

Partial Review
EQUIPMENT EVALUATION REPORT BY THE
OFFICE OF NUCLEAR REACTOR REGULATION
EQUIPMENT QUALIFICATION BRANCH
FOR ALABAMA POWER COMPANY
JOSEPH M. FARLEY UNIT 1
DOCKET NO. 50-348

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3 STAFF EQUIPMENT 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 (week of December 1, 1980) of selected safety-related electrical equipment. The main steam, auxiliary steam and auxiliary feedwater, and feedwater control systems were inspected. The inspection verified proper installation of equipment, overall interface integrity, 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 50-348/80-38. No deficiencies were noted other than discrepancies identified on 14 components where actual nameplate data are different from the information in the licensee's submittals. These discrepancies had been identified by the licensee before the site inspection and corrective measures had been taken. 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 procedures 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 703 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 for Farley Unit 1, 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	300	47.5	100
MSLB	(not provided)	(not provided)	100

The staff has concluded that the minimum temperature profile used in the specifications 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 temperature profile does not appear to fully envelope in all cases the saturation temperature profile recommended by the staff. The peak temperature and peak pressure conditions do not occur at the same time. The saturation temperature of 290°F at the pressure of 47.5 psig should be used instead. The licensee temperature of 272°F at 47.5 psig does not satisfy the above requirement. The licensee should update his equipment summary tables to reflect the change. If there is any equipment that does not meet the staff position, the licensee must either provide 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 an HELB outside containment and applicable radiation levels associated with equipment in the proximity of recirculating fluid lines. The following area outside containment has been addressed:

(1) Auxiliary building

The staff has verified that the parameters identified by the licensee for the MSLB 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 15 ft elevation inside containment. Equipment below this level has been identified by the licensee.

The licensee stated that the components will perform their functions before becoming submerged. In this case, the licensee should provide an assessment of the failure modes associated with the submergence of the equipment. The licensee should also provide assurance that the subsequent failure of the component(s) 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 component(s) may be exempt from the submergence parameter of qualification.

In addition, the licensee has identified a flood level of 3 ft 5 in. above the floor as the maximum flood level resulting from the worst-case HELB outside containment. The licensee has stated that all safety-related equipment outside containment is above this level.

3.6 Chemical Spray

The licensee has specified that boric acid solution constitutes its chemical spray; however, the exact volume percent concentration and pH values were not provided. 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-79-018 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 the phase of their 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 5×10^7 gamma and 2×10^8 beta rads for the integrated dose. These values envelope the DOR guideline requirements and therefore are acceptable.

A required value outside containment of 1.1×10^6 rads in the RHR/LHSI pump room has been used by the licensee to specify limiting radiation levels outside containment. 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

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, 1992.

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.

