SAFETY EVALUATION REPORT OFFICE OF NUCLEAR REACTOR REGULATION EQUIPMENT QUALIFICATION BRANCH FARLEY UNIT 1 DOCKET NO. 50-348

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

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On Feburary 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 IE 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 21, 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 January 14, 1983. A Safety Evaluation Report was subsequently issued to the Alabama Power Company on January 31, 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 to be met for demonstrating the environmental qualification of electrical equipment important to safety located in a harsh environment. In accordance with this rule, equipment for Farley 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 January 11, 1984, a meeting was held to discuss Alabama Power's proposed method to resolve the environmental qualification deficiencies identified in the January 31, 1983 SER and January 14, 1983 FRC TER. Discussions also included Alabama Power'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 a February 29, 1984 submittal from the licensee.

EVALUATION

The evaluation of the acceptability of the licensee's electric 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 31, 1983 SER and January 14, 1983 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 31, 1983 SER, and the FRC TER enclosed with it, are described in the licensee's February 29, 1984 submittal. During the January 11, 1984 meeting with the licensee, the staff discussed the proposed resolution of each deficiency for each equipment items 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 31, 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 January 11, 1984 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 II, 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

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In its February 29, 1984 submittal, 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 (temperature, pressure, etc.) effects resulting from the worst case LOCA and HELB were considered in the IEB 79-01B and NUREG-0588 analyses. The capability of equipment to perform its intended function as a result of flooding in the containment or main steam valve room is documented in the IEB 79-01B and NUREG-0588 submittals. The effects of flooding in areas outside containment other than the main steam valve room were analyzed and found to have no adverse effects on the capability of equipment to perform its intended function as documented in FSAR Appendix 3K.

The harsh environmental condition of the worst-case LOCA and HELB envelops the environmental conditions for all other design-basis events as documented in FSAR Section 6.2. Therefore, the LOCA/HELB accidents are the only design-basis accidents which result in significantly adverse environments to electrical equipment that is required for safe shutdown or accident mitigation. Electrical equipment that could be subject to a harsh environment and is required to mitigate the consequences of design-basis events which result in harsh environments were included in the Master List of equipment.

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 Master List was generated for electrical equipment as defined by 10 CFR 50.49(b)(1) that could be exposed to the harsh environments caused by design-basis events and that is required to remain functional during or following a LOCA or HELB. The harsh environmental condition of the worst-case LOCA and HELB envelops the environmental conditions for all other design-basis events as documented in FSAR Section 6.2. Therefore. the LOCA/HELB accidents are the only design-basis events that result in significantly adverse environments to electrical equipment which is required for safe shutdown or accident mitigation. The Master List was developed by a review of design and as-built documentation, the FSAR, Technical Specifications, Emergency Operating Procedures, P&IDs, and electrical distribution diagrams to determine the systems and components required to perform the functions of reactor trip, containment isolation, and accident mitigation. Such electrical components that could be exposed to harsh environments resulted in the Master List. These electrical components include safety-related and nonsafety-related components and electrical components associated with plant auxiliary systems (e.g., Component Cooling Water) that are required for the operation of safety-related systems and equipment.
- 2. Elementary wiring diagrams of safety-related electrical equipment identified by the methods described in Item 1 above 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) where failure due to postulated environmental conditions could prevent

required operation of the safety-related equipment. If an adverse effect could result, the connected (interlocked) components (safety-related or nonsafety-related) were added to the Master List.

- 3. The operation of safety-related systems and equipment were reviewed co identify any directly mechanically connected auxiliary systems with electrical components which are necessary for the required operation of the safety-related equipment. None of the electrical equipment identified in the Master List requires the operation of directly mechanically connected auxiliary systems that depend on electrical components for operation. Plant auxiliary systems that are directly mechanically connected to and required for the operation of mechanical safety-related equipment (e.g., Component Cooling Water) were also reviewed to identify electrical components required to be environmentally qualified as discussed in Alabama Power Company's response to Item 1 above.
- 4. All nonsafety-related electrical circuits directly or indirectly associated with the electrical equipment identified in Step 1 by a common power supply are properly isolated by design through coordinated protective relays, circuit breakers, and fuses for electrical fault protection. The Farley Nuclear Plant original design criteria provided electrical fault protection devices to protect components connected to a common power supply. The electrical fault protection devices for equipment within the scope of 10 CFR 50.49 that are required to achieve a safe shutdown condition at FNP and within a potential harsh environment resulting from design-basis events are environmentally qualified. An electrical fault on the load side of a power supply feeder breaker or fuse would be isolated without effecting the remaining loads on the common power supply. The electrical design criteria included the use of applicable industry standards (e.g., IEEE, NEMA, ANSI, UL and NEC) and was reviewed and accepted by the NRC prior to receipt of the Farley Nuclear Plant operating license.

