SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

INDIANA AND MICHIGAN ELECTIC COMPANY

DONALD C. COOK NUCLEAR PLANT UNIT NO. 2

DOCKET NO. 50-316

ENVIRONMENTAL QUALIFICATION OF ELECTRIC EQUIPMENT IMPORTANT TO SAFETY

INTRODUCTION

Equipment which is used to perform a necessary safety function must be demonstrated to be capable of maintaining functional operability under all service conditions postulated to occur during its installed life for the time it is required to operate. This requirement, which is embodied in General Design Criteria 1 and 4 of Appendix A and Sections III, XI, and XVII of Appendix B to 10 CFR 50, is applicabled to equipment located inside as well as outside containment. More detailed requirements and guidance relating to the methods and procedures for demonstrating this capability for electrical equipment have been set forth in 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants," NUREG-0588, "Interim Staff Position of Environmental Qualification of Safety-Related Electrical Equipment" (which supplements IEEE Standard 323 and various NRC Regulatory Guides and industry standards), and "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors" (DOR Guidelines).

BACKGROUND

On February 8, 1979, the NRC Office of Inspection and Enforcement (IE) issued to all licensees of operating plants (except those included in the systematic evaluation program (SEP)) IE Bulletin (IEB) 79-01, "Environmental Qualification of Class 1E Equipment. This Bulletin, together with IE Circular 78-08 (issued on May 31, 1978), required the licensees to perform reviews to assess the adequacy of their environmental qualification programs.

On January 14, 1980, NRC issued IEB 79-01B which included the DOR Guidelines and NUREG-0588 as attachments 4 and 5, respectively. Subsequently, on May 23, 1980, Commission Memorandum and Order CLI-80-21 was issued and stated that the DOR Guidelines and portions of NUREG-0588 form the requirements that licensees must meet regarding environmental qualification of safety-related electrical equipment in order to satisfy those aspects of 10 CFR 50, Appendix A. General Design Criterion (GDC) 4. Supplements to IEB 79-01B were issued for further clarification and definition of the staff's needs. These supplements were issued on February 29, September 30, and October 24, 1980.

In addition, the staff issued orders dated August 29, 1980 (amended in September 1980) and October 24, 1980 to all licensees. The August order required that the licensees provide a report, by November 1, 1980, documenting the qualification of safety-related electrical equipment. The October order required the establishment of a central file location for the maintenance of all equipment qualification records. The central file was mandated to be established by December 1, 1980. The staff subsequently issued a Safety Evaluation Report (SER) on environmental qualification of safety-related electrical equipment to the licensee on May 26, 1981. This SER directed the licensee to "either provide documentation of the missing qualification information which demonstrates that safety-related equipment meets the DOR Guidelines or NUREG-0588 requirements or commit to a corrective action (requalification, replacement (etc.))." The licensee was required to respond to NRC within 90 days of receipt of the SER. In response to the staff SER issued in 1981, the licensee submitted additional information regarding the qualification of safety-related electrical equipment. This information was evaluated for the staff by the Franklin Research Center(FRC) in order to: 1) identify all cases where the licensee's response did not resolve the significant qualification issues, 2) evaluate the licensee's qualification documentation in accordance with established criteria to determine which equipment had adequate documentation and which did not, and 3) evaluate the licensee's qualification documentation for safety-related electrical equipment located in harsh environments required for TMI Lessons Learned Implementation. A Technical Evaluation Report (TER) was issued by FRC

on October 28, 1982. A Safety Evaluation Report was subsequently issued to the Indiana & Michigan Electric Company on January 17, 1983, with the FRC TER as an attachment.

A final rule on environmental qualification of electric equipment important to safety for nuclear power plants became effective on February 22, 1983. This rule, Section 50.49 of 10 CFR 50, specifies the requirements of electrical equipment important to safety located in a harsh environment. In accordance with this rule, equipment for D.C. Cook Unit 2 may be qualified to the criteria specified in either the DOR Guidelines or NUREG-0588, except for replacement equipment. Replacement equipment installed subsequent to February 22, 1983 must be qualified in accordance with the provisions of 10 CFR 50.49, using the guidance of Regulatory Guide 1.89, unless there are sound reasons to the contrary.

