7590-01

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NOs. 50-206/213/289/305

GPU NUCLEAR CORPORATION

(THREE MILE ISLAND UNIT 1)

WISCONSIN PUBLIC SERVICE CORPORATION

(KEWAUNEE)

SOUTHERN CALIFORNIA EDISON COMPANY

(SAN ONOFRE UNIT 1)

CONNECTICUT YANKEE POWER COMPANY

(HADDAM NECK)

ISSUANCE OF DIRECTOR'S DECISION UNDER 10 CFR 2.206

The Office of Nuclear Reactor Regulation has considered pursuant to 10 CFR 2.206 alleged equipment qualification deficiencies at specific plants identified in the "Union of Concerned Scientists' Comments on Proposed Rule" filed with the Commission by the Union of Concerned Scientists (Petitioner) on May 23, 1984. The Petitioner included as a concern that specific items of electrical equipment for certain facilities had not been found environmentally qualified in Technical Evaluation Reports prepared by the Franklin Research Center for the NRC in 1982 and 1983.

Upon review of the information pertaining to these items and the information provided by the Petitioner, the Director of the Office of Nuclear Reactor Regulation has determined that the concerns identified by the Petitioner have been adequately addressed. The reasons for the Director's conclusions are contained in the "Director's Decision Under 10 CFR 2.206" (DD-85-20), which is available for public inspection in the Commission's Public Document Room,

1717 H Street, N.W., Washington, D. C. and at the Local Public Document Rooms for the above listed facilities located at: Kewaunee - University of Wisconsin Library Learning Center, 2420 Nicolet Drive, Green Bay, Wisconsin 54301; San Onofre - San Clemente Public Library, 242 Del Mar, San Clemente, California 92672; Haddam Neck - Russell Library, 123 Broad Street, Middletown, Connecticut 06547; and Three Mile Island - Government Publications Section, State Library of Pennsylvania, Education Building, Commonwealth and Walnut Streets, Harrisburg, Pennsylvania 17126.

A copy of the Decision will be filed with the Secretary for the Commission's review in accordance with 10 CFR 2.206(c). As provided in this regulation, the Decision will become the final action of the Commission twenty-five (25) days after issuance, unless the Commission on its own motion institutes review of the Decision within that time.

Dated at Bethesda, Maryland, this 23rd day of December, 1985.

FOR THE NUCLEAR REGULATORY COMMISSION

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

April 18, 1985

Docket No. 50-289

Mr. Henry D. Hukill, Vice President
and Director - TMI-1
GPU Nuclear Corporation
P. O. Box 480
Middletown, Pennsylvania 17057

Dear Mr. Hukill:

By letter dated December 10, 1982 we provided you with a safety evaluation that identified deficiencies in your equipment qualification (EQ) program. Subsequently, on October 5, 1983 and March 8, 1984 we met with you and discussed your proposed resolution for each deficiency and your general methodology for complying with 10 CFR 50.49, "Environmental Qualification of Electrical Equipment Important to Safety for Nuclear Power Plants," which became effective on February 22, 1983. We also audited your EQ files on January 29 and 30, 1985.

Based on our discussions, audits of your files and review of your submittals as documented in the enclosed safety evaluation, we have concluded that you have resolved all equipment qualification deficiencies and have provided acceptable justification for interim operation (JIO) for the two items of equipment for which we granted you a schedular extension by letter dated March 29, 1985. We have found that, (1) your environmental qualification program for electrical equipment important to safety for Three Mile Island, Unit 1 is in compliance with 10 CFR 50.49, (2) your proposed resolution for each environmental qualification deficiency is acceptable, and (3) interim operation will not present undue risk to the public health and safety.

Sincerely,

ORIGINAL SIGNED BY
JOHN F. STOLZ

John F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing

Enclosure:
Safety Evaluation

cc w/enclosure:
See next page

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SAFETY EVALUATION REPORT
OFFICE OF NUCLEAR REACTOR REGULATION
EQUIPMENT QUALIFICATION BRANCH
THREE MILE ISLAND NUCLEAR STATION UNIT 1
DOCKET NO. 50-289

