



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

March 17, 1981

TERA

Dockets Nos. 50- 254
50- 265



Mr. J. S. Abel
Director of Nuclear Licensing
Commonwealth Edison Company
P. O. Box 767
Chicago, Illinois 60690

Dear Mr. Abel:

SUBJECT: ENVIRONMENTAL QUALIFICATION OF SAFETY-RELATED ELECTRICAL EQUIPMENT

RE: QUAD CITIES UNITS 1 & 2
FACILITY LICENSE NOS. DPR-29 AND DPR-30

Reference: Order for Modification of License Concerning the Environmental Qualification of Safety-Related Electrical Equipment, October 24, 1980.

This letter transmits the preliminary results of our review of environmental qualifications of safety-related electrical equipment at your facilities. This evaluation was based on your submittals received over the past months.

The facilities' licenses were modified by the referenced Order of October 24, 1980, to require that all safety-related electrical equipment be qualified to specified requirements not later than June 30, 1982. In addition, the Order noted that a licensee is obligated to modify or replace inadequate equipment promptly.

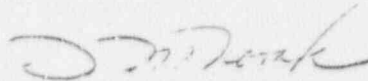
The staff's review of your submittals has resulted in our identifying a number of potential equipment deficiencies involving a lack of proper documentation, inadequate justification of assumed environmental conditions following an accident, and/or inadequate environmental testing of equipment, such that conformance to the DOR guidelines, as required by the Order, cannot be demonstrated. You are requested to review our identified deficiencies, and their ramifications, and provide us your overall finding regarding continued safe operation of your facilities. Accordingly, in order to determine whether your licenses should be modified or suspended, you are required pursuant to 10 CFR 50.54(f), to provide within 10 days of receipt of this letter, a written statement, signed under oath or affirmation supporting the safe operation of your facilities, that takes into account the NRC staff's preliminary list of deficiencies.

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The purpose of this statement is to provide the NRC with needed assurance, by the licensee, regarding the continued safety of the facilities until you can provide an item-by-item reevaluation in a detailed documented manner at a later date. A negative finding on your part concerning the safety of continued operation would result in a unit shutdown, and should be reported as a Licensee Event Report (LER) within twenty-four (24) hours of the determination to the appropriate NRC Regional Office. Include in the LER the actions you have taken for the immediate resolution of the matter. A copy of any such LER should be sent to the Director, Division of Licensing, Office of Nuclear Reactor Regulation.

Please submit a copy of your reply to us via telecopy.

Sincerely,



Thomas M. Novak, Assistant Director
for Operating Reactors
Division of Licensing

Enclosure:
Evaluation Report

cc w/enclosure:
See next page

Mr. J. S. Abel
Commonwealth Edison Company

cc:

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PARTIAL REVIEW

EQUIPMENT EVALUATION REPORT BY THE
OFFICE OF NUCLEAR REACTOR REGULATION

FOR COMMONWEALTH EDISON COMPANY
QUAD CITIES NUCLEAR POWER STATION UNITS 1 AND 2
DOCKET NO. 50-254/265

PARTIAL REVIEW

EQUIPMENT EVALUATION REPORT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

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3 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 Franklin Institute Center, under contract to the NRC Office of Inspection and Enforcement (IE), performed a preliminary evaluation of the licensee's response; this evaluation is documented in a technical evaluation report (TER). IE performed an onsite verification inspection (April 1, 1980) of selected safety-related electrical equipment. The reactor core cooling and the main steam isolation valve and the feedwater systems were inspected. Unit 2 was the only unit inspected visually for this phase of the review. The inspection at Unit 2 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 for the Quad Cities Units 1 and 2 facility in a report dated April 14, 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 HEB, 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 on the licensee's submittal, the staff has concluded that the information on safety-related systems included in the submittal is insufficient to verify

that those systems are all the systems 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 acknowledges the licensee's effort to include only those safety-related systems located in a potentially harsh environment. However, this review requires the listing of all safety-related systems, both inside and outside potentially harsh environments. The list of safety-related systems submitted by the licensee is included in Appendix D. Exceptions to the requirements are 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 141 items of equipment for Unit 1 and 120 items of equipment for Unit 2. These items were assessed individually by the staff to assure that all of the equipment has been adequately addressed.

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 Quad Cities Nuclear Station, Units 1 and 2, relative to the temperature, pressure, and the containment spray, 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.

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	281	48.3	100
MSLB	281	48.3	100

The staff has concluded that the minimum temperature profile for equipment qualification purposes should include a margin to account for analytical uncertainties in the calculated temperature profiles for postulated accidents. A margin of 20°F above steam saturation is considered to be appropriate 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 281°F does not satisfy the above requirement. The licensee should update his equipment summary tables to reflect a temperature margin of at least 20°F above steam saturation temperature. 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, humidity and applicable environment associated with an HELB outside containment. The following areas outside containment have been addressed:

- (1) Torus compartment
- (2) Core spray/RCIC room
- (3) High-pressure heater bay
- (4) Turbine building area
- (5) Reactor feed pump room
- (6) Diesel generator room

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

The licensee identified a number of equipment items for which the environmental conditions do not exceed 120°F and 5×10^4 rads. These items have been exempted from qualification because these environments are considered by the licensee to be benign. Based on the information submitted, the staff requires that the basis and justification for such exemption be provided. The licensee's response should verify that, for the specific materials and components used, such exemptions are indeed warranted.

