

SAFETY EVALUATION REPORT BY THE
OFFICE OF NUCLEAR REACTOR REGULATION
EQUIPMENT QUALIFICATION BRANCH
FOR DUKE POWER COMPANY
OCONEE UNIT 2

DOCKET NO. 50-270

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ENVIRONMENTAL QUALIFICATION OF SAFETY-RELATED ELECTRICAL EQUIPMENT

1 INTRODUCTION

General Design Criteria 1 and 4 specify that safety-related electrical equipment in nuclear facilities must be capable of performing its safety-related function under environmental conditions associated with all normal, abnormal, and accident plant operation. In order to ensure compliance with the criteria, the NRC staff required all licensees of operating reactors to submit a reevaluation of the qualification of safety-related electrical equipment which may be exposed to a harsh environment.

2 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.

Subsequently, Commission Memorandum and Order CLI-80-21 (issued on May 23, 1980) states that the DOR guidelines and portions of NUREG-0588 (which were issued on January 14, 1980, as enclosures 4 and 5 to IEB-79-01B) 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. This order also requires the staff to complete safety evaluation reports (SERs) for all operating plants by February 1, 1981. In addition, this order requires that the licensees have qualified safety-related equipment installed in their plants by June 30, 1982.

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 order also required that all safety-related electrical equipment be qualified by June 30, 1982. In response, the licensee submitted information through a letter dated November 1, 1980, which superseded all previous submittals.

2.1 Purpose

The purpose of this SER is to identify equipment whose qualification program does not provide sufficient assurance that the equipment is capable of performing the design function in hostile environments. The staff position relating to any identified deficiencies is provided in this report.

2.2 Scope

The scope of this report is limited to an evaluation of the equipment which must function in order to mitigate the consequences of a loss-of-coolant accident (LOCA) or a high-energy-line-break (HELB) accident, inside or outside containment, while subjected to the hostile environments associated with these accidents.

3 STAFF EVALUATION

The staff evaluation of the licensee's response included an onsite inspection of selected Class IE equipment and an examination of the licensee's report for completeness and acceptability. The criteria described in the DOR guidelines and in NUREG-0588, in part, were used as a basis for the staff evaluation of the adequacy of the licensee's qualification program.

The NRC Office of Inspection and Enforcement performed (1) a preliminary evaluation of the licensee's response, documented in a technical evaluation report (TER) and (2) an onsite verification inspection of selected safety-related electrical equipment. Components of the engineered safeguards system (ESS) and high-pressure injection system (HPIS) were inspected. The inspection verified proper installation of equipment, overall interface integrity, location with respect to flood level for equipment inside the containment, and manufacturers' nameplate data. The manufacturer's name and model number from the nameplate data were compared to information given in the Component Evaluation Work Sheets (CES) of the licensee's report. The site inspection is documented in report IE 50-270/80-07, dated April 4, 1980. No deficiencies were noted. For this review, the documents referenced above have been factored into the overall staff evaluation.

3.1 Completeness of Safety-Related Equipment

In accordance with IEB 79-01B, the licensee was directed to (1) establish a list of systems and equipment that are required to mitigate a LOCA and an HELB and (2) identify components needed to perform the function of safety-related display information, post-accident sampling and monitoring, and radiation monitoring.

The staff developed a generic master list based upon a review of plant safety analyses and emergency procedures. The instrumentation selected includes parameters to monitor overall plant performance as well as to monitor the performance of the systems on the list. The systems list was established on the basis of the functions that must be performed for accident mitigation (without regard to location of equipment relative to hostile environments).

The list of safety-related systems provided by the licensee was reviewed against the staff-developed master list.

Based upon information in the licensee's submittal, the equipment location references, and in some cases subsequent conversations with the licensee, the staff has verified and determined that the systems included in the licensee's submittal are those required to achieve or support: (1) emergency reactor shutdown, (2) containment isolation, (3) reactor core cooling, (4) containment heat removal, (5) core residual heat removal, and (6) prevention of significant release of radioactive material to the environment. The staff therefore concludes that the systems identified by the licensee (listed in Appendix D) are acceptable, with the exception of those items discussed in Section 5 of this report.

Display instrumentation which provides information for the reactor operators to aid them in the safe handling of the plant was not specifically identified by the licensee. A complete list of all display instrumentation mentioned in the LOCA and HELB emergency procedures must be provided. Equipment qualification information in the form of summary sheets should be provided for all components of the display instrumentation exposed to harsh environments. Instrumentation which is not considered to be safety related but which is mentioned in the emergency procedure should appear on the list. For these instruments, (1) justification should be provided for not considering the instrument safety related and (2) assurance should be provided that its subsequent failure will not mislead the operator or adversely affect the mitigation of the consequences of the accident. The environmental qualification of post-accident sampling and monitoring and radiation monitoring equipment is closely related to the review of the TMI Lessons-Learned modifications and will be performed in conjunction with that review.

The licensee identified 462 items of equipment which were assessed by the staff.

3.2 Service Conditions

Commission Memorandum and Order CLI-80-21 requires that the DOR guidelines and the "For Comment" NUREG-0588 are to be used as the criteria for establishing the adequacy of the safety-related electrical equipment environmental qualification program. These documents provide the option of establishing a bounding pressure and temperature condition based on plant-specific analysis identified in the licensee's Final Safety Analysis Report (FSAR) or based on generic profiles using the methods identified in these documents.

On this basis, the staff has assumed, unless otherwise noted, that the analysis for developing the environmental envelopes relative to the temperature, pressure, and the containment spray caustics, has been performed in accordance with the requirements stated above. The staff has reviewed the qualification documentation to ensure that the qualification specifications envelope the conditions established by the licensee. During this review, the staff assumed that for plants designed and equipped with an automatic containment spray system which satisfies the single-failure criterion, the main-steam-line-break (MSLB) environmental conditions are enveloped by the large-break-LOCA environmental conditions. The staff assumed, and requires the licensee to verify, that the containment spray system is not subjected to a disabling single-component failure and therefore satisfies the requirements of Section 4.2.1 of the DOR guidelines.

Equipment submergence has also been addressed where the possibility exists that flooding of equipment may result from HELBs.