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 (issues 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 July 2, 1981. This SER directed the licensee to "either provide documentation of the missing qualification information which demonstrates that safety-related equipment meets the DOR Guidlines 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 November 5, 1982. A Safety Evaluation Report was subsequently issued to the GPU Nuclear Corporation for Three Mile Island Nuclear Station, Unit 1 (TMI-1), on December 10, 1982 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 TMI-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 October 5, 1983 and March 8, 1984 meetings were held tc discuss GPU Nuclear Corporations proposed method to resolve the environmental qualification deficiencies identified in the December 10, 1982 SER and November 5, 1982 FRC TER. Discussions also included GPU Nuclear Corporation's general methodology for compliance with 10 CFR 50.49, and justification for interim operation for those equipment items for which environmental qualification is not yet completed. As a result of these meetings an audit was performed on January 29 and 30, 1985. Based on the results of the audit the staff has concluded that the licensee has demonstrated environmental qualification of equipment items in the equipment qualification program to the extent that the files reviewed are representative of the remainder of the qualification files. Adequate proof of qualification was evident to conclude that the equipment meets the requirements of 10 CFR 50.49. The minutes of the meetings and proposed method of resolution for each of the environmental qualification deficiencies are documented in the December 11, 1984 and March 25, 1985 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 December 10, 1982 SER and November 5, 1982 FRC TER; (2) compliance with the requirements of 10 CFR 50.49; and (3) justification for interim operation (JIO) for those equipment items for which the environmental qualification is not yet completed.

Proposed Resolutions of Identified Deficiencies

The proposed resolution for the equipment environmental qualification deficiencies, identified in the December 10, 1982 SER, and the FRC TER enclosed with it, are described in the licensee's December 11, 1984 and March 25, 1985 submittals. During the October 5, 1983 and March 8, 1984 meetings 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 December 10, 1982 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 analysis and testing, 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 October 5, 1983 and March 8, 1984 meetings. 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 analysis 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 further audited by the staff during follow-up inspections to be performed by Region I, 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, our review of its submittals, and the results of the January 29 and 30 audit, we find the licensee's approach for resolving the identified environmental qualification deficiencies acceptable.

Compliance With 10 CFR 50.49

In its December 11, 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 all design basis events which could potentially result in a harsh environment, including flooding outside containment were addressed in identifying safety related electrical equipment within the scope of 10 CFR 50.49(b)(1). The environmental effects resulting from all postulated design basis accidents documented in Chapter 14 of the TMI-1 FSAR including the Loss of Coolant Accident and Main Steam Line Break Accident (in Containment and the Intermediate Building) were considered in the identification of safety related electrical equipment which was to be environmental qualified. The flooding resulting from LOCA's and High Energy

Line Breaks (HELB) inside containment is documented in GPUN letters dated June 11, 1982, September 1, 1982 and April 14, 1983. The maximum flood level of 5.66 ft. above the Reactor Building mat, based on a large break LOCA, is below instruments of interest (S/G Level & Pressurizer Level which are located at or above 4.89 ft.). Sufficient flood volume in the Intermediate Building exists (as is addressed in TDR 250 dated January 22, 1984 and GPUN letters dated April 1 and 26 and August 1, 1984) such that no operator action is required for 24 minutes. Therefore, all design basis events including accidents at TMI-1 were considered in the identification of electrical equipment within the scope of paragraph (b)(1) of 10 CFR 50.49.

The licensee's approach for identifying equipment within the scope of paragraph (b)(1) is an 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:

A review of the electrical systems interactions (for failure of electrical components which have not been qualified for harsh environments) on electrical components which are required for accident mitigation has been accomplished. This has been accomplished by a review of the TMI-1 electrical wiring diagrams, with the following results:

a. All motor operated valves required to be qualified have dedicated overcurrent protection devices and contain no interfacing devices that could impact their operation.

b. All solenoid valves are individually fused and have no other electrical devices except limit switches that could impact their operation. These limit switches are identified as part of the valve and are qualified.

c. The pumps identified do not contain any electrical devices other than those identified and qualified which could interface with the operation of these pumps.

d. The identified air handling fan motors do not contain any electrical devices which, if not qualified, could interfere with their operation.

e. The effect of non-qualified instrumentation failure on safety-related instrumentation power supplies has been evaluated. This evaluation concluded that their failure could not result in a failure of the safety-related instrumentation power supplies or affect the operation of components required for accident mitigation.

Certain instrumentation requiring qualification receive its power from ICS/NNI power. While the ICS/NNI power is non-safety-related, it does have diesel backed power and failure of an ICS/NNI power supply is indicated in the control room.

Each such qualified instrument has its power supply identified on the control room panel, therefore, the operator will be aware of an ICS/NNI power supply failure and could then rely on other qualified instrumentation for the required indication. Where such instrumentation provides an automatic control function, the means for qualified manual control and indication are available in the control room.

The support auxiliary systems, the system interfaces, the required instrumentation and electrical auxiliary devices were identified by a review of the specific system flow diagrams, component specifications, manuals and drawings and the elementary wiring diagrams.