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 at elevation 583 ft 0 in. The licensee has not identified any safety-related electrical components for Unit 1 or for Unit 2 as having the potential for becoming submerged after a postulated event.

3.6 Chemical Spray

Chemical sprays are not used in the Quad Cities Nuclear Power Station. The licensee's FSAR value identifies a demineralized water containment spray. This parameter has been factored into the qualification evaluation by the licensee.

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.

For this review, 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 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 between 4.3×10^7 to 1.1×10^8 rads. This value envelopes the DOR guideline requirements and is therefore acceptable.

A required value outside containment of 6.6×10^6 rads has been used by the licensee to specify limiting radiation levels within the ECCS pump rooms of the auxiliary building (that is, the HPCI, core spray, and the RCIC rooms). This value appears to consider the radiation levels influenced by the source term methodology associated with post-LOCA recirculation fluid lines and is acceptable. The licensee also stated that for areas where the radiation dose is less than 5×10^4 rads, the equipment is considered exempt from qualification. Based on the information submitted, the staff cannot conclude that such exemptions are warranted. The licensee is, therefore, required to provide the basis, analysis, and supportive test data to justify such an exemption for all equipment in this category or modify the design accordingly. The staff will review the licensee's response when it is submitted and include the resolution of this item in a supplemental report.

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 for each unit 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, 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.

APPENDIX B
UNIT 1

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

LEGEND:

Designation for Deficiency

R - Radiation
T - Temperature
QT - Qualification time
RT - Require 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

Item No.*	Equipment Description	Manufacturer	Model No.(s)	Deficiency
1	Temperature Element			R,T,QT,P,H, A,M,QM,EXN
2	Motor Driven Pump	General Electric	5K6335XC23A	R,T,QT,P,H, A,M,QM
	Motor Driven Pump	General Electric	5K6335XC193	R,T,QT,P,H, A,M,QM
3	Motor Operated Valve	Limitorque/ Peerless AC	SMB-0-25 SMB	T,P,H,EXN, A,R,QM,QT, M
4	Motor Operated Valve	Limitorque/ Peerless AC	SMB-0-15	T,P,H-EXN, A,R

APPENDIX B
UNIT 1

Item No.*	Equipment Description	Manufacturer	Model No.(s)	Deficiency
5	Motor Operated Valve	Limiterque/Reliance AC	SMB-2-40	T,P,H,EXN, A,R
6	Motor Operated Valve	Limiterque/Reliance AC	SMB-000	QT,M,A
7	Pressure Transmitter	General Electric	4532K11001	QT,T,R,P, QM,QI,A
8	Flow Transmitter	General Electric	4532K43001	QT,T,R,P, QM,QI,A
9	Flow Switch	Barton	289	T,H-EXN,R, A
10	Pressure Switch	Mercontrol	DA-7043-804	R,T,QT,P,H, A,M,RPS
11	Stop Valve	Unknown	178250H02DA	R,T,QT,P,H, A,M,QM
12	Motor Operated Valve	Limiterque/Peerless DC	SMB-3	T,P,H,R-QM, QI,QT,M,A
13	Motor Operated Valve	Limiterque/Reliance AC	SMB-1	T,R,QM,QI, A
14	Motor Operated Valve	Limiterque/Peerless DC	SMB-1	T,R,QM,QI, A
15	Motor Operated Valve	Limiterque/Peerless DC	SMB-0	R,T,QT,P,H, A,M,QM
16	Motor Operated Valve	Limiterque/Peerless DC	SMB-3-80	QT,M,A
17	Motor Operated Valve	Limiterque/Peerless DC	SMB-2 SMB-3 SMB-4	R,T,QT,P,H, A,M,QM
18	Motor Operated Valve	Limiterque/Reliance DC	SMB-0	T,R,QM,QI, A
19	Solenoid Valve	ASCO	830281F	QM,T,H,R,QI, A

APPENDIX B
UNIT 1

Item No.*	Equipment Description	Manufacturer	Model No. (s)	Deficiency
20	Differential Pressure Indicating Switch	Barton	288	T, H-EXN, R, QI, A
21	Flow Transmitter	General Electric	4532K13001	QM, QI, T, P, H, R, A
22	Pressure Transmitter	General Electric	4532K11001	QT, P, R, QI, A
23	Temperature Switch	United Electric Controls	88B	QT, T, P, H, R, QI, A
24	Pressure Transmitter	General Electric	50-551032CAAY1	R, T, P, H, QT, M, QM, A, EXN
25	Pressure Switch	Barksdale	B2T-A12SS	QT, T, H-EXN, R, A
26	Turbine Gland Seal	General Electric	58225A3525	R, T, P, H, QT, M, QM, A, EXN
27	Gland Steam Exhauster Fan	General Electric	58C74AB2193	R, T, P, H, QT, M, QM, A, EXN
28	Motor Speed Changer	General Electric	GE5EC26AC389	R, T, P, H, QT, QM, A, EXN
29	Motor Gear Unit	General Electric	5CD14019A111620	R, T, P, H, QT, P, H, QM, A, EXN
30	Oil Pump Motor	General Electric General Electric	5CD218E252 5CD326E753	QM, R, QI, A, T, H
31	HDCI Signal Converter	General Electric	357513TC108	R, T, P, H, QT, P, H, QM, A, EXN
32	Level Switch	Mercoid	123-2	R, T, P, H, QT, QM, A, EXN
33	Level Switch	Magnetrol	291-SP	R, P, QM, A, EXN
34	Flow Switch	Barton	289	QT, T, R, P, QM, QI, A