3.3 Temperature, Pressure, and Humidity Conditions Inside Containment

The licensee has provided the results of accident analyses as follows:

	<u>Max Temp (°F)</u>	<u>Max Press (psig)</u>	<u>Humidity (%)</u>
LOCA	276	53.9	100

The staff has concluded that the minimum temperature profile for equipment qualification purposes should include a margin to account for higher-than-average temperatures in the upper regions of the containment that can exist due to stratification, especially following a postulated MSLB. Use of the steam saturation temperature corresponding to the total building pressure (partial pressure of steam plus partial pressure of air) versus time will provide an acceptable margin for either a postulated LOCA or MSLB, whichever is controlling, as to potential adverse environmental effects on equipment.

The licensee's specified temperature (service condition) of 276°F does not satisfy the above requirement. A saturation temperature corresponding to the pressure profile (301°F peak temperature at 53.9 psig) should be used instead. The licensee should update his equipment summary tables to reflect this change. If there is any equipment that does not meet the staff position, the licensee must provide either justification that the equipment will perform its intended function under the specified conditions or propose corrective action.

3.4 Temperature, Pressure, and Humidity Conditions Outside Containment

The licensee has provided the temperature, pressure, and humidity associated with HELBs within the penetration room of the auxiliary building. The licensee has stated that equipment within the penetration room showing N/A for temperature and pressure is not required to function after an HELB in that room. However, the equipment is required after a LOCA, and it is subject to radiation. Therefore, it must be qualified for the radiation levels to which it is subject.

The staff has verified that the parameters identified by the licensee for the HELBs are acceptable.

3.5 Submergence

The maximum submergence levels have been established and assessed by the licensee. Unless otherwise noted, the staff assumed for this review that the methodology employed by the licensee is in accordance with the appropriate criteria as established by Commission Memorandum and Order CLI-80-21.

The licensee's value for maximum submergence is 8.3 ft. Equipment below this level has been identified by the licensee. The licensee identified 14 safety-related electrical components--7 cables, 3 valve motors, and 4 level transmitters--as having the potential for becoming submerged after a postulated event. Qualification values are still being analyzed by the licensee for the four level transmitters and associated cables. The licensee has stated that these level transmitters are not required to function after a LOCA, but they are required following an MSLB. The maximum flood level following an MSLB is only 4 ft, which would put the water level at about the same elevation as the level transmitters. However, if credit is given for operator action, the flood level would be below 4 ft and the level transmitters would not become submerged. For the three valve motors and associated cables, the licensee references his response to an NRC question; in the response, the licensee states that two of the valves close before submergence, and the other is normally closed. If it is open, a redundant valve outside containment will provide a backup. In this regard, the licensee should provide an assessment of the failure modes associated with the submergence of the valve motors and cables. Assurance should also be provided that the subsequent failure of these components will not adversely affect any other safety functions or mislead an operator.

Additionally, the licensee should discuss operating time, across the spectrum of events, in relation to the time of submergence. If the results of the licensee's assessment are acceptable, then the components may be exempt from the submergence parameter of qualification.

It is not clear from the information submitted that submergence of safety-related electrical equipment outside of containment was addressed. The licensee should address this area more specifically in the 90-day response and upgrade the CES as appropriate.

3.6 Chemical Spray

The licensee's FSAR value for the chemical concentration is 1800 ppm boric acid solution, with a pH of 4.65. Components identified by the licensee as subject to a chemical spray are Okonite and Anaconda cable, Reliance fan motors, Limitorque and Rotork valve motors, Rosemount level and pressure transmitters, and Motorola pressure transmitters. However, the licensee provides the qualification environment for only Okonite cable (that is, 10,000 ppm boric acid buffered with sodium hydroxide to a pH of 10.5). Qualification values for the Rosemount level and pressure transmitters are being analyzed, and the licensee states that the Motorola pressure transmitters operate before being subject to the spray environment. For the Motorola pressure transmitters, the licensee should provide information

similar to that requested for components that are stated to function before submergence. Therefore, for the purpose of this review, the effects of chemical spray will be considered unresolved. The staff will review the licensee's response when it is submitted and discuss the resolution in a supplemental report.

3.7 Aging

Section 7 of the DOR guidelines does not require a qualified life to be established for all safety-related electrical equipment. However, the following actions are required:

- (1) Make a detailed comparison of existing equipment and the materials identified in Appendix C of the DOR guidelines. The first supplement to IEB-79-01B requires licensees to utilize the table in Appendix C and identify any additional materials as the result of their effort.
- (2) Establish an ongoing program to review surveillance and maintenance records to identify potential age-related degradations.
- (3) Establish component maintenance and replacement schedules which include considerations of aging characteristics of the installed components.

The licensee identified a number of equipment items for which a specified qualified life was established (for examples, 5 years, 15 years, or 40 years). In its assessment of these submittals, the staff did not review the adequacy of the methodology nor the basis used to arrive at these values; the staff has assumed that the established values are based on state-of-the-art technology and are acceptable.

For this review, however, the staff requires that the licensee submit supplemental information to verify and identify the degree of conformance to the above requirements. The response should include all the equipment identified as required to maintain functional operability in harsh environments.

The licensee indicated that this phase of the response is outstanding and that the review is in progress. The staff will review the licensee's response when it is submitted and discuss its evaluation in a supplemental report.

3.8 Radiation (Inside and Outside Containment)

The licensee has provided values for the radiation levels postulated to exist following a LOCA. The application and methodology employed to determine these values were presented to the licensee as part of the NRC staff criteria contained in the DOR guidelines, in NUREG-0588, and in the guidance provided in IEB-79-01B, Supplement 2. Therefore, for this review, the staff has assumed that, unless otherwise noted, the values provided have been determined in accordance with the prescribed criteria. The staff review determined that the values to which equipment was qualified enveloped the requirements identified by the licensee.

The value required by the licensee inside containment is an integrated dose ranging from 7×10^4 to 9.1×10^7 rads. These values do not envelope the DOR guideline requirements (4×10^7 rads) and are therefore not acceptable. The

radiation condition provided by the licensee is lower than provided in the guidelines for gamma and beta radiation. The licensee is requested to either provide justification for using the lower service condition or use the service condition provided in the guidelines. If the former option is chosen, then the analysis, including the basis and the assumptions used in the analysis and the sample calculation, should be provided.

A required value outside containment of 1.3×10^6 rads has been used by the licensee to specify limiting radiation levels within area S73 of the auxiliary building. This value appears to consider the radiation levels influenced by the source term methodology associated with post-LOCA recirculation fluid lines, and is therefore acceptable.