The cooling water support systems are generally located in non-harsh radiological areas. Components within these cooling water systems which are not clearly identifiable to be either located in a non-harsh environment and/or to be non-electrical in nature were listed. All other such auxiliary support systems including the river water supply systems are located in non-harsh environments. These mitigating and mitigating-support systems encompass all of the systems required to mitigate LOCA/HELB's.

In response to IE Notice 79-22 GPUN reviewed principal components and their associated trains of control and power subcomponents to determine the effects of an adverse environment on their performance. The results showed that the necessary systems will perform their function during HELB/LOCA accidents by virtue of location and/or environmental qualification and will not result in an adverse effect on the safety analysis. This review identified no additional electrical equipment at TMI-1 which was not previously included in the Master List. Further, GPUN performed an additional study: (1) to identify power sources of instruments, (2) to determine if the power is safety related and if the failure of the instrument can cause any degradation of a safety related power supply and (3) to identify equipment interlocks associated with these instruments.

Those non-safety circuits which are related by "common power supply" were addressed by a review of the plant electrical design to verify that all such circuits are protected by properly coordinated protective devices which will ensure that failure of a non-safety related circuit will not cause loss of a power supply to qualified electrical equipment.

Those non-safety circuits which are related by "physical proximity" of their wiring are addressed by the fact that the plant design standard is that all circuits are protected by fuses or circuit breakers which are properly sized to protect the circuit wiring. This insures that damage due to faults will be limited and will not result in either fire or excessive heat in raceways or enclosures which might disable qualified electrical equipment. As an extension of the electrical design review noted above, a review is being performed to verify that properly sized fuses have been specified and installed.

We find the methodology 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 October 1, 1984 letter for identification of instrumentation and sampling equipment which requires environmental qualification to meet the intent of Regulatory Guide 1.97. The staff has not yet completed its review for conformance to Regulatory Guide 1.97. However, in the attachments to its October 1, 1984 letter the licensee specifies exceptions to the guidance, justifications, proposed modifications and the schedule for the upgrade. The staff will determine the acceptability of these justifications as part of its review for conformance with Regulatory Guide 1.97. This 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. However, the licensee has included in its environmental qualification program all presently identified post-accident monitoring instrumentation and sampling equipment for which exception is not being taken using the guidance of Regulatory Guide 1.97.

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 Interim Operation

The licensee has provided, in its December 11, 1984 and March 25, 1985 submittals, justification for interim operation addressing each item of equipment for which the environmental qualification is not yet completed (see enclosure for the JIO equipment list).

We have reviewed each JIO provided by the licensee in its December 11, 1984 and March 25, 1985 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 JIO'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 can not 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.

- GPU Nuclear Corporation's electrical equipment environmental qualification program for TMI-1 complies with the requirements of 10 CFR 50.49.

- The proposed resolutions for each of the environmental qualification deficiencies identified in the December 10, 1982 SER and FRC TER are acceptable.

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

Justification for Interim Operation Equipment List

NRC TER No.	TMI-1 ID No.	Equipment Description
N/A	None	Continental Wire and Cable Co./ Bendix (Incore Thermocouple Cable and Connector) JIO-T1-84-6
N/A	RMG-22, -23	Victoreen Monitor Cable and Connector Assembly/Anaconda (Radiation Detection) JIO-T1-84-9

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

March 11, 1985

Docket No. 50-206
LS05-85-03-010

Mr. Kenneth P. Baskin, Vice President
Nuclear Engineering
Safety and Licensing Department
Southern California Edison Company
2244 Walnut Grove Avenue
Post Office Box 800
Rosemead, California 91770

Dear Mr. Baskin:

SUBJECT: ENVIRONMENTAL QUALIFICATION OF ELECTRIC EQUIPMENT IMPORTANT TO SAFETY

Re: San Onofre Nuclear Generating Station, Unit No. 1

The enclosed Safety Evaluation addresses the environmental qualification of electric equipment important to safety for San Onofre Nuclear Generating Station, Unit 1 for compliance with the requirements of 10 CFR 50.49, your proposed resolutions for the deficiencies identified in the Safety Evaluation dated November 30, 1982, and the June 28, 1982 Franklin Research Center Technical Evaluation Report enclosed with it, and justification for continued operation for those equipment items for which environmental qualification has not yet been completed.

On December 20, 1983, a meeting was held with the Southern California Edison Company to discuss the proposed method of resolution for each of the environmental qualification deficiencies identified. Discussions also included Southern California Edison Company's general methodology for compliance with 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants," which became effective February 22, 1983, and justification for continued operation for those equipment items for which environmental qualification is not yet completed. You provided a submittal, by letter dated July 30, 1984 addressing the above subjects and documenting the discussions held at the meeting.