A meeting was held with each licensee of plants for which a TER had been prepared for the staff by FRC in order to discuss all remaining open issues regarding environmental qualification, including acceptability of the environmental conditions for equipment qualification purposes, if this issue had not yet been resolved. On September 13, 1983, a meeting was held to discuss Indiana & Michigan Electric's proposed method to resolve the environmental qualification deficiencies identified in the January 17, 1983 SER and October 28, 1982 FRC TER. Discussions also included Indiana & Michigan Electric's general methodology for compliance with 10 CFR 50.49, and justification for continued operation for those equipment items for which environmental qualification is not yet completed. The minutes of the meeting and proposed method of resolution for each of the environmental qualification deficiencies are documented in January 17, June 12, October 18, and December 10, 1984 submittals from the licensee.

EVALUATION

The evaluation of the acceptability of the licensee's electrical equipment environmental qualification program is based on the results of an audit review performed by the staff of: (1) the licensee's proposed resolutions of the environmental qualification deficiencies identified in the January 17, 1983

SER and October 28, 1982 FRC TER; (2) compliance with the requirements of 10 CFR 50.49; and (3) justification for continued operation (JCO) for those equipment items for which the environmental qualification is not yet completed.

Proposed Resolutions of Identified Deficiencies

The proposed resolutions for the equipment environmental qualification deficiencies, identified in the January 17, 1983 SER, and the FRC TER enclosed with it, are described in the licensee's January 17, June 12 and October 18, 1984 submittals. During the September 13, 1983 meeting with the licensee, the staff discussed the proposed resolution of each deficiency for each equipment item identified in the FRC TER and found the licensee's approach for resolving the identified environmental qualification deficiencies acceptable. The majority of deficiencies identified were documentation, similarity, aging, qualified life and replacement schedule. All open items identified in the SER dated January 17, 1983 were also discussed and the resolution of these items has been found acceptable by the staff.

The approach described by the licensee for addressing and resolving the identified deficiencies includes replacing equipment, performing additional analyses, utilizing additional qualification documentation beyond that reviewed by FRC, obtaining additional qualification documentation and determining that some equipment is outside the scope of 10 CFR 50.49, and therefore not required to be environmentally qualified, e.g., lcoated in a mild environment. We discussed the proposed resolution in detail on an item by item basis with the licensee during the September 13, 1983 meeting. Replacing or exemption equipment, for an acceptable reason, are clearly acceptable methods for resolving environmental qualification deficiencies. The more lengthy discussions with the licensee concerned the use of additional analyses or documentation. Although we did not review the additional analyses or documentation, we discussed how analysis was being used to resolve deficiencies identified in the FRC TER, and the content of the additional documentation in order to determine the acceptability of these methods. The licensee's equipment environmental qualification files will be audited by the staff during follow-up inspections to be performed by Region III, with assistance from IE Headquarters and NRR staff as necessary.

Since a significant amount of documentation has already been reviewed by the staff and Franklin Research Center, the primary objective of the file audit will be to verify that they contain the appropriate analyses and other necessary documentation to support the licensee's conclusion that the equipment is qualified. The inspections will verify that the licensee's program for surveillance and maintenance of environmentally qualified equipment is adequate to assure that this equipment is maintained in the as analyzed or tested condition. The method used for tracking periodic replacement parts, and implementation of the licensee's commitments and actions, e.g., regarding replacement of equiment, will also be verified.

Based on our discussions with the licensee and our review of its submittal, we find the licensee's approach for resolving the identified environmental quaTification deficiencies acceptable.

Compliance With 10 CFR 50.49

In its June 12 and October 18, 1984 submittals, the licensee has described the approach used to identify equipment within the scope of paragraph (b)(1) of 10 CFR 50.49, equipment relied upon to remain functional during and following design basis events. The licensee states that the flooding and environmental consequences of the postulated design basis events documented in Chapter 14 of the D.C. Cook FSAR including the LOCA and MSLB inside containment, were considered in specifying the qualification requirements for 10 CFR 50.49(b)(1) equipment. The environmental consequences of high energy line breaks outside containment were also taken into account. Flooding outside containment was discussed in Attachment 10 to letter No. AEP:NRC:0578B, dated June 11, 1982. The methodology used to identify equipment within the scope of 10 CFR 50.49(b)(1) for the Cook Nuclear Plant was essentially the same as that used to develop the IE Bulletin No. 79-01B equipment list. The IE Bulletin No. 79-01B process developed a list of potentially affected equipment compiled primarily using the FSAR Chapters 5, 6, 7 and 14, Appendices O and Q to the FSAR, Cook Plant Emergency Operating Procedures, and previous licensing submittals to the NRC. Additional guidance for the IE Bulletin No. 79-01B listing was developed to define potentially affected areas of the Cook Plant and the postulated environment at various locations. The flow diagrams and

the Technical Specifications were also reviewed when necessary to assure accuracy. The methodology used to develop the IE Bulletin No. 79-01B equipment list is also described in Attachment 6 to IMECo letter No. AEP:NRC:0578B, dated June 11, 1982.