APPENDIX B
UNIT 1

Item No.*	Equipment Description	Manufacturer	Model No. (s)	Deficiency
35	Pressure Switch	Static-O-Ring	6NN-AA21-VRR	R,T,QT,P,H, A,M,QM,EXN
36	Pressure Switch	Barksdale	D2H-M150SS	R,T,QT,P,H, A,M,QM,EXN
37	Solenoid Valve	Allied Controls-Gould	320X-39 320X-30	R,T,QT,P,H, A,M,QM,EXN
38	Relief and Solenoid Valve	Dresser Industries	1525VX C5450-5	QT,QM,T,H, P,R,QI,A
39	Motor Operated Valve	Limitorque/ Peerless AC	Unknown	H,QI,QM
40	Motor Operated Valve	Limitorque/ Peerless DC	SMB-00-7.5 SMB-00	QT,A
41	Differential Pressure Indicating Switch	Barton	278	R,T,QT,P,H, A,M,QM,EXN
42	Temperature Switch	Fenwall	17002-40	QM,T,QT,H, QI,R,A
43	Pressure Switch	Static-Q-Ring	12NN-KK215-VX	QM,T,P,H,R, A
44	Position Switch	NAMCO	EA-08011100	R,T,QT,P,H, A,M,QM,EXN, QI
45	Motor Operated Valve	Limitorque/ Peerless AC	SMB-0-15 SMB-2-40 SMB-2-60	QT,T,P,H,QI, R,A,M,EXN
46	Motor Operated Valve	Limitorque/ Peerless AC	SMB-000-5 SMB-4T-150 SMB-3-100 SMB-0-10	R,T,QT,P,H,A, M,QM
47	Motor Operated Valve	Limitorque/ Reliance AC	SMB-2-40 SMB-0 SMB-1	R,T,QT,P,H, A,M,QM,EXN

APPENDIX B
UNIT 1

Item No.*	Equipment Description	Manufacturer	Model No. (s)	Deficiency
48	Motor Operated Valve	Limitorque/ Peerless AC	Unknown	R, T, QT, P, H, A, M, QM, EXN
49	Motor Operated Valve	Limitorque/ Peerless AC	SMB-0-15	T, QT, P, H, A, M, QM, EXN
50	Motor Operated Valve	Limitorque/ Reliance AC	SMB-5T-150 SMB-2-60	QT, A, M
51	Motor Operated Valve	Limitorque/ Peerless DC	SMB	QT, A, T, M
52	Motor Operated Valve	Limitorque/ Reliance AC	SMB-3 SMB	QT, A, T, M
53	Pressure Transmitter	General Electric	GE/MAC551	R, T, QT, P, H, A, M, QM, EXN
54	Flow Transmitter	General Electric	GE/MAC553	R, T, QT, P, H, A, M, QM, EXN, QI
55	Level Switch	Magnetrol	249C-X-EP SIMD4DC	R, T, QT, P, H, A, M, QM, EXN
56	Differential Pressure Indicating Switch	Barton	289	R, T, QT, P, H, A, M, QM, EXN
57	Pressure Switch	Mercoid	GN-L-3	T, H-EXN, A, R
58	RHR Service Water Pump	General Electric	5K821167A31	R, T, QT, P, H, A, M, QM, EXN
59	Differential Pressure Switch	Barton	Unknown	R, T, QT, P, H, A, M, QM, EXN
60	Room Cooler	Unknown	Unknown	R, T, QT, P, H, A, M, QM, EXN
61	Solenoid Valve	ASCO	HT8316B14	QM, T, P, H, R, A
62A	Solenoid Valve	Versa	VPS-2402 VGS-4422	R, T, QT, P, H, A, M, QM, EXN

APPENDIX B
UNIT 1

Item No.*	Equipment Description	Manufacturer	Model No. (s)	Deficiency
62B	Solenoid Valve	Versa	VPS-2502 VGS-4522 VGS-4422	R,T,QT,P,H, A,M,QM,EXN
63	Solenoid Valve	Versa	VPS-2302	R,T,QT,P,H A,M,QM,EXN
64	Solenoid Valve	ASCO	8302025F	R,T,QT,P,H, A,M,QM,EXN
65A	Motor Operated Valve	Limitorque	Unknown	R,T,QT,P,H, A,M,QM,EXN
65B	Motor Operated Valve	Limitorque	Unknown	R,T,QT,P,H, A,M,QM,EXN
66	Pressure Switches	Static-O-Ring	12N-AA5-PP	R,T,QT,P,H, A,M,QM,EXN
67	Pressure Switch	NAMCO	Mark II D1200-G	R,T,QT,P,H, A,M,QM,EXN
68	Motor Operated Valve	Limitorque	SMB-000	R,T,QT,P,H, A,M,QM,EXN
69	Electric Air Heater	E. L. Wiegand	Unknown	R,T,QT,P,H, A,M,QM,EXN
70	Motor Operated Damper	Limitorque	SMB	R,T,QT,P,H, A,M,QM,EXN
71	Exhaust Fan	New York Blower	E4966	R,T,QT,P,H, A,M,QM,EXN
72	Flow Transmitter	Leeds & Northrup	1912-3-21- 0-0000-0300- 0300	R,T,QT,P,H, A,M,QM,EXN, RPN
73	Flow Transmitter	Foxboro	15A-1	R,T,QT,P,H, A,M,QM,EXN, RPN
74	Flow Switch	Mercooid	DA-533-3 DA-533-2R1	R,T,QT,P,H, A,M,QM,EXN, RPN