The physical proximity of nonsafety-related electrical circuits associated with electrical equipment identified in Step 1 would not cause an

environmental failure. In the judgment of Alabama Power Company, there is no known scenario for the failure of nonsafety-related electrical circuits whose close physical proximity would adversely impact the capabilities of the electrical equipment identified in Item 1 to perform their intended function in a harsh environment resulting from design-basis events.

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 has been granted an extension request by letter dated April 16, 1984, to the end of the sixth refueling outage scheduled to start in April 1985, but in any event no later than November 30, 1985. As stated in letter dated February 22, 1984, Alabama Power Company has interpreted the scope of 10 CFR 50.49(b)(3) to be those equipment items:

(a) defined as Category 1 and 2 instruments in Alabama Power Company's R.G.
 1.97 Compliance Report, and

(b) not addressed by 10 CFR 50.49(b)(1) and (b)(2), and

(c) located in a harsh environment.

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

As stated in letters dated March 14, 1983 and May 20, 1983, it is the judgement of Alabama Power Company that all electric equipment important to safety within the scope of 10 CFR 50.49 at Farley Unit 1 is environmentally qualified and Justifications for Continued Operation (JCO's) are not necessary.

CONCLUSIONS

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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.

- Alabama Power's electrical equipment environmental qualification program complies with the requirements of 10 CFR 50.49.
- ^o The proposed resolutions for each of the environmental qualification deficiencies identified in the January 31, 1983 SER and FRC TER are acceptable.
- Continued operation will not present undue risk to the public health and safety.

ENCLOSURE 2

SAFETY EVALUATION REPORT OFFICE OF NUCLEAR REACTOR REGULATION EQUIPMENT QUALIFICATION BRANCH FARLEY UNIT 2 DOCKET NO. 50-364

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 IE 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 21, 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 January 17. 1983. A Safety Evaluation Report was subsequently issued to the Alabama Power Company on January 31, 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 to be met for demonstrating the environmental qualification of electrical equipment important to safety located in a harsh environment. In accordance with this rule, equipment for Farley Unit 2 may be qualified to the criteria specified in either in 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 January 11, 1984, a meeting was held to discuss Alabama Power's proposed method to resolve the environmental qualification deficiencies identified in the January 31, 1983 SER and January 14, 1983 FRC TER. Discussions also include Alabama Power'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 are documented in a February 29, 1984 submittal 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 31, 1983 SER and January 17, 1983 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 31, 1983 SER, and the FRC TER enclosed with it, are described in the licensee's February 29, 1984 submittal. During the January 11, 1984 meeting with the licensee, the staff discussed the proposed resolution of each deficiency for each equipment items 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 31, 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 January 11, 1984 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 II, 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 February 29, 1984 submittal, 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 (temperature, pressure, etc.) effects resulting from the worst case LOCA and HELB were considered in the IEB 79-01B and NUREG-0588 analyses. The capability of equipment to perform its intended function as a result of flooding in the containment or main steam valve room is documented in the IEB 79-01B and NUREG-0588 submittals. The effects of flooding in areas outside containment other than the main steam valve room were analyzed and found to have no adverse effects on the capability of equipment to perform its intended function as documented in FSAR Appendix 3K.

The harsh environmental condition of the worst-case LOCA and HELB envelops the environmental conditions for all other design-basis events as documented in FSAR Section 6.2. Therefore, the LOCA/HELB accidents are the only design-basis accidents which result in significantly adverse environments to electrical equipment that is required for safe shutdown or accident mitigation. Electrical equipment that could be subject to a harsh environment and is required to mitigate the consequences of design-basis events which result in harsh environments were included in the Master List of equipment.

