"PARTIAL REVIEW" EQUIPMENT EVALUATION REPORT BY THE OFFICE OF NUCLEAR REACTOR REGULATION

FOR VIRGINIA ELECTRIC AND POWER COMPANY NORTH ANNA UNIT 2 DOCKE? NO. 50-339

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3 STAFF EQUIPMENT EVALUATION

The staff evaluation of the licensee's response included an insite inspection of selected Class IE equipment, audits of qualification docu instation, and an examination of the licensee's report for completeness and acc ptability. The criteria described in NUREG-0588 were used as a basis for the staff evaluation of the the adequacy of the licensee's qualification program.

The NRC Office of Inspection and Enforcement performed an onsite verification inspection (October 21-24, 1980) of selected safety-related electrical equipment. A physical examination was made of installed electrical instrumentation and control equipment associated with the safety injection accumulator, sample, main steam, leakage monitoring, and instrument air systems. 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 50-339/80-34. No major deficiencies were identified. Several minor differences were noted, and the licensee's report will be updated for correctness.

The staff performed two audits of the licence's environmental qualification program, including detailed reviews of the supporting documentation for 10 equipment items. Results of the first audit indicated some deficiencies, particularly that reviews of environmental qualification data appeared to be cursory and some qualification documentation was not available for audit. The second audit indicated that the licensee had not established acceptable failure criteria with respect to their evaluation of qualification documentation. In addition, many referenced qualification documents requested by the staff were not available for audit. For these reasons, the results of the second audit were inconclusive. It should be noted that on October 24, 1980 an order for modification of license was issued to the licensee. The order required the establishment, by December 1, 1980, of a central file for the purpose of maintaining complete and auditable records of environmental qualification of safety-related equipment.

3.1 Completeness of Safety-Related Equipment

In accordance with IEB 79-01B and NUREG-0588, 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) emergeocy reactor shutdown, (2) containment isolation, (3) reactor core cooling, (4) containment heat removal, (5) core residual heat removal, and (6) prevention of significant release of radioactive material to the environment. The staff therefore concludes that the systems identified by the licensee (listed in Appendix D) are acceptable, with the exception of those items discussed in Section 5 of this report.

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

The licensee identified 115 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 North Anna Unit 2 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-steamline-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.

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:

	Max Temp (°F)	Max Press (psig)	Humidity (%)
LOCA	280	45	100
MSLB	430	45	100

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

The licensee's specified temperature (service condition) of 280°F does not satisfy the above requirement. A saturation temperature corresponding to the peak profile (293°F peak temperature at 45 psig) should be used instead. The licensee should update his equipment summary tables to reflect this change. If there is any equipment that does not meet the staff position, the licensee must provide either justification that the equipment will perform its intended function under the specified conditions or propose corrective action.

3.4 Temperature, Pressure, and Humidity Conditions Outside Containment

The licensee has provided the temperature, pressure, humidity and applicable environment associated with an HELB outside containment. The following areas outside containment have been addressed:

- (1) Auxiliary building
- (2) Main steam valve house
- (3) Service building
- (4) Service water valve pit

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 9 ft 1 in. Equipment below this level has been identified by the licensee, along with the proposed corrective action. The licensee identified two item types consisting of six safety-related electrical components -- all solenoid valves -- as having the potential for becoming submerged after a postulated event. As a corrective action, the licensee proposes replacing and relocating these components. The staff concurs with the prorosed resolution.

The licensee stated that the components in question--solenoid valves--perform their functions in less than 60 seconds, fail closed, and are not required to operate after a LOCA. In this case, the licensee should provide an assessment of the failure modes associated with the submergence of the solenoid valves. The licensee should also provide assurance that the subsequent failure of this component 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 solenoid valves may be exempt from the submergence parameter of qualification.

3.6 Chemical Spray

The licensee's value for the chemical concentration is 2000-2100 ppm boron buffered to a pH of 8.5 to 11 with sodium hydroxide for a period of 0-4 hours. Then it is reduced to a pH of 7.8 to 9.0 for the remaining 120 days. The exact volume percent used by the vendor for qualification testing should be verified by the licensee. 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

NUREG-0588 Category II delineates two aging program requirements. Valve operators committed to IEEE Standard 382-1972 and motors committed to IEEE Standard 334-1971 must meet the Category I requirements of the NUREG. This requires the establishment of a qualified life, with maintenance/replacement schedules based on the findings. All other equipment must be subjected only to an aging program which identifies aging-susceptible materials within the component. Additionally, the staff requires that the licensee

 (1) establish an ongoing program to review surveillance and maintenance records to identify potential age-related degradations (2) establish component maintenance and replacement schedules which include consideration. f aging characteristics of the installed components

The licensee's aging program, as identified in the submittal, addresses aging only to the extent that an equipment failure is attributed directly to an aging mechanism. The licensee was directed by the staff to provide details concerning the aging program, including the identification of aging-susceptible materials and compliance with Category I aging criteria, where applicable.

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

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

3.8 Radiation (Inside and Outside Containment)

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

The values required by the licensee inside containment ranged from 6.77×10^6 rads to 1.8×10^7 rads. These values do not envelope the minimum requirements of NUREG-0588. The licensee is therefore requested to either provide justification for using lower service conditions or use the minimum requirements of NUREG-0588. If the former is chosen, the the analyses, including the basis and assumptions used and a sample calculation, should be provided.