An audit of the Environmental Qualification Documentation was conducted on October 2, 3, and 4, 1984, with additional discussions on October 26, 1984. You then provided two submittals, dated November 3 and November 19, 1984, addressing the subjects discussed during the audit and meetings.

Based on discussions during the audit and meetings and the results of our review of your November 3 and November 19, 1984 submittals, we have concluded that Southern California Edison Company's Equipment Qualification Program is in compliance with the requirements of 10 CFR 50.49, since final environmental qualification of electric equipment important to safety either: (1) will be completed by March 31, 1985, which is the earlier of the two dates specified by 10 CFR 50.49(g) for this facility; or (2) an extension of the implementation date for certain equipment from March 31, 1985 to no later than November 30, 1985 has been reviewed and approved by the NRC, and justification for continued operation has been provided and is acceptable to the staff for all equipment not currently qualified. We therefore conclude that continued operation of San Onofre Generating Station, Unit 1 will not present undue risk to the public health and safety.

Sincerely,

John A. Zwolinski, Chief
Operating Reactors Branch #5, DL
Division of Licensing

Enclosure:
Safety Evaluation

cc w/enclosure:
See next page

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SAFETY EVALUATION REPORT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1

DOCKET NO. 50-206

ENVIRONMENTAL QUALIFICATION OF ELECTRIC EQUIPMENT IMPORTANT TO SAFETY

1.0 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).

2.0 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 Part 50, Appendix A, General Design Criterion 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 June 2, 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 June 28, 1982. An

SER was subsequently issued to the Southern California Edison Company on November 30, 1982 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 Part 50, specifies the requirements of electrical equipment important to safety located in a harsh environment. In accordance with this rule, equipment for San Onofre Nuclear Generating Station, 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 December 20, 1983, a meeting was held to discuss Southern California Edison Company's proposed method to resolve the environmental qualification deficiencies identified in the November 30, 1982 SER and June 28, 1982 FRC TER. Discussions also included Southern California Edison Company's general methodology for compliance with 10 CFR 50.49, and justification for continued operation (JCO) for those equipment items for which environmental qualification is not yet completed.

A submittal on July 30, 1984 from the licensee was inadequate to resolve the environmental qualification deficiencies identified by the November 30, 1982 SER and the June 28, 1982 FRC TER, as well as the general methodology for compliance with 10 CFR 50.49. Accordingly, an audit of the environmental qualification documentation files was held on October 2, 3 and 4, 1984, with additional discussions with the licensee on October 26, 1984. This audit and discussions resulted in additional licensee submittals of November 9 and November 19, 1984.

3.0 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 November 30, 1982 SER and June 28, 1982 FRC TER; (2) compliance with the requirements of 10 CFR 50.49; and (3) JCOs 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 November 30, 1982 SER, and the June 28, 1982 FRC TER enclosed with it, are described in the licensee's November 3 and November 19, 1984 submittals. During the December 20, 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 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. The staff discussed the proposed resolutions in detail on an item by item basis with the licensee during the December 20, 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 the staff did

not review the additional analyses or documentation, it 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 staff concluded that the analysis used was acceptable. In addition to the audit performed in October 1984, the licensee's equipment environmental qualification files will be audited by the staff during follow-up inspections to be performed by Region V, with assistance from IE Headquarters and NRR staff as necessary.

Since a significant amount of documentation has already been reviewed by the staff and FRC 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 discussions with the licensee and review of its submittal, the staff finds the licensee's approach for resolving the identified environmental qualification deficiencies acceptable.

Compliance With 10 CFR 50.49

In its November 19, 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 environmental effects (including flooding) from all postulated design basis accidents (both inside and outside containment) were considered in the identification of safety-related electrical equipment to be environmentally qualified. These accidents include loss-of-coolant-accidents and the High Energy Line Break (HELB) inside containment, and various HELBs outside containment.

The equipment that is required to operate during these design basis accidents were identified by a review of the Final Safety Analysis Report, Emergency Operating Procedures, piping and instrumentation diagrams, Technical Specifications and other relevant sources.

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:

The licensee stated that the identification of this equipment was accomplished as a result of compliance with a number of other efforts. These efforts included a preliminary review performed as part of the fire protection review, a response to IE Information Notice 79-22 and other IE Information Notices, Bulletins and Circulars, and an Emergency Core Cooling System (ECCS) single failure evaluation. This ECCS evaluation involved not only the ECCS, but also the associated systems such as the component cooling water system, the containment spray system, the standby power system and the electrical power distribution system.