4 QUALIFICATION OF EQUIPMENT

The following subsections present the staff's assessment, based on the licensee's submittal, of the qualification status of safety-related electrical equipment.

The staff has separated the safety-related equipment into three categories: (1) equipment requiring immediate corrective action, (2) equipment requiring additional qualification information and/or corrective action, and (3) equipment considered acceptable if the staff's concern identified in Section 3.7 is satisfactorily resolved.

In its assessment of the licensee's submittal, the NRC staff did not review the methodology employed to determine the values established by the licensee. However, in reviewing the data sheets, the staff made a determination as to the stated conditions presented by the licensee. Additionally, the staff has not completed its review of supporting documentation referenced by the licensee (for example, test reports). It is expected that when the review of test reports is complete, the environmental qualification data bank established by the staff will provide the means to cross reference each supporting document to the referencing licensee.

If supporting documents are found to be unacceptable, the licensee will be required to take additional corrective actions to either establish qualification or replace the item(s) of concern. This effort will begin in early 1981.

An appendix for each subsection of this report provides a list of equipment for which additional information and/or corrective action is required. Where appropriate, a reference is provided in the appendices to identify deficiencies. It should be noted, as in the Commission Memorandum and Order, that the deficiencies identified do not necessarily mean that equipment is unqualified. However, they are cause for concern and may require further case-by-case evaluation.

4.1 Equipment Requiring Immediate Corrective Action

Appendix A identifies equipment (if any) in this category. The licensee was asked to review the facility's safety-related electrical equipment. The licensee's review of this equipment has not identified any equipment requiring immediate corrective action; therefore, no licensee event reports (LERs) were submitted. In addition, in this review, the staff has not identified any safety-related electrical equipment which is not able to perform its intended safety function during the time in which it must operate.

4.2 Equipment Requiring Additional Information and/or Corrective Action

Appendix B identifies equipment in this category, including a tabulation of deficiencies. The deficiencies are noted by a letter relating to the legend (identified below), indicating that the information provided is not sufficient for the qualification parameter or condition.

Legend

- R - radiation
- T - temperature
- QT - qualification time
- RT - required time
- P - pressure
- H - humidity
- CS - chemical spray
- A - material-aging evaluation; replacement schedule; ongoing equipment surveillance
- S - submergence
- M - margin
- I - HELB evaluation outside containment not completed
- QM - qualification method
- RPN - equipment relocation or replacement; adequate schedule not provided
- EXN - exempted equipment justification inadequate
- SEN - separate-effects qualification justification inadequate
- QI - qualification information being developed
- RPS - equipment relocation or replacement schedule provided

As noted in Section 4, these deficiencies do not necessarily mean that the equipment is unqualified. However, the deficiencies are cause for concern and require further case-by-case evaluation. The staff has determined that an acceptable basis to exempt equipment from qualification, in whole or part, can be established provided the following can be established and verified by the licensee:

- (1) Equipment does not perform essential safety functions in the harsh environment, and equipment failure in the harsh environment will not impact safety-related functions or mislead an operator.
- (2a) Equipment performs its function before its exposure to the harsh environment, and the adequacy for the time margin provided is adequately justified, and
- (2b) Subsequent failure of the equipment as a result of the harsh environment does not degrade other safety functions or mislead the operator.
- (3) The safety-related function can be accomplished by some other designated equipment that has been adequately qualified and satisfies the single-failure criterion.
- (4) Equipment will not be subjected to a harsh environment as a result of the postulated accident.

The licensee is, therefore, required to supplement the information presented by providing resolutions to the deficiencies identified; these resolutions should include a description of the corrective action, schedules for its completion (as applicable), and so forth. The staff will review the licensee's response, when it is submitted, and discuss the resolution in a supplemental report.

It should be noted that in cases where testing is being conducted, a condition may arise which results in a determination by the licensee that the equipment does not satisfy the qualification test requirements. For that equipment, the licensee will be required to provide the proposed corrective action, on a timely basis, to ensure that qualification can be established by June 30, 1982.

4.3 Equipment Considered Acceptable or Conditionally Acceptable

Based on the staff review of the licensee's submittal, the staff identified the equipment in Appendix C as (1) acceptable on the basis that the qualification program adequately enveloped the specific environmental plant parameters, or (2) conditionally acceptable subject to the satisfactory resolution of the staff concern identified in Section 3.7.

For the equipment identified as conditionally acceptable, the staff determined that the licensee did not clearly

- (1) state that an equipment material evaluation was conducted to ensure that no known materials susceptible to degradation because of aging have been used,
- (2) establish an ongoing program to review the plant surveillance and maintenance records in order to identify equipment degradation which may be age related, and/or
- (3) propose a maintenance program and replacement schedule for equipment identified in item 1 or equipment that is qualified for less than the life of the plant.

The licensee is, therefore, required to supplement the information presented for equipment in this category before full acceptance of this equipment can be established. The staff will review the licensee's response when it is submitted and discuss the resolution in a supplemental report.

5 DEFERRED REQUIREMENTS

IEB.79-01B, Supplement 3 has relaxed the time constraints for the submission of the information associated with cold shutdown equipment and TMI lessons-learned modifications. The staff has required that this information be provided by February 1, 1981. The staff will provide a supplemental safety evaluation addressing these concerns.

6 CONCLUSIONS

The staff has determined that the licensee's listing of safety-related systems and associated electrical equipment whose ability to function in a harsh environment following an accident is required to mitigate a LOCA or HELB is complete and acceptable, except as noted in Section 3 of this report. The staff has also determined that the environmental service conditions to be met by the electrical equipment in the harsh accident environment are appropriate, except as noted in Section 3 of this report. Outstanding information identified in Section 3 should be provided within 90 days of receipt of this SER.

The staff has reviewed the qualification of safety-related electrical equipment to the extent defined by this SER and has found no outstanding items which would require immediate corrective action to ensure the safety of plant operation. However, the staff has determined that many items of safety-related electrical equipment identified by the licensee for this review do not have adequate documentation to ensure that they are capable of withstanding the harsh environmental service conditions. This review was based on a comparison of the qualification values with the specified environmental values required by the design, which were provided in the licensee's summary sheets.

Subsection 4.2 identified deficiencies that must be resolved to establish the qualification of the equipment; the staff requires that the information lacking in this category be provided within 90 days of receipt of this SER. Within this period, the licensee should either provide documentation of the missing qualification information which demonstrates that such equipment meets the DOR guidelines or NUREG-0588 or commit to a corrective action (requalification, replacement, relocation, and so forth) consistent with the requirements to establish qualification by June 30, 1982. If the latter option is chosen, the licensee must provide justification for operation until such corrective action is complete.