A required value of 3.6×10^6 rads has been used by the licensee to specify limiting radiation levels for safety injection equipment within the auxiliary building. This value appears to consider the radiation levels influenced by the source term methodology associated with post-LOCA recirculation fluid lines and is therefore acceptable.

4 QUALIFICATION OF EQUIPMENT

The following subsections present the staff's assessment, based on the licensee's submittal and staff audits, 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 additic 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

- material-aging evaluation; replacement schedule; ongoing equipment surveillance
- 5 submergence
- N margin
- 1 HELB evaluation outside containment not completed
- OM 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:

- 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 singlefailure 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

- 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

IER 79-018, Supplement 3 has r axed the time constraints for the submission of the information associated with cold shutdown equipment and TMI lessonslearned 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.

POOR ORIGINAL

APPENDIX E

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

LEGEND:

- R Radiation
- T Temperature
- OT 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
- RFN 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
Level Transmitter	DeLaval	LT-RS-251A	A,QI
Level Transmitter	DeLava1	LT-RS-251B	A,QI
Flow Transmitter	Rosemount	FT-2474	A,CS,R,QI
Flow Transmitter	Rosemoune	FT-2475	A,CS,R,QI
Flow Transmitter	Rosemount	FT-2484	A,CS,R,QI
Flow Transmitter	Rosemount	FT-2485	A,CS,R,QI
Flow Transmitter	Rosemount	FT-2494	A,CS,R,QI
Flow Transmitter	Rosemount	FT-2495	A,CS,K,QI
Level Transmitter	Rosemount	LT-2475	A,CS,R,QI

Equipment Description	Manufacturer	Composent No.	Deficiency
Level Transmitter	Rosemount	LT-2484	A,CS,R,QI
Lovel Transmitter	Rosemount	LT-2485	A,CS,R,QI
Level Transmitter	Rosemount	LT-2496	A,CS,R,QI
Level Transmitter	Rosemount	LT-2474	A,CS,R,QI
Level Transmitter	Rosemount	LT-2476	A,CS,R,QI
Level Transmitter	Rosemount	LT-2486	A,C5,R 01
Level Transmitter	Rosemount	LT-2494	A,CS,R,QI
Level Transmitter	Rosemount	LT-2495	A,CS,R,QI
Level Transmitter	Barton	LT-2459	QT,A,QI
Level Transmitter	Barton	LT-2460	QT,A,QI
Level Transmitter	Barton	LT-2461	QT,A,QI
Pressure Transmitter	Barton	PT-2455	QT,H,A,QI
Pressure Transmitter	Barton	PT-2456	QT,H,A,QI
Pressure Transmitter	Barton	PT-2457	QT,H,A,QI
Solenoid Valves	ASCO	SOV-2200A-1	A,S,RPN
Solenoid Valves	ASCO	SOV-2200B-1	A,S,RPN
Solenoid Valves	ASCO	SOV-2200C-1	A,S,RPN
Solenoid Valves	ASCO	SOV-2200A-2	A,S,RPN
Solenoid Valves	ASCO	SOV-2200B-2	A,S,RPN
Solenoid Valves	ASCO	SOV-2200C-2	A,S,RPN
Level Transmitter*	DeLaval	LIT-RS-251A	R,A,RPN
Level Transmitter	DeLaval	LIT-RS-251B	R,A,RPN
Thermostat	Honeywell	TS-HV-2230	R,A

*)tem audited by NRR staff.

Louipment Description	Manufacturer	Component No.	Deficiency
Pressure Transmitter	Foxboro	PT-2474	A,QI
Pressure Transmitter	Foxboro	PT-2475	A,QI
Pressure Transmitter	Foxboro	PT-2476	A,QI
Pressure Trai mitter	Foxboro	PT-2484	A,QI
Pressure Transmitter	Foxboro	PT-2485	A,Q1
Pressure Transmitter	Foxboro	PT-2486	A,QI
ressure Transmitter	Foxboro	PT-2494	A,Q1
Pressure Transmitter	Foxboro	PT-2495	A,QI
Pressure Transmitter	Fexboro	PT-2496	A,QI
Pump Motor	General Electric	2-RS-P-2A	R,A
Pump Motor	General Electric	2-RS-P-2B	R,A
Exhaust Fans	Westinghouse	1-HV-E-4A	R,A
Exhaust Fans	Westinghouse	1-HV-E-4B	R,A
Exhaust Fans	Wescinghouse	1-HV-E-4C	R,A
Valve Operator	Limitorque	MOV-QS-200A	R,A
Valve Operator	Limitorque	MOV-QS-200B	R,A
Switchgear/Transformer	Gould-Brown Boveri	2EE-ST-01	PA
Switchge "/Transformer	Gould-Brown Boveri	2EE-ST-02	R,A
Switchgear/Transformer	Gould-Brown Boveri	2EE-SS-03	R,A
Switchgear/Transformer	Gould-Broom Boveri	2EE-SS-04	R,A