APPENDIX B
UNIT 1

Item No.*	Equipment Description	Manufacturer	Model No. (s)	Deficiency
75	Temperature Switch	Chromalox	Unknown	R,T,QT,P,H,A,M,QM,EXN,RPN
76	Local Control Panel	Harlo	Unknown	T,QT,P,H,A,M,QM,EXN,RPN
77	Solenoid Valve	Versa/ASCO	VWS-2302/ 8320A23	R,T,P,H,A,M,QM,EXN,RPN
78	Temperature Element	Pall Trinity Micro	14-T-2H	R,T,P,H,A,M,QM,EXN,Q1
79	Damper	Unknown	Unknown	R,T,P,H,A,M,QM,EXN
80	Motor Driven Pump	General Electric	5K365AK169	QM,H,R-EXN,T,A
81	Fan Motor	General Electric	5K213AK2476 5K18AL2151	R,T,P,H,A,M,QM,EXN,RPN
82	Room Cooler Fan	Buffalo Forge	G123-HV	R,T,P,H,A,M,QM,EXN
83	Fan Motor	Unknown	Unknown	R,T,P,H,A,M,QM,EXN
84	Motor Driven Pump	General Electric	5K182BL315	R,T,P,H,A,M,QM,EXN
85	Level Switch	Magnetrol	A-103F-EP/VP	R,T,QT,P,H,A,M,QM,EXN
86	Solenoid Valve	ASCO	8211C89	R,T,QT,P,H,A,M,QM,EXN
87	Solenoid Ball Valve	General Pneumatic	608KW106	R,T,QT,P,H,A,M,QM,EXN
88	Squib Shear Valve	Pynodyne	Unknown	R,T,QT,P,H,A,M,QM,EXN
89	Motor Operated Valve	Limitorque/ Peerless AC	SMB-1-40 SMB	H,QM

APPENDIX B
UNIT 1

Item No.*	Equipment Description	Manufacturer	Model No. (s)	Deficiency
90	Motor Operated Valve	Limitorque/Peerless DC	SMB	R, T, QT, P, H, A, M, CM, EXN
91	Solenoid Valve	ASCO	HT831614	R, T, QT, P, H, A, M, CM, EXN
92	Motor Operated Valve	Limitorque/Peerless AC	SMB-00C-5	H, CM
93	Solenoid Valve	ASCO	HVA-90-105-2A W PBLXB31636 HVA-96-082A HVA-97-081A	QT, T, H, R-EXN, A
94	Level Switch	Magretrol	402	CM, T, H, R-EXN, A
95	Position Switch	NAMCO	Mark II D1200G	R, T, QT, P, H, A, M, CM, EXN
96	Solenoid Valve	ASCO	Unknown	R, T, QT, P, H, A, M, CM, EXN
97	Solenoid Valve	ASCO	SN-681055	R, T, QT, P, H, A, M, CM, EXN
98	Pressure Switch	Barxsdale	B2T-M1255 B2T-A1255	R, T, QT, P, H, A, M, CM, EXN
99	Level Indicating Switch	Varney	4418C 4418CE	CM, T, H-EXN, R, A
100	Position Switch	Unknown	Unknown	R, T, QT, P, H, A, M, CM, EXN
101	Motor Operated Valve	Limitorque/Reference	SMB-2-40	CM, EXN
102	Differential Pressure Indicating Switch	Barton	288	R, T, QT, P, H, A, M, CM, EXN
103	Reactor Element	General Electric	DW 294 92731	R, T, QT, P, H, A, M, CM, EXN

APPENDIX B
UNIT 1

Item No.*	Equipment Description	Manufacturer	Model No. (s)	Deficiency
104	Solenoid Valve	Versa/Barksdale	VPS2402 VGS4422/ D1H-A150SS	R,T,QT,P,H, A,M,QM,EXN
105	Diesel Auxiliary Control	Ideal Electric & Manufacturing	267777	R,T,QT,P,H, A,M,QM,EXN
106	Excitation Cabinet	Electromotive Div.	9474	R,T,QT,P,H, A,M,QM,EXN
107	Diesel Generator	Electromotive Div.	Unknown	R,T,QT,P,H, A,M,QM,EXN
108	Switchgear	General Electric	AMH4.76-250 AKD-5	R,T,QT,P,H, A,M,QM,EXN
109A	Motor Control Center	General Electric	7700	R,T,QT,P,H, A,M,QM,EXN
109B	Motor Control Center	General Electric	7700	R,T,QT,P,H, A,M,QM,EXN, RPN
110	Reactor Protection Bus	General Electric	Type NAB, Style 2A Plant H	R,T,QT,P,H, A,M,QM,EXN
111	AC Bus	Cutler Hammer	6CF55505	R,T,QT,P,H, A,M,QM,EXN
112	AC Bus MWG Set	General Electric	5L54404A22T30	R,T,QT,P,H, A,M,QM,EXN
113	Engine Control Panel	Electromotive Div. of GM	Unknown	R,T,QT,P,H, A,M,QM,EXN
114	Non-Segregated Bus	Unknown	Unknown	R,T,QT,P,H, A,M,QM,EXN
115	D/G Secondary Control Panel	Ideal Electric	267777	R,T,QT,P,H, A,M,QM,EXN
116	D/G Neutral Grounding Panel	General Electric	208419-68P	R,T,QT,P,H, A,M,QM,EXN

