire spread through the gaps. The licensee

conducted an analysis for each area with a seismic gap. Systems evaluations were conducted to verify that safe plant shutdown would not be compromised as a result of the postulated fires.

The minimum set of safe-shutdown systems necessary to meet the requirements of Appendix R are described in the March 1983 Report. These systems are:

Chemical and Volume Control System (CVCS)
Reactor Coolant System (RCS)
Auxiliary Feedwater System (AFW)
Residual Heat Removal System (RHR)
Component Cooling Water System (CCW)
Essential Service Water System (ESW)
Emergency Power System (EPS)
Main Steam System (MS)

4.2 Evaluation

The guidelines of Section D.1.(j) of Appendix A to BTP APCSB 9.5-1 are not met because there are unsealed penetrations, i.e., seismic gaps, in barriers separating fire areas.

In order to confirm that safe-shutdown capability is available in the event of the postulated fires, we performed a detailed review of Fire Area 33B. In Supplement 2 and additional information obtained in telephone conferences on June 20 and June 21, 1985, the licensee stated that the resulting postulated fire damage is to the following shutdown equipment/components:

MS: Pressure transmitters and associated cables for steam generators 2 and 3. Control cable associated with main steam system power operated relief valves (PORVs) steam generators 1 and 4.

AFW: Control cable for auxiliary feedwater control valves, FMO 212, 242, 241 and 211 for steam generators 1 and 4.

RCS: Cables for T_{hot} and T_{cold} primary temperature indication is loops 1 and 4.

CVCS: Cable for charging flow control valve, QRV-251.

Per Table 2-1 of Supplement 2, the licensee indicates that the unaffected safe shutdown systems for Fire Area 33B are: ESW, CCW, EPS and RHR. For those safe-shutdown system trains subject to potential fire damage, the following redundant train or other capability is provided:

MS: Instrumentation associated with steam generators 1 and 4 is not affected by the fire. The main steam PORVs for steam generators 1 and 4 will be manually operated.

AFW: The affected valves in the AFW trains to steam generators 1 and 4 will be manually operated, allowing two of three AFW trains to be available.

RCS: T_{hot} and T_{cold} indications for loops 1 and 4 are affected. However, alternative primary temperature indication is provided as documented in Appendix R Safety Evaluation Report input dated November 4, 1983.

CVCS: Mechanical stops will cause the charging flow control valve, QRV-251 to fail in a satisfactory minimum flow control position.

4.4 Conclusion

Based on our review, we conclude that the methodology used by the licensee to evaluate postulated fire spread through the seismic gaps and safe shutdown capability in the event of a postulated fire is acceptable. Further, based on our review of the systems evaluations contained in Supplement 2, we conclude

that satisfactory safe shutdown capability is available for those areas with seismic gaps and that the licensee has demonstrated adequate post-fire shutdown capability in the event of fire spread via the seismic gaps. These unsealed fire barrier penetrations, i.e., seismic gaps, are, therefore, an acceptable deviation from the guidelines of Section D.1.(j) of Appendix A to BTP APCS 9.5-1.

5.0 Summary

Based on our evaluations, we conclude that the following are acceptable deviations from the guidelines of Appendix A to BTP APCS 9.5-1:

1. Auxiliary Building Ventilation Duct Penetrations (Fire Areas A, B, C, D and E)
2. Containment and Auxiliary Buildings Seismic Gaps (Numerous Fire Areas)

We also conclude that the following is not an acceptable deviation from our guidelines:

1. Non-Fire Rated Hatch Covers (Numerous Fire Areas)

Dated: August 27, 1985

Principal Contributors:

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