The licensee's approach for identifying equipment within the scope of paragraph (b)(1) is in accordance with the requirements off that paragraph, and therefore acceptable.

The method used by the licensee for identification of electrical equipment within the scope of paragraph (b)(2) of 10 CFR 50.49, nonsafety-related electric equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions, is summarized below:

1. The flooding and environmental consequences of the postulated design basis events documented in Chapter 14 of the Donald C. Cook Nuclear Plant Final Safety Analysis Report (FSAR), including the Loss-of-Coolant Accident (LOCA) and the Main Steam Line Break (MSLB) inside containment, were considered in specifying the qualification requirements for 10 CFR 50.49(b)(1) equipment. The environmental consequences of High Energy Line Breaks (HELBs) outside containment were also taken into account. With regard to flooding outside containment, this topic was discussed in Attachment 10 to letter No. AEP:NRC:0578B dated June 11, 1982.

2. The elementary wiring diagrams of the safety-related electrical equipment within the scope of 10 CFR 50.49 were reviewed to identify any auxiliary devices electrically connected directly into the control or power circuitry of the safety-related equipment (e.g., automatic trips), whose failure due to postulated environmental conditions could prevent required operation of the safety-related equipment. No 10 CFR 50.49(b)(2) equipment control circuits.

3. The operation of safety-related systems and equipment was reviewed to identify any mechanically connected auxiliary systems with electrical components that are necessary for the required operation of the safety-related equipment. The primary documents used for this review were the flow diagrams. The equipment list submitted to identify equipment within the scope of IE Bulletin No. 70-01B reflects this review. The 10 CFR 50.49(b)(1) equipment list was developed as described above. If any auxiliary equipment contained in the IE Bulletin No. 79-01B equipment list met the subsequent requirements test, then it was also included in the 10 CFR 50.49 equipment list.

4. Nonsafety-related electrical circuits indirectly associated with the electrical equipment in the scope of 10 CFR 50.49 common power supply or physical proximity were considered by a review of the electrical design, including the use of properly coordinated protective relays, circuit breakers, and fuses for electrical fault protection. No 10 CFR 50.49(b)(2) equipment has been found whose failure would cause a failure of the safety-related equipment within the scope of 10 CFR 50.49. The circuit breaker and fuse coordination study, and the thermal coordination for the adequate protection of load conductors on 600-volt motor control centers study, were undertaken as a consequence of the 10 CFR 50 Appendix R fire protection requirements.

We find the methodology being used by the licensee is acceptable since it provides reasonable assurance that equipment within the scope of paragraph (b)(2) of 10 CFR 50.49 has been identified.

With regard to paragraph (b)(3) of 10 CFR 50.49, the licensee refers to its May 20, 1983 letter for identification of equipment which may fall into Regulatory Guide 1.97 Categories 1 and 2. The staff has not yet completed its review for conformance to Regulatory Guide 1.97. However, the further staff review for Regulatory Guide 1.97 conformance may result in the licensee being required to include additional equipment in its environmental qualification program in order to meet the requirements of 10 CFR 50.49(b)(3).

We find the licensee's approach to identifying equipment within the scope of paragraph (b)(3) of 10 CFR 50.49 acceptable since it is in accordance with the requirements of that paragraph.

Justification for Continued Operation

The licensee has provided, in its October 18, 1984 submittal, justification for continued operation addressing each item of equipment for which the environmental qualification is not yet completed (see enclosure for the JCO equipment list). The licensee's letter dated December 10, 1984 modified some of these JCO's.