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	Component No.	Deficiency
Resistance Thermometer Detector	Rosemount	N1B13TE412B	R,A,QM,M,CS
Resistance Thermometer Detector	Rosemount	N1B13TE412D	R,A,QM,M,CS
Resistance Thermometer Detector	Rosemount	N1B13TE422B	R,A,QM,M,CS
Resistance Thermometer Detector	Rosemount	N1B13TE422D	R,A,QM,M,CS
Resistance Thermometer Detector	Rosemount	N1B13TE432B	R,A,QM,M,CS
Resistance Thermometer Detector	Rosemount	N1B13TE432D	R,A,QM,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Terminal Block	States	11TB001	A,QM,S,CS
Terminal Block	States	11TB002	A,QM,S,CS
Terminal Block	States	21TB003	A,QM,S,CS
Terminal Block	States	21TB004	A,QM,S,CS
Terminal Block	States	31TB001	A,QM,S,CS
Terminal Block	States	31TB002	A,QM,S,CS
Electrical Penetration	GE	Q1T52B012	A,M,CS
Electrical Penetration	GE	Q1T52B028	A,M,CS
Electrical Penetration	GE	Q1T52B030	A,M,CS
Instrument Cable	Boston Insul. Wire	1V1V5002B	A,M,CS
Instrument Cable	Boston Insul. Wire	1V1V5002D	A,M,CS
Instrument Cable	Boston Insul. Wire	1V2V5002B	A,M,CS
Instrument Cable	Boston Insul. Wire	1V2V5002D	A,M,CS
Instrument Cable	Boston Insul. Wire	1V3V5002B	A,M,CS
Instrument Cable	Boston Insul. Wire	1V3V5002D	A,M,CS
Pressure Transmitter	Barton	N1B21PT402	R,T,P,H,A,QM,M,CS
Pressure Transmitter	Barton	N1B21PT403	R,T,P,H,A,QM,M,CS
Resistance Thermometer Detector	Rosemount	N1B21TE410	R,A,QM,M,CS
Resistance Thermometer Detector	Rosemount	N1B21TE413	R,A,QM,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Resistance Thermometer Detector	Rosemount	N1B21TE420	R,A,QM,M,CS
Resistance Thermometer Detector	Rosemount	N1B21TE423	R,A,QM,M,CS
Resistance Thermometer Detector	Rosemount	N1B21TE430	R,A,QM,M,CS
Resistance Thermometer Detector	Rosemount	N1B21TE433	R,A,QM,M,CS
Terminal Block	States	11TB001	A,QM,S,CS
Terminal Block	States	11TB003	A,QM,S,CS
Terminal Block	States	11TB004	A,QM,S,CS
Terminal Block	States	21TB001	A,QM,S,CS
Terminal Block	States	21TB002	A,QM,S,CS
Terminal Block	States	21TB005	A,QM,S,CS
Electrical Penetration	GE	Q1T52B012	A,M,CS
Electrical Penetration	GE	Q1T52B030	A,M,CS
Electrical Penetration	GE	Q1T52B040	A,M,CS
Instrument Cable	Boston Insul. Wire	1VYV5031B	A,M,CS
Instrument Cable	Boston Insul. Wire	1VYV5033B	A,M,CS
Instrument Cable	Boston Insul. Wire	1VYV5002E	A,M,CS
Instrument Cable	Boston Insul. Wire	1VYV5002F	A,M,CS
Instrument Cable	Boston Insul. Wire	1VYV5002C	A,M,CS
Instrument Cable	Boston Insul. Wire	1V2V5002E	A,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Instrument Cable	Boston Insul. Wire	1V2V5002F	A,M,CS
Instrument Cable	Boston Insul. Wire	1V2V5002G	A,M,CS
Limit Switch	Namco Controls	N1B31ZS8047	A,QM,S,CS
Electrical Penetration	GE	QIT52B022	A,M,CS
Electrical Penetration	GE	QIT52B038	A,M,CS
Terminal Block	States	N1B31SV8047-B/JB	A,QM,S,CS
Level Transmitter	Barton	Q1B31LT459	R,T,P,H,A,QM,M,CS
Level Transmitter	Barton	Q1B31LT460	R,T,P,H,A,QM,M,CS
Level Transmitter	Barton	Q1B31LT461	R,T,P,H,A,QM,M,CS
Pressure Transmitter	Foxboro	Q1B31PT455	R,T,P,H,A,QM,M,CS
Pressure Transmitter	Foxboro	Q1B31PT456	R,T,P,H,A,QM,M,CS
Pressure Transmitter	Foxboro	Q1B31PT457	R,T,P,H,A,QM,M,CS
Instrument Cable	Boston Insul. Wire	1VYV5031D	A,S,M,CS
Instrument Cable	Boston Insul. Wire	1VYV5002U	A,S,M,CS
Instrument Cable	Boston Insul. Wire	1V2V5002T	A,S,M,CS
Instrument Cable	Boston Insul. Wire	1V2V5002U	A,S,M,CS
Instrument Cable	Boston Insul. Wire	1V3V5002T	A,S,M,CS
Instrument Cable	Boston Insul. Wire	1V3V5002U	A,S,M,CS
Electrical Penetration	GE	QIT52B012	A,M,CS
Electrical Penetration	GE	QIT52B028	A,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Electrical Penetration	GE	Q1T52B030	A,M,CS
Electrical Penetration	GE	Q1T52B040	A,M,CS
Control Cable	Okonite	1VBL5078C	A,S,M,CS
Control Cable	Okonite	1VBQ5021E	A,S,M,CS
Solenoid Valve	ASCO	N1C22SV0498A	R,T,QT,P,H,A,QM,QI
Solenoid Valve	ASCO	N1C22SV0479B	R,T,QT,P,H,A,QM,QI
Terminal Block	States	N1C22V0478A-A/JB	T,A
Terminal Block	States	N1C22V0488A-A/JB	T,A
Terminal Block	States	N1C22V0498A-A/JB	T,A
Level Transmitter	Barton	Q1C22LT474	R,T,P,H,A,QM,M,CS
Level Transmitter	Barton	Q1C22LT475	R,T,P,H,A,QM,M,CS
Level Transmitter	Barton	Q1C22LT476	R,T,P,H,A,QM,M,CS
Level Transmitter	Barton	Q1C22LT484	R,T,P,H,A,QM,M,CS
Level Transmitter	Barton	Q1C22LT485	R,T,P,H,A,QM,M,CS
Level Transmitter	Barton	Q1C22LT486	R,T,P,H,A,QM,M,CS
Level Transmitter	Barton	Q1C22LT494	R,T,P,H,A,QM,M,CS
Level Transmitter	Barton	Q1C22LT495	R,T,P,H,A,QM,M,CS
Level Transmitter	Barton	Q1C22LT496	R,T,P,H,A,QM,M,CS
Flow Transmitter	Foxboro	Q1C22FT474	R,T,P,H,A,QM,M,CS
Flow Transmitter	Foxboro	Q1C22FT475	R,T,P,H,A,QM,M,CS
Flow Transmitter	Foxboro	Q1C22FT484	R,T,P,H,A,QM,M,CS
Flow Transmitter	Foxboro	Q1C22FT485	R,T,P,H,A,QM,M,CS
Flow Transmitter	Foxboro	Q1C22FT494	R,T,P,H,A,QM,M,CS
Flow Transmitter	Foxboro	Q1C22FT495	R,T,P,H,A,QM,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Electrical Penetration	GE	Q1T52B010	A,M,CS
Electrical Penetration	GE	Q1T52B012	A,M,CS
Electrical Penetration	GE	Q1T52B028	A,M,CS
Electrical Penetration	GE	Q1T52B030	A,M,CS
Instrument Cable	Boston Insul. Wire	1V1V5002L	A,M,CS
Instrument Cable	Boston Insul. Wire	1V1V5002M	A,M,CS
Instrument Cable	Boston Insul. Wire	1V1V5002N	A,M,CS
Instrument Cable	Boston Insul. Wire	1V2V5002L	A,M,CS
Instrument Cable	Boston Insul. Wire	1V2V5002M	A,M,CS
Instrument Cable	Boston Insul. Wire	1V2V5002N	A,M,CS
Instrument Cable	Boston Insul. Wire	1V3V5002H	A,M,CS
Instrument Cable	Boston Insul. Wire	1V3V5002J	A,M,CS
Instrument Cable	Boston Insul. Wire	1V3V5002K	A,M,CS
Instrument Cable	Boston Insul. Wire	1V3V5002L	A,M,CS
Instrument Cable	Boston Insul. Wire	1V3V5002M	A,M,CS
Instrument Cable	Boston Insul. Wire	1V3V5002N	A,M,CS
Instrument Cable	Boston Insul. Wire	1V4V5002A	A,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Instrument Cable	Boston Insul. Wire	1V4V5002B	A,M,CS