Equipment Description	Manufacturer	Component No.	Deficiency
Fump Motors*	Westinghouse	2-SI-P-1A	R,T,A
Pump Motors	Westinghouse	2-SI-P-18	R,T,A
Pump Motors	Westinghouse	2-CH-P-1A	R,T,A
Pump Motors	Westinghouse	2-CH-P-18	R,T,A
Pump Motors	Westinghouse	2-CH-P-1C	R,T,A
ans	Buffalo Forge	2-HV-F-40A	R,T,A
ans	Buffalo Forge	2-HV-F-40B	R,T,A
Temperature Monitors	Rosemount	TE-AM-215	R,T,A
Cemperature Monitors	Rosemount	TE-AM-216	R,T,A
femperature Monitors	Rosemount	TE-AM-217A	R,T,A
emperature Monitors	Rosemount	TE-AM-2178	R,T,A
emperature Monitors	Rosemount	TE-AM-217C	R,T,A
Cemperature Monitors	Rosemount	TE-AM-217D	R,T,A
emperature Monitors	Rosemount	TE-AM-100A	R,T,RT,QT,H,A
Cemperature Monitors	Rosemount	TE-AM-100B	R,T,RT,QT,H,A
emperature Monitors	Rosemount	TE-AM-101A	R,T,RT,QT,H,A
emperature Monitors	Rosemount	TE-AM-101B	R,T,RT,QT,H,A
emperature Monitors	Rosemount	TE-AM-102A	R,T,RT,QT,H,A
emperature Monitors	Rosemount	TE-AM-102B	R,T,RT,QT,H,A
emperature Monitors	Rosemount	TE-AM-103A	R,T,RT,QT,H,A
emperature Monitors	Rosemount	TE-AM-103B	R,T,RT,QT,H,A
emperature Monitors	Rosemount	TE-AM-104A	R,T,RT,QT,H,A
emperature Monitors	Rosemount	TE-AM-104B	R,T,RT,QT,H,A

*Item audited by NRR staff

Description	Manufacturer	Component No.	Deficiency
Temperature Monitors	Rosemount	TE-AM-105A	R,T,RT,QT,H,A,QM
Temperature Monitors	Rosemount	TE-AM-105B	R,T,RT,QT,H,A,QM
Temperature Monitors	Rosemount	TE-AM-106A	R,T,RT,QT,H,A,QM
Temperature Monitors	Rosemount	TE-AM-106B	R,T,RT.QT,H,A,QM
Temperature Monitors	Rosemount	TE-AM-107A	R,T,RT,QT,H,A,QM
Temperature Monitors	Rosemount	TE-AM-107B	R,T,RT,QT,H,A,QM
Temperature Monitors	Rosemount	TE-AM-108A	R,T,RT,QT,H,A,QM
Temperature Monitors	Rosemount	TE-AM-108B	R,T,RT,QT,H,A,QM
Flow Transmitter	Barton	FT-2940	R, T, A
Flow Transmitter	Barton	FT-2943	R, T, A
Power Cable	Okonite	NGA-20	QT,H,CS,A,QM
Power Cable	Okonite	NGA-21	QT,H,CS,A,QM
Power Cable	Okonite	NGB-15	QT,H,CS,A,QM
Power Cable	Okonite	NGB-16	QT,H,CS,A,QM
Power Cable	Okonite	NGB-17	QT,H,CS,A,QM
Power Cable	Okonite	NGB-18	QT,H,CS,A,QM
Yower Cable	Okonite	NGB-19	QT,H,CS,A,QM
Cable*	Cerro Co.	NGA-15	QT,T,H,A
Control Cable	Cerro Co.	NGA-19	QT,T,H,A
Control Cable	Cerro Co.	NGA-34	QT,T,H,A
Control Cable	Cerro Co.	NGA-35	QT,T,H,A
Control Cable	Cerro Co.	NGA-36	QT,T,H,A
Control Cable	Cerro Co.	NGA-37	QT,T,H,A

*Item audited by NRR staff

Equipment Description	Manufacturer	Component No.	Deficiency
Control Cable	Cerro Co.	NGA-38	QT,T,H,A
Control Cable	Cerro Co.	NGA-39	QT,T,H,A
Control Cable	Cerro Co.	NGA-40	QT,T,d.A
Control Cable	Cerro Co.	NGA-44	QT,T,H,A
Control Cable	Cerro Co.	NGA-45	QT,T,H,A
Control Cable	Cerro Co.	NGA-47	QT,T,H,A
Control Cable	Certo Co.	NGA-49	QT,T,H,A
Controlle	Cerro Co.	NGA-57	QT,T,H,A
Control Cable	Cer o Co.	NGA-77	QT,T,H,A
Instrument Cable	Boston Insu- lated Wire	NGA-67	QT,A
Instrument Cabie	Boston Insu- lated Wire	NGA-68	QT,A
Instrument Cable	Boston Insu- lated Wire	NGA-69	QT,A
Instrument Cable	Boston Insu- latec Wire	NGA-70	QT,A
Instrument Cable	Boston Insu- lated Wire	NGB-35	QT,A
Instrument Cable	Boston Insu- lated Wire	NGA-39	QT,A
Instrument Cable	Boston Insu- lated Wire	NGA-40	QT,A
Instrument Cable	Boston Insu- lated Wire	NGA-55	QT,A
Power Cable*	General Cable	NGA-3	QT,H,A
Power Cable	General Cable	NGA-4	QT,H,A