These ECCS evaluations utilized failure modes and effects analysis, which would identify those nonsafety related electric equipment items whose failure could prevent satisfactory accomplishment of safety functions, therefore, the staff finds 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 states that in preparation of the main list, many devices which provided control room indication for post-accident monitoring were included on the list (10 CFR 50.49 Section b(3)). In addition, Southern California Edison Company is currently addressing the requirements of Reg. Guide 1.97.

Additional monitoring equipment may be identified as part of the resolution of Supplement 1 to NUREG-0737 and will be qualified as necessary to 10 CFR 50.49.

The staff finds 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(JCO)

The licensee has provided, in its November 3, 1984 submittal, JCOs addressing each item of equipment for which the environmental qualification is not yet completed (see enclosure for the JCO equipment list).

The staff has reviewed each JCO provided by the licensee in its November 3, 1984 submittal and finds them acceptable since they are based on essentially the same criteria that were used by the staff and its contractor to review JCOs previously submitted by licensees. These criteria, listed below, are also essentially the same as those contained in 10 CFR 50.49(i).

1. 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.

2. Partial test data that does not demonstrate full qualification, but provides a basis for concluding the equipment will perform its function. If it can not 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.

3. 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.

4.0 CONCLUSIONS

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

- Southern California Edison Company's electrical equipment environmental qualification program complies with the requirements of 10 CFR 50.49 since all electrical equipment important to safety will be environmentally qualified by March 31, 1985 or an alternative date reviewed and approved by the staff and since acceptable justification for continued operation has been provided for all equipment not currently qualified.

- The proposed resolutions for each of the environmental qualification deficiencies identified in the November 30, 1982 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.

5.0 ACKNOWLEDGEMENT

This Safety Evaluation was prepared by P. Shemanski and W. Paulson.

Dated: March 11, 1985

ENCLOSURE

Justification For Continued Operation Equipment List

SONGS-1 Tag Number	NRC TER Number	Description
C75, C76	-	Westinghouse Hydrogen Recombiner Model B
-	-	Conax Electrical Conductor Seal Assembly Model N-11001, N-11011
MOV 18, 19	5	Limitorque Motor Operator Model SMB-00/Class B
-	54	Raychem Control and Instrumentation Cable Flametrol Insulation
LE 2001, LE 3001 LE 2002 A, B, C LE 3002 A, B, C	-	Transamerica Delaval Level Transmitter Model XM-54852, XM-54853
RT 1255, 1257	-	General Atomic Radiation Monitor Model RD-23
TE-400 A, B, C TE-401A/2401A TE-401 B, C TE-402A/3402A TE-402B, C TE-410 A, B, C	41	Weed Instrument Company RTD Model Numbers: 1D6E/612D-1A-D-6-C-16.5-C-0 1D6E/612-1A-D-6-C-16.5-C-0

SONGS-1 Tag Number	NRC TER Number	Description
TE-411A/3411A TE-411B, C TE-412A/2412A TE-412B, C TE-420A, B, C TE-421A/3421A TE-421 B, C TE-422A/2422A TE-422 B, C		
VPC 23, EPC 23	44	Amphenol Penetration Model 50020353
G1GS	50	Westinghouse Pump Motor Type ABDP
G27 A, G27 B,	48	Westinghouse Pump Motors Model AALG
G3 A, B	49	Westinghouse Pump Motors Type CS
MOV 1100 B, C, D	1, 3	Limitorque Valve Motor Operators SMB-00/Class B
MOV 720 A	7	Limitorque Valve Motor Operator SMB-00/Class B
MOV 866 A, B	6	Limitorque Valve Motor Operator SMB-00/Class B
MOV 880	4	Limitorque Valve Motor Operator SMB-00/Class B

SONGS-1 Tag Number	NRC TER Number	Description
CV 515, 516, 517 518, 525, 526 527, 528, 737A, 737 B	17, 35, 52 13, 36, 51, 16	Paul Monroe Hydraulic Rotary Valve Operators Model Number PD 89423, PD 89425, PD=89426
PE 2001, 3001 TE 2001, 3001 AEH2 2001, 3001	-	Exo-Sensor, Inc. Hydrogen Monitor Assemblies Drawing 108D001
MOV 805 A, B, C	8	Limitorque Motor Operators Model SMA-1/Class B
-	-	Revere Corp. Thermocouple Cable Model Number 16, Type JX
-	-	Rockbestos Coaxial Cable Model RSS-6-104
G-45 A, G-45 B	47	Chempump Pump Motors Model GPS-60L-46H-3T
FT 460, 461, 462	25	Foxboro Flow Transmitters Model E 11 DM Without MCA/RRW
FT 912, 913, 914	22	Foxboro Flow Transmitters Model 630-2AS
PT-425	32	Foxboro Flow Transmitter Model E 11 GM