Instrument Cable	Boston Insul. Wire	1V4V5002C	A,M,CS
Level Transmitter	Delaval	Q1E11LT3594A	A,M,CS
Level Transmitter	Delaval	Q1E11LT3594B	A,M,CS
Electrical Penetration	GE	Q1T52B006	A,M,CS
Electrical Penetration	GE	Q1T52B020	A,M,CS
Control Cable	Okonite	1VAI5009F	A,M,CS
Control Cable	Okonite	1VBI5008C	A,M,CS
1-in. Motor-Operated Valve	Limitorque	Q1E14V002	A,M,CS
1-in. Motor-Operated Valve	Limitorque	Q1E14V004	A,M,CS
Limit Switch	Namco Controls	Q1P13ZS3196	A,CS
Limit Switch	Namco Controls	Q1P13ZS2867B	A,CS
Limit Switch	Namco Controls	Q1P13ZS3197	A,CS
Limit Switch	Namco Controls	Q1P13ZS2866B	A,CS
Limit Switch	Namco Controls	Q1E12ZS3999A	A,CS
Limit Switch	Namco Controls	Q1E12ZS3999B	A,CS
Motor	Joy Manufacturing	Q1E12M001A	A,CS
Motor	Joy Manufacturing	Q1E12M001B	A,CS
Motor	Joy Manufacturing	Q1E12M001C	A,CS
Motor	Joy Manufacturing	Q1E12M001D	A,CS
Terminal Block	States	Q1P13SV3196-B/JB	A,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Electrical Penetration	GE	Q1T52B001	A,M,CS
Electrical Penetration	GE	Q1T52B002	A,M,CS
Electrical Penetration	GE	Q1T52B005	A,M,CS
Electrical Penetration	GE	Q1T52B006	A,M,CS
Electrical Penetration	GE	Q1T52B007	A,M,CS
Electrical Penetration	GE	Q1T52B019	A,M,CS
Electrical Penetration	GE	Q1T52B020	A,M,CS
Electrical Penetration	GE	Q1T52B022	A,M,CS
Electrical Penetration	GE	Q1T52B023	A,M,CS
Electrical Penetration	GE	Q1T52B025	A,M,CS
Electrical Penetration	GE	Q1T52B041	A,M,CS
Terminal Block	States	Q1P13SV2867B-B/JB	A,CS
Terminal Block	States	Q1P13SV3197B-B/JB	A,CS
Terminal Block	States	Q1P13SV2866B-B/JB	A,CS
Terminal Block	States	Q1P13SV3999A-A/JB	A,CS
Terminal Block	States	Q1P13SV3999B-B/JB	A,CS
Power Cable	Okonite	1VAFU-R5Q	A,M,CS
Power Cable	Okonite	1VAFU-J4Q	A,M,CS
Power Cable	Okonite	1VAED-15Q	A,M,CS
Power Cable	Okonite	1VAED-16Q	A,M,CS
Power Cable	Okonite	1VBEE-08Q	A,M,CS
Power Cable	Okonite	1VBEE-16Q	A,M,CS
Control Cable	Okonite	1VAFU-R5D	A,M,CS
Control Cable	Okonite	1VAQ5048F	A,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Control Cable	Okonite	1VXR5005H	A,M,CS
Control Cable	Okonite	1VAFU-J4D	A,M,CS
Control Cable	Okonite	1VAQ5009C	A,M,CS
Control Cable	Okonite	1VBL5008C	A,M,CS
Control Cable	Okonite	1VBL5008D	A,M,CS
Control Cable	Okonite	1VBL5008K	A,M,CS
Control Cable	Okonite	1VBL5008L	A,M,CS
Control Cable	Okonite	1VBQ5010J	A,M,CS
Control Cable	Okonite	1VYR5035D	A,M,CS
Control Cable	Okonite	1VBL5008X	A,M,CS
Control Cable	Okonite	1VBL5008W	A,M,CS
Control Cable	Okonite	1VBQ5012F	A,M,CS
Control Cable	Okonite	1VYR5035F	A,M,CS
Control Cable	Okonite	1VAL5122C	A,M,CS
Control Cable	Okonite	1VAQ5029E	A,M,CS
Control Cable	Okonite	1VBL5094C	A,M,CS
Control Cable	Okonite	1VBQ5029E	A,M,CS
Instrument Cable	Boston Insul. Wire	1VYR5066B	A,M,CS
Electric Hydrogen Recombiner	Westinghouse	Q1E17K001A-A	A,CS
Electric Hydrogen Recombiner	Westinghouse	Q1E17K001B-B	A,CS
Electric Penetration	GE	Q1T52B001	A,M,CS
Electric Penetration	GE	Q1T52B023	A,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Electric Penetration	GE	Q1T52B024	A,M,CS
Electric Penetration	GE	Q1T52B042	A,M,CS
Power Cable	Okonite	1VAFALL3T	A,M,CS
Power Cable	Okonite	1VBFBRH6T	A,M,CS
Instrument Cable	Boston Insul. Wire	1VXQ5009B	A,M,CS
Instrument Cable	Boston Insul. Wire	1VXQ5009D	A,M,CS
Instrument Cable	Boston Insul. Wire	1VXQ5009F	A,M,CS
Instrument Cable	Boston Insul. Wire	1VYQ5017B	A,M,CS
Instrument Cable	Boston Insul. Wire	1VYQ5017D	A,M,CS
Instrument Cable	Boston Insul. Wire	1VYQ5017F	A,M,CS
Motor	Joy Manufacturing	Q1E19M001A	A,CS
Motor	Joy Manufacturing	Q1E19M001B	A,CS
Motor	Joy Manufacturing	Q1E19M001C	A,CS
Motor	Joy Manufacturing	Q1E19M001D	A,CS
Electrical Penetration	GE	Q1T52B J2	A,M,CS
Electrical Penetration	GE	Q1T52B014	A,M,CS
Electrical Penetration	GE	Q1T52B015	A,M,CS
Electrical Penetration	GE	Q1T52B017	A,M,CS
Power Cable	Okonite	1VAF-A-J5Q	A,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Power Cable	Okonite	1VAFA-I5Q	A,M,CS
Power Cable	Okonite	1VAFA-I4Q	A,M,CS
Power Cable	Okonite	1VAFA-I3Q	A,M,CS
12-in. Motor-Operated Valve	Limitorque	Q1E21V038A	A,S,CS
12-in. Motor-Operated Valve	Limitorque	Q1E21V038B	A,S,CS
12-in. Motor-Operated Valve	Limitorque	Q1E21V038C	A,S,CS
Limit Switch	Namco Controls	N1E21ZS8871	A,CS
3-in. Motor-Operated Valve	Limitorque	Q1E21V249A	A,S,CS
Limit Switch	Namco Controls	N1E21ZS8149A	QM,S,CS,A
Limit Switch	Namco Controls	N1E21ZS8149B	QM,S,CS,A
Limit Switch	Namco Controls	N1E21ZS8149C	QM,S,CS,A
Limit Switch	Namco Controls	N1E21ZS8808AB	QM,S,CS,A
Limit Switch	Namco Controls	N1E21ZS8808BB	QM,S,CS,A
Limit Switch	Namco Controls	N1E21ZS8808CB	QM,S,CS,A
Terminal Block	States	N1E21SV8871-A/JB	A,CS
Terminal Block	States	N1E21SV8149AA-A/JB	CS,A,QM,S
Terminal Block	States	N1E21SV8149BA-A/JB	CS,A,QM,S
Terminal Block	States	N1E21SV8149CA-A/JB	CS,A,QM,S
Electrical Penetration	GE	Q1T52B002	A,M,CS
Electrical Penetration	GE	Q1T52B006	A,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Electrical Penetration	GE	Q1T52B014	A,M,CS
Electrical Penetration	GE	Q1T52B016	A,M,CS
Electrical Penetration	GE	Q1T52B019	A,M,CS
Electrical Penetration	GE	Q1T52B038	A,M,CS
Power Cable	Okonite	1VAFU-Z2Q	H,K,G,A
Power Cable	Okonite	1VBFU-S2Q	H,K,G,A
Power Cable	Okonite	1VAFU-Z3Q	H,K,G,A
Power Cable	Okonite	1VBFU-T4Q	H,K,G,A
Control Cable	Okonite	1VAFU-Z2D	H,K,G,A
Control Cable	Okonite	1VAFU-Z2G	H,K,G,A
Control Cable	Okonite	1VAQ-5023E	H,K,G,A
Control Cable	Okonite	1VXKA163B	H,K,G,A
Control Cable	Okonite	1VBFV-S2D	H,K,G,A
Control Cable	Okonite	1VBFV-S2G	H,K,G,A
Control Cable	Okonite	1VBQ5024C	H,K,G,A
Control Cable	Okonite	1VYKA163B	H,K,G,A
Control Cable	Okonite	1VAFU-Z3D	H,K,G,A
Control Cable	Okonite	1VAFU-Z3G	H,K,G,A
Control Cable	Okonite	1VAQ5024E	H,K,G,A
Control Cable	Okonite	1VXA163D	H,K,G,A
Control Cable	Okonite	1VAL5049C	H,K,G,A
Control Cable	Okonite	1VAQ5022H	H,K,G,A
Control Cable	Okonite	1VAFU-T4	H,K,G,A
Control Cable	Okonite	1VAQ5018E	H,K,G,A

