RESPONSE TO IE BULLETIN 79-01B

FOR

QUAD CITIES NUCLEAR POWER STATION

UNITS 1 AND 2

COMMONWEALTH EDISON COMPANY

DOCKET NUMBERS 50-254 AND 50-265

PREPARED BY: BECHTEL POWER CORPORATION

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1.0 STUDY OBJECTIVES

This study has been prepared in response to NRC IE Bulletin 79-01B, dated January 14, 1980. It has been prepared by Bechtel Power Corporation, Ann Arbor, Michigan, for Commonwealth Edison Company's Quad Cities Nuclear Power Station Units 1 and 2.

The scope of the study includes:

a. Preparing a master list of all engineered safety feature (ESF) systems

b. Identifying all components required to function under postulated accident conditions

c. Defining environmental service conditions for the components identified above

d. Establishing maximum flood elevation inside containment

e. Evaluating qualification data for components and documenting bases of equipment qualification

f. Recommending action to be taken where qualification data for components does not exist or is inadequate for station service conditions

g. Where qualification data does not exist, preparing a justification for continued station operation, or identifying those items for which a licensee event report (LER) should be prepared by Commonwealth Edison Company

h. Preparing a report documenting the results of the study in accordance with Item 7 of NRC IE Bulletin 79-01B

i. Preparing contract documents to specify testing and analyses where required to resolve outstanding items

j. Preparing procurement documents for replacement equipment where existing equipment is identified for replacement

k. Performing engineering for equipment relocation and modification where necessary to resolve open items

2.0 STUDY RESULTS

The systems required to function following the postulated accidents have been identified and the essential components listed. Environmental service conditions have been established. Evaluation of environmental qualification test reports have been completed. Data sheets (Appendixes D.1 and D.2) are provided for essential components subject to harsh environmental service conditions. These data sheets document the qualification test conditions, or document action in progress to resolve the status of the component. Table 2-1 provides a tabulation of systems included in the study, percent of system components with outstanding items, and percent of outstanding qualification data items. Data sheets for components with outstanding items also contain specific actions to be taken to resolve outstanding items, and justifications for continued station operation while the action items are being implemented.

3.0 STUDY CONCLUSIONS AND RECOMMENDATIONS

Investigations in response to NRC IE Bulletin 79-01B indicate that a significant number of components are either not subjected to harsh environmental service conditions or have qualification data documented. Vendors have been contacted and confirming letters have been written to the equipment manufacturers requesting qualification data, if available, or component materials data for analysis. Table 3-1 provides a list of letters written. Resolution of qualification status for the remaining components is being pursued by one or any combination of the following methods:

a. Equipment will be subjected to worst case environmental service conditions and performance/function tested following exposure. A test report will be prepared for each test.

b. Equipment will be replaced with qualified equipment.

c. Equipment will be relocated and/or shielded.

d. Where qualification data may exist but materials data is required to determine existence of suitable test reports, additional vendor contacts will be made and investigations performed.

Contract packages for qualification testing have been prepared and are scheduled to be issued for bids before January 1, 1981. Procurement documents for replacement components are being prepared and are scheduled to be issued for bids during the first quarter of 1981. Vendor contacts have been made and work is in progress where additional qualification data may be obtainable from the vendor.

Replacement components will be installed during the first refueling outage after the new components are received onsite. When the outstanding items identified in Appendixes D.1 and D.2 are closed out, all Class 1E electrical components will be qualified and the basis of the qualification documented.

It is recommended that work continue as outlined above to close out the outstanding items in Appendixes D.1 and D.2.

4.0 DETAILED EVALUATION

4.1 DEFINITION OF POSTULATED ACCIDENTS

NRC IE Bulletin 79-01B defines the postulated accident conditions to be addressed as the loss-of-coolant-accident/high energy line break (LOCA/HELB) inside the containment and the HELB outside the containment.

For the Quad Cities Nuclear Power Station (QCNPS) Units 1 and 2, the LOCA/HELB inside the containment is discussed in FSAR Sections 5.2.3 and 6.2.7. The HELB outside the containment is discussed in Special Report No. 12, Revision 1, submitted to the NRC in February 1975. In evaluating the effects of HELB, concurrent multiple breaks are not evaluated.

For the LOCA/HELB inside the containment, worst case environmental conditions are established by the LOCA, resulting from a double-ended recirculation line break. The environmental conditions which result from this accident are provided in Section 4.3 and Appendix C.

For a HELB outside the containment, Special Report No. 12 identifies the high energy lines and the locations of postulated breaks. In support of the response to IE Bulletin 79-01B, studies were performed to establish equipment integrated radiation doses as a result of the postulated accidents. These environmental conditions are discussed in Section 4.3.

The following postulated accidents were analyzed to establish the worst environmental conditions:

a. LOCA inside drywell

b. Main steam line break (MSLB) in the steam tunnel

c. Main feedwater line break

d. High-pressure coolant injection (HPCI) steam line break

e. Reactor core isolation cooling (RCIC) steam line break

f. Reactor water clean up (RWCU) line break

Where components, because of their locations, could be subjected to differing environments for the various accidents, the most severe environmental conditions were utilized for qualification. Components located within compartments with postulated HELBs would be subjected to pressure, temperature, and humidity conditions resulting from those HELBs, but would not be subjected to radiation doses in excess of 5×10^4 rads simultaneously. These same components could be subjected to radiation doses in excess of 5×10^4 rads following a LOCA, but these doses would not be simultaneous with pressure, temperature, and humidity. To simplify this analysis, qualification data was initially sought which demonstrated operability of these components for the combination of all environmental conditions. Where qualification could not be demonstrated for the entire spectrum of conditions simultaneously, components were evaluated for the conditions associated with each individual accident. Environmental conditions are based on the specific accidents for which the components must function. Components which are exposed to harsh environments during accidents for which they are not required to function do not require qualification for these environments. Where qualification testing is to be performed, testing will be performed for each postulated environment separately.

4.2 IDENTIFICATION OF CLASS 1E COMPONENTS REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS (BULLETIN ACTION ITEM 1)

The QCNPS FSAR and emergency procedures were reviewed to identify the ESF systems which are required to mitigate the consequences of the postulated accidents discussed in Section 4.1. These systems are those needed to achieve reactor shutdown, containment isolation, reactor core cooling, containment and reactor heat removal, and to prevent the release of radioactive material to the environment in excess of the guidelines of 10 CFR 100.

Appendix A.1 provides the master list of Unit 1 and common systems required to function following all of the postulated accidents discussed in Section 4.1. Appendix A.2 provides the master list of Unit 2 systems required to function following all of the postulated accidents discussed in Section 4.1. Table A-1 identifies which systems are required to function following each of the postulated accidents.

The station piping and instrument diagrams and electrical schematics were reviewed to determine the specific components which must function following the postulated accidents. Based on this review, a master components list has been developed for each system identified in Appendixes A.1 and A.2. The master components list identifies each Class 1E and/or essential electrical component that is required to function following the postulated accidents discussed in Section 4.1. Appendix B.1 provides the master components list for Unit 1 and common systems. Appendix B.2 provides the master components list for Unit 2 systems. Throughout this report, Class 1E is used in reference to components designed to Class 1E, as well as components not designed to Class 1E but which are essential following the postulated accidents.

4.3 DEFINITION OF ENVIRONMENTAL SERVICE CONDITIONS (BULLETIN ACTION ITEMS 3 AND 5)

4.3.1 Inside the Drywell

The drywell pressure and temperature response following the postulated LOCA are provided in FSAR Figures 5.2.15 and 5.2.16, respectively. These figures are included in Appendix C. The maximum humidity inside the drywell is defined in FSAR Table 5.2.2 as 100%. Chemical sprays are not used in the QCNPS design. Demineralized water containment spray is utilized and considered in the evaluation. The QCNPS FSAR does not provide integrated radiation doses inside the drywell. Studies were performed to establish the integrated doses inside the drywell for a postuated LOCA. The integrated doses for 1 day, 30 days, and 1 year are provided in Appendix C. The study methodology is described in Section 4.3.5. Radiation doses are evaluated for actual equipment operating times. Appendix C also defines the containment spray fluid and provides the maximum drywell pressure, temperature, humidity, and flood elevation.

4.3.2 Outside the Drywell, Subject to HELB

HELB is discussed in detail in Special Report No. 12, Revision 1, submitted to the NRC in February 1975. The environmental conditions (pressure, temperature, and humidity) due to a pipe break in the steam tunnel, torus compartment, core spray/RCIC room, reactor water cleanup heat exchanger room and turbine building are listed in Appendix C. Radiation doses following a HELB are less severe than the doses associated with a LOCA and are therefore not provided. Flooding does not occur outside the drywell as a result of the postulated HELBs. Chemical and demineralized water spray do not exist outside the drywell. For this study, the environmental effects of a pipe break are considered only in the compartment in which the break occurs, as well as areas open to the break area.

4.3.3 Outside the Drywell, Post-LOCA Radiation Exposures

Integrated doses have been calculated for areas outside the drywell. Doses were established for 1 day, 30 days, and 1 year exposure. Integrated doses of less than 5 x 10^4 rads during a component's service life are evaluated as nonharsh environmental conditions. Integrated doses of 5 x 10^4 rads and higher are evaluated as harsh environmental conditions. Appendix C provides integrated doses as a function of exposure time for areas containing components identified in Appendixes B.1 and B.2. The radiation study methodology is described in Section 4.3.5.

4.3.4 Nonharsh Areas

Plant areas which are not covered in the above referenced Appendix C tables are considered nonharsh environmental areas with respect to HELB and post-LOCA radiation. These areas are either maintained in a suitable environmental condition by safety-related heating, ventilating, and air conditioning (HVAC) equipment, or are considered nonharsh because they are controlled to less than 104F prior to the postulated accidents and are relatively large open areas with no large motors or other equivalent heat sources.

Where environmental conditions are maintained by safety-related HVAC equipment, the HVAC system is provided with redundant components and/or a backup power supply for reliable operation. Safety-related HVAC systems are provided for the following areas:

a. Control room, cable spreading room, battery rooms, computer room, and electrical equipment room

b. Standby diesel generator room

c. HPCI room

d. Residual heat removal corner rooms

e. Core spray/RCIC corner rooms

4.3.5 Radiation Study Methodology

A radiation study was performed to establish integrated doses to equipment following a postulated LOCA. The core fission product inventory was based on General Electric document "Radiation Source Information for NUREG 0578 Implementation, Computer Run identified as SNUMB 7007S" dated November 1979.

The fission products were diluted into the appropriate fluid media as follows:

Fluid	Noble Gases(%)	Halogens(%)	Other (%)
Suppression pool liquid	50	-	1
Reactor coolant liquid	100	50	1
Containment atmosphere	100	25	-
Reactor steam	100	25	-

Dilution of the fission products was considered using the fluid volume as the dilution media.

For components located inside the drywell, only gamma doses were considered if the component was enclosed in a nonorganic material (e.g., valve motor actuators in metal enclosures). The gamma dose was established based on immersion of the component in the gaseous drywell atmosphere for the time which the component must remain functional. For components enclosed in organic material (e.g., cable) beta radiation doses were calculated. Where components enclosed in organic materials are installed in metal enclosures (e.g., cable in conduit or flex-conduit), beta radiation will be neglected. Inspections have been performed in the Quad Cities Unit 2 drywell, confirming that all equipment and cable is enclosed in nonorganic materials. Beta doses have therefore not been considered.

For components located outside the drywell, source terms were established for piping systems containing reactor steam, reactor coolant liquid, suppression pool liquid, and containment atmosphere. Since the piping wall thickness is sufficient to shield against beta radiation, only gamma radiation need be considered. Each Class 1E component was located with respect to the piping systems containing post-LOCA radioactive fluids. The integrated dose was established based on the piping source term, distance from pipe to component, and component operating time. Where a component could receive doses from more than one piping system, the doses were added to derive a total dose. Appendix C, Table C-3, provides integrated doses as a function of time calculated 1 foot from the greatest single source in each major plant area.

4.3.6 Aging

In this study, the need to consider aging is based on the evaluation of component design and application. The effects of aging have also been considered based on Enclosure 4 to NRC Bulletin 79-01B, "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors" and NUREG-0588, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment."

a. Components Located Inside the Drywell

The environmental conditions inside the drywell are defined as harsh (Section 4.3.1 and 4.3.4) and hence the effects of thermal and radiation aging are evaluated for all Class 1E electrical components.

B. Components Located Outside the Drywell

1. Radiation aging

The components which are located outside the drywell and steam tunnel are exposed to insignificant amounts of radiation during normal operating conditions. The effects of radiation aging are therefore not considered in the qualification evaluation of these components.

Under postulated accident conditions some components may be exposed to greater than 5×10^4 rads (integrated radiation dose). The effects of this short-term radiation exposure are considered in qualification evaluation.

Components located inside the steam tunnel are evaluated for radiation aging.

2. Thermal aging

Most areas outside the drywell are maintained in a suitable environmental condition by safety-related HVAC equipment. The normal maximum temperature is 104F, which in this study is defined as a nonharsh environment (Section 4.3.4). Thermal aging for these components is not required since the normal and post-accident environments are nonharsh. In addition, temperature extremes (up to 120F) may occur in some plant areas. However, these conditions would result only during periods of extreme outdoor temperatures.

Equipment designed and installed per industry standards would be capable of satisfactory operation without exhibiting age-related degradation due to these temperature extremes. Therefore, the effects of thermal aging are not considered for components located in areas where the maximum ambient temperature is maintained at 120F or below.

4.4 EVALUATION OF ENVIRONMENTAL QUALIFICATION DATA (BULLETIN ACTION ITEMS 2 AND 4)

Appendixes B.1 and B.2 identify all specific components necessary following the postulated accidents. In addition, this bulletin covers general use electrical items such as motor lubricating oil, sealants, tape, terminal blocks, gaskets, etc. These general use items are discussed in Section 4.5.

For each specific component identified in Appendixes B.1 and B.2, a component evaluation worksheet was prepared. These worksheets identified the most harsh environment each component would be subjected to following the postulated accidents. Environments were considered nonharsh when the temperature was controlled to 104F or less and the maximum integrated radiation dose was less than 5×10^4 rads. Areas where infrequent temperature extremes up to 120F could occur, and additionally, where temperature variations are not a result of the postulated accidents are considered as mild environments. Equipment in these areas functions normally in the same environment as postulated for post-accident conditions. For nonharsh and mild environments, qualification data is not required.

Since industry standards did not exist for environmental qualification of Class 1E electrical equipment during the time the Quad Cities station was designed and constructed, qualification testing was not required for these components when originally purchased. However, many of these same components were used in later designs and qualification testing data is available. Also some testing has been performed by the Nuclear Steam System Supplier in response

to NRC IE Bulletin 79-01. These qualification reports have been evaluated to determine their applicability to the components identified in Appendixes B.1 and B.2. Where applicable qualification data exists, this data has been entered on the component evaluation worksheets to document the suitability of the component.

Some components will be qualified by analysis or a combination of analysis and testing. In these cases, the analysis and testing performed will be documented.

Finally, for those components which are exposed to harsh environments and for which data is not available and qualification by analysis is not appropriate, the qualification status will be resolved by testing, replacement, or relocation of the component to a nonharsh environment.

The component evaluation worksheets are provided in Appendix D.1 for Unit 1 and common components. The component evaluation worksheets are provided in Appendix D.2 for Unit 2 components.

The qualification plan, which will be followed to resolve outstanding items, is discussed in Section 4.5.

4.5 CLASS 1E EQUIPMENT QUALIFICATION PLAN

4.5.1 Specific Components

Where it has been demonstrated that a component will not function under the postulated environment, an LER will be prepared. Where existing data is not available to demonstrate qualification of a component, one or more of the following methods will be utilized to resolve the status of the component:

a. The component will be tested under worst case environmental conditions

b. An identical component from the spare parts inventory or one of the installed components will be tested.

c. The component will be relocated in a nonharsh environment.

d. The component will be replaced.

4.5.2 General Use Components

A walkdown inspection of accessible electrical boxes and cable connections was performed in the Quad Cities Unit 2 drywell. The inspection was performed following the spring 1980 refueling outage prior to returning the station to power.

The purpose of the inspection was to identify miscellaneous general use electrical items (i.e., gaskets, seals, grommets, terminal blocks, splices, and termination tapes) used inside the drywell. In addition, the condition of cables at the electrical boxes and component terminations was inspected. Boxes which did not have preassigned numbers were numbered by the inspection team. These field-assigned numbers were prefixed with 79-01B. During the inspection, any gaskets found damaged were reported to station electrical personnel for replacement. Splices and termination tapes were not found in the electrical boxes inspected. The results of the electrical box inspection are provided in Table 4-1.