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 Master List was generated for electrical equipment as defined by 10 CFR 50.49(b)(1) that could be exposed to the harsh environments caused by design-basis events and that is required to remain functional during or following a LOCA or HELB. The harsh environmental condition of the worst-case LOCA and HELB envelops the environmental conditions for all other design-basis events as documented in FSAR Section 6.2. Therefore. the LOCA/HELB accidents are the only design-basis events that result in significantly adverse environments to electrical equipment which is required for safe shutdown or accident mitigation. The Master List was developed by a review of design and as-built documentation, the FSAR, Technical Specifications, Emergency Operating Procedures, P&IDs, and electrical distribution diag, ams to determine the systems and components required to perform the functions of reactor trip, containment isolation, and accident mitigation. Such electrical components that could be exposed to harsh environments resulted in the Master List. These electrical components include safety-related and nonsafety-related components and electrical components associated with plant auxiliary systems (e.g., Component Cooling Water) that are required for the operation of safety-related systems and equipment.
- 2. Elementary wiring diagrams of safety-related electrical equipment identified by the methods described in Item 1 above 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) where failure due to postulated environmental conditions could prevent

required operation of the safety-related equipment. If an adverse effect could result, the connected (interlocked) components (safety-related or nonsafety-related) were added to the Master List.

- 3. The operation of safety-related systems and equipment were reviewed to identify any directly mechanically connected auxiliary systems with electrical components which are necessary for the required operation of the safety-related equipment. None of the electrical equipment identified in the Master List requires the operation of directly mechanically connected auxiliary systems that depend on electrical components for operation. Plant auxiliary systems that are directly mechanically connected to and required for the operation of mechanical safety-related equipment (e.g., Component Cooling Water) were also reviewed to identify electrical components required to be environmentally qualified as discussed in Alabama Power Company's response to Item 1 above.
- 4. All nonsafety-related electrical circuits directly or indirectly associated with the electrical equipment identified in Step 1 by a common power supply are properly isolated by design through coordinated protective relays, circuit breakers, and fuses for electrical fault protection. The Farley Nuclear Plant original design criteria provided electrical fault protection devices to protect components connected to a common power supply. The electrical fault protection devices for equipment within the scope of 10 CFR 50.49 that are required to achieve a safe shutdown condition at FNP and within a potential harsh environment resulting from design-basis events are environmentally qualified. An electrical fault on the load side of a power supply feeder breaker or fuse would be isolated without effecting the remaining loads on the common power supply. The electrical design criteria included the use of applicable industry standards (e.g., IEEE, NEMA, ANSI, UL and NEC) and was reviewed and accepted by the NRC prior to receipt of the Farley Nuclear Plant operating license.

The physical proximity of nonsafety-related electrical circuits associated with electrical equipment identified in Step 1 would not cause

an environmental failure. In the judgment of Alabama Power Company, there is no known scenario for the failure of nonsafety-related electrical circuits whose close physical proximity would adversely impact the capabilities of the electrical equipment identified in Item 1 to perform their intended function in a harsh environment resulting from design-basis events.

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 has been granted an extension request by letter dated October 21, 1983 until March 31, 1985. As stated in letter dated February 22, 1984, Alabama Power Company has interpreted the scope of 10 CFR 50.49(b)(3) to be those equipment items:

- (a) defined as Category 1 and 2 instruments in Alabama Power Company's R.G.
 1.97 Compliance Report, and
- (b) not addressed by 10 CFR 50.49(b)(1) and (b)(2), and
- (c) located in a harsh environment.

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

As stated in letters dated March 14, 1983 and May 20, 1983, it is the judgement of Alabama Power Company that all electric equipment important to safety within the scope of 10 CFR 50.49 at Farley Unit 2 is environmentally qualified and Justifications for Continued Operation (JCO's) are not necessary.

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.

- Alabama Power's electrical equipment environmental qualification program complies with the requirements of 10 CFR 50.49.
- ^o The proposed resolutions for each of the environmental qualification deficiencies identified in the January 31, 1983 SER and FRC TER are acceptable.
- Continued operation will not present undue risk to the public health and safety.