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Control Cable	Okonite	1VAL5042F	H,K,G,A
Control Cable	Okonite	1VAL5042G	H,K,G,A
Control Cable	Okonite	1VAQ5022F	A,M,CS
Control Cable	Okonite	1VAL5043F	A,M,CS
Control Cable	Okonite	1VAL5043G	A,M,CS
Control Cable	Okonite	1VAL5023C	A,M,CS
Control Cable	Okonite	1VAL5044F	A,M,CS
Control Cable	Okonite	1VAL5044G	A,M,CS
Control Cable	Okonite	1VAQ5024C	A,M,CS
Fans	Joy Manufacturing Co.	Q1E22M001A	A,CS
Fans	Joy Manufacturing Co.	Q1E22M001B	A,CS
2½-in. Motor-Operated Valve	Limitorque	Q1E22V001A	A,M,CS
2½-in. Motor-Operated Valve	Limitorque	Q1E22V001B	A,M,CS
Electrical Penetration	GE	Q1T52B001	A,M,CS
Electrical Penetration	GE	Q1T52B019	A,M,CS
Electrical Penetration	GE	Q1T52B020	A,M,CS
Electrical Penetration	GE	Q1T52B023	A,M,CS
Power Cable	Okonite	1VAED06Q	A,M,CS
Power Cable	Okonite	1VBEE09Q	A,M,CS
Control Cable	Okonite	1VAED06E	A,M,CS
Control Cable	Okonite	1VBEE09E	A,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
2-in. Motor-Operated Valve	Limitorque	Q1E23V021	A,S,M,CS
6-in. Motor-Operated Valve	Limitorque	Q1E23V003	A,M,CS
3/4-in. Motor-Operated Valve	Limitorque	Q1E23V022A	A,M,CS
3/4-in. Motor-Operated Valve	Limitorque	Q1E23V022B	A,M,CS
3/4-in. Motor-Operated Valve	Limitorque	Q1E23V022C	A,M,CS
3/4-in. Motor-Operated Valve	Limitorque	Q1E23V022D	A,M,CS
3/4-in. Motor-Operated Valve	Limitorque	Q1E23V025A	A,M,CS
3/4-in. Motor-Operated Valve	Limitorque	Q1E23V025B	A,M,CS
Electrical Penetration	GE	Q1T52B005	A,M,CS
Electrical Penetration	GE	Q1T52B007	A,M,CS
Electrical Penetration	GE	Q1T52B015	A,M,CS
Electrical Penetration	GE	Q1T52B016	A,M,CS
Electrical Penetration	GE	Q1T52B017	A,M,CS
Electrical Penetration	GE	Q1T52B019	A,M,CS
Electrical Penetration	GE	Q1T52B020	A,M,CS
Electrical Penetration	GE	Q1T52B038	A,M,CS
Power Cable	Okonite	1VAFU-W4Q	A,M,CS
Power Cable	Okonite	1VAFU-N2Q	A,M,CS
Power Cable	Okonite	1VAFV-Y5Q	A,M,CS
Power Cable	Okonite	1VBFV-Y4Q	A,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Power Cable	Okonite	1VAFU-L4Q	A,M,CS
Power Cable	Okonite	1VAFU-L5Q	A,M,CS
Power Cable	Okonite	1VBFV-H4Q	A,M,CS
Power Cable	Okonite	1VBFV-H5Q	A,M,CS
Power Cable	Okonite	1VAFU-M4Q	A,M,CS
Power Cable	Okonite	1VBFV-M3Q	A,M,CS
Control Cable	Okonite	1VAFU-W4C	A,M,CS
Control Cable	Okonite	1VAED06E	A,M,CS
Control Cable	Okonite	1VBFV-N2C	A,M,CS
Control Cable	Okonite	1VBEE09E	A,M,CS
Control Cable	Okonite	1VBFV-Y5C	A,M,CS
Control Cable	Okonite	1VBFV-Y5C	A,M,CS
Control Cable	Okonite	1VAFU-L4C	A,M,CS
Control Cable	Okonite	1VAFU-L5C	A,M,CS
Control Cable	Okonite	1VAFV-H4C	A,M,CS
Control Cable	Okonite	1VAFV-H5C	A,M,CS
Control Cable	Okonite	1VAFU-M4C	A,M,CS
Control Cable	Okonite	1VBFV-M3C	A,M,CS
Limit Switch	Namco Controls	Q1G21ZS3376	A,QM,S,CS
Limit Switch	Namco Controls	N1G21ZS1003	A,QM,S,CS
Limit Switch	Namco Controls	Q1G21ZS7126	A,QM,S,CS
Electrical Penetration	GE	Q1T52B019	A,M,CS
Electrical Penetration	GE	Q1T52B038	A,M,CS
Electrical Penetration	GE	Q1T52B041	A,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Terminal Block	States	Q1G21SV3376-B/JB	A,QM,S,CS
Terminal Block	States	N1G21SV1003A-A/JB	A,QM,S,CS
Terminal Block	States	N1G21SV7126-A/JB	A,QM,S,CS
Instrument Cable	Boston Insul. Wire	1VYR5066G	A,M,CS,H,K,G
Control Cable	Okonite	1VBL5045C	A,M,CS,H,K,G
Control Cable	Okonite	1VBQ5030J	A,M,CS,H,K,G
Control Cable	Okonite	1VAL5037D	A,M,CS,H,K,G
Control Cable	Okonite	1VAQ5021J	A,M,CS,H,K,G
Control Cable	Okonite	1VAL5036C	A,M,CS,H,K,G
Control Cable	Okonite	1VAQ5020J	A,M,CS,H,K,G
Terminal Block	States	Q1N11SV3369AA-A/JB	A,M
Terminal Block	States	Q1N11SV3369BA-A/JB	A,M
Terminal Block	States	Q1N11SV3369CA-A/JB	A,M
Terminal Block	States	Q1N11SV3370AA-A/JB	A,M
Terminal Block	States	Q1N11SV3370BA-A/JB	A,M
Terminal Block	States	Q1N11SV3370CA-A/JB	A,M
Terminal Block	States	Q1N11SV3368AA-A/JB	A,M
Terminal Block	States	Q1N11SV3368BA-A/JB	A,M
Terminal Block	States	Q1N11SV3368CA-A/JB	A,M