Where qualificaton data is not available for existing installed materials, procedures will be written to replace these items with qualified materials. The station inventory of lubricating oils, greases, and other general use items will include qualified materials and steps implemented so that only these materials are utilized on Class 1E components.

4.6 SUBMITTAL OF LICENSEE EVENT REPORTS (BULLETIN ACTION ITEM 6)

In the event any Class 1E electrical equipment item is determined to be not capable of meeting its required function under the established service conditions, Bechtel will advise Commonwealth Edison Company so that an LER can be submitted. LERs, when submitted, will identify the conditions under which the component must function and the basis for the determination that it is incapable of functioning. Where justification for continued station operation exists, this will be included in the LER. LERs will be submitted within the time frame specified by NRC IE Bulletin 79-01B.

LERs will not be submitted for items previously documented as not being capable of meeting their required function in the response submitted for NRC IE Bulletin 79-01 (Reference 5.0.e).

5.0 REFERENCES

a. USNRC IE Bulletin 79-01B, dated January 14, 1980

b. Quad Cities Nuclear Power Station Final Safety Analysis Report, Docket Numbers 50-254 and 50-265

c. Analysis of Effects of Pipe Break Outside Primary Containment, Quad Cities Station, Units 1 and 2, Special Report No. 12, Revision 1, February 1975

d. Quad Cities Station Emergency Procedures, QGA-1, Loss of Coolant (Fast Leak; Large or Small Line Break Inside Containment), Revision 8, December 4, 1979; QGA-2, Loss of Coolant (Slow Leak), Revision 3, December 4, 1979; QGA-3, Major Steam Line Break (Outside Drywell), Revision 3, December 4, 1979

e. Report on Results on Qualification Data Search for Quad Cities Units 1 and 2, NEDO-24217, General Electric Company, November 1979

TABLE 2-1

COMPONENT QUALIFICATION STATUS

System	Number of Components	Components With Outstanding Items (%)	Outstanding Qualification Data Items (%)
Reactor Protection			
Unit 1	8	0	0
Unit 2	8	0	0
Core Spray			
Unit 1	22	64	9
Unit 2	22	64	9
High-Pressure Coolant Injection			
Unit 1	61	3	2
Unit 2	57	4	3
Auto Depressurization/ Main Steam			
Unit 1	47	17	12
Unit 2	47	17	12
Residual Heat Removal/ Containment Spray			
Unit 1	73	45	8
Unit 2	73	45	8
Pressure Suppression			
Unit 1	47	26	4
Unit 2	47	26	4
Standby Gas Treatment			
Unit 1	26	69	10
Unit 2	NA	NA	NA
Service Water			
Unit 1	9	44	6
Unit 2	7	57	8
Diesel Oil Piping			
Unit 1	7	0	0
Unit 2	3	0	0
Containment Isolation			
Unit	21	5	3
Unit 2	21	5	3

TABLE 2-1 (Continued)

System	Number of Components	Components With Outstanding Items (%)	Outstanding Qualification Data Items (%)
Control Rod Drive Hydraulic			
Unit 1	1,073	0	0
Unit 2	1,073	0	0
Reactor Recirculation			
Unit 1	44	23	13
Unit 2	44	23	13
Process Radiation Monitoring			
Unit 1	2	0	0
Unit 2	2	0	0
Reactor Building Ventilation			
Unit 1	4	0	0
Unit 2	4	0	0
Control Room HVAC			
Unit 1	8	0	0
Unit 2	NA	NA	NA
Standby AC Power			
Unit 1	30	23	3
Unit 2	26	27	4
Standby DC Power			
Unit 1	20	5	1
Unit 2	19	5	1
Reactor Core Isolation Cooling			
Unit 1	30	3	3
Unit 2	30	3	3
General Use Electrical			
Unit 1	38	97	94
Unit 2	NA	NA	NA
Unit 1 Totals	1,570	9	4
Unit 2 Totals	1,483	6	2

TABLE 3-1

LIST OF LETTERS TO MANUFACTURERS
REQUESTING QUALIFICATION DATA

Manufacturer	Letter Chron Number	Date Sent
Automatic Switch	772	May 6, 1980
Barksdale	804	May 9, 1980
Barton	820	May 9, 1980
Buffalo Forge	883	May 3, 1980
Chromalox (Dave Ray & Associates)	876	May 22, 1980
Cutler Hammer	836	May 15, 1980
Dresser Industries	784	May 8, 1980
Edwin L. Wiegland (Dave Ray & Associates)	87[illegible]	May 22, 1980
Fenwal	785	May 8, 1980
Electromotive Division G.M.	834	May 13, 1980
General Electric (cable)	911	May 29, 1980
General Electric (motors)	912	May 29, 1980
GE (neutron monitoring preamplifiers)	913	May 29, 1980
Foxboro	904	May 22, 1980
Gould	835	May 13, 1980
Harlo	877	May 22, 1980
Leeds & Northrup	893	May 22, 1980
Limitorque	914	May 29, 1980
Magnetrol	813	May 13, 1980
Mercoid	815	May 13, 1980
Namco Snap-Lock	845	May 15, 1980
Raychem Corporation	915	May 29, 1980
Simplex Wire & Cable Company	892	May 22, 1980
Static-O-Ring	846	May 15, 1980
United Electric Control	848	May 16, 1980
Versa	847	May 15, 1980
Yarway	833	May 13, 1980
Temptron	842	May 13, 1980
Static-O-Ring (2)	916	May 29, 1980
Essex	917	May 29, 1980
H.K. Portor Company (Limitorque Peerless)	918	May 29, 1980

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TABLE 4-1

TABULATION OF FIELD INSPECTION
DATA FOR ELECTRICAL BOXES INSIDE THE DRYWELL
QUAD CITIES UNIT 2

Component	Box Number	Type	Location Elev	Location Azim	Terminal Block Type	Remarks
AO-2-203-1A	79-01B-2	TB	595	0	Could not be identified, similar to Allen Bradley	
AO-2-203-1A	79-01B-7	TB	595	0	Could not be identified, similar to Allen Bradley	
AO-2-203-1B	79-01B-1	TB	595	0	Could not be identified, similar to Allen Bradley	
AO-2-203-1B	79-01B-8	TB	595	0	Could not be identified, similar to Allen Bradley	
AO-2-203-1C	79-01B-4	TB	595	0	Could not be identified, similar to Allen Bradley	
AO-2-203-1C	79-01B-5	TB	595	0	Could not be identified, similar to Allen Bradley	
AO-2-203-1D	79-01B-3	TB	595	0	Could not be identified, similar to Allen Bradley	
AO-2-203-1D	79-01B-6	TB	595	0	Could not be identified, similar to Allen Bradley	
AO-2-220-1	None	NA	NA	NA	NA	No box in drywell equipment located between MSIVs
MO-2-1001-50	NA	NA	NA	NA	NA	Could not be located
MO-2-1001-63	79-01B-15	PB	647	15	NA	

TABLE 4-1 (Continued)

Component	Box Number	Type	Location Elev	Location Azim	Terminal Block Type	Remarks
MO-2-1201-2	79-01B-16	PB	613	175	NA	Three feet below grating, could not be opened
MO-2-1301-16	79-01B-22	Conduit pull box	600	0	NA	Not opened
MO-2-1301-16	79-01B-23	Conduit pull box	600	0	NA	Not opened
MO-2-2301-4	79-01B-24	PB	600	110	NA	High location, difficult to reach
MO-2-202-5A	79-01B-10	PB	595	260	NA	
MO-2-202-5B	79-01B-21	PB	595	50	NA	
MO-2-202-6A	79-01B-12	PB	615	175	NA	
MO-2-202-6B	79-01B-11	PB	615	225	NA	Two cables had plugs with four female pins, cables not continued.
MO-2-202-9A	NA	NA	NA	NA	NA	Valve could not be located.
MO-2-202-9B	NA	NA	NA	NA	NA	Valve could not be located.
MO-2-220-4A	NA	NA	590	180	NA	Not accessible
MO-2-220-4B	79-01B-9	PB	600	30	NA	One flex loose; electrical foreman notified

TABLE 4-1 (Continued)

Component	Box Number	Type	Location Elev	Location Azim	Terminal Block Type	Remarks
POS-2-220-51	NA	NA	NA	NA	NA	Valve could not be located.
POS-2-220-52	NA	NA	NA	NA	NA	Valve could not be located.
AO-2-220-44	79-01B-17	PB	618	100	NA	
AO-2-203-3A	NA	NA	NA	NA	NA	Equipment could not be located.
AO-2-203-3B	79-01B-14	PB	619	300	NA	
AO-2-203-3C	79-01B-13	PB	619	260	NA	PB could not be opened, air duct obstruction.
AO-2-203-3D	79-01B-19	PB	618	NA	NA	Box was not opened.
AO-2-203-3E	79-01B-18	PB	618	5	NA	
AO-2-1001-33A	79-01B-26	PB	605	30	NA	
AO-2-1001-33B	79-01B-25	PB	595	220	NA	Screws and connectors were found in box. Electrician cleaned the box.

APPENDIX A.1

QUAD CITIES UNIT 1 AND COMMON SYSTEMS LIST

Facility: Quad Cities
Unit: 1
Docket: 50-254

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QUAD CITIES 1

Systems or Portions of Systems Required
Following a LOCA or Other HELB

1. Reactor Protection System
2. Core Spray System
3. High-Pressure Coolant Injection System
4. Auto Depressurization System/Main Steam System
5. Residual Heat Removal/Containment Spray System
6. Pressure Suppression System
7. Standby Gas Treatment System
8. Deleted (Included with 1)
9. Service Water System
10. Diesel Oil Piping System
11. Containment Isolation System*
12. Control Rod Drive Hydraulic System
13. Reactor (Nuclear Boiler) Recirculation System
14. Process Radiation Monitoring System
15.A Reactor Building Ventilation
15.B Control Room HVAC
16. Standby Alternating Current Power
17. Standby Direct Current Power
18. Reactor Core Isolation Cooling System (RCIC)
19. General Use Electrical Equipment

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

APPENDIX A.2

QUAD CITIES UNIT 2 SYSTEMS LIST

Facility: Quad Cities
Unit: 2
Docket: 50-265

Revision 4
November 1, 1980

QUAD CITIES 2

Systems or Portions of Systems Required
Following a LOCA, or Other HELB

1. Reactor Protection System
2. Core Spray System
3. High-Pressure Coolant Injection System
4. Auto Depressurization System/Main Steam System
5. Residual Heat Removal/Containment Spray System
6. Pressure Suppression System
7. Standby Gas Treatment System (this system is common to both units and is included with Unit 1)
8. Deleted (Included with 1)
9. Service Water System
10. Diesel Oil Piping System
11. Containment Isolation System*
12. Control Rod Drive Hydraulic System
13. Reactor (Nuclear Boiler) Recirculation System
14. Process Radiation Monitoring System
15. A Reactor Building Ventilation
15. B Control Room HVAC (this system is common to both units and is included with Unit 1)
16. Standby Alternating Current Power
17. Standby Direct Current Power
18. Reactor Core Isolation Cooling System (RCIC)
19. General Use Electrical Equipment (this system is common to both units and is included with Unit 1)

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

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TABLE A-1

SYSTEMS (AND ASSOCIATED COMPONENTS REFERENCED IN APPENDIX B) REQUIRED FOLLOWING EACH POSTULATED ACCIDENT(1)

System	LOCA Large Break	LOCA Small Break	MSLB Inside Drywell	MSLB Outside Drywell	Feedwater Line Break	HPCI Line Break	RWCU Line Break	RCIC Line Break
Reactor Protection	X	X	X	X	X		X	
Core Spray	X	X	X	X	X			
HPCI		X		X	X	(2)		
ADS/MS		X		X	X			
RHR/Containment Spray	X	X	X	X	X			
Pressure Suppression	X	X	X					
SGTS	X	X	X	X	X			
Service Water	X	X	X	X	X			
Diesel Oil Piping	X	X	X	X	X			
Containment Isolation	X	X	X	X	X		(3)	
Control Rod Drive	X	X	X	X	X			
Process Radiation Monitoring	X	X	X	X	X	X	X	X
RB HVAC	X	X	X	X	X	X	X	X
Control Room HVAC	X	X	X	X	X	X	X	X
Standby AC Power	X	X	X	X	X			
Standby DC Power	X	X	X	X	X			
RCIC								(2)
General Use Electrical	X	X	X	X	X	X	X	X

(1) This table is provided to identify those systems which must be qualified for each postulated accident environment.

(2) Items required are the break detection devices and isolation valves.

(3) Items required are the RWCU isolation valves.

APPENDIX B.1

QUAD CITIES UNIT 1 AND COMMON SPECIFIC AND GENERAL USE COMPONENTS LIST SORTED BY SYSTEM

Facility: Quad Cities
Unit: 1
Docket: 50-254

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November 1, 1980

MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Reactor Protection System(1)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM		Location	
Plant Identification Number	Generic Name (**)	Inside Primary Containment	Outside Primary Containment
*LS-1-302-82A,B,C,D	Level Switch (M-41)		X
~~PS-1-503-A,B,C,D~~	~~Pressure Switch, Low (M-14)~~		~~X~~(2)
*AO-1-203-1A,B,C,D	Globe Valve, Air Operated (M-13)	X	
*AO-1-203-2A,B,C,D	Globe Valve, Air Operated (M-13)		X
*PS-1-1001-88A,B,C,D	Pressure Switch, High (M-34)		X
*PS-1-263-55A,B,C,D	Pressure Switch (M-35)		X
*LIS-1-263-57A,B	Level Indication Switch (M-35)		X
*LIS-1-263-58A,B	Level Indication Switch (M-35)		X
~~RAM-1-0762-A,B,C,D E,F,G,H~~	~~IRM, Preamplifier~~		~~X~~(3)
~~RAM-1-0752A,B,C,D~~	~~SRM, Preamplifier~~		~~X~~(3)
***TE-1-1291-60A,B, C,D,E,F,G,H	Temperature Element		X

* These components are listed for information only. Their qualification evaluation is covered with their respective systems.

** Shows P&ID number of respective system.

*** Area Temperature Detectors for Reactor Cleanup System

SYSTEM: Reactor Protection System[1] (Continued)

(1) This listing includes additional miscellaneous components required to detect or mitigate the specified accidents. Some of these components are not part of the reactor protection system.

(2) These components have been deleted because, although they initiate a scram, the scram is an anticipatory scram for conditions not related to the postulated accidents.

(3) These components have been deleted because their function is to monitor transients not associated with the postulated accidents.

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MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Core Spray

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
MO-1-1402-25A,B	Gate Valve, Motor Operated		X
MO-1-1402-24A,B	Gate Valve, Motor Operated		X
MO-1-1402-4A,B	Globe Valve, Motor Operated		X
PT-1-1461-A,B	Flow Transmitter		X
PT-1-1460-A,B	Pressure Transmitter		X
1-1401A,B	Core Spray Pump		X
MO-1-1402-3A,B	Gate Valve, Motor Operated		X
FS-1-1464-A,B	Flow Switch		X
MO-1-1402-38A,B	Gate Valve, Motor Operated		X
PS-1-1462-A,B,C,D	Pressure Switch		X

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MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: High-Pressure Coolant Injection

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
MO-1-2301-4	Gate Valve, Motor Operated	X	
DPIS-1-2352	Differential Pressure Indicating Switch		X
DPIS-1-2353	Differential Pressure Indicating Switch		X
PS-1-2389A,B,C,D	Pressure Switch (Low)		X
MO-1-2301-5	Gate Valve, Motor Operated		X
MO-1-2301-3	Gate Valve, Motor Operated		X
SV-12	Turbine Stop Valve		X
MO-1-2301-14	Globe Valve, Motor Operated		X
PT-1-2359	Pressure Transmitter		X
FT-1-2358	Flow Transmitter		X
MO-1-2301-9	Gate Valve, Motor Operated (dc)		X
MO-1-2301-6	Gate Valve, Motor Operated (dc)		X
MO-1-2301-10	Globe Valve, Motor Operated		X
MO-1-2301-48	Gate Valve, Motor Operated		X
MO-1-2301-49	Gate Valve, Motor Operated		X
None	Turbine Gland Seal Condensate Hotwell Drain Pump		X
None	Gland Steam Exhauster Fan		X

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location: Inside Primary Containment	Location: Outside Primary Containment
PT-1-2382	Pressure Transmitter		X
MO-1-2301-35	Gate Valve, Motor Operated and Position Switch		X
MO-1-2301-8	Gate Valve, Motor Operated		X
MO-1-2301-15	Gate Valve, Motor Operated		X
TS-1-2370A,B,C,D	Temperature Switch		X
TS-1-2371A,B,C,D	Temperature Switch		X
TS-1-2372A,B,C,D	Temperature Switch		X
TS-1-2373A,B,C,D	Temperature Switch		X
MO-1-2301-36	Gate Valve, Motor Operated and Position Switch		X
SO-1-2301-30	Air Operated Valve (Solenoid)		X
~~POS-1-2301-30~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
SO-1-2301-29	Air Operated Valve (Solenoid)		X
~~POS-1-2301-29~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
SO-1-2301-65	Air Operated Valve (Solenoid)		X
~~POS-1-2301-65~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
SO-1-2301-64	Air Operated Valve (Solenoid)		X
~~POS-1-2301-64~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
LS-1/2-2350-A,B,C,D	Level Switch		X
LS-1-2351-A,B	Level Switch		X

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location (elevation)	
		Inside Primary Containment	Outside Primary Containment
PS-1-2354	Flow Switch		X
PS-1-2360	Pressure Switch		X
PS-1-2368A,B	Pressure Switch		X
None	Motor Speed Changer		X
None	Motor Gear Unit		X
None	Emergency Oil Pump		X
None	Auxiliary Oil Pump		X
1-2386	HPCI Motor Control Signal Convertor		X
LS-LCS-1	Level Switch		X

(1) This component has been deleted because it is used for position indication only and failure of the switch will not affect the associated valve control circuit.