Subsection 4.3 identified acceptance and conditional acceptance based on noted deficiencies. Where additional information is required, the licensee should respond within 90 days of receipt of this SER by providing assurance that these concerns will be satisfactorily resolved by June 30, 1982.

The staff issued to the licensee Sections 3 and 4 of this report and requested, under the provisions of 10 CFR 50.54(f), that the licensee review the deficiencies enumerated and the ramifications thereof to determine whether safe operation of the facility would be impacted in consideration of the deficiencies. The licensee has completed a preliminary review of the identified deficiencies and has determined that, after due consideration of the deficiencies and their ramifications, continued safe operation would not be adversely affected.

Based on these considerations, the staff concludes that conformance with the above requirements and satisfactory completion of the corrective actions by June 30, 1982 will ensure compliance with the Commission Memorandum and Order of May 23, 1980. The staff further concludes that there is reasonable assurance of continued safe operation of this facility pending completion of these corrective actions. This conclusion is based on the following:

- (1) that there are no outstanding items which would require immediate corrective action to assure safety of plant operation

(2) some of the items found deficient have been or are being replaced or relocated, thus improving the facility's capability to function following a LOCA or HELB

(3) the harsh environmental conditions for which this equipment must be qualified result from low-probability events; events which might reasonably be anticipated during this very limited period would lead to less demanding service conditions for this equipment.

APPENDIX A

Equipment Requiring
Immediate Corrective Action
(Category 4.1)

No equipment in this Category for Oconee Unit 2.

APPENDIX B

Equipment Requiring Additional Information and/or Corrective Action (Category 4.2)

LEGEND:

Designation for Deficiency

R - Radiation
 T - Temperature
 QT - Qualification time
 RT - Required time
 P - Pressure
 H - Humidity
 CS - Chemical spray
 A - Material aging evaluation, replacement schedule, ongoing equipment surveillance
 S - Submergence
 M - Margin
 I - HELB evaluation outside containment not completed
 QM - Qualification method
 RPN - Equipment relocation or replacement, adequate schedule not provided
 EXN - Exempted equipment justification inadequate
 SEN - Separate effects qualification justification inadequate
 QI - Qualification information being developed
 RPS - Equipment relocation or replacement schedule provided

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Okonite	2CBLE0180	CS,A
Cable	Okonite	2CBLE0181	CS,A
Cable	Okonite	2CBLE0183	CS,A
Cable	Okonite	2CBLE0185	CS,A
Cable	Okonite	2CBLE0205	CS,A
Cable	Okonite	2CBLE0136	CS,A,S
Cable	Okonite	2CBLE0137	CS,A,S

APPENDIX B (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Okonite	2CBLE0145	CS,A
Cable	Okonite	2CBLE0164	CS,A
Cable	Okonite	2CBLE0166	CS,A
Cable	Okonite	2CBLE0308	R,CS,A,RPN
Cable	Okonite	2CBLE0309	R,CS,A,RPN
Cable	Okonite	2CBLE0316	R,CS,A,RPN
Cable	Okonite	2CBLE0317	R,CS,A,RPN
Cable	Okonite	2CBLE0318	CS,A
Cable	Okonite	2CBLE0169	CS,A
Cable	Okonite	2CBLE0170	CS,A
Cable	Okonite	2CBLE0172	QT,A
Cable	Okonite	2CBLE0173	CS,A
Cable	Okonite	2CBLE0174	CS,A
Cable	Okonite	2CBLE0177	CS,A
Cable	Okonite	2CBLE0178	CS,A
Cable	Okonite	2CBLE0187	R,CS,A,RPN
Cable	Okonite	2CBLE0191	R,CS,A,RPN
Cable	Okonite	2CBLE0192	CS,A
Cable	Okonite	2CBLE0195	CS,A
Cable	Okonite	2CBLE0196	CS,A
Cable	Okonite	2CBLE0207	CS,A
Cable	Boston Insulated Wire	2CBLE0053	T,QT,P,A,QI
Cable	Boston Insulated Wire	2CBLE0089	T,QT,P,A,QI

APPENDIX B (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Boston Insulated Wire	2CBLE0103	T,QT,P,A,QI
Cable	Boston Insulated Wire	2CBLE0396	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0398	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0448	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0450	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0400	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0402	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0404	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0406	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0408	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0410	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0412	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0414	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0416	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0418	QT,A,QI-
Cable	Boston Insulated Wire	2CBLE0420	QT,A,QI

APPENDIX B (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Boston Insulated Wire	2CBLE0422	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0424	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0426	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0428	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0430	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0432	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0434	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0436	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0438	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0440	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0442	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0444	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0446	QT,A,QI
Cable	Boston Insulated Wire	2CBLE0057	T,QT,P,A,QI
Cable	Boston Insulated Wire	2CBLE0079	T,QT,P,A,QI
Cable	Boston Insulated Wire	2CBLE0107	T,QT,P,A,QI

APPENDIX B (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Boston Insulated Wire	2CBLE0127	T,QT,P,A,QI
Cable	Raychem	2CBLE0140	P,A,QM
Cable	Raychem	2CBLE0141	P,A,QM
Cable	Raychem	2CBLE0142	P,A,QM
Cable	Raychem	2CBLE0143	P,A,QM
Cable	Raychem	2CBLE0148	P,A,QM
Cable	Raychem	2CBLE0149	P,A,QM
Cable	Raychem	2CBLE0150	P,A,QM
Cable	Raychem	2CBLE0151	P,A,QM
Cable	Brand Rex	2CBLE0246	QT,A,QI
Cable	Brand Rex	2CBLE0249	QT,A,QI
Cable	Brand Rex	2CBLE0252	QT,A,QI
Cable	Brand Rex	2CBLE0294	QT,A,QI
Cable	Brand Rex	2CBLE0054	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0090	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0104	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0458	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0459	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0460	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0461	R,T,QT,P,H,A, QI

APPENDIX B (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Brand Rex	2CBLE0452	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0455	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0139	QT,A,QI
Cable	Brand Rex	2CBLE0397	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0399	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0449	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0451	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0423	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0437	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0439	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0441	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0058	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0080	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0108	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0128	R,T,QT,P,H,A, QI
Cable	Brand Rex	2CBLE0468	R,QT,H,A,QI
Cable	Brand Rex	2CBLE0469	R,QT,H,A,QI