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Terminal Block	States	Q1N11SV3976A-B/JB	A,M
Terminal Block	States	Q1N11SV3976B-B/JB	A,M
Terminal Block	States	Q1N11SV3976C-B/JB	A,M
Level Transmitter	Barton	Q1N11LT477	R,T,P,H,CS,A,QM,M
Level Transmitter	Barton	Q1N11LT487	R,T,P,H,CS,A,QM,M
Level Transmitter	Barton	Q1N11LT497	R,T,P,H,CS,A,QM,M
Electrical Penetration	GE	Q1T52B040	A,M,CS
Electrical Penetration	GE	Q1T52B041	A,M,CS
Instrument Cable	Boston Insul. Wire	1VXV5013L	A,M,CS
Instrument Cable	Boston Insul. Wire	1VXV5014H	A,M,CS
Instrument Cable	Boston Insul. Wire	1VXV5014J	A,M,CS
Terminal Block	States	Q1N12SV3234A-A/JB	M,A
Terminal Block	States	Q1N12SV3234B-B/JB	M,A
Terminal Block	States	Q1N12SV3235A-A/JB	M,A
Terminal Block	States	Q1N12SV3235B-B/JB	M,A
Level Switch	Delaval	Q1N21LSH2828A	A,M
Level Switch	Delaval	Q1N21LSH2828B	A,M
Level Switch	Delaval	Q1N21LSH2828C	A,M
Level Switch	Delaval	Q1N21LSH2829A	A,M
Level Switch	Delaval	Q1N21LSH2829B	A,M
Level Switch	Delaval	Q1N21LSH2829C	A,M
Terminal Block	States	A1TB034	M,A