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MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Auto Depressurization/Main Steam

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM			
		Location	
Plant Identification Number	Generic Name	Inside Primary Containment	Outside Primary Containment
1-203-3A	Target Rock Valve and Associated Solenoid	X	
1-203-3B,C,D,E	Electromatic Relief Valve and Associated Solenoid Valve	X	
AO-1-203-1A,B,C,D	Main Steam Isolation Valve with Associated Solenoid Valves	X	
~~POS-1-203-1A,B,C,D~~	~~Main Steam Isolation Valve, Position Switch~~	~~X~~	(1)
MO-1-220-1	Globe Valve, Motor Operated	X	
TS-1-261-15A,B,C,D 16A,B,C,D 17A,B,C,D 18A,B,C,D	Temperature Switch		X
MO-1-220-2	Globe Valve, Motor Operated		X
AO-1-203-2A,B,C,D	Main Steam Isolation Valve with Associated Solenoid Valve		X
~~POS-1-203-2A,B,C,D~~	~~Main Steam Isolation Valve, Position Switch~~		~~X~~ (1)
DPIS-1-261-2A,B,C,D,E,F,G,H,J,K,L,M,N,P,R,S	Differential Pressure Indication Switch		X
~~PS-1-261-30-A,B,C,D~~	~~Pressure Switch~~		~~X~~ (1)

(1) These components have been deleted because, although they initiate a scram, the scram is an anticipatory scram for conditions not related to the postulated accidents.

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Unit: 1
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MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Residual Heat Removal/Containment Spray

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
PT-1-1043A,B	Pressure Transmitter		X
MO-1-1001-7 A,B,C,D	Gate Valve, Motor Operated		X
PS-1-1053 A,B,C,D,E, F,H,J	Pressure Switch		X
MO-1-1001-18A,B	Gate Valve, Motor Operated		X
MO-1-1001-36A,B	Globe Valve, Motor Operated		X
MO-1-1001-37A,B	Globe Valve, Motor Operated		X
MO-1-1001-28A,B	Globe Valve, Motor Operated		X
MO-1-1001-34A,B	Gate Valve, Motor Operated		X
MO-1-1001-29A,B	Gate Valve, Motor Operated		X
MO-1-1001-26A,B	Gate Valve, Motor Operated		X
MO-1-1001-23A,B	Gate Valve, Motor Operated		X
FT-1-1051A,B	Flow Transmitter		X
MO-1-1001-63	Gate Valve, Motor Operated	X	
MO-1-1001-60	Gate Valve, Motor Operated		X
FT-1-1049A,B	Flow Transmitter		X
DPIS-1-1001-81A,B	Differential Pressure Indicating Switch		X

SYSTEM: Residual Heat Removal/Containment Spray (Continued)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
MO-1-1001-50	Gate Valve, Motor Operated	X	
MO-1-1001-47	Gate Valve, Motor Operated		X
MO-1-1001-19A,B	Gate Valve, Motor Operated		X
MO-1-1001-16A,B	Globe Valve, Motor Operated		X
MO-1-1001-5A,B	Globe Valve, Motor Operated		X
FT-1-1042A,B	Flow Transmitter		X
PT-1-1044A,B	Pressure Transmitter		X
LS-1-4941-2A,B,C	Level Switch (High)		X
1-1001-65A,B,C,D	RHR Service Water Pumps and Motors		X
MO-1-1001-20,21	Gate Valve, Motor Operated		X
1-1002A,B,C,D	RHR Pump		X
MO-1-1001-4A,B	Motor Operated Valve		X
MO-1-1001-185A,B	Motor Operated Valve		X
DPS-1-1001-78A,B	Differential Pressure Switch		X
1-5745A,B,C,D	RHR Service Water Pump Cubical Coolers		X

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MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Pressure Suppression Piping

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM		Location	
Plant Identification Number	Generic Name	Inside Primary Containment	Outside Primary Containment
SO-1-1601-69	Solenoid Valve		X
~~POS-1-1601-61~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
SO-1-1601-68	Solenoid Valve		X
~~POS-1-1601-60~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
SO-1-8801A,B,C,D,	Air Operated Valve (Solenoid)		X
~~POS-1-8801A,B,C,D~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
SO-1-8802A,B,C,D	Air Operated Valve (Solenoid)		X
~~POS-1-8802A,B,C,D~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
PS-1-1001-83A,B,C,D	Pressure Switch		X
PS-1-1001-88A,B,C,D	Pressure Switch		X
PS-1-1001-89A,B,C,D	Pressure Switch		X
PS-1-1001-90A,B,C,D	Pressure Switch		X
SO-1-1601-52A,B	Solenoid Valve		X
~~POS-1-1601-23,24~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
SO-1-1601-70	Solenoid Valve		X
~~POS-1-1601-62~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
SO-1-1601-71	Solenoid Valve		X

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location: Inside Primary Containment	Location: Outside Primary Containment
~~POS-1-1601-63~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
~~PT-1-1625~~	~~Pressure Transmitter~~		~~X~~(2)
SO-1-1601-51A,B	Solenoid Valve		X
~~POS-1-1601-21,22~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
SO-1-8803	Air Operated Valve (Solenoid)		X
SO-1-8804	Air Operated Valve (Solenoid)		X
SO-1-1601-65	Solenoid Valve		X
~~POS-1-1601-56~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
SO-1-1601-67	Solenoid Valve		X
~~POS-1-1601-59~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
SO-1-1601-66	Solenoid Valve		X
~~POS-1-1601-58~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
MO-1-1601-57	Globe Valve, Motor Operated		X
SO-1-1601-50A,B	Solenoid Valve		X
~~POS-1-1601-20A,B~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
PS-1-1622A,B	Pressure Switch		X
~~LT-1-1626~~	~~Level Transmitter~~		~~X~~(3)
AO-1-1601-55	Gate Valve, Air Operated (Solenoid)		X

SYSTEM: Pressure Suppression Piping (Continued)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location: Inside Primary Containment	Location: Outside Primary Containment
~~PCS-1-1601-55~~	~~Gate Valve, Air Operated (Position Switch)~~		~~X~~(1)
TE-1-1630A,B	Temperature Element		X
TE-1-1631A,B	Temperature Element		X

(1) This component has been deleted because it is used for position indication only and failure of the switch will not affect the associated valve control circuit.

(2) This component has been deleted because its function is required uring normal operation only.

(3) This component has been deleted because it provides indication only.

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CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Standby Gas Treatment

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
MO-1-7503	Butterfly Valve, Motor Operated		X
MO-2-7503	Butterfly Valve, Motor Operated		X
MO-1/2-7504A,B	Butterfly Valve, Motor Operated		X
MO-1/2-7505A,B	Butterfly Valve, Motor Operated		X
TSH-1/2-7541-11A,B	Temperature Switch		X
1/2-A-7503	Electric Air Heater		X
1/2-B-7503	Electric Air Heater		X
1/2-A-7506	Fan		X
1/2-B-7506	Fan		X
AO-1/2-7510A,B	Butterfly Valve, Air Operated (Solenoid)		X
MO-1/2-7507A,B	Butterfly Valve, Motor Operated		X
FT-1/2-7541-6A,B	Flow Transmitter		X
FSL-1/2-7541-8A,B	Flow Switch (Low)		X
FSL-1/2-7541-33A,B	Flow Switch (Low)		X
FT-1/2-7541-1A,B	Flow Transmitter		X
2212-29A,B	Local Control Panel		X

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CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Service Water

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
1-5746B	South RHR Hx Room Emergency Cooler		X
1-5746A	North RHR Hx Room Emergency Cooler		X
1-5748B	South Core Spray Equipment Room Emergency Cooler		X
1-5748A	North Core Spray Equipment Room Emergency Cooler		X
1-5747	HPCI Room Emergency Cooler		X
1&1/2-3903	Diesel Generator Cooling Water Pumps		X
1&1/2-5749	Diesel Generator Cooling Pump Cubicle Coolers		X

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MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Diesel Oil Piping

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM			
		Location	
Plant Identification Number	Generic Name	Inside Primary Containment	Outside Primary Containment
1 & 1/2-5203	Diesel Oil Transfer Pump		X
LS H/L-1/2-5241-5	Level Switch		X
SO-1 & 1/2-5201	Solenoid Valve		X
LS H/L-1 & 1/2-5241-3	Level Switch		X

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MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Containment Isolation

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name (**)	Location: Inside Primary Containment	Location: Outside Primary Containment
*AO-1-203-1A,B,C,D	Globe Valve, Air Operated (M-13)	X	
*AO-1-203-2A,B,C,D	Globe Valve, Air Operated (M-13)		X
*MO-1-220-1	Gate Valve, Motor Operated (M-13)	X	
*MO-1-220-2	Gate Valve, Motor Operated (M-13)		X
*AO-1-220-44	Globe Valve, Air Operated (M-35)	X	
*AO-1-220-45	Globe Valve, Air Operated (M-35)		X
*SO-1-305-120	Solenoid Valve		X
*SO-1-305-121	Solenoid Valve		X
*SO-1-305-122	Solenoid Valve		X
*SO-1-305-123	Solenoid Valve		X
*MO-1-1001-47	Gate Valve, Motor Operated (M-37)		X
*MO-1-1001-50	Gate Valve, Motor Operated (M-37)	X	
*MO-1-1001-37A,B	Globe Valve, Motor Operated		X
*MO-1-1001-26A,B,	Gate Valve, Motor Operated (M-37)		X

SYSTEM: Containment Isolation (Continued)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name (**)	Location	
		Inside Primary Containment	Outside Primary Containment
*MO-1-1001-23A,B	Gate Valve, Motor Operated		X
*MO-1-1001-63	Gate Valve, Motor Operated (M-37)	X	
*MO-1-1001-60	Gate Valve, Motor Operated		X
*MO-1-1001-36A,B	Globe Valve, Motor Operated (M-37)		X
*MO-1-1001-34A,B	Gate Valve, Motor Operated (M-37)		X
*MO-1-1001-29A,B	Gate Valve, Motor Operated (M-37)		X
*MO-1-1001-28A,B	Globe Valve, Motor Operated (M-37)		X
*MO-1-1001-7A,B,C,D	Gate Valve, Motor Operated (M-37)		X
*MO-1-1001-20	Gate Valve, Motor Operated (M-37)		X
*MO-1-1001-21	Gate Valve, Motor Operated (M-37)		X
MO-1-1201-2	Gate Valve, Motor Operated	X	
MO-1-1201-5	Gate Valve, Motor Operated		X
*MO-1-1301-16	Gate Valve, Motor Operated (M-50)	X	
*MO-1-1301-17	Gate Valve, Motor Operated (M-50)		X
*AO-1-1301-12,13	Globe Valve, Air Operated		X
*AO-1-1301-34,35	Globe Valve, Air Operated (M-50)		X

SYSTEM: Containment Isolation (Continued)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name (**)	Location: Inside Primary Containment	Location: Outside Primary Containment
*MO-1-1301-25	Gate Valve, Motor Operated (M-50)		X
*MO-1-1402-24A,B	Gate Valve, Motor Operated (M-36)		X
*MO-1-1402-25A,B	Gate Valve, Motor Operated (M-36)		X
*MO-1-1402-4A,B	Globe Valve, Motor Operated (M-36)		X
*MO-1-1402-3A,B	Gate Valve, Motor Operated (M-36)		X
AO-1-2001-3,4	Air Operated Valve (Solenoid)		X
~~POS-1-2001-3,4~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
AO-1-2001-15,16	Air Operated Valve (Solenoid)		X
~~POS-1-2001-15,16~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
*MO-1-2301-4	Gate Valve, Motor Operated (M-46)	X	
*MO-1-2301-5	Gate Valve, Motor Operated (M-46)		X
*AO-1-2301-29,30 64,65	Globe Valve, Air Operated (M-46)		X
*MO-1-2301-36	Gate Valve, Motor Operated (M-46)		X
1-700-736B,C,D,E,F	Squib Shear Valve		X
1-700-733B,C,D,E,F	Solenoid Ball Valve		X
MO-1-3702	Gate Valve, Motor Operated (M-33)		X
MO-1-3703	Gate Valve, Motor Operated (M-33)		X

SYSTEM: Containment Isolation (Continued)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM			
		Location	
Plant Identification Number	Generic Name (**)	Inside Primary Containment	Outside Primary Containment
MO-1-3706	Gate Valve, Motor Operated (M-33)		X
*AO-1-1601-21,22	Butterfly Valve, Air Operated		X
*AO-1-1601-23	Butterfly Valve, Air Operated		X
*AO-1-1601-61	Gate Valve, Air Operated		X
*AO-1-1601-56,60,24	Butterfly Valve, Air Operated		X
SO-1-4720	Air Operated Valve (Solenoid)		X
~~POS-1-4720~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
SO-1-4721	Air Operated Valve (Solenoid)		X
~~POS-1-4721~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)

* These components are listed here for information only. Their qualification evaluation is covered with their respective systems.

** Shows P&ID number of respective system

(1) This component has been deleted because it is used for position indication only and failure of the switch will not affect the associated valve control circuit.

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CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Control Rod Drive

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM		Location	
Plant Identification Number	Generic Name	Inside Primary Containment	Outside Primary Containment
*SO-1-305-117	Solenoid Valve		X
*SO-1-305-118	Solenoid Valve		X
SO-1-302-20A,B	Solenoid Valve		X
SO-1-302-19A,B	Solenoid Valve		X
LS-1-302-82A,B,C,D,	Level Switch		X
POS-1-302-21A,B	Air Operated Valve (Position Switch)		X
POS-1-302-22	Air Operated Valve (Position Switch)		X
*SO-1-305-120	Solenoid Valve		X
*SO-1-305-121	Solenoid Valve		X
*SO-1-305-122	Solenoid Valve		X
*SO-1-305-123	Solenoid Valve		X

* Typical of 177 valves

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MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Reactor (Nuclear Boiler) Recirculation

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location: Inside Primary Containment	Location: Outside Primary Containment	
LITS-1-263-73A,B	Level Indicating Transmitter Switch		X	
PS-1-263-111A,B,C,D	Pressure Switch		X	
~~PT-1-647A,B~~	~~Pressure Transmitter~~		~~X~~	(1)
~~LT-1-646-A,B~~	~~Level Transmitter~~		~~X~~	(1)
~~PT-1-662~~	~~Pressure Transmitter~~		~~X~~	(1)
PS-1-263-52A,B	Pressure Switch		X	
PS-1-263-55A,B,C,D	Pressure Switch		X	
~~LT-1-263-61~~	~~Level Transmitter~~		~~X~~	(2)
~~POS-1-220-51~~	~~Globe Valve, Air Operated (Position Switch)~~	~~X~~		(3)
~~AO-1-220-51~~	~~Globe Valve, Air Operated (Solenoid Valve)~~	~~X~~		(3)
~~POS-1-220-52~~	~~Globe Valve, Air Operated (Position Switch)~~	~~X~~		(3)
~~AO-1-220-52~~	~~Globe Valve, Air Operated (Solenoid Valve)~~	~~X~~		(3)

SYSTEM: Reactor (Nuclear Boiler) Recirculation (Continued)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM				
		Location		
Plant Identification Number	Generic Name	Inside Primary Containment	Outside Primary Containment	
LITS-1-263-59A,B	Level Indicator Transmitter Switch		X	
LIS-1-263-57A,B	Level Indicator Switch		X	
LIS-1-263-72A,B,C,D	Level Indicator Switch		X	
LIS-1-263-58A,B	Level Indicator Switch		X	
~~POS-1-220-44~~	~~Globe Valve, Air Operated (Position Switch)~~	~~X~~		(4)
AO-1-220-44	Globe Valve, Air Operated (Solenoid Valve)	X		
~~POS-1-220-45~~	~~Globe Valve, Air Operated (Position Switch)~~		~~X~~	(4)
AO-1-220-45	Globe Valve, Air Operated (Solenoid Valve)		X	
MO-1-202-5A,B	Motor Operated Valve	X		
PS-1-261-23A,B	Pressure Switch		X	
DPIS-1-261-34A,B,C,D	Differential Pressure Switch		X	
DPIS-1-261-35A,B,C,D E,F,G,H	Differential Pressure Switch		X	
~~MO-1-202-4A,B~~	~~Motor Operated Valve~~	~~X~~		(5)
MO-1-202-6A,B	Motor Operated Valve	X		
MO-1-202-9A,B	Motor Operated Valve	X		

SYSTEM: Reactor (Nuclear Boiler) Recirculation (Continued)

(1) This component has been deleted because it is required for control of the feedwater regulation valve during normal operation only.