*ltem audited by NRR staff

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Description	Manufacturer	Component No.	Deficiency
Power Cable	General Cable	NGA-5	QT,H,A
Fower Cable	General Cable	NGA-6	QT,H,A
Power Cable	General Cable	NGA-9	QT,H,A
Power Cable	General Cable	NGA-10	QT,H,A
Fower Cable	General Cable	NGA-12	QT,H,A
Power Cable	General Cable	NGA-13	QT,H,A
Power Cable	Okonite	NGA-3	QT,A
Power Cable	Okonite	NGA-4	QT,A
Power Cable	Okonite	NGA-13	QT,A
Power Cable	Okonite	NGA-14	QT,A
Power Cable	Okonite	NGB-5	QT,A
Power Cable	Okonite	NGB-7	QT,A
Power Cable	Okonite	NGB-11	QT,A
Power Cable	Okonite	NGB-12	QT,A
Instrument Cable	Cerro	NGA-67	QT,A
Instrument Cable	Cerro	NGA-68	QT,A
Instrument Cable	Cerru	NGA-70	QT,A
Instrument Cable	Cerro	NGB-35	QT,A
Instrument Cable	Cerro	NGB-39	QT,A
ower Cable*	General Cable	NGB-5	QT,H,A
ower Cable	General Cable	MGB-7	QT,H,A
Power Cable	General Cable	NGB-11	QT,H,A
ower Cable	General Cable	NGB-12	QT,H,A

*Item audited by NRR staff

Equipment Description	Manufacturer	Component No.	Deficiency
Solenoid Valve*	ASCO	SOV-DG-200A	R,A
Power Cable	Okonite	NGB-01	QT,A
Terminal Blocks*	Connection, Inc.	None	QT,A
Penetration Assemblies*	Conax	None	RT,QT,A
Penetration Assemblies	Conax	None	RT,QT,A
Splices	Cona×, Kapton	None	RT,QT,A
Splices	Conax, Kapton	None	RT,QT,A
Pump Motors	General Electric	2-RS-P-IA	QT,CS,A
Pump Motors	General Electric	2-RS-P-1B	QT,CS,A
Terminal Blocks	Marathon	None	QT,A
Terminal Blocks	Connection	None	QT,A
Terminal Blocks	Thermo- Electric	None	QT,A
Terminal Blocks	General Electric	None	QT,A
Terminal Blocks	Westinghouse	None	QT,A
Termination Tape	Okonite	None	QT,R,A
Splicing Material	Raychem	None	QT,A
Solenoid Valve	ASCO	SOV-SS-200B	R,A
Solenoid Valve	ASCO	S0V-SS-212B	R,A
Solenoid Valve	ASCO	SOV-SS-201B	R,A
Solenoid Valve	ASCO	SOV-SS-203A	R,A

*Item audited by NRR staff

Equipment Description	Manufacturer	Component No.	Deficiency
Solenoid Valve	ASCO	SOV-55-203B	R,A
Solenoid Valve	ASCO	SOV-SS-204B	R,A
Termination Connectors	Raychem	None	QT,A
Hydrogen Recombiner	Rockwell Intl	. 1-HC-HC-1	QT,A,QM
Hydrogen Recombiner	Rockwell Intl	. 2-HC-HC-1	QT,A,QM
Pressure Transmitter	Foxboro	PT-LM-200A	QT,A
Pressure Transmitter	Foxboro	PT-LM-2008	QT,A
Pressure Transmitter	Foxboro	PT-LM-200C	QT,A
Pressure Transmitter	Foxboro	PT-LM-200D	QT,A
Solenoid Valve	ASCO	SOV-CC-202B	CS,A,QM
Solenoid Valve	ASCO	SOV-CC-202D	CS,A,QM
Solenoid Valve	ASCO	SOV-CC-202F	CS,A,QM
Solenoid Valve	ASCO	SOV-IA-201A	CS,A,QM
Solenoid Valve	ASCO	SOV-VG-200B	QT,RT,CS,A,Q
Solenoid Valve	ASCO	SOV-RM-200C	QT, RT, CS, A,Q
Solenoid Valve	ASCO	SOV-SS-200A	QT,RT,CS,A,Q
Sclenoid Valve	ASCO	SOV-SS-201A	QT,RT,CS,A,Q
Solenoid Valve	ASCO	SOV-SS-204A	QT,RT,CS,A,Q
Solenoid Valve	ASCO	SOV-SS-212A	QT,RT,CS,A,Q
Solenoid Valve	ASCO	SOV-CC-201B	QT,RT,CS,A,Q
Selenoid Valve	ASCO	SOV-CC-205B	QT,RT,CS,A,Q
Solenoid Valve	ASCO	SOV-CC-205C	QI,RT,CS,A,Q
Solenoid Valve	ASCO	SOV-DA-200B	QT,RT,CS,A,Q
Solenoid Valve	ASCO	SOV-DG-200B	QT,RT,CS,A.Q