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Terminal Block	States	Q1N23SV3227AA-A/JB	M,A
Terminal Block	States	Q1N23SV3227BA-A/JB	M,A
Terminal Block	States	Q1N23SV3227CA-A/JB	M,A
Terminal Block	States	Q1N23SV3228AA-A/JB	M,A
Terminal Block	States	Q1N23SV3228BA-A/JB	M,A
Terminal Block	States	Q1N23SV3228CA-A/JB	M,A
Terminal Block	States	Q1N25SV3772A-A/JB	M,A
Terminal Block	States	Q1N25SV3772B-A/JB	M,A
Terminal Block	States	Q1N25SV3772C-A/JB	M,A
Limit Switch	Namco Controls	Q1P15ZS3103	A,QM,CS
Limit Switch	Namco Controls	Q1P15ZS3765	A,QM,CS
Limit Switch	Namco Controls	Q1P15ZS3766	A,QM,CS
Limit Switch	Namco Controls	Q1P15ZS3179A	A,QM,CS
Limit Switch	Namco Controls	Q1P15ZS3179B	A,QM,CS
Limit Switch	Namco Controls	Q1P15ZS3179C	A,QM,CS
Limit Switch	Namco Controls	Q1P15ZS3180A	A,QM,CS
Limit Switch	Namco Controls	Q1P15ZS3180B	A,QM,CS
Limit Switch	Namco Controls	Q1P15ZS3180C	A,QM,CS
Limit Switch	Namco Controls	Q1P15ZS3181A	A,QM,CS
Limit Switch	Namco Controls	Q1P15ZS3181B	A,QM,CS
Limit Switch	Namco Controls	Q1P15ZS3181C	A,QM,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Limit Switch	Namco Controls	Q1P15ZS3104	A,QM,CS
Terminal Block	States	Q1P15SV3103-A/JB	A,CS
Terminal Block	States	Q1P15SV3765-A/JB	A,CS
Electrical Penetration	GE	Q1T52B007	A,M,CS
Electrical Penetration	GE	Q1T52B019	A,M,CS
Electrical Penetration	GE	Q1T52B020	A,M,CS
Terminal Block	States	Q1P15SV3766-A/JB	A,CS
Terminal Block	States	Q1P15SV3179A-A/JB	A,CS
Terminal Block	States	Q1P15SV3179B-A/JB	A,CS
Terminal Block	States	Q1P15SV3179C-B/JB	A,CS
Terminal Block	States	Q1P15SV3180A-A/JB	A,CS
Terminal Block	States	Q1P15SV3180B-A/JB	A,CS
Terminal Block	States	Q1P15SV3180C-B/JB	A,CS
Terminal Block	States	Q1P15SV3181A-A/JB	A,CS
Terminal Block	States	Q1P15SV3181B-A/JB	A,CS
Terminal Block	States	Q1P15SV3181C-B/JB	A,CS
Terminal Block	States	Q1P15SV3104-A/JB	A,CS
Control Cable	Okonite	1VAL5063B	A,M,CS
Control Cable	Okonite	1VAQ5049H	A,M,CS
Control Cable	Okonite	1VXR5010B	A,M,CS
Control Cable	Okonite	1VAL5065B	A,M,CS
Control Cable	Okonite	1VAQ5032J	A,M,CS
Control Cable	Okonite	1VXR5010F	A,M,CS
Control Cable	Okonite	1VAL5066A	A,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Control Cable	Okonite	1VAQ5033J	A,M,CS
Control Cable	Okonite	1VXR5010H	A,M,CS
Control Cable	Okonite	1VAL5084B	A,M,CS
Control Cable	Okonite	1VAL5085B	A,M,CS
Control Cable	Okonite	1VBL5074B	A,M,CS
Control Cable	Okonite	1VAL5086B	A,M,CS
Control Cable	Okonite	1VAL5087B	A,M,CS
Control Cable	Okonite	1VBL5075B	A,M,CS
Control Cable	Okonite	1VAL5088B	A,M,CS
Control Cable	Okonite	1VAL5089B	A,M,CS
Control Cable	Okonite	1VBL5076B	A,M,CS
Control Cable	Okonite	1VAL5064B	A,M,CS
Control Cable	Okonite	1VAQ5047H	A,M,CS
Control Cable	Okonite	1VXR5010D	A,M,CS
10-in. Motor-Operated Valve	Limitorque	Q1P16V0207A	A,M,CS
10-in. Motor-Operated Valve	Limitorque	Q1P16V0207B	A,M,CS
10-in. Motor-Operated Valve	Limitorque	Q1P16V0207C	A,M,CS
10-in. Motor-Operated Valve	Limitorque	Q1P16V0207D	A,M,CS
6-in. Motor-Operated Valve	Limitorque	Q1P16V081	A,M,CS
Electrical Penetration	GE	Q1T52B005	A,M,CS
Electrical Penetration	GE	Q1T52B007	A,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Electrical Penetration	GE	Q1T52B014	A,M,CS
Electrical Penetration	GE	Q1T52B015	A,M,CS
Electrical Penetration	GE	Q1T52B019	A,M,CS
Electrical Penetration	GE	Q1T52B020	A,M,CS
Power Cable	Okonite	1VBFV-J4Q	A,M,CS
Power Cable	Okonite	1VBFV-J5Q	A,M,CS
Power Cable	Okonite	1VAFU-K6Q	A,M,CS
Power Cable	Okonite	1VAFU-W2Q	A,M,CS
Power Cable	Okonite	1VAFU-H4Q	A,M,CS
Control Cable	Okonite	1VBFV-J4D	A,M,CS
Control Cable	Okonite	1VBG5007D	A,M,CS
Control Cable	Okonite	1VYR4006B	A,M,CS
Control Cable	Okonite	1VYR4006D	A,M,CS
Control Cable	Okonite	1VYKB164B	A,M,CS
Control Cable	Okonite	1VYKB164C	A,M,CS
Control Cable	Okonite	1VBFV-J5D	A,M,CS
Control Cable	Okonite	1VBQ5009D	A,M,CS
Control Cable	Okonite	1VAFU-K6D	A,M,CS
Control Cable	Okonite	1VAQ5007D	A,M,CS
Control Cable	Okonite	1VXR5005B	A,M,CS
Control Cable	Okonite	1VXR5005D	A,M,CS
Control Cable	Okonite	1VXR5005F	A,M,CS
Control Cable	Okonite	1VXKB164B	A,M,CS
Control Cable	Okonite	1VXKB164C	A,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Control Cable	Okonite	1VAFU-W2D	A,M,CS
Control Cable	Okonite	1VAFU-H4A	A,M,CS
Control Cable	Okonite	1VAQ5002F	A,M,CS
6-in. Motor-Operated Valve	Limitorque	Q1P17V097	A,M,CS
Limit Switch	Namco Controls	Q1P17ZS3184	A,QM,S,CS
Limit Switch	Namco Controls	Q1P17ZS3443	A,QM,S,CS
Electric Penetration	GE	Q1T52B016	A,M,CS
Electric Penetration	GE	Q1T52B019	A,M,CS
Electric Penetration	GE	Q1T52B020	A,M,CS
Electric Penetration	GE	Q1T52B038	A,M,CS
Electric Penetration	GE	Q1T52B041	A,M,CS
Terminal Block	States	Q1P17SV3184-B/JB	A,QM,S,CS
Terminal Block	States	Q1P17SV3443-A/JB	A,QM,S,CS
Power Cable	Okonite	1VBFV-C3Q	A,M,CS
Control Cable	Okonite	1VBFV-C3D	A,M,CS
Control Cable	Okonite	1VBQ5017C	A,M,CS
Control Cable	Okonite	1VYR5006F	A,M,CS
Control Cable	Okonite	1VBL5009C	A,M,CS
Control Cable	Okonite	1VBL5009D	A,M,CS
Control Cable	Okonite	1VBL5009E	A,M,CS
Control Cable	Okonite	1VBL5009F	A,M,CS
Control Cable	Okonite	1VBQ5017H	A,M,CS
Control Cable	Okonite	1VYR5035B	A,M,CS
Control Cable	Okonite	1VAL5055C	A,M,CS