(2) This component has been deleted because it provides indication only.

(3) This piping system does not penetrate the drywell, therefore this component is not required for containment isolation.

(4) This component has been deleted because it is used for position indication only and failure of the switch will not affect the associated valve control circuit.

(5) These valves have been deleted because they are wired out to remain inoperable, and their function is not required following an accident.

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CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Process Radiation Monitoring

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
RE-1-1735A,B	Rx Building Ventilation Exhaust Radiation Element		::

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CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Reactor Building Ventilation

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
AO-1-5742A,B	Butterfly Valve, Air Operated (Solenoid)		X
AO-1-5741A,B	Butterfly Valve, Air Operated (Solenoid)		X

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CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Control Room HVAC

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
1/2-5795-10	Supply Air Fan		X
1/2-5795-30	Return Air Fan		X
1/2-9472-23	Damper		X
1/2-9472-24	Damper		X
1/2-5772-57	Damper		X
1/2-C-5732	Water Chillers		X
None	Chilled Water Pumps		X
SO-1/2-9441-003	Solenoid Valve		X

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CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Standby Alternating Current Power

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
1-6601	Standby Diesel Generator		X
1/2-6601	Standby Diesel Generator		X
SWGR 13-1	4.16 kV Switchgear		X
SWGR 14-1	4.16 kV Switchgear		X
SWGR 18	480 V Switchgear		X
SWGR 19	480 V Switchgear		X
MCC 18-1A,B	480 V Rx Building MCC		X
MCC 18-2	480 V Turbine Building MCC		X
MCC 18-3	480 V Turbine Building MCC		X
MCC 18/19-5	480 V Rx Building MCC		X
MCC 19-1	480 V Rx Building MCC		X
MCC 19-2	480 V Turbine Building MCC		X
MCC 19-3	480 V Rx Building MCC		X
MCC 19-4	480 V Rx Building MCC		X
MCC 19-6	480 V Rx Building MCC		X

SYSTEM: Standby Alternating Current Power (Continued)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM			
		Location	
Plant Identification Number	Generic Name	Inside Primary Containment	Outside Primary Containment
RPS Bus 1A	120 V ac Reactor Protection System Bus 1A		X
RPS Bus 1B	120 V ac Reactor Protection System Bus 1B		X
Essential Service Bus	120/240 V ac Essential Service Bus		X
Instrument Bus	120/240 V ac Instrument Bus		X
Essential Bus MMG Set	120/240 V ac Essential Bus Supply MMG Set		X
2251-12, 2212-46	Excitation Cabinet for D/G 1-1/2		X
None	Engine Control Panel for D/G 1		X
2212-32X	Engine Control Panel for D/G 1/2		X
2251-37,45	Diesel Auxiliary Control Panel for D/G 1-1/2		X
None	Secondary Control Panel D/G 1-1/2		X
None	Neutral Grounding Panel D/G 1-1/2		X
None	4 kV Nonsegregated Bus		X

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MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Standby Direct Current Power

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM			
		Location	
Plant Identification Number	Generic Name	Inside Primary Containment	Outside Primary Containment
250 V Batt Chgr 1	250 V Battery Charger		X
250 V Batt Chgr 1/2	250 V Battery Charger		X
MCC 1 (Turb Bldg)	250 V dc Turbine Building MCC		X
MCC 1A and 1B	250 V dc Reactor Building MCC		X
250 V Battery	250 V dc Battery		X
125 V Batt Chgr 1	125 V Battery Charger		X
125 V Batt chgr 1A	125 V Battery Charger		X
125 V Battery	125 V dc Battery		X
125 V DCDP 1A and 1B	125 V dc Turbine Building Distribution Panel		X
125 V DCDP 1	125 V dc Reactor Building Distribution Panel		X
48/24 V Batt 1A and 1B	48/24 V Battery		X
24 V Batt Chgr 1A and 1B (+)	24 V Battery Charger		X
24 V Batt Chgr 1A and 1B (-)	24 V Battery Charger		X
48/24 V DCDP 1A and 1B	48/24 V dc Distribution Panel		X

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CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Reactor Core Isolation Cooling

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location: Inside Primary Containment	Location: Outside Primary Containment
MO-1-1301-17	Gate Valve, Motor Operated		X
MO-1-1301-16	Gate Valve, Motor Operated	X	
TS-1-1360-14A,B,C,D 15A,B,C,D 16A,B,C,D 17A,B,C,D	Temperature Switch		X
DPIS-1-1360-1A,B	Differential Pressure Indicating Switch		X
PS-1-1360-9A,B,C,D	Pressure Switch Low		X
AO-1-1301-34,35	Globe Valve, Air Operated (Solenoid)		X
~~POS-1-1301-34,35~~	~~Globe Valve, Air Operated (Position Switch)~~		~~X~~(1)
AO-1-1301-12,13	Globe Valve, Air Operated (Solenoid)		X
~~POS-1-1301-12,13~~	~~Globe Valve, Air Operated (Position Switch)~~		~~X~~(1)
MO-1-1301-53	Motor Operated Valve		X
MO-1-1301-60	Motor Operated Valve		X

(1) These components have been deleted because they are used for position indication only and failure of the switches will not affect the associated valve control circuit.

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MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: General Use Electrical Equipment

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
Cable	5 kV Power		X
Cable	600 V Power and Control	X	X
Cable	Instruments	X	X
Cable	Thermocouples	X	X
Electrical Penetration	High-Voltage Power	X	X
Electrical Penetration	Low-Voltage Power and Control	X	X
Electrical Penetration	Instruments	X	X
Electrical Penetration	Thermocouples	X	X
Terminal Blocks	Terminal Blocks	X	X

APPENDIX B.2

QUAD CITIES UNIT 2 SPECIFIC AND GENERAL

USE COMPONENTS LIST SORTED BY SYSTEM

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MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Reactor Protection System(1)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name (**)	Location: Inside Primary Containment	Location: Outside Primary Containment
*LS-2-302-82A,B,C,D	Level Switch (M-83)		X
~~PS-2-503-A,B,C,D~~	~~Pressure Switch, Low (M-61)~~		~~X~~(2)
*AO-2-203-1A,B,C,D	Globe Valve, Air Operated (M-60)	X	
*AO-2-203-2A,B,C,D	Glove Valve, Air Operated (M-60)		X
*PS-2-1001-88A,B,C,D	Pressure Switch, High (M-76)		X
*PS-2-263-55A,B,C,D	Pressure Switch (M-77)		X
*LIS-2-263-57A,B	Level Indication Switch (M-77)		X
*LIS-2-263-58A,B	Level Indication Switch (M-77)		X
~~RAM-2-0762A,B,C,D E,F,G,H~~	~~IRM, Preamplifier~~		~~X~~(3)
~~RAM-2-0752A,B,C,D~~	~~SRM, Preamplifier~~		~~X~~(3)
***TE-2-1291-60A,B, C,D,E,F,G,H	Temperature Element		X

* These components are listed for information only. Their qualification evaluation is covered with their respective systems.

** Shows P&ID number of respective system.

*** Area temperature detectors for reactor cleanup system

SYSTEM: Reactor Protection System[1] (Continued)

(1) This listing includes additional miscellaneous components required to detect or mitigate the specified accidents. Some of these components are not part of the reactor protection system.

(2) These components have been deleted because, although they initiate a scram, the scram is an anticipatory scram for conditions not related to the postulated accidents.

(3) These components have been deleted because their function is to monitor transients not associated with the postulated accidents.

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CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Core Spray

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
MO-2-1402-25A,B	Gate Valve, Motor Operated		X
MO-2-1402-24A,B	Gate Valve, Motor Operated		X
MO-2-1402-4A,B	Globe Valve-Motor Operated		X
FT-2-1461A,B	Flow Transmitter		X
PT-2-1460A,B	Pressure Transmitter		X
2-1401A,B	Core Spray Pump		X
MO-2-1402-3A,B	Gate Valve, Motor Operated		X
FS-2-1464A,B	Flow Switch		X
MO-2-1402-38A,B	Gate Valve, Motor Operated		X
PS-2-1462A,B,C,D	Pressure Switch		X

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CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: High-Pressure Coolant Injection

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
MO-2-2301-4	Gate Valve, Motor Operated	X	
DPIS-2-2352	Differential Pressure Indicating Switch		X
DPIS-2-2353	Differential Pressure Indicating Switch		X
PS-2-2389A,B,C,D	Pressure Switch (Low)		X
MO-2-2301-5	Gate Valve, Motor Operated		X
MO-2-2301-3	Gate Valve, Motor Operated		X
SV-12	Turbine Stop Valve		X
MO-2-2301-14	Globe Valve, Motor Operated		X
PT-2-2359	Pressure Transmitter		X
FT-2-2358	Flow Transmitter		X
MO-2-2301-9	Gate Valve, Motor Operated (dc)		X
MO-2-2301-6	Gate Valve, Motor Operated (dc)		X
MO-2-2301-10	Globe Valve, Motor Operated		X
MO-2-2301-48	Gate Valve, Motor Operated		X
MO-2-2301-49	Gate Valve, Motor Operated		X
None	Turbine Gland Seal Condensate Hotwell Drain Pump		X
None	Gland Steam Exhauster Fan		X

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location: Inside Primary Containment	Location: Outside Primary Containment
PT-2-2382	Pressure Transmitter		X
MO-2-2301-35	Gate Valve, Motor Operated and Position Switch		X
MO-2-2301-8	Gate Valve, Motor Operated		X
MO-2-2301-15	Gate Valve, Motor Operated		X
TS-2-2370A,B,C,D	Temperature Switch		X
TS-2-2371A,B,C,D	Temperature Switch		X
TS-2-2372A,B,C,D	Temperature Switch		X
TS-2-2373A,B,C,D	Temperature Switch		X
MO-2-2301-36	Gate Valve, Motor Operated and Position Switch		X
SO-2-2301-30	Air Operated Valve, Solenoid		X
SO-2-2301-29	Air Operated Valve, Solenoid		X
SO-2-2301-65	Air Operated Valve, Solenoid		X
SO-2-2301-64	Air Operated Valve, Solenoid		X
~~POS-2-2301-30~~	~~Air Operated Valve, Position Switch~~		~~X~~(1)
~~POS-2-2301-29~~	~~Air Operated Valve, Position Switch~~		~~X~~(1)
~~POS-2-2301-64~~	~~Air Operated Valve, Position Switch~~		~~X~~(1)
~~POS-2-2301-65~~	~~Air Operated Valve, Position Switch~~		~~X~~(1)
None	Motor Speed Changer		X
None	Motor Gear Unit		X

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM			
		Location	
Plant Identification Number	Generic Name	Inside Primary Containment	Outside Primary Containment
None	Emergency Oil Pump		X
None	Auxiliary Oil Pump		X
LS-2-2351A,B	Level Switch		X
FS-2-2354	Flow Switch		X
PS-2-2360	Pressure Switch		X
PS-2-2368A,B	Pressure		X
2-2386	HPCI Motor Control Signal Convertor		X
LS-LCS-1	Level Switch		X

(1) This component has been deleted because it is used for position indication only and failure of the switch will not affect the associated valve control circuit.

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CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Auto Depressurization/Main Steam

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location: Inside Primary Containment	Location: Outside Primary Containment
2-203-3A	Target Rock Valve and Associated Solenoid	X	
2-203-3B,C,D,E	Electromatic Relief Valve and Associated Solenoid Valve	X	
AO-2-203-1A,B,C,D	Main Steam Isolation Valve with Associated Solenoid Valves	X	
MO-2-220-1	Globe Valve, Motor Operated	X	
TS-2-261-15A,B,C,D 16A,B,C,D 17A,B,C,D 18A,B,C,D	Temperature Switch		X
MO-2-220-2	Globe Valve, Motor Operated		X
AO-2-203-2A,B,C,D	Main Steam Isolation Valve with Associated Solenoid Valve		X
DPIS-2-261-2A,B,C,D,E,F,G,H,J,K,L,M,N,P,R,S	Differential Pressure Indication Switch		X
~~POS-2-203-1A,B,C,D~~	~~Main Steam Isolation Valve, Position Switch~~	~~X~~ (1)	
~~POS-2-203-2A,B,C,D~~	~~Main Steam Isolation Valve, Position Switch~~		~~X~~ (1)
~~PS-2-261-30A,B,C,D~~	~~Pressure Switch~~		~~X~~ (1)

(1) These components have been deleted because, although they initiate a scram, the scram is an anticipatory scram for conditions not related to the postulated accidents.

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CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Residual Heat Removal/Containment Spray

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
PT-2-1043A,B	Pressure Transmitter		X
MO-2-1001-7A,B,C,D	Gate Valve, Motor Operated		X
PS-2-1053A,B,C,D,E,F,H,J	Pressure Switch		X
MO-2-1001-18A,B	Gate Valve, Motor Operated		X
MO-2-1001-36A,B	Globe Valve, Motor Operated		X
MO-2-1001-37A,B	Globe Valve, Motor Operated		X
MO-2-1001-28A,B	Globe Valve, Motor Operated		X
MO-2-1001-34A,B	Gate Valve, Motor Operated		X
MO-2-1001-29A,B	Gate Valve, Motor Operated		X
MO-2-1001-26A,B	Gate Valve, Motor Operated		X
MO-2-1001-23A,B	Gate Valve, Motor Operated		X
FT-2-1051A,B	Flow Transmitter		X
MO-2-1001-63	Gate Valve, Motor Operated	X	
MO-2-1001-60	Gate Valve, Motor Operated		X
FT-2-1049A,B	Flow Transmitter		X
DPIS-2-1001-81A,B	Differential Pressure Indicating Switch		X

SYSTEM: Residual Heat Removal/Containment Spray (Continued)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
MO-2-1001-50	Gate Valve, Motor Operated	X	
MO-2-1001-47	Gate Valve, Motor Operated		X
MO-2-1001-19A,B	Gate Valve, Motor Operated		X
MO-2-1001-16A,B	Globe Valve, Motor Operated		X
MO-2-1001-5A,B	Globe Valve, Motor Operated		X
FT-2-1042A,B	Flow Transmitter		X
PT-2-1044A,B	Pressure Transmitter		X
LS-2-4941-2A,B,C	Level Switch (High)		X
2-1001-65A,B,C,D	RHR Service Water Pumps and Motors		X
MO-2-1001-20,21	Gate Valve, Motor Operated		X
2-1002A,B,C,D	RHR Pump		X
MO-2-1001-4A,B	Motor Operated Valve		X
MO-2-1001-185A,B	Motor Operated Valve		X
DPS-2-1001-78A,B	Differential Pressure Switch		X
2-5745A,B,C,D	RHR Service Water Pump Cubical Coolers		X

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CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Pressure Suppression Piping

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM			
		Location	
Plant Identification Number	Generic Name	Inside Primary Containment	Outside Primary Containment
SO-2-1601-69	Solenoid Valve		X
SO-2-1601-68	Solenoid Valve		X
SO-2-8801A,B,C,D,	Air Operated Valve, Solenoid		X
SO-2-8802A,B,C,D	Air Operated Valve, Solenoid		X
PS-2-1001-83A,B,C,D	Pressure Switch		X
PS-2-1001-88A,B,C,D	Pressure Switch		X
PS-2-1001-89A,B,C,D	Pressure Switch		X
PS-2-1001-90A,B,C,D	Pressure Switch		X
SO-2-1601-52A,B	Solenoid Valve		X
SO-2-1601-70	Solenoid Valve		X
SO-2-1601-71	Solenoid Valve		X
~~PT-2-1625~~	~~Pressure Transmitter~~		~~X~~(1)
SO-2-1601-51A,B	Solenoid Valve		X
SO-2-8803	Air Operated Valve, Solenoid		X
SO-2-8804	Air Operated Valve, Solenoid		X
SO-2-1601-65	Solenoid Valve		X
SO-2-1601-67	Solenoid Valve		X

SYSTEM: Pressure Suppression Piping (Continued)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location: Inside Primary Containment	Location: Outside Primary Containment
SO-2-1601-66	Solenoid Valve		X
MO-2-1601-57	Globe Valve, Motor Operated		X
SO-2-1601-50A,B	Solenoid Valve		X
PS-2-1622A,B	Pressure Switch		X
~~LT-2-1626~~	~~Level Transmitter~~		~~X~~(2)
AO-2-1601-55	Gate Valve, Air Operated (Solenoid)		X
~~POS-2-1601-55~~	~~Gate Valve, Air Operated (Position Switch)~~		~~X~~(3)
~~POS-2-1601-61~~	~~Air Operated Valve, (Position Switch)~~		~~X~~(3)
~~POS-2-1601-60~~	~~Air Operated Valve, (Position Switch)~~		~~X~~(3)
~~POS-2-8801A,B,C,D~~	~~Air Operated Valve, (Position Switch)~~		~~X~~(3)
~~POS-2-8802A,B,C,D~~	~~Air Operated Valve, (Position Switch)~~		~~X~~(3)
~~POS-2-1601-23,24~~	~~Air Operated Valve (Position Switch)~~		~~X~~(3)
~~POS-2-1601-62~~	~~Air Operated Valve (Position Switch)~~		~~X~~(3)
~~POS-2-1601-63~~	~~Air Operated Valve (Position Switch)~~		~~X~~(3)
~~POS-2-1601-21,22~~	~~Air Operated Valve (Position Switch)~~		~~X~~(3)
~~POS-2-1601-56~~	~~Air Operated Valve (Position Switch)~~		~~X~~(3)
~~POS-2-1601-59~~	~~Air Operated Valve (Position Switch)~~		~~X~~(3)

SYSTEM: Pressure Suppression Piping (Continued)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location: Inside Primary Containment	Location: Outside Primary Containment
~~POS-2-1601-58~~	~~Air Operated Valve (Position Switch)~~		~~X~~(3)
~~POS-2-1601-20A,B~~	~~Air Operated Valve (Position Switch)~~		~~X~~(3)
TE-2-1630A,B	Temperature Element		X
TE-2-1631A,B	Temperature Element		X

(1) This component has been deleted because its function is required during normai operation only.