Equipment Description	Manufacturer	Component No.	Deficiency
Solenoid Valve	ASCO	SOV-B0-200B	QT,RT,CS,A,Q
Solenoid Valve	ASCO	SOV-B0-200D	QT,RT,CS,A,QI
Solenoid Valve	ASCO	SOV-B0-200F	QT,RT,CS,A,Q
Solencid Valve	ASCO	SOV-B0-200G	QT,R*,CS,A,QM
Solenoid Valve	ASCO	SOV-B0-200H	QT,RT,CS,A,QM
Solenoid Valve	ASCO	SOV-B0-200J	QT,RT,CS,A,QM
Solenoid Valve	ASCO	SOV-SW-201A1	QT,RT,CS,A,QM
Solenoid Valve	ASCO	50-5W-201A2	QT,RT,CS,A,Q
Solenoid Valve	ASCO	SC-SW-20181	QT,RT,CS,A,Q
Solenoid Valve	ASCO	SOV-SW-201B2	QT,RT,CS,A,Q
Fan Motors	Joy Manufac- turing Co.	2-HV-F-71A	R,A,RPS
Fan Motors	Joy Manufac- turing Co.	2-HV-F-71B	R,A,RPS
Solenoid Valve*	ASCO	SOV-ED-200A	R,A,RPS
Solenoid Valve	ASCO	SOV-BD-200C	R,A,RPS
Solenoid Valve	ASCO	SOV-BD-200E	R,A,RPS
Solenoid Valve	ASCO	SOV-00-200A	R,A,RPS
Solenoid Valve	ASCO	SOV-CC-200B	R,A,RPS
Solenoid Valve	ASCO	SOV-CC-200C	R,A,RPS
Solchoid Valve	ASCO	SOV-CC-201A	R,A,RPS
Solenoid Valve	ASCO	SOV-CC-202A	R,A,RPS
Solenoid Valve	ASCO	SOV-CC-202C	R,A,RPS
Solenoid Valve	ASCO	SOV-CC-202E	R, A, RPS

*Item audited by NRR staff

Lquipment Description	Manufacturer	Component No.	Deficiency
Solenoid Valve	ASCO	SOV-CC-203A	R,A,RPS
Solenoid Valve	ASCO	SOV-CC-203B	R,A,RPS
Solenoid Valve	ASCO	SOV-CC-204A-1	R,A,RPS
Solenoid Valve	ASCO	SOV-CC-204A-2	R,A,RPS
Solenoid Valve	ASCO	SOV-CC-204B-1	R,A,RPS
Solenoid Valve	ASCO	SOV-CC-2048-2	R,A,RPS
Solenoid Valve	ASCO	SOV-CC-204C-1	R,A,RPS
Solencid Valve	ASCO	SOV-CC-204C-2	R,A,RPS
Solenoid Valve	ASCO	SOV-IA-202A	R,A,RPS
Solenoid Valve	ASCO	SOV-IA-202B	R,A,RPS
Solenoid Valve	ASCO	SOV-DA-200A	R,A,RPS
Solenoid Valve	ASCO	SOV-RM-200A	R,A,RPS
Solenoid Valve	ASCO	SOV-RM-200B	R,A,RPS
Solenoid Valve	ASCO	SOV-SI-200A	R,A,RPS
Solenoid Valve	ASCO	SOV-SI-200B	R,A,RPS
Solenoid Valve	ASCO	SOV-SI-201	R,A,RPS
iolenoid Valve	ASCO	SOV-VG-200A	R,A,RPS
olenoid Valve	ASCO	SOV-1H-200A	R,A,RPS
olenoid Valve	ASCO	SOV-IH-2008	R,A,RPS
olenoid Valve	ASCO	SOV-IH-200C	R,A,RPS
olenoid Valve	ASCO	SCV-IH-201B	R,A,RPS
olenoid Valve	ASCO	SOV-MS-211A	R,A,RPS
olenoid Valve	ASCO .	SOV-MS-2118	R.A.RPS

Lquipment Description	Manufacturer	Companent No.	Deficiency
Solenoid Valve	ASCO	SOV-SS-206B	R,A,RPS
Solencid Valve	ASCO	SOV-SS-202B	R,A,RPS
Solenoid Valve	ASCO	SOV-LM-200A	R,A,RPS
Solenoid Valve	ASCO	SOV-LM-200B	R,A,RPS
Solenoid Valve	ASCO	SOV-1M-200C	R,A,RPS
Solenoid Valve	ASCO	SOV-LM-200D	R,A,RPS
Solenoid Valve	ASCO	SOV-LM-200E	R,A,RPS
Solen 'd Valve	ASCO	SOV-LM-200F	R,A,RPS
Solenoid Valve	ASCO	SOV-LM-200G	R,A,RPS
Solenoid Valve	ASCO	SOV-LM-200H	R,A,RPS
Solenoid Valve	ASCO	SOV-2204	R,A,RPS
Solenoid Valve	ASCO	SOV-2519A	R,A,RPS
Solenoiá Valve	ASCO	SOV-213A-1	R,A,RPS
Solenoid Valve	ASCO	SOV-213A-2	R,A,RPS
Solenoid Valve	ASCO	SOV-213B-1	R,A,RPS
Solenoid Valve	ASCO	SOV-213B-2	R,A,RPS
Solencid Valve	ASCO	SOV-213C-1	R,A,RPS
Solenoid Valve	ASCO	SOV-213C-2	R,A,RPS
Solenoid Valve	ASCO	SOV-209A	R,A,RPS
Solenoid Valve	ASCO	SOV-209B	R,A,RPS
Solencid Valve	ASCO	SOV-203	R,A,RPS
Solenoid talve	ASCO	SOV-202-1	R,A,RPS