APPENDIX B
UNIT 1

Item* No.	Equipment Description	Manufacturer	Model No. (s)	Deficiency
117	Battery Charger	Gould	GRF240T100X GRF120T100X GRF24525F30X	R,T,QT,P,H, A,M,QM,EXN
118	Motor Control Center	Culter Hammer	6002H3478	R,P,QT,A,M, QM,EXN
119	DC Battery	Gould	FPS-25 FPR-13 DPR-9	R,T,QT,P,H, A,M,QM,EXN
120	DC Distributor Panel	Culter Hammer	Unknown	R,T,QT,P,H, A,M,QM,EXN
121	Motor Operated Valve	Limitorque/ Reliance AC	SMB-2 SMB-000	R,T,QT,P,H, A,M,QM,EXN
122	Motor Operated Valve	Limitorque/ Peerless DC	SMB-00	R,T,QT,P,H, A,M,QM,EXN
123	Position Switch	NAMCO	Mark II D1200G	R,T,QT,P,H, A,M,QM,EXN
124	Differential Pressure Indicating Switch	Barton	288	P,R,A,M,QM, EXN
125	Temperature Switch	Fenwal	17002-40	P,H,R,A,M, QM
126	Supply Air Fan	Trans Company	KALF575A	R,T,QT,P,H, A,M,EXN
127	Return Air Fan	Joy Mfg.	38-21-1750	QM,T,R,H, R-EXN,QI,A
128	Pressure Switch	Barksdale	B2T-A12SS	QM,T,H-EXN, R,A
129	Position Switch	NAMCO	Mark II D1200G	R,T,QT,P,H, A,M,QM,EXN
130	Solenoid Valve	Unknown	Unknown	R,T,QT,P,H, A,M,QM,EXN

APPENDIX B
UNIT 1

Item No.*	Equipment Description	Manufacturer	Model No. (s)	Deficiency
131	Cable	General Electric	Unknown	R,T,QT,P,H, A,M,QM,QI
132	Cable	Simplex	Unknown	R,T,QT,P,H, A,M,QM,QI
133	Cable	Simplex	Unknown	R,T,QT,P,H, A,M,QM,QI
134	Solenoid Valve	ASCO	830281F	R,T,QT,P,H, A,M,QM,EXN
135	Electrical Penetration	GE-NEBS	Unknown	R,T,QT,P,H, A,M,QM,QI
136	Water Chillers	Trane Co.	3E5H80	R,T,QT,P,H, A,M,QM,EXN
137	Chilled Water Pump	Ingersoll-Rand	0469-4154	QM,T,P,H, R-EXN,QI,A
138A	Cable	General Electric	Unknown	R,T,QT,P,H, A,M,QM,QI
138B	Cable	General Electric	Unknown	R,T,QT,P,H, A,M,QM,QI
139	Polyvinyl Chloride Jacket	Simplex	Unknown	R,T,QT,P,H, A,M,QM,QI
140	Insulation	Simplex	Unknown	R,T,QT,P,H, A,M,QM,QI
141	Terminal Blocks	Allen Bradley	Unknown	R,T,QT,P,H, A,M,QM,RPN

*Item No. corresponds to the item numbers in TER Report No. 05417-12.

APPENDIX C
UNIT 1

Equipment Considered Acceptable
or Conditionally Acceptable
(Category 4.3)

Item No.	Equipment Description	Manufacturer	Model No. (s)	Deficiency
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No equipment in this category for Quad Cities Unit 1.

APPENDIX D

Safety-Related Systems List

Reactor Protection/Neutron Monitoring System
Core Spray System
High-Pressure Coolant Injection System
Auto Depressurization System/Main Steam System
Residual Heat Removal System (RHRS)
Pressure Suppression System
Standby Gas Treatment System
Service Water System
Diesel Oil Piping System
Containment Isolation System*
Control Rod Drive Hydraulic System
Reactor (Nuclear Boiler) Recirculation System
Process Radiation Monitoring System
Reactor Building Ventilation
Control Room HVAC
Standby Alternating Current Power
Standby Direct Current Power
Reactor Core Isolation Cooling System (RCIC)
General Use Electrical Equipment
Main Steam (Alternate Use Only)
Main Feedwater/Condensate (Alternate Use Only)

*Containment Isolation includes all components in various systems performing the containment isolation function.

APPENDIX A
UNIT 2

Equipment Requiring
Immediate Corrective Action
(Category 4.1)

Item No.	Equipment	Manufacturer	Model No.(s)	Deficiency
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No equipment in this category for Quad Cities Unit 2.