We have reviewed each JCO provided by the licensee in its Ocotber 18, and December 10, 1984 submittals, and find them acceptable since they are based on essentially the same criteria that were used by the staff and its contractor to review JCO's previously submitted by licensees. These criteria, listed below, are also essentially the same as those contained in 10 CFR 50.49(i).

a. The safety function can be accomplished by some other designated equipment that is qualified, and failure of the principal equipment as a result of the harsh environment will not degrade other safety functions or mislead the operator.

b. Partial test data that does not demonstrate full qualification, but provides a basis for concluding the equipment will perform its function. If it cannot be concluded from the available data that the equipment will not fail after completion of its safety function, then that failure must not result in significant degradation of any safety function or provide misleading information to the operator.

c. Limited use of administrative controls over equipment that has not been demonstrated to be fully qualified. For any equipment assumed to fail as a result of the accident environment, that failure must not result in significant degradation of any safety function or provide misleading information to the operator.

CONCLUSIONS

Based on the above evaluation, we conclude the following with regard to the qualification of electric equipment important to safety within the scope of 10 CFR 50.49.

- Indiana & Michigan Electric's electrical equipment environmental qualification program complies with the requirements of 10 CFR 50.49.

- The proposed resolutions for each of the environmental qualification deficiencies identified in the January 17, 1983 SER and FRC TER are acceptable.

- Continued operation until completion of the licensee's environmental qualification program will not present undue risk to the public health and safety.

Justification for Continued Operation Equipment List

Plant Identification Number	NRC TER Number	Description
VRS-1101, 1201 2101, 2201	N/A	Eberline Radiation Monitoring System Detectors
NPS-121, 122	N/A	Barton 763 Pressure Transmitters
NLA-310, NLI-311 320, 321, 110, 111, 120, 121, 130, 131	N/A	Barton 764 Differential Pressure Transmitters
BLP-110, 111, 112, 120, 121, 122, 130, 131, 132, 140, 141, 142 MFC-110, 111, 120, 121 130, 131, 140, 141 NLP-151, 152, 153	38, 34, 40	Barton 764 Differential Pressure Transmitters
N/A	N/A	Rachem & Brand Rex Instrument Cable
N/A	N/A	Cable Terminations for RCS Vents
Various	N/A	Samuel Moore & Boston Insulated Wire Instrument Cable
N/A	N/A	Samuel Moore, Boston Insulated Wire and Cerro Wire & Cable Cables
VRA-1310, 1410 2310, 1410	N/A	Victoreen Radiation Monitoring System Detectors
PP-050, 026, 035	10, 11, 12	Westinghouse Pump Motors

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

INDIANA AND MICHIGAN ELECTIC COMPANY

DONALD C. COOK NUCLEAR PLANT UNIT NO. 1

DOCKET NO. 50-315

ENVIRONMENTAL QUALIFICATION OF ELECTRIC EQUIPMENT IMPORTANT TO SAFETY

INTRODUCTION

Equipment which is used to perform a necessary safety function must be demonstrated to be capable of maintaining functional operability under all service conditions postulated to occur during its installed life for the time it is required to operate. This requirement, which is embodied in General Design Criteria 1 and 4 of Appendix A and Sections III, XI, and XVII of Appendix B to 10 CFR 50, is applicable to equipment located inside as well as outside containment. More detailed requirements and guidance relating to the methods and procedures for demonstrating this capability for electrical equipment have been set forth in 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants," NUREG-0588, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment" (which supplements IEEE Standard 323 and various NRC Regulatory Guides and industry standards), and "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors" (DOR Guidelines).

BACKGROUND

On February 8, 1979, the NRC Office of Inspection and Enforcement (IE) issued to all licensees of operating plants (except those included in the systematic evaluation program (SEP)) IE Bulletin (IEB) 79-01, "Environmental Qualification of Class 1E Equipment. This Bulletin, together with IE Circular 78-08 (issued on May 31, 1978), required the licensees to perform reviews to assess the adequacy of their environmental qualification programs.

On January 14, 1980, NRC issued IEB 79-01B which included the DOR Guidelines and NUREG-0588 as attachments 4 and 5, respectively. Subsequently, on May 23, 1980, Commission Memorandum and Order CLI-80-21 was issued and stated that the DOR Guidelines and portions of NUREG-0588 form the requirements that licensees must meet regarding environmental qualification of safety-related electrical equipment in order to satisfy those aspects of 10 CFR 50, Appendix A, General Design Criterion (GDC) 4. Supplements to IEB 79-01B were issued for further clarification and definition of the staff's needs. These supplements were issued on February 29, September 30, and October 24, 1980.