Equipment Description	Manufacturer	Component No.	Deficiency
Solenoid Valve	ASCO	SOV-SS-207A	R,T,RT,QT,P, H,CS,A,RPS
Solenoid Valve	ASCO	SOV-SS-2078	R,T,RT,QT,P, H,CS,A,RPS
Solenoid Valve	ASCO	SOV-MS-201A-1	R,A,RPS
Solenoid Valve	ASCO	SOV-MS-201A-2	R,A,RPS
Solenoid Valve	ASCO	SOV-MS-201A-4	R,A,RPS
Solenoid Valve	ASCO	SOV-MS-201A-5	R,A,RPS
Solenoid Valve	ASCO	SOV-MS-2018-1	R,A,RPS
Solenoid Valve	ASCO	SOV-MS-2018-2	R,A,RPS
Solenoid Valve	ASCO	SOV-MS-2018-4	R,A,RPS
Solenoid Valve	ASCO	SOV-MS-201B-5	R,A,RPS
Solenoid Valve	ASCO	SOV-MS-201C-1	R,A,RPS
Solenoid Valve	ASCO	SOV-MS-2010-2	R,A,RPS
Solenoid Valve	ASCO	SOV-MS-2010-4	R,A,RPS
Solenoid Valve	ASCO	SOV-MS-201C-5	R,A,RPS
Solenoid Valve	ASCO	SOV-CV-250A	R,A,RPN
Solenoid Valve	ASCO	SOV-CV-250B	R,A,RPN
Solenoid Valve	ASCO	SOV CV-250C	R,A,RPN
Solenoid Valve	ASCO	SOV-CV-250D	R,A,RPN
Solenoid Valve	ASCO	SOV-SS-202A	R.T.,RT,QT,P, H,CS,A,RPN
Solenoid Valve	ASCO	SOV-SS-206A	R,T,RT,QT,P, H,CS,A,RPN
Solencid Valve	ASCO ·	SOV-LM-201A	R,A,RPS
Solenoid Valve	ASCO	SOV-LM-201B	R,A,RP5

Equipment Description	Manufacturer	Component No.	Deficiency
Solenoid Valve	ASCO	SOV-LM-201C	R,A,RPS
Solenoid Valve	ASCO	SOV-LM-2010	R,A,RPS
Solenoid Valve	ASCO	SOV-HV-1158-1	R,A,RPS
Solenoid Valve	ASCO	SOV-HV-115B-2	R,A,RPS
Solenoid Valve	ASCO	SOV-2460A	R,T,RT,QT,P, H,CS,A,RPS
Solenoid Valve	ASCO	SOV-2460B	R,T,RT,QT,P, H,CS,A,RPS
Solenaid Valve	ASCU	SOV-2936	R,T,RT,OT,P H,CS,A,RPS
Solenoid Valve	ASCO	SOV-2380	R,T,RT,QT,P, H,CS,A,RPS
Solenoid Valve	ASCO	SOV~2859	R,T,RT,QT,P, H,CS,A,RPS
Solenoid Valve	ASCO	SOV-2884A	R,A,RPS
Solenoid Valve	ASCO	SOV-2884B	R,A,RPS
Solenoid Valve	ASCO	SOV-2884C	R,A,RPS
Pump Motor	Marathon Electric	2-SW-P-5	R,A,RPS
Pump Motor	Marathon Electric	2-SW-P-6	R,A,RPS
Pump Motor	Marathon Electric	2-SW-P-7	R,A,RPS
Pump Motor	Marathon Electric	2-SW-P-8	R,A,RPS
Hydrogen Analyzer 🤺	Bendix	H ₂ A-HC-100	R A, RPS
Hydrogen Analyzer	Bendix	H2A-HC-200	R,A,RPS
Motor Operated Damper	Honeywell	M0V-HV-163A	R,T,QT,RT, P.H.A.RPS

Equipment Description		Manufacturer	Component No.	Deficiency
Motor Operated	Damper	Honeywell	MOV-HV-1638	R,T,QT,RT, P,H,A,RPS
Motor Operated	Damper	Honeywell	MOV-HV-163C	R,T,QT,RT, P,H,A,RPS
Valve Operator		Limitorque	MOV-214	R,A,RPN
Valve Operator		Limitorque	MOV-210A	R,A,RPN
Valve Operator		Limitorque	MOV-2108	R,A,RPN
Valve Operator		Limitorque	MOV-2380	T,QT,P,CS,A,R
Valve Operator		Limitorque	MOV-2350	R,A,RPN
Valve Operator		Limiterque	MOV-2836	R,A,RPN
Valve Operator		Limitorque	MOV-2115E	R,A,RPN
Valve Operator		Limitorque	MOV-2275B	R,A,RPN
Resistance Temp Detector	erature	Rosemount	TE-2412B	A,RPS
Resistance Temp Detector	erature	Rosemount	TE-2412D	A,RPS
Resistance Temp Detector	erature	Rosemount	TE-2422B	A,RPS
Resistance Temp Detector	erature	Rosemount	TE-2422D	A,RPS