(2) This component has been deleted because it provides indication only.

(3) This component has been deleted because it is used for position indication only and failure of the switch will not affect the associated valve control circuit.

Facility: Quad Cities
Unit: 2
Docket: 50-265

Revision 3
June 2, 1980

MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Service Water

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM			
		Location	
Plant Identification Number	Generic Name	Inside Primary Containment	Outside Primary Containment
2-5746B	South RHR Hx Room Emergency Cooler		X
2-5746A	North RHR Hx Room Emergency Cooler		X
2-5748B	South Core Spray Equipment Room Emergency Cooler		X
2-5748A	North Core Spray Equipment Room Emergency Cooler		X
2-5747	HPCI Room Emergency Cooler		X
2-3903	Diesel Generator Cooling Water Pumps		X
2-5749	Diesel Generator Cooling Pump Cubicle Coolers		X

Facility: Quad Cities
Unit: 2
Docket: 50-265

Revision 3
June 2, 1980

MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Diesel Oil Piping

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM		Location	
Plant Identification Number	Generic Name	Inside Primary Containment	Outside Primary Containment
2-5203	Diesel Oil Transfer Pump		X
SO-2-5201	Solenoid Valve		X
LS H/L-2-5241-3	Level Switch		X

Facility: Quad Cities
Unit: 2
Docket: 50-265

Revision 4
November 1, 1980

MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Containment Isolation

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM			
		Location	
Plant Identification Number	Generic Name (**)	Inside Primary Containment	Outside Primary Containment
*AO-2-203-1A,B,C,D	Globe Valve, Air Operated (M-60)	X	
*AO-2-203-2A,B,C,D	Globe Valve, Air Operated (M-60)		X
*MO-2-220-1	Gate Valve, Motor Operated (M-60)	X	
*MO-2-220-2	Gate Valve, Motor Operated (M-		X
*AO-2-220-44	Gl[illegible] Valve, Air Operated (M-77)	X	
*AO-2-220-45	Globe Valve, Air Operated (M-77)		X
*SO-2-305-120	Solenoid Valve		X
*SO-2-305-121	Solenoid Valve		X
*SO-2-305-122	Solenoid Valve		X
*SO-2-305-123	Solenoid Valve		X
*MO-2-1001-47	Gate Valve, Motor Operated (M-79)		X
*MO-2-1001-50	Gate Valve, Motor Operated (M-79)	X	
*MO-2-1001-37A,B	Globe Valve, Motor Operated		X
*MO-2-1001-26A,B,	Gate Valve, Motor Operated (M-79)		X

SYSTEM: Containment Isolation (Continued)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name (**)	Location	
		Inside Primary Containment	Outside Primary Containment
*MO-2-1001-23A,B	Gate Valve, Motor Operated		X
*MO-2-1001-63	Gate Valve, Motor Operated (M-79)	X	
*MO-2-1001-60	Gate Valve, Motor Operated		X
*MO-2-1001-36A,B	Globe Valve, Motor Operated (M-79)		X
*MO-2-1001-34A,B	Gate Valve, Motor Operated (M-79)		X
*MO-2-1001-29A,B	Gate Valve, Motor Operated (M-79)		X
*MO-2-1001-28A,B	Globe Valve, Motor Operated (M-79)		X
*MO-2-1001-7A,B,C,D	Gate Valve, Motor Operated (M-79)		X
*MO-2-1001-20	Gate Valve, Motor Operated (M-79)		X
*MO-2-1001-21	Gate Valve, Motor Operated (M-79)		X
MO-2-1201-2	Gate Valve, Motor Operated	X	
MO-2-1201-5	Gate Valve, Motor Operated		X
*MO-2-1301-16	Gate Valve, Motor Operated (M-89)	X	
*MO-2-1301-17	Gate Valve, Motor Operated (M-89)		X
*AO-2-1301-12,13	Globe Valve, Air Operated (M-89)		X
*AO-2-1301-34,35	Globe Valve, Air Operated (M-89)		X

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name (**)	Location	
		Inside Primary Containment	Outside Primary Containment
*MO-2-1301-25	Gate Valve, Motor Operated (M-89)		X
*MO-2-1402-24A,B	Gate Valve, Motor Operated (M-78)		X
*MO-2-1402-25A,B	Gate Valve, Motor Operated (M-78)		X
*MO-2-1402-4A,B	Globe Valve, Motor Operated (M-78)		X
*MO-2-1402-3A,B	Gate Valve, Motor Operated (M-78)		X
AO-2-2001-3,4	Gate Valve, Air Operated (Solenoid)		X
AO-2-2001-15,16	Gate Valve, Air Operated (Solenoid)		X
*MO-2-2301-4	Gate Valve, Motor Operated (M-87)	X	
*MO-2-2301-5	Gate Valve, Motor Operated (M-87)		X
*AO-2-2301-29,30 64,65	Globe Valve, Air Operated (M-87)		X
*MO-2-2301-36	Gate Valve, Motor Operated (M-87)		X
2-700-736B,C,D,E,F	Squib Shear Valve		X
2-700-733B,C,D,E,F	Solenoid Ball Valve		X
MO-2-3702	Gate Valve, Motor Operated (M-75)		X
MO-2-3703	Gate Valve, Motor Operated (M-75)		X
MO-2-3706	Gate Valve, Motor Operated (M-75)		X

SYSTEM: Containment Isolation (Continued)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM			
		Location	
Plant Identification Number	Generic Name (**)	Inside Primary Containment	Outside Primary Containment
~~POS-2-2001-3,4~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
~~POS-2-2001-15,16~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
*AO-1-1601-21,22	Butterfly Valve, Air Operated		X
*AO-1-1601-23	Butterfly Valve, Air Operated		X
*AO-1-1601-61	Gate Valve, Air Operated		X
*AO-1-1601-56,60,24	Butterfly Valve, Air Operated		X
SO-1-4720	Air Operated Valve (Solenoid)		X
SO-1-4721	Air Operated Valve (Solenoid)		X
~~POS-1-4720~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)
~~POS-1-4721~~	~~Air Operated Valve (Position Switch)~~		~~X~~(1)

* These components are listed here for information only. Their qualification evaluation is covered with their respective systems.

** Shows P&ID number of respective system

(1) This component has been deleted because it is used for position indication only and failure of the switch will not affect the associated valve control circuit.

Facility: Quad Cities
Unit: 2
Docket: 50-265

Revision 3
June 2, 1980

MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Control Rod Drive

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
*SO-2-305-117	Solenoid Valve		X
*SO-2-305-118	Solenoid Valve		X
SO-2-302-20A,B	Solenoid Valve		X
SO-2-302-19A,B	Solenoid Valve		X
LS-2-302-82A,B,C,D,	Level Switch		X
POS-2-302-21A,E	Air Operated Valve (Position Switch)		X
POS-2-302-22	Air Operated Valve (Position Switch)		X
*SO-2-305-120	Solenoid Valve		X
*SO-2-305-121	Solenoid Valve		X
*SO-2-305-122	Solenoid Valve		X
*SO-2-305-123	Solenoid Valve		X

*Typical of 177 valves

Facility: Quad Cities
Unit: 2
Docket: 50-265

Revision 4
November 1, 1980

MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Reactor (Nuclear Boiler) Recirculation

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location: Inside Primary Containment	Location: Outside Primary Containment	
LITS-2-263-73A,B	Level Indicating Transmitter Switch		X	
PS-2-263-111A,B,C,D	Pressure Switch		X	
~~PT-2-647A,B~~	~~Pressure Transmitter~~		~~X~~	(1)
~~LT-2-646-A,B~~	~~Level Transmitter~~		~~X~~	(1)
~~PT-2-662~~	~~Pressure Transmitter~~		~~X~~	(1)
PS-2-263-52A,B	Pressure Switch		X	
PS-2-263-55A,B,C,D	Pressure Switch		X	
~~LT-2-263-61~~	~~Level Transmitter~~		~~X~~	(2)
~~POS-2-220-51~~	~~Globe Valve, Air Operated (Position Switch)~~	~~X~~		(3)
~~AO-2-220-51~~	~~Globe Valve, Air Operated (Solenoid Valve)~~	~~X~~		(3)
~~POS-2-220-52~~	~~Globe Valve, Air Operated (Position Switch)~~	~~X~~		(3)
~~AO-2-220-52~~	~~Globe Valve, Air Operated (Solenoid Valve)~~	~~X~~		(3)

SYSTEM: Reactor (Nuclear Boiler) Recirculation (Continued)

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location: Inside Primary Containment	Location: Outside Primary Containment	
LITS-2-263-59A,B	Level Indicator Transmitter Switch		X	
LIS-2-263-57A,B	Level Indicator Switch		X	
LIS-2-263-72A,B,C,D	Level Indicator Switch		X	
LIS-2-263-58A,B	Level Indicator Switch		X	
~~POS-2-220-44~~	~~Globe Valve, Air Operated (Position Switch)~~	~~X~~		(4)
AO-2-220-44	Globe Valve, Air Operated (Solenoid Valve)	X		
~~POS-2-220-45~~	~~Globe Valve, Air Operated (Position Switch)~~		~~X~~	(4)
AO-2-220-45	Globe Valve, Air Operated (Solenoid Valve)		X	
~~MO-2-202-4A,B~~	~~Motor Operated Valve~~	~~X~~		(5)
MO-2-202-5A,B	Motor Operated Valve	X		
MO-2-202-6A,B	Motor Operated Valve	X		
MO-2-202-9A,B	Motor Operated Valve	X		
PS-2-261-23A,B	Pressure Switch		X	
DPIS-2-261-34A,B,C,D	Differential Pressure Indication Switch		X	
DPIS-2-261-35A,B,C,D, E,F,G,H	Differential Pressure Indication Switch		X	

SYSTEM: Reactor (Nuclear Boiler) Recirculation (Continued)

(1) This component has been deleted because it is required for control of the feedwater regulation valve during normal operation only.

(2) This component has been deleted because it provides indication only.

(3) This piping system does not penetrate the drywell, therefore these valves are not required for containment isolation.

(4) This component has been deleted because it is used for position indication only and failure of the switch will not affect the associated valve control circuit.

(5) These valves have been deleted because they are wired out to remain inoperable, and their function is not required following an accident.

Facility: Quad Cities
Unit: 2
Docket: 50-265

Revision 3
June 2, 1980

MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Process Radiation Monitoring

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
RE-2-1735A,B	Rx Building Ventilation Exhaust Radiation Element		X

Facility: Quad Cities
Unit: 2
Docket: 50-265

Revision 3
June 2, 1980

MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Reactor Building Ventilation

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
AO-2-5742A,B	Butterfly Valve, Air Operated (Solenoid)		X
AO-2-5741A,B	Butterfly Valve, Air Operated (Solenoid)		X

Facility: Quad Cities
Unit: 2
Docket: 50-265

Revision 4
November 1, 1980

MASTER LIST*

CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Standby Alternating Current Power

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM			
		Location	
Plant Identification Number	Generic Name	Inside Primary Containment	Outside Primary Containment
2-6601	Standby Diesel Generator		X
SWGR 23-1	4.16 kV Switchgear		X
SWGR 24-1	4.16 kV Switchgear		X
SWGR 28	480 V Switchgear		X
SWGR 29	480 V Switchgear		X
MCC 28-1A,B	480 V Rx Building MCC		X
MCC 28-2	480 V Turbine Building MCC		X
MCC 28-3	480 V Turbine Building MCC		X
MCC 28/29-5	480 V Rx Building MCC		X
MCC 29-1	480 V Rx Building MCC		X
MCC 29-2	480 V Turbine Building MCC		X
MCC 29-3	480 V Rx Building MCC		X
MCC 29-4	480 V Rx Building MCC		X
MCC 29-6	480 V Rx Building MCC		X

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location	
		Inside Primary Containment	Outside Primary Containment
RPS Bus 1A	120 V ac Reactor Protection System Bus 1A		X
RPS Bus 1B	120 V ac Reactor Protection System Bus 1B		X
Essential Service Bus	120/240 V ac Essential Service Bus		X
Instrument Bus	120/240 V ac Instrument Bus		X
Essential Bus MMG Set	120/240 V ac Essential Bus Supply MMG Set		X
2252-12	Excitation Cabinet for D/G 2		X
None	Engine Control Panel for D/G 2		X
2252-37	Diesel Auxiliary Control Panel for D/G 2		X
None	Secondary Control Panel for D/G 2		X
None	Neutral Grounding Panel for D/G 2		X
None	4 kV Nonsegregated Bus		X

Facility: Quad Cities
Unit: 2
Docket: 50-265

Revision 3
June 2, 1980

MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT
REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Standby Direct Current Power

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM		Location	
Plant Identification Number	Generic Name	Inside Primary Containment	Outside Primary Containment
250 V Batt Chgr 2	250 V Battery Charger		X
MCC 2 (Turb Bldg)	250 V dc Turbine Building MCC		X
MCC 2A and 2B	250 V dc Reactor Building MCC		X
250 V Battery	250 V dc Battery		X
125 V Batt Chgr 2	125 V Battery Charger		X
125 V Batt chgr 2A	125 V Battery Charger		X
125 V Battery	125 V dc Battery		X
125 V DCDP 2A and 2B	125 V dc Turbine Building Distribution Panel		X
125 V DCDP 2	125 V dc Reactor Building Distribution Panel		X
48/24 V Batt 2A and 2B	48/24 V Battery		X
24 V Batt Chgr 2A and 2B (+)	24 V Battery Charger		X
24 V Batt Chgr 2A and 2B (-)	24 V Battery Charger		X
48/24 V DCDB 2A and 2B	48/24 V dc Distribution Panel		X

Facility: Quad Cities
Unit: 2
Docket: 50-265

Revision 4
November 1, 1980

MASTER LIST

CLASS 1E ELECTRICAL EQUIPMENT REQUIRED TO FUNCTION UNDER POSTULATED ACCIDENT CONDITIONS

SYSTEM: Reactor Core Isolation Cooling

SPECIFIC COMPONENTS ASSOCIATED WITH ABOVE SYSTEM

Plant Identification Number	Generic Name	Location: Inside Primary Containment	Location: Outside Primary Containment
MO-2-1301-17	Gate Valve, Motor Operated		X
MO-2-1301-16	Gate Valve, Motor Operated	X	
TS-2-1360-14A,B,C,D 15A,B,C,D 16A,B,C,D 17A,B,C,D	Temperature Switch		X
DPIS-2-1360-1A,B	Differential Pressure Indicating Switch		X
PS-2-1360-9A,B,C,D	Pressure Switch Low		X
AO-2-1301-34,35	Globe Valve, Air Operated (Solenoid)		X
~~POS-2-1301-34,35~~	~~Globe Valve, Air Operated (Position Switch)~~		~~X~~ (1)
AO-2-1301-12,13	Globe Valve, Air Operated (Solenoid)		X
~~POS-2-1301-12,13~~	~~Globe Valve, Air Operated (Position Switch)~~		~~X~~ (1)
MO-2-1301-53	Motor Operated Valve		X
MO-2-1301-60	Motor Operated Valve		X