APPENDIX B (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Brand Rex	2CBLE0470	R,QT,H,A,QI
Cable	Brand Rex	2CBLE0471	R,QT,H,A,QI
Cable	Anaconda	2CBLE0199	CS,A,S
Cable	Anaconda	2CBLE0202	CS,A
Cable	Sam. Moore	2CBLE0453	A,S
Cable	Sam. Moore	2CBLE0454	A,S
Cable	Sam. Moore	2CBLE0456	A,S
Cable	Sam. Moore	2CBLE0457	A,S
Valve Motor	Limitorque	2VMTR0021	CS,A
Valve Motor	Limitorque	2VMTR0022	CS,A
Valve Motor	Limitorque	2VMTR0023	CS,A
Valve Motor	Limitorque	2VMTR0024	CS,A
Valve Motor	Limitorque	2VMTR0017	CS,A
Valve Motor	Limitorque	2VMTR0011	CS,A
Valve Motor	Limitorque	2VMTR0013	CS,A,S
Valve Motor	Limitorque	2VMTR0006	CS,A,S
Valve Motor	Limitorque	2VMTR0007	CS,A,S
Valve Motor	Limitorque	2VMTR0008	CS,A
Valve Motor	Limitorque	2VMTR0009	R,A
Valve Motor	Limitorque	2VMTR0025	R,A
Valve Motor	Limitorque	2VMTR0003	R,A
Valve Motor	Limitorque	2VMTR0004	R,A
Valve Motor	Limitorque	2VMTR0014	R,A
Valve Motor	Limitorque	2VMTR0027	R,A

APPENDIX B (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Valve Motor	Limatorque	2VMTR0041	CS,A
Valve Motor	Limatorque	2VMTR0042	CS,A
Valve Motor	Limatorque	2VMTR0055	R,QT,H,A
Valve Motor	Limatorque	2VMTR0061	R,QT,H,A
Valve Motor	Limatorque	2VMTR0062	R,QT,H,A
Valve Motor	Limatorque	2VMTR0063	R,QT,H,A
Valve Motor	Limatorque	2VMTR0001	CS,A
Valve Motor	Limatorque	2VMTR0002	CS,A
Valve Motor	Limatorque	2VMTR0018	CS,A
Valve Motor	Limatorque	2VMTR0019	CS,A
Valve Motor	Limatorque	2VMTR0039	CS,A
Valve Motor	Limatorque	2VMTR0040	CS,A
Solenoid Valve	ASCO	2SLND0003	R,QT,H,A,RPN
Solenoid Valve	ASCO	2SLND0200	R,QT,H,A,RPN
Solenoid Valve	ASCO	2SLND0014	R,T,QT,P,H,A, RPN
Solenoid Valve	ASCO	2SLND0015	R,T,QT,P,H,A, RPN
Solenoid Valve	ASCO	2SLND0005	R,QT,H,A,RPN
Solenoid Valve	ASCO	2SLND0006	R,QT,H,A,RPN
Solenoid Valve	ASCO	2SLND0008	R,QT,H,A,RPN
Solenoid Valve	ASCO	2SLND0012	R,QT,H,A,RPN
Solenoid Valve	ASCO	2SLND0013	R,QT,H,A,RPN
Solenoid Valve	Super Spl.	2SLND0009	R,QT,H,A,RPN

APPENDIX B (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Solenoid Valve	Super Spl.	2SLND00010	R,QT,H,A,RPN
Solenoid Valve	Super Spl.	2SLND00011	R,QT,H,A,RPN
Solenoid Valve	Ross	2SLND00004	R,QT,H,A,RPN
Terminal Block	States	2TBOX00001	R,H,A,QI
Terminal Block	States	2TBOX00002	R,H,A,QI
Terminal Block	States	2TBOX00003	R,H,A,QI
Terminal Block	States	2TBOX00009	R,H,A,QI
Terminal Block	States	2TBOX00004	R,H,A,QI
Terminal Block	States	2TBOX00005	R,H,A,QI
Terminal Block	States	2TBOX00007	R,T,P,H,A,QI
Terminal Block	States	2TBOX00008	P,T,P,H,A,QI
Terminal Block	States	2TBOX00020	R,H,A,QI
Terminal Block	States	2TBOX00010	R,H,A,QI
Terminal Block	States	2TBOX00011	R,H,A,QI
Terminal Block	States	2TBOX00012	R,H,A,QI
Terminal Block	States	2TBOX00013	R,H,A,QI
Terminal Block	States	2TBOX00015	R,H,A,QI
Transzorb	Gen. Semi.	2TBOX0101	R,QT,H,A,RPS
Transzorb	Gen. Semi.	2TBOX0102	R,QT,H,A,RPS
Transzorb	Gen. Semi.	2TBOX0103	R,QT,H,A,RPS
Transzorb	Gen. Semi.	2TBOX0109	R,QT,H,A,RPS
Transzorb	Gen. Semi.	2TBOX0104	R,QT,H,A,RPS
Transzorb	Gen. Semi.	2TBOX0105	R,QT,H,A,RPS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Transzorb	Gen. Semi.	2TBOX0107	R,T,QT,P,H,A, RPS
Transzorb	Gen. Semi.	2TBOX0108	R,T,QT,P,H,A, RPS
Transzorb	Gen. Semi.	2TBOX0110	R,QT,H,A,RPS
Transzorb	Gen. Semi.	2TBOX0111	R,QT,H,A,RPS
Transzorb	Gen. Semi.	2TBOX0112	R,QT,H,A,RPS
Transzorb	Gen. Semi.	2TBOX0113	R,QT,H,A,RPS
Transzorb	Gen. Semi.	2TBOX0115	R,QT,H,A,RPS
Pressure Switch	Mercoïd	2PRSW0001	A,M
Pressure Switch	Mercoïd	2PRSW0002	A,M
Pressure Switch	Mercoïd	2PRSW0003	A,M
Pressure Switch	Mercoïd	2PRSW0004	A,M
Pressure Switch	Mercoïd	2PRSW0005	A,M
Pressure Switch	Mercoïd	2PRSW0006	A,M
Pressure Switch	Mercoïd	2PRSW0007	A,M
Pressure Switch	Mercoïd	2PRSW0008	A,M
Pressure Switch	Mercoïd	2PRSW0009	A,M
Pressure Switch	Mercoïd	2PRSW0010	A,M
Pressure Switch	Meletron	2PRSW0011	R,QT,H,A
Pressure Switch	Meletron	2PRSW0012	R,QT,H,A
Pressure Transmitter	Motorola	2PTRM0002	CS,A,M
Pressure Transmitter	Motorola	2PTRM0003	CS,A,M -