SONGS-1 Tag Number	NRC TER Number	Description
HV 851 A/B, 852 A/B, 853 A/B, 854 A/B	58	Teledyne Solenoid Valve Actuators Model 02112-002-5210 and 02112-003-5210
FCV 1115, D, E, F	12, 57	Valve Actuator Assemblies Honeywell Positioner ASCO Solenoid Model 8300
TE 606	38	Foxboro Temperature Element Model DB-13V-26W
SV 19, 127 (CV40, 116)	64	ASCO Solenoid Valve Model WPLB 3800
SV 28 (CV 10)	70	ASCO Solenoid Valve Model WPLB 8300
SV 29, 30 (POV 9, 10)	63	ASCO Solenoid Valve Model 8345
SV 108, 110, 112 (CV 102, 104, 106)	13	ASCO Solenoid Valve Model WPLB 8300
SV 109, 111, 113 (CV 103, 105, 107)	67	ASCO Solenoid Valve Model WPLB 8300
SV 118, 128 (CV 114, 82)	60, 62	ASCO Solenoid Valve Model WPLB 8300
SV 125 (CV 115)	61	ASCO Solenoid Valve Model WPLB 8300

SONGS-1 Tag Number	NPC TER Number	Description
SV 410, 411 (CV 410, 411)	-	ASCO Solenoid Valve Model LB 8316
SV 702 A, B, C, D	14, 15	Marotta Solenoid Valve Model 583H-AA
SV 1212-6, 7 (CV 146, 147)	68	ASCO Solenoid Valves Model WPLB 8300
FY 1202, 1203, 1204 (CV 202, 203, 204)	-	ASCO Solenoid Valves Model WPLB 8300
HV 1287 (CV 287)	69	ASCO Solenoid Valve Model WPLB 8300
-	55	Anaconda-Ericsson, Inc. Power and Control Cable Silicone Rubber Insulation
RT 1256 A, B RT 1258 A, B	-	General Atomic Company Radiation Detector Model RD-1, RD-2A
PY 3545, 2546, 2530, 3531 (CV 545, 546, 530, 531)	65	ASCO Solenoid Valves Model 8316
-	55	Rockbestos Instrumentation Cable PVC and Teflon Insulation
EPC 4, WPC 7, WPC 9, EPC 1, WPC 5	43	Viking Industries Inc. Electrical Penetrations Power and Control-480VAC

SONGS-1 Tag Number	NRC TER Number	Description
WPC 3, WPC 4, EPC 2, EPC 3	43	Viking Industries Inc. Electrical Penetrations Power and Control-480VAC
-	43	Viking Industries Inc. Electrical Penetrations Power and Control-120VAC
-	56	Rockbestos Control and Instrument Cable Firewall EP Insulation
-	56	Rockbestos Control and Instrument Cable Firewall III Insulation
-	59	General Electric Power and Control Cable Vulkine Insulation
-	53	General Electric Power and Control Cable FR-EPR Neoprene Insulation
EI5, WI6, EPC 11, 12 WCP 11, 13	45	Conax Electrical Penetration Assemblies Model 7895-10000-02
ZSO 2530, 3531, 3545, 2546 ZSC 2530, 3531, 3545, 2546 ZSO 2300, 2301, 3300, 3301 ZSC 2300, 2301, 3300, 3301	37	NAMCO Limit Switches Model EA-180

SONGS-1 Tag Number	NRC TER Number	Description
MOV 356, 357, 358 720B, 883	3, 7	Limitorque Valve Motor Operators SMB-00/Class BH Motor Insulation
G8 A, B	46	Westinghouse Pump Motors Type CSP
-	39, 40	Raychem Nuclear Inline Cable Splice Assemblies Model WCSF-N
SV 532 A, 533 A 534 A, 535 A, 536 A, 537 A (CVs 532, 533, 534, 535, 536, 537) SV 3201, 3213	10, 11	ASCO Solenoid Valves Model NP 8320
SV-1212-8, SV-1212-9, SV-119, SV-120, SV-121 SV-122, SV-123, SV-124 SV-125 A (CV-123), SV-3302, SV-3303, SV-2004, SV-3004, SV-2401, SV-2402, SV-2403 SV-2404, SV-3401, SV-3402 SV-3403, SV-3404	71, 67, 66	Target Rock Solenoid Valves Model 81A-001, 002, 003, 114; 79RR-003; 80B-001-10; 80 EE-001
-	55	Simplex Wire and Cable Company Power and Control Cable Anhydrex-XX Insulation
-	55	Rome Cable Company Cable Pozone A/Roprene Insulation