In addition, the staff issued orders dated August 29, 1980 (amended in September 1980) and October 24, 1980 to all licensees. The August order required that the licensees provide a report, by November 1, 1980, documenting the qualification of safety-related electrical equipment. The October order required the establishment of a central file location for the maintenance of all equipment qualification records. The central file was mandated to be established by December 1, 1980. The staff subsequently issued a Safety Evaluation Report (SER) on environmental qualification of safety-related electrical equipment to the licensee on May 26, 1981. This SER directed the licensee to "either provide documentation of the missing qualification information which demonstrates that safety-related equipment meets the DOR Guidelines or NUREG-0588 requirements or commit to a corrective action (requalification, replacement (etc.))." The licensee was required to respond to NRC within 90 days of receipt of the SER. In response to the staff SER issued in 1981, the licensee submitted additional information regarding the qualification of safety-related electrical equipment. This information was evaluated for the staff by the Franklin Research Center (FRC) in order to: 1) identify all cases where the licensee's response did not resolve the significant qualification issues, 2) evaluate the licensee's qualification documentation in accordance with established criteria to determine which equipment had adequate documentation and which did not, and 3) evaluate the licensee's qualification documentation for safety-related electrical equipment located in harsh environments required for TMI Lessons Learned Implementation. A Technical Evaluation Report (TER) was issued by FRC on

October 28, 1982. A Safety Evaluation Report was subsequently issued to the Indiana & Michigan Electric Company on January 17, 1983, with the FRC TER as an attachment.

A final rule on environmental qualification of electric equipment important to safety for nuclear power plants became effective on February 22, 1983. This rule, Section 50.49 of 10 CFR 50, specifies the requirements of electrical equipment important to safety located in a harsh environment. In accordance with this rule, equipment for D.C. Cook Unit 1 may be qualified to the criteria specified in either the DOR Guidelines or NUREG-0588, except for replacement equipment. Replacement equipment installed subsequent to February 22, 1983 must be qualified in accordance with the provisions of 10 CFR 50.49, using the guidance of Regulatory Guide 1.89, unless there are sound reasons to the contrary.

A meeting was held with each licensee of plants for which a TER had been prepared for the staff by FRC in order to discuss all remaining open issues regarding environmental qualification, including acceptability of the environmental conditions for equipment qualification purposes, if this issue had not yet been resolved. On September 13, 1983, a meeting was held to discuss Indiana & Michigan Electric's proposed method to resolve the environmental qualification deficiencies identified in the January 17, 1983 SER and October 28, 1982 FRC TER. Discussions also included Indiana & Michigan Electric's general methodology for compliance with 10 CFR 50.49, and justification for continued operation for those equipment items for which environmental qualification is not yet completed. The minutes of the meeting and proposed method of resolution for each of the environmental qualification deficiencies are documented in January 17, June 12, October 18, and December 10, 1984 submittals from the licensee.

EVALUATION

The evaluation of the acceptability of the licensee's electrical equipment environmental qualification program is based on the results of an audit review performed by the staff of: (1) the licensee's proposed resolutions of the

environmental qualification deficiencies identified in the January 17, 1983 SER and October 28, 1982 FRC TER; (2) compliance with the requirements of 10 CFR 50.49; and (3) justification for continued operation (JCO) for those equipment items for which the environmental qualification is not yet completed.

Proposed Resolutions of Identified Deficiencies

The proposed resolutions for the equipment environmental qualification deficiencies, identified in the January 17, 1983 SER, and the FRC TER enclosed with it, are described in the licensee's January 17, June 12 and October 18, 1984 submittals. During the September 13, 1983 meeting with the licensee, the staff discussed the proposed resolution of each deficiency for each equipment item identified in the FRC TER and found the licensee's approach for resolving the identified environmental qualification deficiencies acceptable. The majority of deficiencies identified were documentation, similarity, aging, qualified life and replacement schedule. All open items identified in the SER dated January 17, 1983 were also discussed and the resolution of these items has been found acceptable by the staff.

The approach described by the licensee for addressing and resolving the identified deficiencies includes replacing equipment, performing additional analyses, utilizing additional qualification documentation beyond that reviewed by FRC, obtaining additional qualification documentation and determining that some equipment is outside the scope of 10 CFR 50.49, and therefore not required to be environmentally qualified, e.g., located in a mild environment. We discussed the proposed resolutions in detail on an item by item basis with the licensee during the September 13, 1983 meeting. Replacing or exempting equipment, for an acceptable reason, are clearly acceptable methods for resolving environmental qualification deficiencies. The more lengthy discussions with the licensee concerned the use of additional analyses or documentation. Although we did not review the additional analyses or documentation, we discussed how analysis was being used to resolve deficiencies identified in the FRC TER, and the content of the additional documentation in order to determine the acceptability of these

methods. The licensee's equipment environmental qualification files will be audited by the staff during follow-up inspections to be performed by Region III, with assistance from IE Headquarters and NRR staff as necessary.