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Control Cable	Okonite	1VAQ5029H	A,M,CS
Instrument Cable	Boston Insul. Wire	1VYR5064F	A,M,CS
Solenoid Valve	ASCO	Q1B31SV8047	R,T,QT,P,H,CS, A,QM,S,M,RPN
Limit Switch	Namco Controls	N1C22ZS0478	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	N1C22SV0478A	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	N1C22SV0478B	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	N1C22ZS0488	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	N1C22SV0488A	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	N1C22SV0488B	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	N1C22ZS0498	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	N1C22SV0498B	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	N1C22ZS0479	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	N1C22SV0479A	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	N1C22ZS0489	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	N1C22SV0489A	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	N1C22SV0489B	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	N1C22ZS0499	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	N1C22SV0499A	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	N1C22SV0499B	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1P13SV3196	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P13SV2867B	R,T,QT,P,H,CS, A,QM,M,RPN

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Solenoid Valve	ASCO	Q1P13SV3197	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P13SV2866B	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1E12SV3999A	R,T,QT,P,H,CS, A,QM,S,M,RPN
Solenoid Valve	ASCO	Q1E12SV3999B	R,T,QT,P,H,CS, A,QM,S,M,RPN
Solenoid Valve	ASCO	Q1E21SV6671	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1E21SV8149AB	R,T,QT,P,H,CS, A,QM,S,M,RPN
Solenoid Valve	ASCO	Q1E21SV8149BB	R,T,QT,P,H,CS, A,QM,S,M,RPN
Solenoid Valve	ASCO	Q1E21SV8149CB	R,T,QT,P,H,CS, A,QM,S,M,RPN
Solenoid Valve	ASCO	Q1G21SV3376	R,T,QT,P,H,CS, A,QM,S,M,RPN
Solenoid Valve	ASCO	N1G21SV1003B	R,T,QT,P,H,CS, A,QM,S,M,RPN
Solenoid Valve	ASCO	Q1G21SV7126	R,T,QT,P,H,CS, A,QM,S,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3369A	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3369AA	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3369AC	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3369A	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3369BA	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3369BC	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3369C	T,QT,P,H,A,QM,M,RPN

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Solenoid Valve	ASCO	Q1N11SV3369CA	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3369CC	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3370A	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3370AA	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3370AC	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3370B	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3370BA	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3370BC	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3370C	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3370CA	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3370CC	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3368A	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3368AA	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3368B	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3368BA	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3368C	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3368CA	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3976A	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3976A	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3976B	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3976B	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N11SV3976C	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3976C	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3369AJ	T,QT,P,H,A,QM,M,RPN

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Limit Switch	Namco Controls	Q1N11ZS3369BJ	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3369CJ	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3370AJ	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3370BJ	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N11ZS3370CJ	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N12ZS3234A	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N12ZS3234B	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N12ZS3235A	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N12ZS3235B	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N23ZS3228A	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N23ZS3228B	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N23ZS3228C	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N23ZS3227A	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N23ZS3227B	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N23ZS3227C	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N25ZS3772A	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N25ZS3772B	T,QT,P,H,A,QM,M,RPN
Limit Switch	Namco Controls	Q1N25ZS3772C	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N12SV3234A	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N12SV3234B	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N12SV3235A	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N12SV3235B	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N23SV3228AA	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N23SV3228BA	T,QT,P,H,A,QM,M,RPN

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Solenoid Valve	ASCO	Q1N23SV3228CA	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N23SV3227AA	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N23SV3227BA	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N23SV3227CA	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N25SV3772A	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N25SV3772B	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1N25SV3772C	T,QT,P,H,A,QM,M,RPN
Solenoid Valve	ASCO	Q1P15SV3103	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P15SV3765	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P15SV3766	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P15SV3179A	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P15SV3179B	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P15SV3179C	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P153180A	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P153180B	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P153180C	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P153181A	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P153181B	R,T,QT,P,H,CS, A,QM,M,RPN

APPENDIX B (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Solenoid Valve	ASCO	Q1P153181C	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P15SV3104	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P17SV3184	R,T,QT,P,H,CS, A,QM,M,RPN
Solenoid Valve	ASCO	Q1P17SV3443	R,T,QT,P,H,CS, A,QM,M,RPN