APPENDIX B
UNIT 2

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

LEGEND:

Designation for Deficiency

R - Radiation
T - Temperature
QT - Qualification time
RT - Require 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 justification inadequate
QI - Qualification information being developed
RPS - Equipment relocation or replacement schedule provided

Item No. *	Equipment Description	Manufacturer	Model No. (s)	Deficiency
1	Temperature Element			R, T, QT, P, H, A, M, QM, EXN
2	Motor Driven Pump	General Electric	5K6338XC23A	R, T, QT, P, H, A, M, QM
3	Motor Operated Valve	Limitorque/Peerless AC	SMB-0-25	T, P, H, EXN, A, R, QM, QT, M
4	Motor Operated Valve	Limitorque/Peerless AC	SMB-0-15	T, P, H-EXN, A, R
5	Motor Operated Valve	Limitorque/Reliance AC	SMB-2-40	T, P, H-EXN, A, R
6	Motor Operated Valve	Limitorque/Reliance AC	SMB-000	QT, P, A

APPENDIX B (Continued)
UNIT 2

Item No.*	Equipment Description	Manufacturer	Model No.(s)	Deficiency
7	Pressure Transmitter	General Electric	4532K11001	QT,T,R,P, QM,QI,A
8	Flow Transmitter	General Electric	4532K43001	QT,T,R,P, QM,QI,A
9	Flow Switch	Barton	289	T,H-EXN,R,A
10	Pressure Switch	Mercantrol	DA-7043-804	R,T,QT,P,H, A,M,RPS
11	Stop Valve	Unknown	178250H02D4	R,T,QT,P,H, A,M,QM
12	Motor Operated Valve	Limitorque/ Peerless DC	SMB-3	T,P,H,R-QM, QI,QT,M,A
13	Motor Operated Valve	Limitorque/ Reliance AC	SMB	T,R,QM,QI,A
14	Motor Operated Valve	Limitorque/ Peerless DC	Unknown	T,R,QM,QI,A
15	Motor Operated Valve	Limitorque/ Peerless DC	SMB-3-80	QT,M,A
16	Motor Operated Valve	Limitorque	SMB-2, SMB-3 SMB-4, SMB-0 SMB-000	R,T,QT,P,H, A,M,QM
17	Solenoid Valve	ASCO	830281F	QM,T,H,R,QI,A
18	Differential Pressure Indicating Switch	Barton	288	T,H-EXN,R, QI,A
19	Flow Transmitter	General Electric	4532K13001	QM,QI,T,P,H, R,A
20	Pressure Transmitter	General Electric	4532K11001	QT,P,R,QI,A
21	Temperature Switch	United Electric Controls	888	QT,T,P,H,R, QI,A

APPENDIX B (Continued)
UNIT 2

Item No.*	Equipment Description	Manufacturer	Model No. (s)	Deficiency
22	Pressure Transmitter	General Electric	50-551032CAAY1	R,T,P,H,QT, M,QM,A,EXN
23	Pressure Switch	Barksdale	B2T-A1255	QT,T,H-EXN, R,A
24	Turbine Gland Seal	General Electric	58225A3525	R,T,P,H,QT, M,QM,A,EXN
25	Gland Steam Exhauster Fan	General Electric	58C74AB2193	R,T,P,H,QT, M,QM,A,EXN
26	Motor Speed Charger	General Electric	5BC26AC289	R,T,P,H,QT, QM,A,EXN
27	Motor Gear Unit	General Electric	5CD14019A111620	R,T,P,H,QT, H,QM,A,EXN
28	Oil Pump Motor	General Electric	5CD218E252 5CD326E758	QM,R,QI,A,T, H
29	HPCI Signal Converter	General Electric	357513TC108	R,T,P,H,QT, QM,A,EXN
30	Level Switch	Mercoid	123-2	R,T,P,H,QT, QM,A,EXN
31	Level Switch	Magnetrol	291-SP	R,P,QM,A,EXN
32	Flow Switch	Barton	289	QT,T,R,P,QM, QI,A
33	Pressure Switch	Static-O-Ring	6NN-AA21-VRR	R,T,QT,P,H, A,M,QM,EXN
34	Pressure Switch	Barksdale	D2H-M150SS	R,T,QT,P,H, A,M,QM,EXN
35	Solenoid Valve	Allied Controls-Gould	320X-39 320X-30	R,T,QT,P,H, A,M,QM,EXN
36	Safety Relief and Solenoid Valves	Dresser Industries	C5450-5	H,R,A,CS,M

APPENDIX B (Continued)
UNIT 2

Item No. *	Equipment Description	Manufacturer	Model No. (s)	Deficiency
37	Relief and Solenoid Valve	Dresser Industries	1525YX	QT, QM, T, H, P, R, QI, A
38	Motor Operated Valve	Limitorque/Peerless AC	Unknown	H, QI, QM
39	Motor Operated Valve	Limitorque/Peerless DC	SMB-00-7.5	QT, A
40	Differential Pressure Indicating Switch	Barton	278	R, T, QT, P, H, A, M, QM, EXN
41	Temperature Switch	Fenwall	17002-40	QM, T, QT, H, QI, R, A
42	Motor Operated Valve	Limitorque/Peerless AC	SMB-0-15 SMB-2-60	QT, T, P, H, QI, R, A, M, EXN
43	Motor Operated Valve	Limitorque/Peerless AC	SMB-000-5	R, T, QT, P, H, A, M, QM
44	Motor Operated Valve	Limitorque	SMB-2-40	R, T, QT, P, H, A, M, QM, EXN
45	Motor Operated Valve	Limitorque/Peerless	SMB	R, T, QT, P, H, A, M, QM, EXN
46	Motor Operated Valve	Limitorque/Peerless AC	SMB-0-15	T, QT, P, H, A, M, QM, EXN
47	Motor Operated Valve	Limitorque/Reliance AC	SMB	QT, A, M
48	Motor Operated Valve	Limitorque	SMB-5T-150 SMB-2-60	QT, A, T, M
49	Motor Operated Valve	Limitorque/Peerless AC	SMB-3-100 SMB-4T-150	QT, A, T, M
50	Motor Operated Valve	Limitorque/Peerless DC	SMB	R, T, QT, P, H, A, M, QM, EXN
51	Motor Operated Valve	Limitorque/Reliance AC	SMB SMB-3	R, T, QT, P, H, A, M, QI