Since a significant amount of documentation has already been reviewed by the staff and Franklin Research Center, the primary objective of the file audit will be to verify that they contain the appropriate analyses and other necessary documentation to support the licensee's conclusion that the equipment is qualified. The inspections will verify that the licensee's program for surveillance and maintenance of environmentally qualified equipment is adequate to assure that this equipment is maintained in the as analyzed or tested condition. The method used for tracking periodic replacement parts, and implementation of the licensee's commitments and actions, e.g., regarding replacement of equipment, will also be verified.

Based on our discussions with the licensee and our review of its submittal, we find the licensee's approach for resolving the identified environmental qualification deficiencies acceptable.

Compliance With 10 CFR 50.49

In its June 12 and October 18, 1984 submittals, the licensee has described the approach used to identify equipment within the scope of paragraph (b)(1) of 10 CFR 50.49, equipment relied upon to remain function during and following design basis events. The licensee states that the flooding and environmental consequences of the postulated design basis events documented in Chapter 14 of the D.C. Cook FSAR including the LOCA and MSLB inside containment, were considered in specifying the qualification requirements for 10 CFR 50.49(b)(1) equipment. The environmental consequences of high energy line breaks outside containment were also taken into account. Flooding outside containment was discussed in Attachment 10 to letter No. AEP:NRC:0578B, dated June 11, 1982. The methodology used to identify equipment within the scope of 10 CFR 50.49(b)(1) for the Cook Nuclear Plant was essentially the same as that used to develop the IE Bulletin No. 79-01B equipment list. The IE Bulletin No. 79-01B process developed a list of potentially affected equipment compiled

primarily using the FSAR Chapters 5, 6, 7 and 14, Appendices O and Q to the FSAR, Cook Plant Emergency Operating Procedures, and previous licensing submittals to the NRC. Additional guidance for the IE Bulletin No. 79-01B listing was developed to define potentially affected areas of the Cook Plant and the postulated environment at various locations. The flow diagrams and the Technical Specifications were also reviewed when necessary to assure accuracy. The methodology used to develop the IE Bulletin No. 79-01B equipment list is also described in Attachment 6 to IMECo letter No. AEP:NRC:0578B, dated June 11, 1982.

The licensee's approach for identifying equipment within the scope of paragraph (b)(1) is in accordance with the requirements of that paragraph, and therefore acceptable.

The method used by the licensee for identification of electrical equipment within the scope of paragraph (b)(2) of 10 CFR 50.49, nonsafety-related electric equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions, is summarized below:

1. The flooding and environmental consequences of the postulated design basis events documented in Chapter 14 of the Donald C. Cook Nuclear Plant Final Safety Analysis Report (FSAR), including the Loss-of-Coolant Accident (LOCA) and the Main Steam Line Break (MSLB) inside containment, were considered in specifying the qualification requirements for 10 CFR 50.49(b)(1) equipment. The environmental consequences of High Energy Line Breaks (HELBs) outside containment were also taken into account. With regard to flooding outside containment, this topic was discussed in Attachment 10 to letter No. AEP:NRC:0578B dated June 11, 1982.

2. The elementary wiring diagrams of the safety-related electrical equipment within the scope of 10 CFR 50.49 were reviewed to identify any auxiliary devices electrically connected directly into the control or power circuitry of the safety-related equipment (e.g., automatic trips), whose failure due to postulated environmental conditions could prevent required

operation of the safety-related equipment. No 10 CFR 50.49(b)(2) equipment has been found in the 10 CFR 50.49(b)(1) equipment control circuits.

3. The operation of safety-related systems and equipment was reviewed to identify any mechanically connected auxiliary systems with electrical components that are necessary for the required operation of the safety-related equipment. The primary documents used for this review were the flow diagrams. The equipment list submitted to identify equipment within the scope of IE Bulletin No. 79-01B reflects this review. The 10 CFR 50.49(b)(1) equipment list was developed as described above. If any auxiliary equipment contained in the IE Bulletin No. 79-01B equipment list met the subsequent requirements test, then it was also included in the 10 CFR 50.49 equipment list.