SONGS-1 Tag Number	NRC TER Number	Description
-	55	Okonite Power and Control Cable Okonex/Okoprene Insulation
EI3, EI4, WI13, WI14	43	Viking Industries Inc. Electrical Penetrations Instrument Penetrations TC & Twisted Pair Cable
LT 3400, A, B, C LT 2400 A, B, C PT 1121 A PT 1120 A PT 430, 431, 425 X1 PT 425 X 2 FT 456, 457, 458 PT 3000 A, B, C FTH 3453, 3454, 3455 FTL 3453, 3454, 3455 PT 2010, 3010 PT 2011, 3011 PT 2001, 3001	34, 30, 31 32, 18	Foxboro Transmitters Model N-E10
LT 430, 431, 432 PT 432 FT 500, 501 PT 501, 502, 503 FT 504	29, 30, 31 23, 20, 33	Foxboro Transmitters Model E-10 With MCA/RRW Modification

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

September 11, 1984

Docket No. 50-305

Mr. C. W. Giesler, Vice President
Nuclear Power
Wisconsin Public Service Corporation
Post Office Box 1200
Green Bay, Wisconsin 54307-9002

Dear Mr. Giesler:

SUBJECT: FINAL RESOLUTION OF ENVIRONMENTAL QUALIFICATION OF ELECTRIC EQUIPMENT IMPORTANT TO SAFETY

We have completed our review of the Kewaunee Nuclear Power Plant environmental qualification of electrical equipment program.

We have concluded that your program complies with the requirements of 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants." Our Safety Evaluation is enclosed.

You are required to submit a letter stating that all equipment within the scope of the rule has been identified and is environmentally qualified. Inform us immediately of any electrical equipment under the scope of the rule found to be outside the requirements of the rule. In addition, the rule requires you to maintain all environmental qualification documentation in an auditable form.

Sincerely,

Steven A. Varga, Branch Chief
Operating Reactors Branch #1
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

8409260228

cc: Steven E. Keane, Esquire
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SAFETY EVALUATION REPORT
OFFICE OF NUCLEAR REACTOR REGULATION
EQUIPMENT QUALIFICATION BRANCH
KEWAUNEE
DOCKET NO. 50-305

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 capability 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 IE 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 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 positions. 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 June 1, 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 the licensee's qualification documentation for safety-related electrical equipment located in harsh

environment as 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 Wisconsin Public Service Corporation on February 21, 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 Kewaunee 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 20, 1984 a meeting was held to discuss Wisconsin Public Service's proposed method to resolve the environmental qualification deficiencies identified in the February 2, 1983 SER and January 14, 1983 FRC TER. Discussions also included Wisconsin Public Service's general methodology for compliance with 10 CFR 50.49, and justification for continued operation for those equipment items for which environmental qualification was not yet completed. The proposed method of resolution for each of the environmental qualification deficiencies are documented in a March 16, 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 February 2, 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 had not yet been completed.

Proposed Resolutions of Identified Deficiencies

The proposed resolutions for the equipment environmental qualification deficiencies, identified in the February 2, 1983 SER, and the FRC TER enclosed with it, are described in the licensee's March 16, 1984 submittal. During the January 20, 1984 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 February 2, 1983 were also discussed and the resolution of these items has been found acceptable by the staff.

The approach described by the licensee for resolving the identified deficiencies includes replacing equipment, performing additional analyses, utilizing additional qualification documentation beyond that reviewed by FRC, obtaining additional qualification documentation, installing radiation shielding, and determining that some equipment is outside the scope of 10 CFR 50.49, and therefore not required to be environmentally qualified, e.g., required for cold shutdown only. We discussed the proposed resolutions in detail on an item by item basis

with the licensee during the January 20, 1984 meeting. Replacing, shielding 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. In order to confirm the adequacy of the analyses and documentation, it will be audited by the staff during follow-up inspections of the licensee's environmental qualification files to be performed by Region III, with assistance from IE Headquarters and NRR staff as necessary. During these follow-up inspections, implementation of the licensee's commitments and actions, i.e., replacement and shielding of equipment, will also be verified.