APPENDIX B (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Pressure Transmitter	Motorola	2PTRM0008	R,T,QT,P,H,A, RPN
Pressure Transmitter	Motorola	2PTRM0009	R,T,QT,P,H,A, RPN
Pressure Transmitter	Motorola	2PTRM0010	R,T,QT,P,H,A, RPN
Pressure Transmitter	Motorola	2PTRM0011	R,T,QT,P,H,A, RPN
Pressure Transmitter	Motorola	2PTRM0012	R,T,QT,P,H,CS, A,RPN
Pressure Transmitter	Motorola	2PTRM0013	R,T,QT,P,H,CS, A,RPN
Pressure Transmitter	Motorola	2PTRM0014	R,T,QT,P,H,CS, A,RPN
Pressure Transmitter	Motorola	2PTRM0015	R,T,QT,P,H,CS, A,RPN
Pressure Transmitter	Motorola	2PTRM0001	CS,A,M
Pressure Transmitter	Rosemount	2PTRM0016	R,QT,CS,A
Pressure Transmitter	Rosemount	2PTRM0004	CS,A,M
Pressure Transmitter	Rosemount	2PTRM0005	CS,A,M
Pressure Transmitter	Rosemount	2PTRM0006	CS,A,M
Pressure Transmitter	Rosemount	2PTRM0007	CS,A,M
Fan Motor	Reliance	2FMTR0001	CS,A
Fan Motor	Reliance	2FMTR0003	CS,A
Fan Motor	Reliance	2FMTR0005	CS,A
Fan Motor	Louis-Alli	2FMTR0002	A,M
Fan Motor	Louis-Alli	2FMTR0004	A,M
Level Transmitter	Rosemount	2LTRM0014	R,QT,CS,A,S

APPENDIX B (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Level Transmitter	Rosemount	2LTRM0015	R,QT,CS,A,S
Level Transmitter	Rosemount	2LTRM0016	R,QT,CS,A,S
Level Transmitter	Rosemount	2LTRM0017	R,QT,CS,A,S
Heat Shrink Tubing	Raychem	Type WCSF-N Various Locations	RT,QT,CS,A
Cable Sealant	3M	Scotch Cast 9 Various Locations	RT,QT,CS,A,M
Transmitter O-Ring Seals	?	Various Locations	RT,QT,T,P,H,CS, R,A
Lubricating Grease for Limitorque MOVs	Chevron	Type SRI-2 Various Locations	RT,QT,R,A,M

APPENDIX C

Equipment Considered Acceptable or Conditionally Acceptable (Category 4.3)

LEGEND:

Designation for Deficiency

- R - Radiation
- T - Temperature
- QT - Qualification time
- RT - Required time
- P - Pressure
- H - Humidity
- CS - Chemical spray
- A - Material aging evaluation, replacement schedule, ongoing equipment surveillance
- S - Submergence
- M - Margin
- I - HELB evaluation outside containment not completed
- QM - Qualification method
- RPN - Equipment relocation or replacement, adequate schedule not provided
- EXN - Exempted equipment justification inadequate
- SEN - Separate effects qualification justification inadequate
- QI - Qualification information being developed
- RPS - Equipment relocation or replacement schedule provided