TE-2410

TE-2413

TE-2420

TE-2423

A, RPS

A, RPS

A, RPS

A, RPS

APPENDIX B (Continued)

Resistance Temperature Detector

Resistance Temperature Detector

Resistance Temperature Detector

Resistance Temperature Detector Rosemount

Rosemount

Rosemount

Rosemount

Equipment Description	Manufacturer	Component No.	Deficiency
Resistance Temperature Detector	Rosemount	TE-2430	A,RPS
Resistance Temperature	Rosemount	TE-2433	A,RPS

APPENDIX C

Equipment Considered Acceptable or Conditionally Acceptable (Category 4.2)

LEGEND:

- R Radiation
- T Temperature
- QT Qualification time
- RT Required time
- P Pressire
- H Humid ty
- CS Chem._al 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
Valve Operator	Limitorque	MOV-QS-201A	A
Valve Operator	Limitorque	MOV-QS-201B	A
Valve Operator	Limitorque	10V-RS-255A	А
Valve Operator	Limitorque	MOV-RS-255B	A
Valve Operator	Limitorque	MOV-RS-256A	Å
Valve Operator	Limitorque	MOV-RS-256B	А
Valve Operator	Limitorque	MOV-SW-201A	А
Valve Operator	Limitorque	MOV-SW-2012	А
Valve Operator	Limitorque	MOV-SW-201C	A

Description	Manuficturer	Component No.	Deficiency
Valve Operator	Limitorque	MOV-SW- 2010	A
Valve Operator	Limitorque	MOV-SW-203B	A
Valve Operator	Limitorque	MOV-SW-204A	A
Valve Operator	Limitorque	MOV-SW-205A	Α
Valve Operator	Limitorque	MOV-SW-2058	A
Valve Operator	Limitorque	MOV-SW-205C	A
Valve Operator	Limitorque	MOV-SW-205D	A
Valve Operator	Limitorque	MOV-SW-206A	A
Valve Operator	Limitorque	MOV-SW-206B	A
Valve Operator	Limitorque	MOV-SW-208A	A
Valve Operator	Limitorque	MOV-SW-208B	Ę.
Valve Operator	Limitorque	MOV-SW-213A	A
Valve Operator	Limitorque	MOV-SW-2138	A
Valve Operator	Limitorque	MOV-RS-200A	Α
Valve Operator	Limitorque	MOV-RS-200B	A
Valve Operator	Limitorque	MOV-RS-201A	A
Valve Operator	Limitorque	MOV-RS-201B	A
Valve Operator	Limitorque	MOV-2860A	A
/alve Operator	Limitorque	MOV-2860B	A
alve Operator	Limitorque	MOV-2885A	A
alve Operator	Limitorque	MOV-28858	A
/alve Operator	Limitorque	MOV-2863A	A
alve Operator	Limitorque	M0Y-2863B	A
alve Operator	limitoroup	MOV-26678	٨

Equipment Description	Manufacturer	Component No.	Deficiency
Valve Operator	Limitorque	MOV-2669B	A
Valve Operator	Limitorque	MOV-2270B	A
Valve Operator	Limitorque	MG∀-2370	A
Valve Operator	Limitorque	MOV-2373	А
Valve Operator	Limitorque	MOV-2869A	A
Valve Operator	Limitorque	MOV-2869B	A
Valve Operator	Limitorque	MOV-2286A	А
Valve Operator	Limitorque	MOV-2285B	A
Valve Operator	Limitorque	MOV-2286C	A
Valve Operator	Limitorque	MOV-2287A	А
Valve Operator	Limitorque	MOV-2287B	А
Valve Operator	Limitorque	MOV-2287C	A
Valve Operator	Limitorque	MOV-2267A	A
Valve Operator	Limitorque	MOV-2269A	A
Valve Operator	Limitorque	MOV-2270A	A
Valve Operator	Limitorque	MOV-2289A	A
Valve Operator	Limitorque	MOV-2289B	A
Valve Operator	Limitorque	MOV-2867A	A
Valve Operator	Limitorque	MOV-2867B	A
Valve Operator	Limitorque	MOV-2867D	A
Valve Operator	Limitorque	MOV-2275A	A
Valve Operator	Limitorque	MOV-2275C	А
Valve Operator	Limitorque	MOV-2381	А
E/P Converter	Copes-Vulcan	FC-2122	