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

Compliance With 10 CFR 50.49

In its March 16, 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 safety-related electrical equipment, within the scope of the rule, was identified through a thorough review of the KNPP FSAR accident analyses, flow diagrams, equipment lists, and emergency and operating procedures. Flooding outside containment due to service water systems including high energy line breaks (HELBs) were considered in the identification of electrical equipment within the scope of (b)(1) of 10 CFR 50.49. The licensee confirmed that no electrical equipment important to safety was installed below the submergence levels. Therefore, all design-basis events including

accidents at KNPP were considered in the identification of electrical equipment within the scope of paragraph (b)(1) of 10 CFR 50.49 (i.e., "safety-related electric equipment . . .").

We conclude that the licensee's approach for identifying equipment within the scope of paragraph (b)(1) is in accordance with the requirements of that paragraph, and is 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, for nonsafety-related electric equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions, is summarized below:

1. A list was generated of safety-related electric equipment as defined in paragraph (b)(1) of 10 CFR 50.49 required to remain functional during or following design-basis events. The list was based on reviews of the KNPP Final Safety Analysis Report (FSAR) accident analyses, flow diagrams, equipment lists, and emergency operating procedures. All design basis accidents, including flooding outside containment, were considered in the development of the list.

2. The schematics and/or wiring diagrams were reviewed to determine the electrical interactions between safety-related and nonsafety-related equipment (auxiliary devices) whose failure of nonsafety-related electrical equipment due to postulated environmental conditions could prevent the satisfactory accomplishment of safety functions by safety-related equipment.

3. The operation of the 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 (e.g., auxiliary

cooling and lubricating components). This involved the review of the KNPP FSAR accident analyses, flow diagrams, equipment lists, and emergency operating procedures.

4. The possible electrical interactions of nonsafety-related electrical equipment indirectly associated with the electrical equipment identified in Step 1 by the use of a common power supply were prevented by plant design in accordance with 10 CFR 50 Appendix A General Design Criteria, applicable industry standards, and properly coordinated circuit fault protection.

A review of the schematics and/or wiring diagrams for all equipment on the KNPP Master List is in progress to confirm the design philosophy regarding possible electrical interactions. This review has not revealed any electrical interactions between safety-related and nonsafety-related equipment to date. This effort is scheduled for completion by the end of August, 1984. The licensee had stated that if the review identifies any components in 10 CFR 50.49(b)(2) that are not qualified, they will be added to the KNPP Master List.

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, or will be, identified.

With regard to paragraph (b)(3) of 10 CFR 50.49, the licensee in its March 16, 1984 submittal states that it reviewed the KNPP Emergency Operating Procedures to identify equipment needed by the operator to mitigate the consequences of a HELB or LOCA including the Active Status Panels. This equipment has been environmentally qualified and is included in the Master List since it falls within the scope of 10 CFR 50.49(b)(3). WPSC has also qualified all "Installed TMI Action Items" as required by Supplement 3 to IE Bulletin 79-01B. However, not all of this equipment falls within the scope of the rule. WPSC has committed to maintain all "Installed TMI Action Items" as qualified but has only included that equipment

which falls within the scope of the rule on the Master List at this time. WPSC is continuing to conduct a review of equipment described by 10 CFR 50.49(b)(3) in accordance with the response to Generic Letter 82-83, Supplement 1 to NUREG-0737. As this effort is completed, equipment considered by WPSC to be classified in Regulatory Guide 1.97, Rev. 2. as Category 1 and 2, will be qualified in accordance with 10 CFR 50.49 and added to the Master List as required.

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

Justification for Continued Operation

The licensee has provided, in its April 22, 1983 and March 16, 1984 submittals, justification for continued operation addressing each item of equipment for which the environmental qualification was not yet completed.

We have reviewed each JCO provided by the licensee in its April 22, 1983 and March 16, 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 JCOs 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 is acceptable if it provides a basis for concluding the equipment will perform its function. If it can not 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 is acceptable. For any equipment assumed to fail as a result of the accident environment, such failure must not result in significant degradation of any safety function or provide misleading information to the operator.

The licensee stated in the March 16, 1984 submittal that all electrical equipment within the scope of the rule is environmentally qualified with the exception of a few components scheduled for replacement or relocation during the 1984 refueling outage. By a telecon on May 4, 1984, the licensee confirmed that all of the components scheduled for replacement or relocation have been completed and thus, there is no further need for justification for continued operation since all electrical equipment within the scope of 10 CFR 50.49 is environmentally qualified.

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.

o Wisconsin Public Service'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 February 2, 1983 SER and FRC TER are acceptable.

- o Continued operation of Kewaunee will not present undue risk to the public health and safety.

This completes the Kewaunee electrical equipment environmental qualification program review. The licensee is required to maintain all environmental qualification documentation up to date and in an auditable form as required by paragraph (j) of 10 CFR 50.49.