APPENDIX B (Continued)
UNIT 2

Item No. *	Equipment Description	Manufacturer	Model No. (s)	Deficiency
52	Motor Operated Valve	Limiterque/ Peerless DC	SMB	R, T, QT, P, H, A, M, QM, EXN
53	Pressure Transmitter	General Electric	GE/MAC 551	R, T, QT, P, H, A, M, QM, EXN
54	Flow Transmitter	General Electric	GE/MAC 553	R, T, QT, P, H, A, M, QM, EXN
55	Level Switch	Magnetrol	249C-X-EPL- SIMD4DC	R, T, QT, P, H, A, M, QM, EXN
56	Differential Pressure Switch	Barton	289	R, T, QT, P, H, A, M, QM, EXN, RPN
57	Pressure Switch	Mercoide	GN-L-3	R, T, QT, P, H, A, M, QI, EXN
58	RHR Service Water Pump Motor	General Electric	5K821167A31	R, T, QT, P, H, A, M, QM, EXN
59	Pressure Transmitter	General Electric	GE/MAC 551 50- 55132GAAW1	R, T, QT, P, H, A, M, QI, EXN
60	Motor Driven Pump	General Electric	5K6336XC193 A, B, D	R, T, QT, P, H, A, M, QI, EXN
61	Motor Operated Valve	Limiterque/ Reliance AC	SMB-1 SMB-0	R, T, Q, P, H, A, M, QM, EXN
62	Differential Pressure Switch	Barton	Unknown	R, T, QT, P, H, A, M, QM, EXN, RPN
63	Room Cooler	Unknown	Unknown	R, T, QT, P, H, A, M, QM, EXN
64	Solenoid Valve	ASCO	HT83161814 HT831614	R, T, QT, P, H, A, M, QM, EXN
65A, B	Solenoid Valve	Versa	VPS-2402 VPS-2502 VGS-4422 VGS-4522	R, T, QT, P, H, A, M, QM, EXN

APPENDIX B (Continued)
UNIT 2

Item No.*	Equipment Description	Manufacturer	Model No.(s)	Deficiency
66	Solenoid Valve	Versa	VGS-4532 VPS-2402 VPS-2401 VPS-4422	R,T,QT,P,H,A,M, QM,EXN
67	Solenoid Valve	ASCO	HT831614 HT8316B14 8302026F	R,T,QT,P,H,A,M, QM,EXN
68	Solenoid Valve	Versa	VPS-2302	R,T,QT,P,H,A,M, QM,EXN
69	Motor Operated Valve	Limitorque	SMB-000	R,T,QT,P,H,A,M, QM,EXN
70	Pressure Switch	Static-O-Ring	12N-AA5-PP	R,T,QT,P,H,A,M, QM,EXN
71	Pressure Switch	Static-O-Ring	12NN-KK215-VX	R,T,QT,P,H,A,M, QM,EXN,RPN
72	Thermocouples	Pall Trinity Micro	14-T-2H	R,T,QT,P,H,A,M, QM,EXN,RPN
73	Motor Driven Pump	General Electric	5K365AK169	R,T,QT,P,H,A,M, QM,EXN
74	Fan Motor	General Electric	5K213AK2476 5K184AL2151	R,T,QT,P,H,A,M, QM,RPN,EXN
75	Room Cooler Fan	Buffalo Forge	G-123NV Type 15474	R,T,QT,P,H,A,M, QM,EXN
76	Fan Motor	Unknown	Unknown	R,T,QT,P,H,A,M, QM,EXN
77	Motor Driven Pump	General Electric	5K182BL315	R,T,QT,P,H,A,M, QM,EXN
78	Level Switch	Magnetrol	A-103F-EP/VP	R,T,QT,P,H,A,M, QM,EXN
79	Solenoid Valve	ASCO	8211C89	R,T,QT,P,H,A,M, QM,EXN