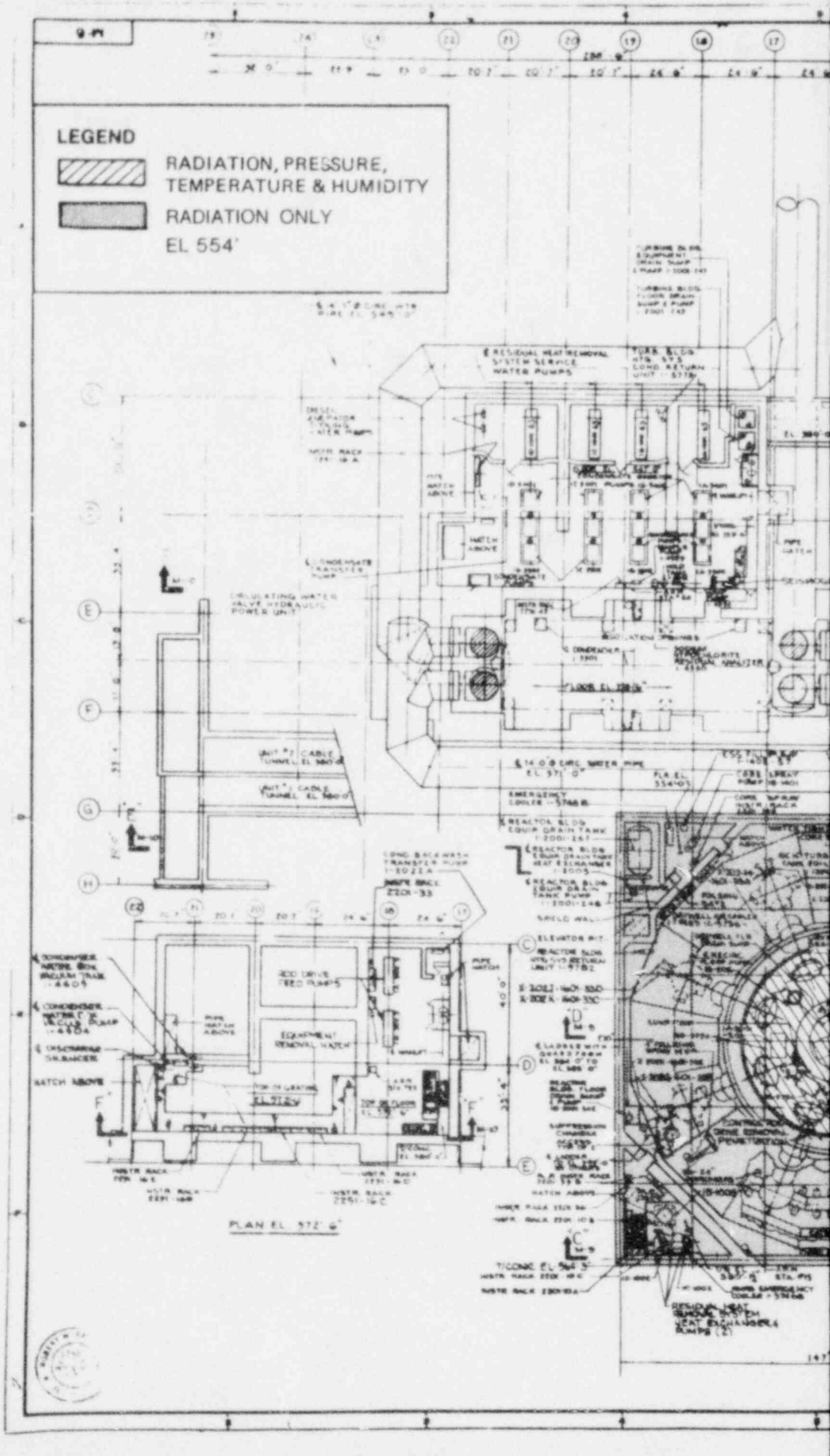
(1) These components have been deleted because they are used for position indication only and failure of the switches will not affect the associated valve control circuit.