Equipment	Manufacturer	Component No	Deficiency
valve Operator	Limitorque	N:: V-HV-200A	
Valve Operator	Limitorque	MOV-HV-200B	
Flow Transmitter	Foxboro	FT-2414	
Flow Transmitter	Foxboro	FT-2415	
Flow Transmitter	Foxboro	FT-2416	
Flow Transmitter	Foxboro	FT-2424	
Flow Transmitter	Foxboro	FT-2425	
Flow Transmitter	Foxboro	FT-2426	
Flow Transmitter	Foxboro	FT-2434	
Flow Transmitter	Foxboro	FT-2435	
Flow Transmitter	Foxboro	FT-2436	
Valve Operator	Limitorque	MOV-2865A	
Valve Operator	Limitorque	MOV-2865B	,
Valve Operator	Limitorque	MOV- 2865C	
F/P Converter	Fisher	ACV-2180	
A/C Chillers	Westinghouse	2-HV-E-4A	
A/C Chillers	Westinghouse	2-HV-E-4B	
A/C Chillers	Westinghouse	2-HV-E-4C	
A/C Strainers	Elliot Co.	2-HV-S-1A	
A/C Strainers	Elliot Co.	2-HV-S-18	
Fans	Aerovent Fan Co.	2-HV-F-24	
Fans ,	Aerovent Fan Co.	2-HV-P-20A	
Fans	Aerovent Fan Co	2-HV-P-20B	

Lguipment Description	Manufacturer	Component No.	Deficiency
Fans	Aerovent Fan Co.	2-HV-P-200	
rans	Aerovent Fan Co.	2-HV-P-22A	
Fans	Aerovent Fan Co.	2-HV-P-228	
Fans	Aerovent Fan Co.	2-HV-P-22C	
Pinps	Bingham- Williamette Co	2-HV-P-20n	
Pumps	Bingham- Williamette Co	2-HV-P-208	
Pumps	Bingham- Willizmette Co	2-HV-P-20C	
Pumps	Bingham- Williamette Co	2-HV-P-22.4	
Pumps	Bingham- Williamette Co	2-HV-P-22B	
Pumps	Bingham- Williamette Co	2-HV-P-22C	
Pumps	Johnson Pump Co.	2-DP-P10A	
Pumps	Johnson Pump Co.	2-DP-P108	
Valve Operator	Elliot Co.	MOV-HV-215-1	
Valve Operator	Elliot Co.	MOv-HV-215-2	
alve Operator	Elliot Co.	MOV-HV-216-1	
Valve Sperator	Elliot Co.	MOV-HV-216-2	
alve Operator	Limitorque	MOV .N-201	

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Equip Descr	oment ription		Manufacturer	Component No.	Deficiency
Motor	· Control	Center*	Klockner- Moeller	2-EP-MC-19	A
Motor	Control	Center	Klockner- Moeller	2-EP-MC-20	A
Mator	Control	Center	Klockner- Moeller	2-EP-MC-21	A
Motor	Control	Center	Klockner- Moeller	2-EP-MC-22	A
Limit	Switch*		Namco	HCV-2200A	A
Limit	Switch		Namco	HCV-2200B	А
Limit	Switch		Namco	HCV-2200C	A
Limit	Switch		Namco	SOV-2842	A
Motor	Operated	Valve	Limitorque	M0V-2890A	A
Motor	Operated	Valve	Limitorque	M0V-2862A	A
Motor	Ocerated	Valve	Limitorque	MOV-2862B	A
Motor	Operaced	Valve	Limitorque	MOV-2864A	A
Motor	Operated	Valve	Limitorque	MOV-2864B	A
Motor	Operated	Valve	Linitorque	MOV-2867C	A
Motor	Op onted	Valve	Limitorque	MOV-2885C	A
Motor	Operated	Valve	Limitorque	MOV-2885D	A
Motor	Operated	Valve	Limitorque	MOV-2850B	A
Motor	Operated	Valve	Limitorque	MOV-2890C	A
lotor	Operated	Valve	Limitorque	MOV-2890D	A
lotor	Op rated	Valve	Limitorque	MOV-21158	A
lotor	Operated	Valve	Limitorque	MOV-21150	A

*Item audited by NRR staff

Equipment Description	Manufacturer	Component No.	Deficiency
Valve Operator	Limi*orque	MOV-SW-203A	A
Valve Operator	Limitorque	MOV-SW-203C	A
Valve Operator	Limitorque	MOV-SW-203D	А
Valve Operator	Limitorque	MOV-SW-204B	А
Valve Operator	Limitorque	MOV-SW-204C	А
Valve Operator	Limitorque	MOV-SW-204D	A

APPENDIX U

Safety-Related Systems List¹

Function	System
Emergency Reactor Shutdown	Proctor Coolant
	Reactor Protection
	Safeguards Actuation
	Chemical and Volume Control
Containment Isolation	Main Steam Isolation
	Main Feedwater Isolation
	Containment Isolation
	Safety Injection
	Chemical and Volume Control
	Containment Spray
	Component Cooling Water
	Sampling
Reactor Core Cooling	Chemical and Volume Control
	Safety Injection
Containment Heat Removal	Containment Spray
	Recirculation Spray

The NRC staff recognizes that there are differences in nomerclature 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.

Function	Jystem
Core Residual Heat Removal	Main Feedwater
	Auxiliary Feedwater
	Main Steam
	Component Cooling Water
	Service Water
Prevention of Significant Releas of Radioactive Material to the Environment	Containment Air Purification/Cleanup
	Hydrogen Recombiners
	Containment Radiation Menitoring
	Containment Spray
Supporting Systems	Emergency Power
	Heating and Ventilation