APPENDIX B (Continued)
UNIT 2

Item No.*	Equipment Description	Manufacturer	Model No. (s)	Deficiency
80	Solenoid Valve	General Pneumatic	608KW106	R, T, QT, P, H, A, M, QM, EXN
81	Squib Shear Valve	Pynodyne	Unknown	R, T, QT, P, H, A, M, QM, EXN
82	Motor Operated Valve	Limitorque/ Peerless AC	SMB-1-40	A, CS, M
83	Motor Operated Valve	Limitorque	SMB	R, T, QT, P, H, A, M, QI, EXN
84	Solenoid Valve	ASCO	HT831614	R, T, QT, P, H, A, M, QM, EXN
85	Solenoid Valve	ASCO	Unknown	R, T, QT, P, H, A, M, QM, EXN
86	Motor Operated Valve	Limitorque	SMB-000-5	H, CS, A, M
87	Solenoid Valve	ASCO	HVA90-405-2A WPBLXB31636 HVA96-082A HVA96-081A	R, T, QT, P, H, A, M, QM, EXN
88	Level Switch	Magnetrol	402	R, T, QT, P, H, A, M, QM, EXN
89	Position Switches	NAMCO	Mark II D1200G	R, T, QT, P, H, A, M, QM, EXN
90	Solenoid Valve	ASCO	Type NP-1	A, CS, M
91	Solenoid Valve	Unknown	Unknown	R, T, QT, P, H, A, M, QM, EXN
92	Pressure Switch	Barksdale	B2T-M12SS B2T-A12SS	R, T, QT, P, H, A, M, QM, EXN
93	Level Switch	Yarway	4418C 4418CE	R, T, QT, P, H, A, M, QM, EXN
94	Motor Operated Valve	Limitorque	SMB SMB-2	R, T, QT, P, H, A, M, QI, EXN
95	Differential Pressure Switch	Barton	288	R, T, QT, P, H, A, M, QM, EXN

APPENDIX B (Continued)
UNIT 2

Item No.*	Equipment Description	Manufacturer	Model No.(s)	Deficiency
96	Differential Pressure Switch	Barton	288	R,T,QT,P,H,A,M, QM,EXN
97	Radiation Tube	General Electric	DWG 194X927GI	R,T,QT,P,H,A,M, QM,EXN
98	Solenoid Valve	Versa/Barksdale	VPS-2402/ VGS-4422 D1H-A15055	R,T,QT,P,H,A,M, QM,EXN
99	Diesel Auxiliary Control	Ideal Electric & Mfg.	No. 267777	R,T,QT,P,H,A,M, QM,EXN
100	Excitation Cabinet	Electromotive Div.	9474	R,T,QT,P,H,A,M, QM,EXN
101	Diesel Generator	Electromotive Div.	8366072A-20-C1	R,T,QT,P,H,A,M, QM,EXN
102	Switch Gear	General Electric	AMH 4.76-250 AKD-5	R,T,QT,P,H,A,M, QM,EXN
103A, B	Motor Control Center	General Electric	7700	R,T,QT,P,H,A,M, QM,EXN,RPN
104	Engine Control Panel	Electromotive	520E4GW	R,T,QT,P,H,A,M, QM,EXN
105	Nonsegregated Bus	Unknown	Unknown	R,T,QT,P,H,A,M, QM,EXN
106	D/G Secondary Control Panel	Ideal Electric	267777	R,T,QT,P,H,A,M, QM,EXN
107	D/G Grounding Panel	General Electric	208419-68P KVA-5	R,T,QT,P,H,A,M, QM,EXN
108	Battery Charger	Gould	GRF240T100X GRF-120-T GRF-120T100X GRF-24525F30X	R,T,QT,P,H,A,M, QM,EXN
109	Motor Control Center	Cutler Hammer	6002H347B	QT,P,R,A,M,QM EXN
110	DC Battery	Gould	FPS-25,DPR-9 FPR-13	R,T,QT,P,H,A,M, QM,EXN

APPENDIX B (Continued)
UNIT 2

Item No.	Equipment Description	Manufacturer	Model No.(s)	Deficiency
111	DC Distribution Panel	Cutler Hammer	Unknown	R,T,QT,P,H,A,M QM,EXN
112	DC Distribution Panel	Cutler Hammer	Unknown	R,T,QT,P,H,A,M QM,EXN,RPN
113	Motor Operated Valve	Limitorque/ Peerless AC	SMB	CS,A,M
114	Motor Operated Valve	Limitorque/ Peerless DC	Unknown	R,T,QT,P,H,A,M QM,EXN,RPN
115	Solenoid Valve	ASCO	830281F	R,T,QT,P,H,A,M QM,EXN,RPN
116	Differential Pressure Switch	Barton	288	P,R,A,M,EXN
117	Temperature Switch	Fenwall	17002-40	P,H,R,A,M
118	Motor Operated Valve	Limitorque	SMB,SMB-0	R,T,QT,P,H,A,M, QM,EXN
119	Pressure Switch	Barksdale	B2T-A12SS	R,A,M,H,EXN
120	Solenoid Valve	ASCO	830281F	R,T,QT,P,H,A,M QM,EXN

Item no. corresponds to number in TER Report No. C5417-13

APPENDIX C
UNIT 2

Equipment Considered Acceptable
or Conditionally Acceptable
(Category 4.3)

Item No.	Equipment Description	Manufacturer	Model No. (s)	Deficiency
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No equipment in this category for Quad Cities Unit 2.

APPENDIX D

Safety-Related Systems List

Reactor Protection/Neutron Monitoring System
Core Spray System
High-Pressure Coolant Injection System
Auto Depressurization System/Main Steam System
Residual Heat Removal System (RHRS)
Pressure Suppression System
Standby Gas Treatment System
Service Water System
Diesel Oil Piping System
Containment Isolation System*
Control Rod Drive Hydraulic System
Reactor (Nuclear Boiler) Recirculation System
Process Radiation Monitoring System
Reactor Building Ventilation
Control Room HVAC
Standby Alternating Current Power
Standby Direct Current Power
Reactor Core Isolation Cooling System (RCIC)
General Use Electrical Equipment
Main Steam (Alternate Use Only)
Main Feedwater/Condensate (Alternate Use Only)

*Containment isolation includes all components in various systems performing the containment isolation function.