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Okonite	2CBLE0179	A
Cable	Okonite	2CBLE0182	A
Cable	Okonite	2CBLE0184	A
Cable	Okonite	2CBLE0247	A
Cable	Okonite	2CBLE0250	A
Cable	Okonite	2CBLE0253	A
Cable	Okonite	2CBLE0203	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Okonite	2CBLE0204	A
Cable	Okonite	2CBLE0295	A
Cable	Okonite	2CBLE0197	A
Cable	Okonite	2CBLE0198	A
Cable	Okonite	2CBLE0200	A
Cable	Okonite	2CBLE0201	A
Cable	Okonite	2CBLE0255	A
Cable	Okonite	2CBLE0259	A
Cable	Okonite	2CBLE0260	A
Cable	Okonite	2CBLE0264	A
Cable	Okonite	2CBLE0462	A
Cable	Okonite	2CBLE0463	A
Cable	Okonite	2CBLE0464	A
Cable	Okonite	2CBLE0465	A
Cable	Okonite	2CBLE0466	A
Cable	Okonite	2CBLE0467	A
Cable	Okonite	2CBLE0328	A
Cable	Okonite	2CBLE0329	A
Cable	Okonite	2CBLE0028	A
Cable	Okonite	2CBLE0029	A
Cable	Okonite	2CBLE0037	A
Cable	Okonite	2CBLE0038	A
Cable	Okonite	2CBLE0039	A
Cable	Okonite	2CBLE0138	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Okonite	2CBLE0144	A
Cable	Okonite	2CBLE0146	A
Cable	Okonite	2CBLE0147	A
Cable	Okonite	2CBLE0152	A
Cable	Okonite	2CBLE0153	A
Cable	Okonite	2CBLE0154	A
Cable	Okonite	2CBLE0155	A
Cable	Okonite	2CBLE0156	A
Cable	Okonite	2CBLE0157	A
Cable	Okonite	2CBLE0158	A
Cable	Okonite	2CBLE0224	A
Cable	Okonite	2CBLE0159	A
Cable	Okonite	2CBLE0160	A
Cable	Okonite	2CBLE0161	A
Cable	Okonite	2CBLE0162	A
Cable	Okonite	2CBLE0163	A
Cable	Okonite	2CBLE0165	A
Cable	Okonite	2CBLE0299	A
Cable	Okonite	2CBLE0300	A
Cable	Okonite	2CBLE0303	A
Cable	Okonite	2CBLE0304	A
Cable	Okonite	2CBLE0306	A
Cable	Okonite	2CBLE0307	A
Cable	Okonite	2CBLE0312	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Okonite	2CBLE0313	A
Cable	Okonite	2CBLE0314	A
Cable	Okonite	2CBLE0372	A
Cable	Okonite	2CBLE0377	A
Cable	Okonite	2CBLE0382	A
Cable	Okonite	2CBLE0472	A
Cable	Okonite	2CBLE0473	A
Cable	Okonite	2CBLE0474	A
Cable	Okonite	2CBLE0475	A
Cable	Okonite	2CBLE0476	A
Cable	Okonite	2CBLE0478	A
Cable	Okonite	2CBLE0479	A
Cable	Okonite	2CBLE0480	A
Cable	Okonite	2CBLE0481	A
Cable	Okonite	2CBLE0482	A
Cable	Okonite	2CBLE0483	A
Cable	Okonite	2CBLE0484	A
Cable	Okonite	2CBLE0497	A
Cable	Okonite	2CBLE0334	A
Cable	Okonite	2CBLE0335	A
Cable	Okonite	2CBLE0338	A
Cable	Okonite	2CBLE0339	A
Cable	Okonite	2CBLE0342	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Okonite	2CBLE0343	A
Cable	Okonite	2CBLE0345	A
Cable	Okonite	2CBLE0487	A
Cable	Okonite	2CBLE0488	A
Cable	Okonite	2CBLE0489	A
Cable	Okonite	2CBLE0332	A
Cable	Okonite	2CBLE0490	A
Cable	Okonite	2CBLE0491	A
Cable	Okonite	2CBLE0492	A
Cable	Okonite	2CBLE0167	A
Cable	Okonite	2CBLE0168	A
Cable	Okonite	2CBLE0171	A
Cable	Okonite	2CBLE0175	A
Cable	Okonite	2CBLE0176	A
Cable	Okonite	2CBLE0319	A
Cable	Okonite	2CBLE0321	A
Cable	Okonite	2CBLE0322	A
Cable	Okonite	2CBLE0386	A
Cable	Okonite	2CBLE0391	A
Cable	Okonite	2CBLE0485	A
Cable	Okonite	2CBLE0486	A
Cable	Okonite	2CBLE0186	A
Cable	Okonite	2CBLE0188	A
Cable	Okonite	2CBLE0189	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Okonite	2CBLE0190	A
Cable	Okonite	2CBLE0194	A
Cable	Okonite	2CBLE0206	A
Cable	Okonite	2CBLE0265	A
Cable	Okonite	2CBLE0268	A
Cable	Okonite	2CBLE0270	A
Cable	Okonite	2CBLE0273	A
Cable	Okonite	2CBLE0277	A
Cable	Okonite	2CBLE0280	A
Cable	Okonite	2CBLE0282	A
Cable	Okonite	2CBLE0285	A
Cable	Okonite	2CBLE0287	A
Cable	Okonite	2CBLE0288	A
Cable	Okonite	2CBLE0289	A
Cable	Okonite	2CBLE0292	A
Cable	Okonite	2CBLE0324	A
Cable	Okonite	2CBLE0326	A
Cable	Okonite	2CBLE0349	A
Cable	Okonite	2CBLE0352	A
Cable	Boston Insulated Wire	2CBLE0401	A
Cable	Boston Insulated Wire	2CBLE0403	A
Cable	Boston Insulated Wire	2CBLE0405	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Boston Insulated Wire	2CBLE0407	A
Cable	Boston Insulated Wire	2CBLE0409	A
Cable	Boston Insulated Wire	2CBLE0411	A
Cable	Boston Insulated Wire	2CBLE0413	A
Cable	Boston Insulated Wire	2CBLE0415	A
Cable	Boston Insulated Wire	2CBLE0417	A
Cable	Boston Insulated Wire	2CBLE0419	A
Cable	Boston Insulated Wire	2CBLE0421	A
Cable	Boston Insulated Wire	2CBLE0425	A
Cable	Boston Insulated Wire	2CBLE0427	A
Cable	Boston Insulated Wire	2CBLE0429	A
Cable	Boston Insulated Wire	2CBLE0431	A
Cable	Boston Insulated Wire	2CBLE0433	A
Cable	Boston Insulated Wire	2CBLE0435	A
Cable	Boston Insulated Wire	2CBLE0443	A
Cable	Boston Insulated Wire	2CBLE0445	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Boston Insulated Wire	2CBLE0447	A
Cable	Raychem	2CBLE0248	A, Note 1
Cable	Raychem	2CBLE0251	A, Note 1
Cable	Raychem	2CBLE0254	A, Note 1
Cable	Raychem	2CBLE0296	A, Note 1
Cable	Raychem	2CBLE0297	A, Note 1
Cable	Raychem	2CBLE0298	A, Note 1
Cable	Raychem	2CBLE0256	A, Note 1
Cable	Raychem	2CBLE0257	A, Note 1
Cable	Raychem	2CBLE0258	A, Note 1
Cable	Raychem	2CBLE0261	A, Note 1
Cable	Raychem	2CBLE0262	A, Note 1
Cable	Raychem	2CBLE0263	A, Note 1
Cable	Raychem	2CBLE0493	A, Note 1
Cable	Raychem	2CBLE0494	A, Note 1
Cable	Raychem	2CBLE0495	A, Note 1
Cable	Raychem	2CBLE0496	A, Note 1
Cable	Raychem	2CBLE0266	A, Note 1
Cable	Raychem	2CBLE0267	A, Note 1
Cable	Raychem	2CBLE0269	A, Note 1