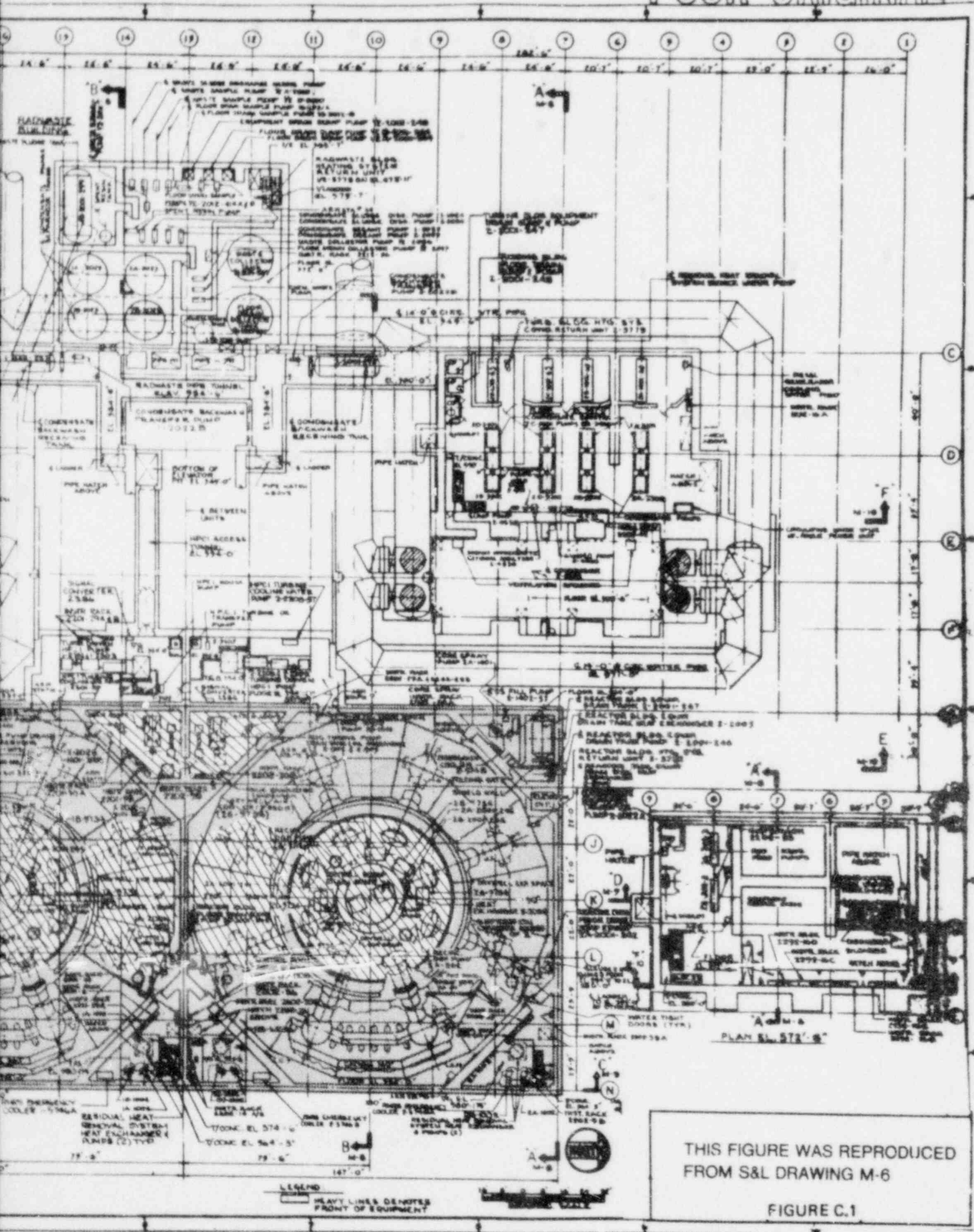
APPENDIX C

QUAD CITIES UNITS 1 AND 2 KEY PLAN IDENTIFYING HARSH ENVIRONMENTAL AREAS AND TABULATION OF SERVICE CONDITIONS

LIST OF FIGURES AND TABLES

POOR ORIGINAL

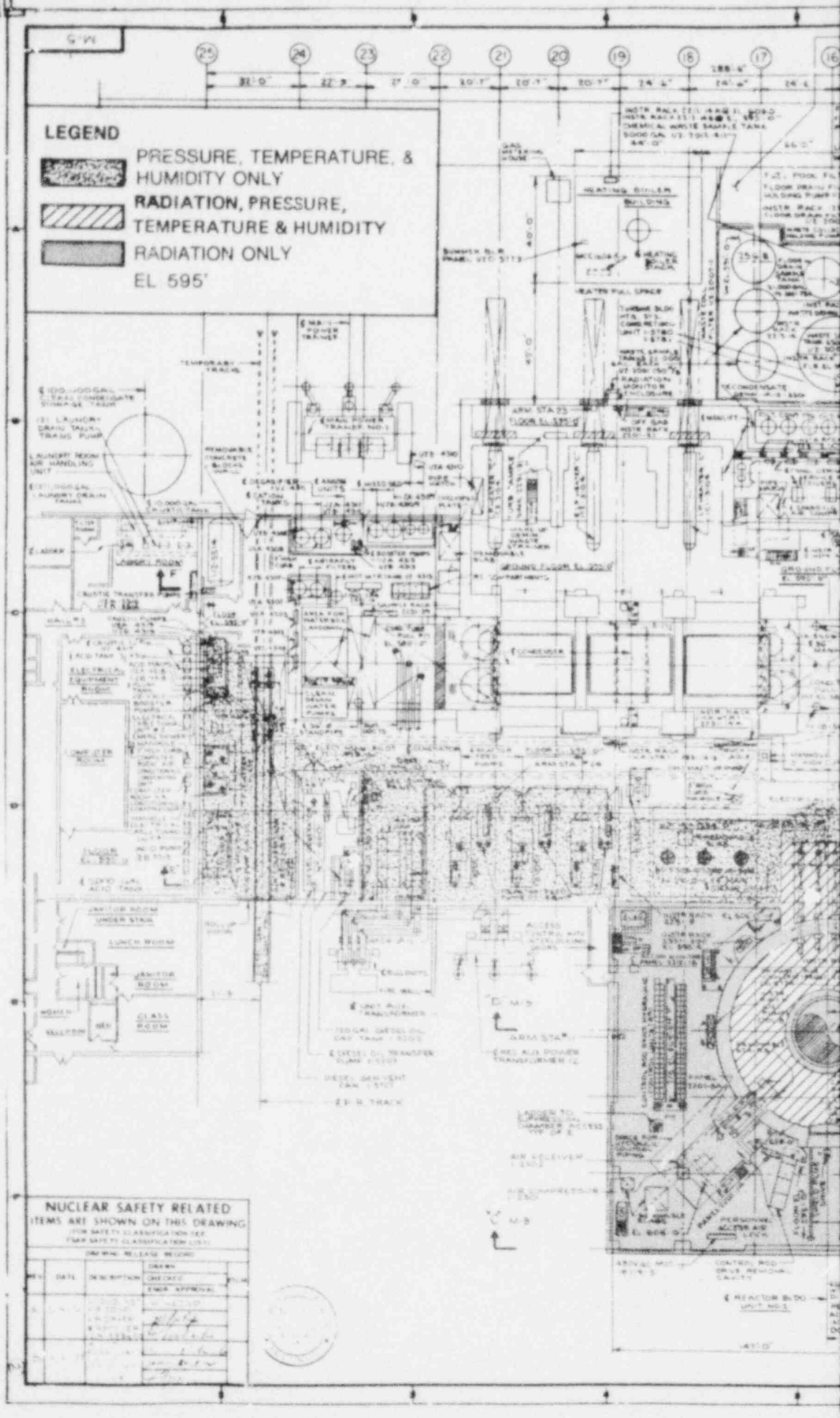




THIS FIGURE WAS REPRODUCED FROM S&L DRAWING M-6

FIGURE C.1

POOR ORIGINAL



POOR ORIGINAL

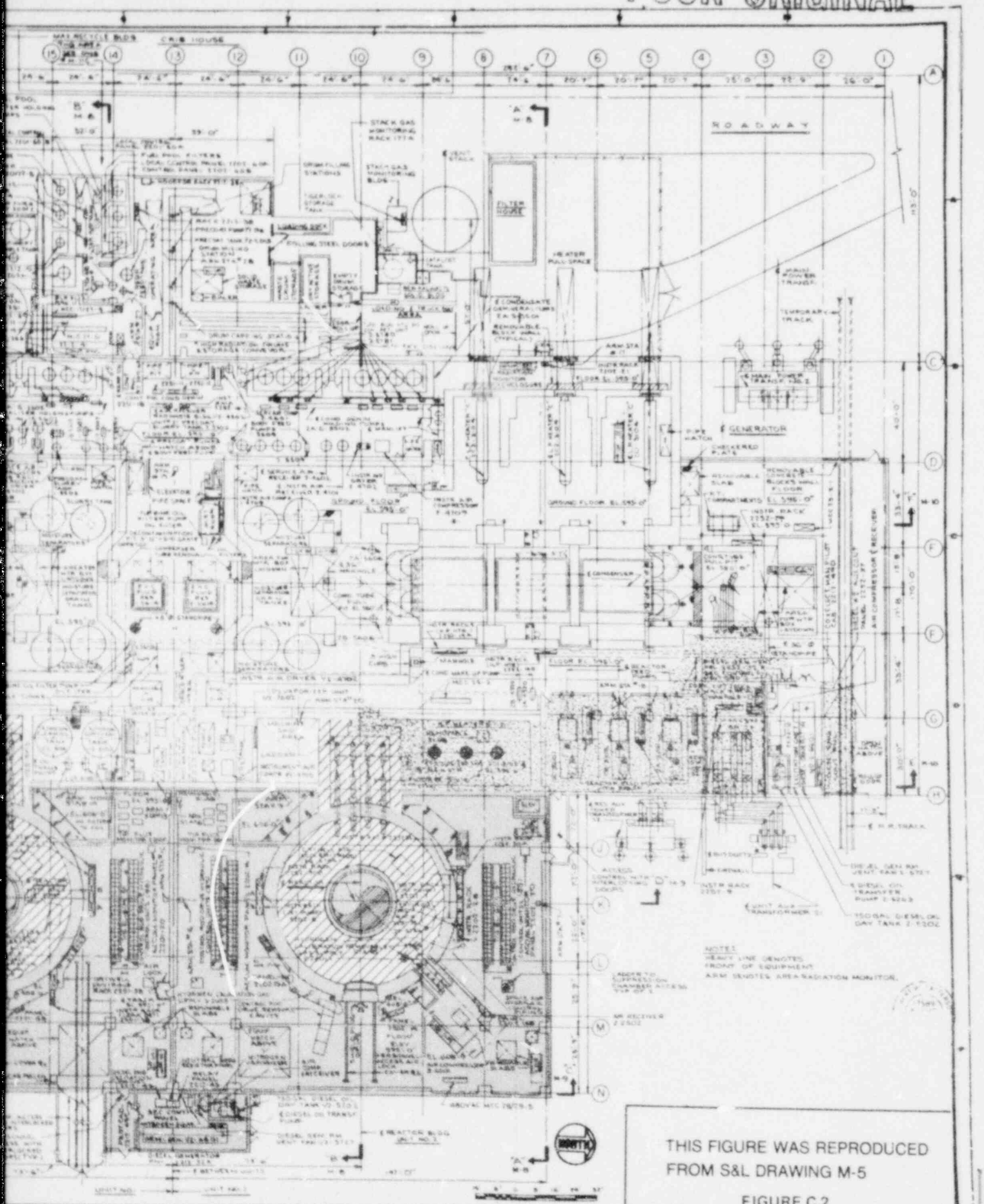


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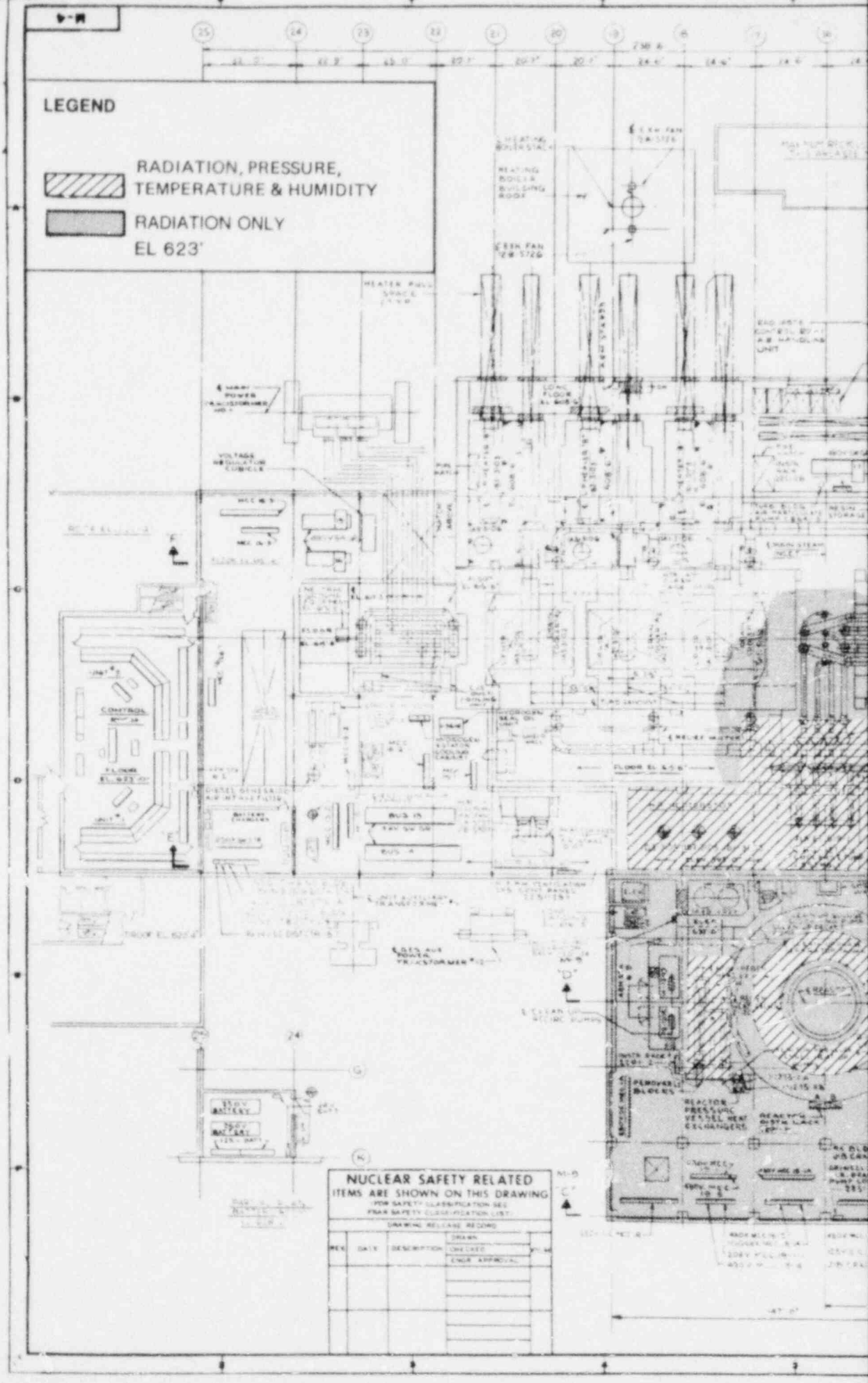
FIGURE C.2



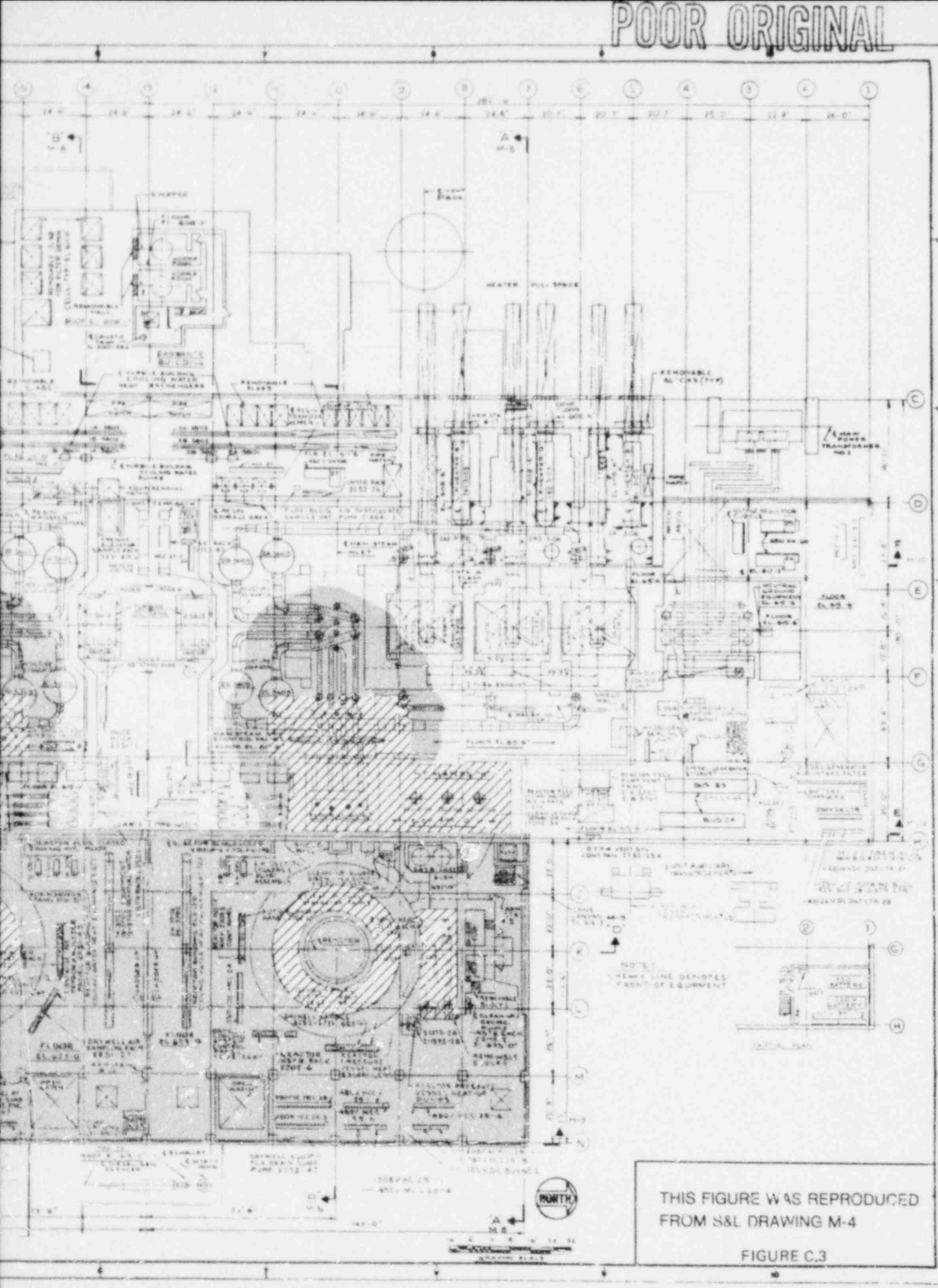


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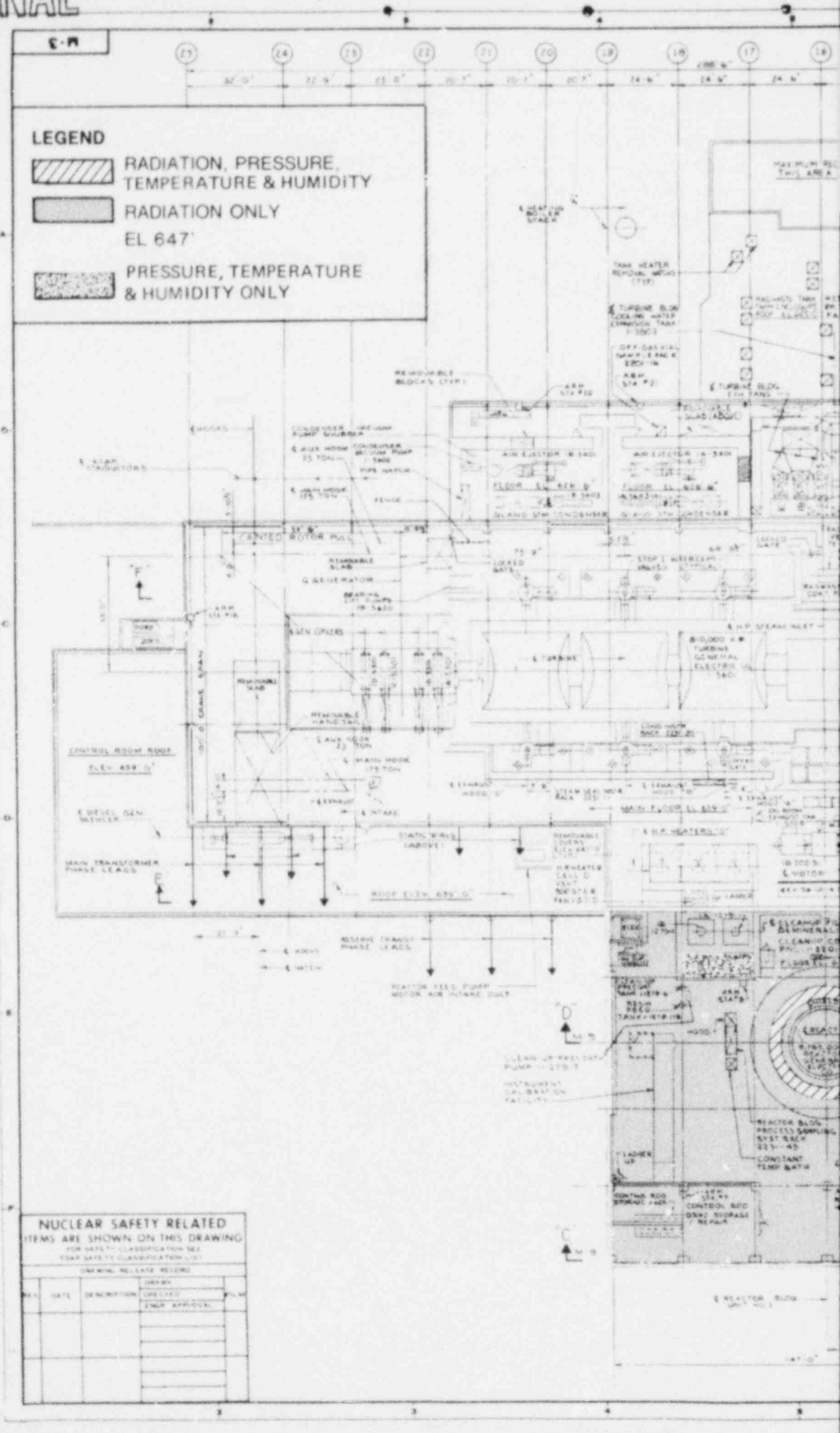
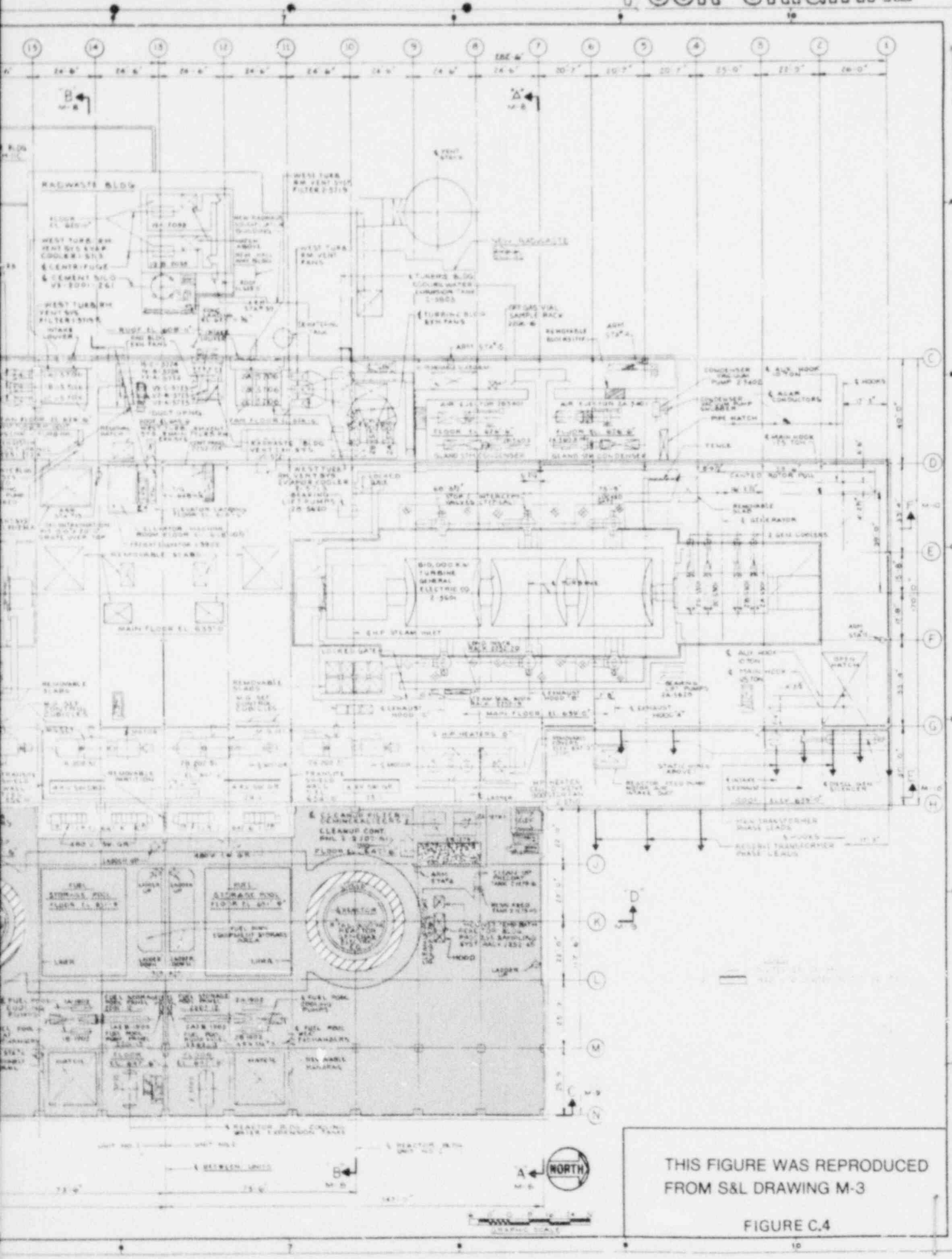
FIGURE C.3