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	Component No.	Deficiency
Control Cable	Okonite	1VAL5060B	A
Control Cable	Okonite	1VBL4025B	A
Control Cable	Okonite	1VXL5071A	A
Control Cable	Okonite	1VAL5061C	A
Control Cable	Okonite	1VBL5034C	A
Control Cable	Okonite	1VBL5034D	A
Control Cable	Okonite	1VXL5072B	A
Control Cable	Okonite	1VAL5062B	A
Control Cable	Okonite	1VBL5035B	A
Control Cable	Okonite	1VBL5035D	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Control Cable	Okonite	1VXL5073A	A
Control Cable	Okonite	1VAL5019E	A
Control Cable	Okonite	1VAL5019F	A
Control Cable	Okonite	1VAL5045C	A
Control Cable	Okonite	1VAQ5013A	A
Control Cable	Okonite	1VAT0001C	A
Control Cable	Okonite	1VAT0001D	A
Control Cable	Okonite	1VAT0001E	A
Control Cable	Okonite	1VAL5020E	A
Control Cable	Okonite	1VAL5020F	A
Control Cable	Okonite	1VAL5046C	A
Control Cable	Okonite	1VAQ5015A	A
Control Cable	Okonite	1VAL5021E	A
Control Cable	Okonite	1VAL5021F	A
Control Cable	Okonite	1VAL5047C	A
Control Cable	Okonite	1VAQ5017A	A
Control Cable	Okonite	1VBL5010E	A
Control Cable	Okonite	1VBL5010D	A
Control Cable	Okonite	1VBL5021C	A
Control Cable	Okonite	1VBQ5013D	A
Control Cable	Okonite	1VBT0001F	A
Control Cable	Okonite	1VBT0001G	A
Control Cable	Okonite	1VBT0001H	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Control Cable	Okonite	1VBL5011E	A
Control Cable	Okonite	1VBL5011D	A
Control Cable	Okonite	1VBL5022C	A
Control Cable	Okonite	1VBQ5015D	A
Control Cable	Okonite	1VBL5012E	A
Control Cable	Okonite	1VBL5012D	A
Control Cable	Okonite	1VBL5023C	A
Control Cable	Okonite	1VBQ5017E	A
Control Cable	Okonite	1VAL5045B	A
Control Cable	Okonite	1VAQ5013B	A
Control Cable	Okonite	1VXR5008A	A
Control Cable	Okonite	1VAL5046B	A
Control Cable	Okonite	1VAQ5015B	A
Control Cable	Okonite	1VXR5008B	A
Control Cable	Okonite	1VAL5047B	A
Control Cable	Okonite	1VAQ5017B	A
Control Cable	Okonite	1VXR5008C	A
Control Cable	Okonite	1VBL5021B	A
Control Cable	Okonite	1VBQ5013E	A
Control Cable	Okonite	1VBL5022B	A
Control Cable	Okonite	1VBQ5015E	A
Control Cable	Okonite	1VBL5023B	A
Control Cable	Okonite	1VBQ5017E	A
Control Cable	Okonite	1VAL5003B	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Control Cable	Okonite	1VAQ5011A	A
Control Cable	Okonite	1VXR5007B	A
Control Cable	Okonite	1VBL5007B	A
Control Cable	Okonite	1VBQ5013B	A
Control Cable	Okonite	1VYR5033E	A
Control Cable	Okonite	1VAL5004C	A
Control Cable	Okonite	1VAQ5010D	A
Control Cable	Okonite	1VBL5005C	A
Control Cable	Okonite	1VBQ5011B	A
Control Cable	Okonite	1VXKJ183C	A
Control Cable	Okonite	1VXKJ183D	A
Control Cable	Okonite	1VXKJ183G	A
Control Cable	Okonite	1VXKJ183H	A
Instrument Cable	Boston Insulated Wire	1VYR5064A	A
Instrument Cable	Boston Insulated Wire	1VYR5064B	A
14-in. Motor-Operated Stop-Check Globe Valve	Limitorque	Q1N21V001A-B	A
14-in. Motor-Operated Stop-Check Globe Valve	Limitorque	Q1N21V001B-B	A
14-in. Motor-Operated Stop-Check Globe Valve	Limitorque	Q1N21V001C-B	A
Control Cable	Okonite	1VAL5120A	A
Control Cable	Okonite	1VAL5120B	A
Control Cable	Okonite	1VAL5120C	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Control Cable	Okonite	1VAL5120D	A
Control Cable	Okonite	1VBL5092A	A
Control Cable	Okonite	1VBL5092B	A
Control Cable	Okonite	1VBL5092C	A
Control Cable	Okonite	1VBFV-K2A	A
Control Cable	Okonite	1VBFV-K3A	A
Control Cable	Okonite	1VBFV-L2A	A
Power Cable	Okonite	1VBFV-K2Q	A
Power Cable	Okonite	1VBFV-K3Q	A
Power Cable	Okonite	1VBFV-L2Q	A
4-in. Motor-Operated Stop-Check Globe Valve	Limitorque	Q1N23V011A	A
4-in. Motor-Operated Stop-Check Globe Valve	Limitorque	Q1N23V011B	A
4-in. Motor-Operated Stop-Check Globe Valve	Limitorque	Q1N23V011C	A
Power Cable	Okonite	1VAFU-U4Q	A
Power Cable	Okonite	1VAFU-U5Q	A
Power Cable	Okonite	1VAFU-I2Q	A
Control Cable	Okonite	1VAFU-U4A	A
Control Cable	Okonite	1VAFU-U4D	A
Control Cable	Okonite	1VAFU-U5A	A
Control Cable	Okonite	1VAFU-U5D	A
Control Cable	Okonite	1VAFU-I2A	A
Control Cable	Okonite	1VAFU-I2D	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Component No	Deficiency
Control Cable	Okonite	1VAL5007B	A
Control Cable	Okonite	1VAL5008B	A
Control Cable	Okonite	1VAL5009B	A
Control Cable	Okonite	1VAQ5010E	A
Control Cable	Okonite	1VAQ5010K	A
Control Cable	Okonite	1VAQ5012E	A
Control Cable	Okonite	1VAQ5012K	A
Control Cable	Okonite	1VAQ5014E	A
Control Cable	Okonite	1VAQ5014K	A
Control Cable	Okonite	1VXR5007K	A
Control Cable	Okonite	1VXR5007L	A
Control Cable	Okonite	1VXR5007M	A
Control Cable	Okonite	1VAL5013C	A
Control Cable	Okonite	1VAL5014C	A
Control Cable	Okonite	1VAL5015C	A
Control Cable	Okonite	1VAQ5048H	A
Control Cable	Okonite	1VAQ5048K	A
Control Cable	Okonite	1VAQ5006C	A
Control Cable	Okonite	1VAQ5006H	A
Control Cable	Okonite	1VAQ5008C	A
Control Cable	Okonite	1VAQ5008H	A
Control Cable	Okonite	1VXR5007G	A
Control Cable	Okonite	1VXR5007H	A
Control Cable	Okonite	1VXR5007J	A

APPENDIX C (Continued)

Equipment Description	Manufacturer	Component No.	Deficiency
Instrument Cable	Boston Insulated Wire	1VAL5007C	A
Instrument Cable	Boston Insulated Wire	1VAL5008C	A
Instrument Cable	Boston Insulated Wire	1VAL5009C	A
Instrument Cable	Boston Insulated Wire	1VAL5013D	A
Instrument Cable	Boston Insulated Wire	1VAL5014D	A
Instrument Cable	Boston Insulated Wire	1VAL5015D	A
Control Cable	Okonite	1VAL5076A	A
Control Cable	Okonite	1VAL5077A	A
Control Cable	Okonite	1VAL5078A	A
Control Cable	Okonite	1VAQ5030E	A
Control Cable	Okonite	1VAQ5031E	A
Control Cable	Okonite	1VAQ5032E	A
Control Cable	Okonite	1VXR5008G	A
Control Cable	Okonite	1VXR5008H	A
Control Cable	Okonite	1VXR5008J	A

APPENDIX D
Safety-Related Systems List¹

Function	System
Emergency Reactor Shutdown	Reactor Protection
	Engineered Safeguards Actuation
	Reactor Coolant
	Chemical and Volume Control
Containment Isolation	Main Feedwater and Condensate
	Auxiliary Feedwater
	Main and Auxiliary Steam
	Residual Heat Removal
	Chemical Injection
	Chemical and Volume Control
	Liquid Waste Disposal
	Component Cooling water
	Service water
	Containment Spray
Reactor Core Cooling	Sampling
	Containment Cooling and Pruge
	Chemical and Volume Control/Safety Injection
	Safeguards System, RHR/LHSI

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	Containment Spray
	Containment Cooling and Purge
	Residual Heat Removal
Core Residual Heat Removal	Auxiliary Feedwater
	Main Feedwater and Condensate
	Main Steam
	Residual Heat Removal ¹
	Component Cooling Water
	Service Water
	Chemical and Volume Control
Prevention of Significant Release of Radioactive Material to Environ- ment	Containment Spray (Iodine Removal)
	Containment Post-LOCA Air Mixing
	Reactor Cavity Post-LOCA Dilution
	Hydrogen Recombiner
	Radiation Monitoring
	Sampling
Supporting Systems	Emergency Power
	Control Room Habitability
	Safety Equipment Area Ventilation

¹Only equipment required to achieve hot shutdown following an accident is included in the master list submitted by licensee. Cold shutdown equipment is to be addressed later.