4. Nonsafety-related electrical circuits indirectly associated with the electrical equipment in the scope of 10 CFR 50.49 by common power supply or physical proximity were considered by a review of the electrical design, including the use of properly coordinated protective relays, circuit breakers, and fuses for electrical fault protection. No 10 CFR 50.49(b)(2) equipment has been found whose failure would cause a failure of the safety-related equipment within the scope of 10 CFR 50.49. The circuit breaker and fuse coordination study, and the thermal coordination for the adequate protection of load conductors on 600-volt motor control centers study, were undertaken as a consequence of the 10 CFR 50 Appendix R fire protection requirements.

We find the methodology being used by the licensee is acceptable since it provides reasonable assurance that equipment within the scope of paragraph (b)(2) of 10 CFR 50.49 has been identified.

With regard to paragraph (b)(3) of 10 CFR 50.49, the licensee refers to its May 20, 1983 letter for identification of equipment which may fall into Regulatory Guide 1.97 Categories 1 and 2. The staff has not yet completed its

review for conformance to Regulatory Guide 1.97. However, the further staff review for Regulatory Guide 1.97 conformance may result in the licensee being required to include additional equipment in its environmental qualification program in order to meet the requirements of 10 CFR 50.49 (b)(3).

We find the licensee's approach to identifying equipment within the scope of paragraph (b)(3) of 10 CFR 50.49 acceptable since it is in accordance with the requirements of that paragraph.

Justification for Continued Operation

The licensee has provided, in its October 18, 1984 submittal, justification for continued operation addressing each item of equipment for which the environmental qualification is not yet completed (see enclosure for the JCO equipment list). The licensee's letter dated December 10, 1984 modified some of these JCO's.

We have reviewed each JCO provided by the licensee in its Ocotber 18, and December 10, 1984 submittals, and find them acceptable since they are based on essentially the same criteria that were used by the staff and its contractor to review JCO's previously submitted by licensees. These criteria, listed below, are also essentially the same as those contained in 10 CFR 50.49(i).

a. The safety function can be accomplished by some other designated equipment that is qualified, and failure of the principal equipment as a result of the harsh environment will not degrade other safety functions or mislead the operator.

b. Partial test data that does not demonstrate full qualification, but provides a basis for concluding the equipment will perform its function. If it cannot be concluded from the available data that the equipment will not fail after completion of its safety function, then that failure must not result in significant degradation of any safety function or provide misleading information to the operator.

c. Limited use of administrative controls over equipment that has not been demonstrated to be fully qualified. For any equipment assumed to fail as a result of the accident environment, that failure must not result in significant degradation of any safety function or provide misleading information to the operator.

CONCLUSIONS

Based on the above evaluation, we conclude the following with regard to the qualification of electric equipment important to safety within the scope of 10 CFR 50.49.

- Indiana & Michigan Electric's electrical equipment environmental qualification program complies with the requirements of 10 CFR 50.49.

- The proposed resolutions for each of the environmental qualification deficiencies identified in the January 17, 1983 SER and FRC TER are acceptable.

- Continued operation until completion of the licensee's environmental qualification program will not present undue risk to the public health and safety.

Justification for Continued Operation Equipment List

Plant Identification Number	NRC TER Number	Description
VRS-1101, 1201 2101, 2201	N/A	Eberline Radiation Monitoring System Detectors
NPS-121, 122	N/A	Barton 763 Pressure Transmitters
NLA-310, NLI-311 320, 321, 110, 111, 120, 121, 130, 131	N/A	Barton 764 Differential Pressure Transmitters
BLP-110, 111, 112, 120 121, 122, 130, 131, 132, 140, 141, 142 MFC-110, 111, 120, 121, 130, 131, 140, 141 NLP-151, 152, 153	38,34,40	Barton 764 Differential Pressure Transmitters
N/A	N/A	Rachem & Brand Rex Instrument Cable
N/A	N/A	Cable Terminations for RCS Vents
Various	N/A	Samuel Moore & Boston Insulated Wire Instrument Cable
N/A	N/A	Samuel Moore, Boston Insulated Wire and Cerro Wire & Cable Cables
VRA-1310, 1410 2310, 1410	N/A	Victoreen Radiation Monitoring System Detectors
PP-050, 026, 035	10, 11, 12	Westinghouse Pump Motors