POOR ORIGINAL

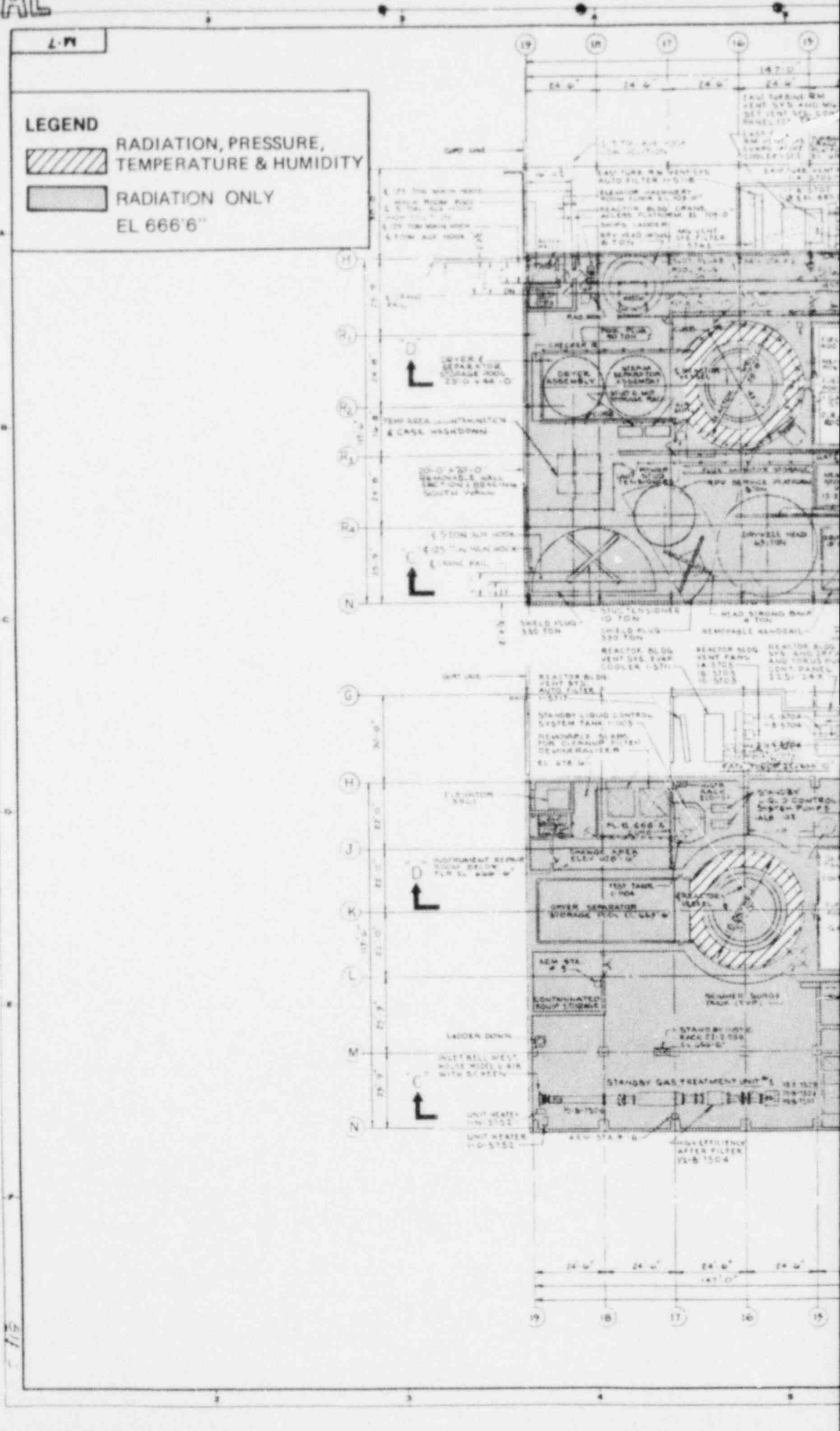


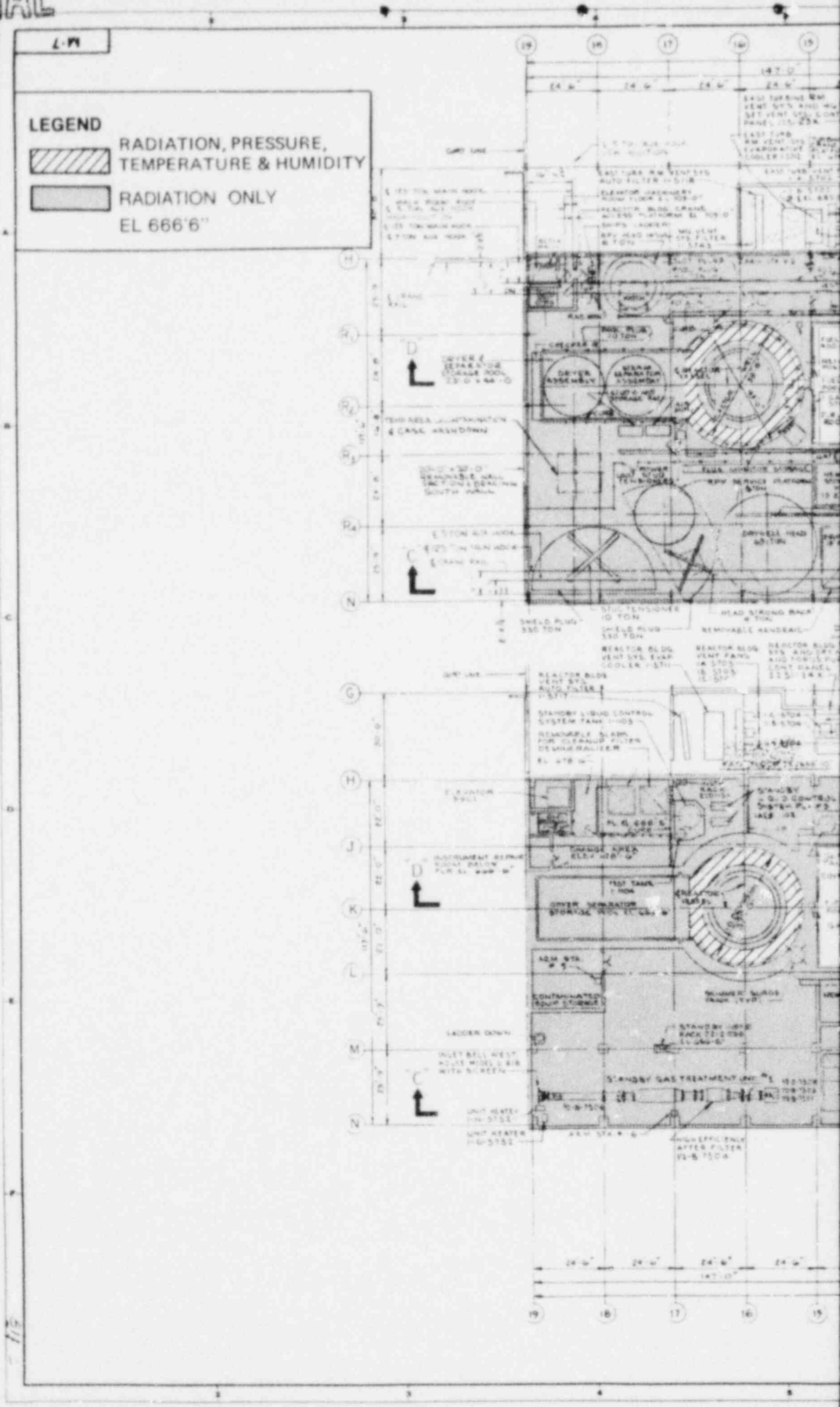


THIS FIGURE WAS REPRODUCED FROM S&L DRAWING M-3

FIGURE C.4

POOR ORIGINAL





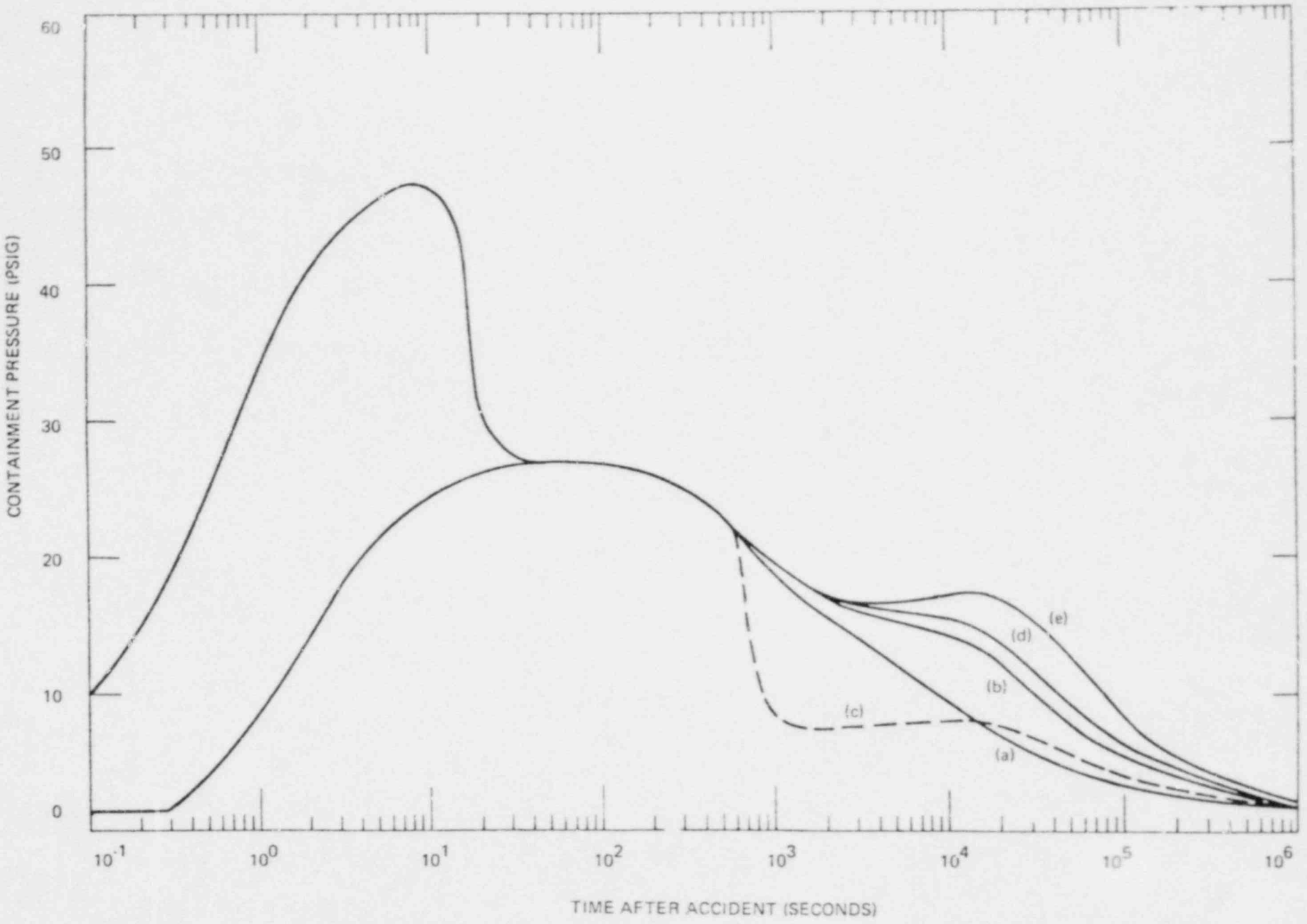


FIGURE C.6

FIGURE 2.15 CONTAINMENT PRESSURE RESPONSE FOLLOWING DESIGN BASIS LOSS OF COOLANT ACCIDENT

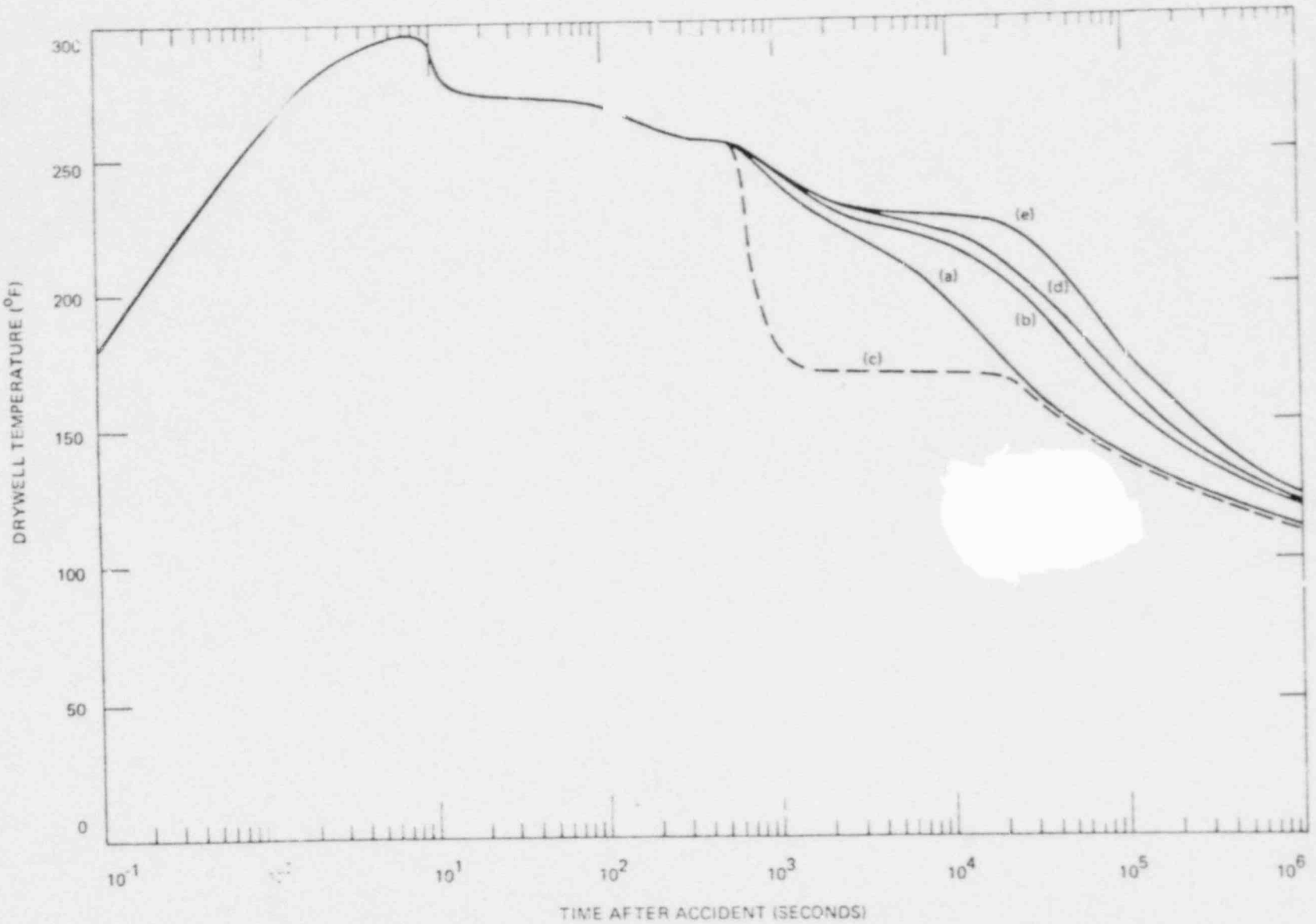


FIGURE C.7

FIGURE [illegible].16. DRYWELL TEMPERATURE RESPONSE FOLLOWING DESIGN BASIS LOSS OF COOLANT ACCIDENT

Revision 3
June 2, 1980

TABLE C-1

MAXIMUM ENVIRONMENTAL CONDITIONS INSIDE THE DRYWELL
FOLLOWING THE POSTULATED LOCA/HELB

Temperature	Pressure	Relative Humidity	Containment Spray	Gamma Radiation	Submergence Elevation
281F	63 psia	100%	Demineralized water	1 day-4.3×10^7 rads 30 day-1.0×10^8 rads 1 year-1.1×10^8 rads	583'-0"

TABLE C-2

MAXIMUM ENVIRONMENTAL CONDITIONS
OUTSIDE THE DRYWELL FOLLOWING THE
POSTULATED HELB ACCIDENTS

Area	Pipe Break	Maximum Pressure (psia)	Maximum Temperature (°F)	Relative Humidity (%)
Torus compartment (region of postulated line break)	HPCI steam RCIC Steam	27.0	242	100
Core spray/RCIC room	RCIC steam	Not evaluated - Equipment in this room not required for RCIC steam line break		
Steam tunnel	Main steam Feedwater RCIC steam	27.0	242	100
RWCU heat exchanger and holding pump room	RWCU	Not evaluated - Only two containment isolation valves required to function. Qualification will meet conservatively assumed inside drywell conditions.		
High-pressure heater bay	Main steam Feedwater	Not evaluated - No equipment which is required to function is located in this area.		
Turbine building el 615'-6" north of Column G, between Columns 9 and 11 and 15 and 16	Main steam	Not evaluated - No equipment which is required to function is located in this area.		

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November 1, 1980

TABLE C-2 (Continued)

Area	Pipe Break	Maximum Pressure (psia)	Maximum Temperature (°F)	Relative Humidity (%)
Reactor feed pump room	Feedwater	Not evaluated - No equipment which is required to function is located in this room.		
Turbine building el 595'-0" area south of Unit 1 pump room and north of Unit 2 pump room	Feedwater	Not evaluated - No equipment which is required to function is located in this area.		
Diesel generator room	Feedwater	Not evaluated - Qualification for the environment due to a postulated feedwater line break is not required since three diesels are available to provide emergency ac power.		

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June 2, 1980

TABLE C-3

RADIATION ENVIRONMENTAL CONDITIONS OUTSIDE
DRYWELL FOLLOWING THE POSTULATED LOCA
MAXIMUM RADIATION SOURCES

Area	Source*	Integrated Dose Levels (rads) 1 Day	30 Days	1 Year
Torus	SP	1.5×10^7	3.2×10^7	3.9×10^7
Residual heat removal corner rooms	SP	2.4×10^5	9.4×10^5	1.7×10^6
HPCI room	MS	6.6×10^6	1.6×10^7	1.7×10^7
Core spray/RCIC rooms	MS	6.6×10^6	1.6×10^7	1.7×10^7
Steam tunnel	MS	3.1×10^5	8.5×10^5	1.6×10^6
Reactor building el 595'-0"	RW	2.5×10^6	7.8×10^6	1.4×10^7
Reactor building el 623'-0"	CA	6.8×10^5	1.6×10^6	1.6×10^6
Reactor building el 647'-6"	CA	6.8×10^5	1.6×10^6	1.6×10^6
Reactor building el 666'-6"	CA	6.8×10^5	1.6×10^6	1.6×10^6

* SP = Supression pool liquid
RW = Reactor water
MS = Reactor steam
CA = Containment airborne