APPENDIX C (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Cable	Raychem	2CBLE0271	A, Note 1
Cable	Raychem	2CBLE0272	A, Note 1
Cable	Raychem	2CBLE0274	A, Note 1
Cable	Raychem	2CBLE0278	A, Note 1
Cable	Raychem	2CBLE0279	A, Note 1
Cable	Raychem	2CBLE0281	A, Note 1
Cable	Raychem	2CBLE0283	A, Note 1
Cable	Raychem	2CBLE0284	A, Note 1
Cable	Raychem	2CBLE0286	A, Note 1
Cable	Raychem	2CBLE0290	A, Note 1
Cable	Raychem	2CBLE0291	A, Note 1
Cable	Raychem	2CBLE0293	A, Note 1
Cable	Raychem	2CBLE0350	A, Note 1
Cable	Raychem	2CBLE0361	A, Note 1
Cable	Raychem	2CBLE0366	A, Note 1
Cable	Anaconda	2CBLE0232	A
Cable	Anaconda	2CBLE0234	A
Cable	Anaconda	2CBLE0135	A
Cable	Anaconda	2CBLE0193	A
Electrical Penetration	Viking	2PENT0011	A
Electrical Penetration	Viking	2PENT0012	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Electrical Penetration	Viking	2PENT0016	A
Electrical Penetration	Viking	2PENT0018	A
Electrical Penetration	Viking	2PENT0005	A
Electrical Penetration	Viking	2PENT0013	A
Electrical Penetration	Viking	2PENT0001	A
Electrical Penetration	Viking	2PENT0002	A
Electrical Penetration	Viking	2PENT0007	A
Electrical Penetration	Viking	2PENT0026	A
Electrical Penetration	Viking	2PENT0032	A
Electrical Penetration	Viking	2PENT0006	A
Electrical Penetration	Viking	2PENT0010	A
Electrical Penetration	Viking	2PENT0004	A
Electrical Penetration	Viking	2PENT0023	A
Electrical Penetration	Viking	2PENT0024	A
Electrical Penetration	Viking	2PENT0036	A, Note 1
Electrical Penetration	Viking	2PENT0039	A, Note 1
Electrical Penetration	Viking	2PENT0009	A
Electrical Penetration	Viking	2PENT0014	A
Electrical Penetration	Viking	2PENT0015	A
Electrical Penetration	Viking	2PENT0017	A
Electrical Penetration	Viking	2PENT0022	A
Electrical Penetration	Viking	2PENT0025	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Electrical Penetration	Viking	2PENT0027	A
Electrical Penetration	Viking	2PENT0028	A
Electrical Penetration	Viking	2PENT0029	A
Electrical Penetration	Viking	2PENT0035	A
Electrical Penetration	Viking	2PENT0037	A
Electrical Penetration	Viking	2PENT0038	A
Electrical Penetration	Viking	2PENT0040	A
Electrical Penetration	Viking	2PENT0041	A
Electrical Penetration	Viking	2PENT0008	A
Electrical Penetration	Viking	2PENT0019	A
Electrical Penetration	Viking	2PENT0020	A
Electrical Penetration	Viking	2PENT0021	A
Valve Motor	Limitorque	2VMTR0030	A
Valve Motor	Limitorque	2VMTR0031	A
Valve Motor	Limitorque	2VMTR0010	A
Valve Motor	Limitorque	2VMTR0026	A
Valve Motor	Limitorque	2VMTR0043	A
Valve Motor	Limitorque	2VMTR0044	A
Valve Motor	Limitorque	2VMTR0052	A
Valve Motor	Limitorque	2VMTR0053	A
Valve Motor	Limitorque	2VMTR0054	A
Valve Motor	Limitorque	2VMTR0056	A
Valve Motor	Limitorque	2VMTR0057	A
Valve Motor	Limitorque	2VMTR0058	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Item No.	Deficiency
Valve Motor	Limatorque	2VMTR0059	A
Valve Motor	Limatorque	2VMTR0060	A
Valve Motor	Limatorque	2VMTR0015	A
Valve Motor	Limatorque	2VMTR0016	A
Valve Motor	Limatorque	2VMTR0028	A
Valve Motor	Limatorque	2VMTR0033	A
Valve Motor	Limatorque	2VMTR0034	A
Valve Motor	Limatorque	2VMTR0064	A
Valve Motor	Limatorque	2VMTR0036	A
Valve Motor	Limatorque	2VMTR0050	A
Valve Motor	Limatorque	2VMTR0051	A
Valve Motor	Limatorque	2VMTR0037	A
Pump Motor	Westinghouse	2PMTR0001	A
Pump Motor	Westinghouse	2PMTR0005	A
Pump Motor	Westinghouse	2PMTR0009	A
Pump Motor	Westinghouse	2PMTR0002	A
Pump Motor	Westinghouse	2PMTR0006	A
Pump Motor	Westinghouse	2PMTR0008	A
Pump Motor	Westinghouse	2PMTR0003	A
Pump Motor	Westinghouse	2PMTR0007	A
Level Transmitter	Bailey	2LTRM0011	A
Level Transmitter	Bailey	2LTRM0012	A
Level Transmitter	Bailey	2LTRM0013	A

Note 1: The licensee has stated, in a phone conversation on 1/7/81, that these components are qualified for one year. Therefore, qualification time has not been listed as a deficiency. A later revision to the submittal will reflect this change.

APPENDIX D
Safety-Related Systems List¹

Function	System
Emergency Reactor Shutdown	Chemical Addition and Sampling Reactor Coolant Engineered Safeguards Reactor Protection
Containment Isolation	Chemical Addition and Sampling Reactor Building Ventilation Feedwater Component Cooling Low Pressure Service Water Main Steam High Pressure Injection Low Pressure Injection Reactor Building Spray Reactor Building Cooling Liquid Waste Disposal
Reactor Core Cooling	High Pressure Injection Low Pressure Injection Accumulators (Part of Reactor Coolant)

¹The NRC staff recognized that there are differences in nomenclature of systems because of plant vintage and engineering design, consequently, some systems performing identical or similar functions may have different names. In those instances, it was necessary to verify the function of the system(s) with the responsible IE regional reviewer and/or the licensee.

APPENDIX D (continued)

Function	System
Containment Heat Removal	Reactor Building Spray
	Reactor Building Cooling
	Reactor Building Ventilation
	Containment Sump Recirculation (Part of Liquid Waste Disposal)
Core Residual Heat Removal	Coolant Storage Quench Tank
	Residual Heat Removal (Part of Low Pressure Injection)
	Auxiliary Feedwater (Part of Feedwater)
	Pressurizer Spray ⁽¹⁾
	Power Operated Relief Valves ⁽¹⁾
	Main Steam
	Steam Dump (Part of Main Steam)
	Component Cooling
	Low Pressure Service Water
Prevention of Significant Release of Radioactive Material to Environment	Iodine Removal (Part of Reactor Building Spray)
	Containment Radiation Monitoring ⁽¹⁾
	Containment Combustible Gas Control ⁽¹⁾
	Containment Radiation Sampling ⁽¹⁾
	Containment Air Purification/Cleanup (Part of Reactor Building Ventilation)

Note (1): Covered as part of TMI-2 Lessons Learned; does not appear in systems list.

APPENDIX D (Continued)

Function	System
Supporting Systems	Emergency Power ⁽²⁾
	Safety Equipment Area Ventilation ⁽²⁾
	Control Room Habitability ⁽²⁾

Note (2): Electrical components in system not exposed to harsh environment.