



GE Nuclear Energy

Joseph F. Quirk
ABWR Licensing Manager
Project Manager: ABWR Certification

General Electric Company
175 Curtner Avenue, M/C 782; San Jose, CA 95125-1014
408 925-6219 (phone) 408 925-4257 (facsimile)

August 30, 1996

MFN 143-96
Docket No. 52-001

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington DC 20555

Attention: Jerry N. Wilson
Nuclear Reactor Regulation (DRPM)

Subject: Submittal of GE's ABWR DCD, Revision 3, ABWR CDM, Revision 8
and ABWR SSAR Amendment 37, Revision 9

Reference:

1. Letter (MFN 094-96) from Joseph F. Quirk (GE) to Document Control Desk (NRC), "ABWR Design Control Document Changes," dated July 1, 1996.
2. Letter (MFN 079-96) from J. F. Quirk (GE) to Document Control Desk (NRC), "Changes to Design Documentation for the Advanced Boiling Water Reactor (ABWR)," dated June 10, 1996.
3. Letter (MFN 039-96) from J. F. Quirk (GE) to Document Control Desk (NRC), "Submittal of Amendment 36, Revision 8, to GE's ABWR SSAR and Certified Design Material, Revision 7," dated March 22, 1996.
4. Letter (MFN 004-95) from J. N. Fox (GE) to Document Control Desk (NRC), "Submittal of Revision 2 to the ABWR Design Control Document," dated January 17, 1995.

The purpose of the enclosed submittal of GE's ABWR DCD, Revision 3, ABWR CDM, Revision 8, and ABWR SSAR Amendment 37, Revision 9 is to incorporate the changes documented in References 1 and 2. This completes our submittals except for any adjustments that might be needed to reflect Commission decisions in the final rule.

In accordance with direction of NRR/DRPM staff, GE is providing a total of twenty-eight (28) copies of this letter and its attachments and enclosures. The Document Control Desk is requested, also per direction of NRR/DRPM staff, to distribute twenty-one (21) copies to the recipients listed in Attachment 1.

50036

9609090224 960830
PDR ADOCK 05200001
A PDR

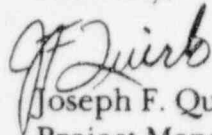
2050
1/28

Attachment 2 lists the differences between the enclosed revisions of DCD and CDM/SSAR. This list supersedes the lists previously provided in Attachment 2 of Reference 3 and Attachment 3 of Reference 4. As evidenced in Attachment 2, with the exception of several formatting differences and those areas in which the differences are intentional (e.g. Severe Accident/PRA, Tier 2* information, proprietary information, safeguards information), both SSAR Amendment 37, Revision 9, and CDM, Revision 8, are identical to the DCD Revision 3.

Page change instructions for DCD, Revision 3, are provided in Attachment 3; for CDM, Revision 8, in Attachment 4 and for SSAR, Revision 9, in Attachment 5.

The listing of effective pages of the DCD, which identifies the revision number that should show on each page upon update of the DCD by replacement of the change pages, is included in the DCD change pages for incorporating it ahead of the DCD Introduction. This listing supersedes that in Attachment 2 of Reference 4 as amended by GE letter of May 31, 1995.

Sincerely,



Joseph F. Quirk
Project Manager
ABWR Certification
MC-782, (408) 925-6219

cc: (w/o attachments and enclosures)

S. A. Hucik	(GE)
W. T. Russell	(NRC)
T. E. Quay	(NRC)
J. N. Wilson	(NRC)
D. C. Scaletti	(NRC)
S. M. Franks	(DOE)
F. A. Ross	(DOE)

Attachments and Enclosures

Attachment 1

Distribution of enclosures - ABWR DCD, Revision 3, ABWR CDM, Revision 8 and ABWR SSAR Amendment 37, Revision 9 - with the cover letter and Attachments 1 through 5

Organization

File Center
NRC PDR
ACRS (M. El-Zeftawy)
OGC

DRPM/PERB
DRPM/PSGB
DRPM/PDST
DRPM - D. C. Scaletti
DRPM - J. N. Wilson

DE/EMCB
DE/EMEB
DE/ECGB
DE/EELB

DSSA/SPLB
DSSA/SRXB
DSSA/SCSB
DSSA/SPSB

DRCH/HICB
DRCH/HHFB
DRCH/HQMB

ADPR/TSB

Attachment 2

Difference Between DCD, Revision 3 and CDM, Revision 8

DCD Section/Pg	Difference
Tier 1	
2.14.1-4	DCD Figure 2.14.1 cleaned up electronically.
2.15.10 Figures	DCD figures updated electronically
Section 3.2 Figures	DCD drawings cleaned up

- Continued

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
Tier 2	
ii	DCD utilizes Appendix 3K
iv	DCD and SSAR titles are different for Section 14.3
Chapter 1	
1.1-1	Replaced "Advanced Boiling Water Standard Safety Analysis Report" with "Tier 2" in first paragraph of DCD
1.1-1	Replaced "SSAR" with "Tier 2" in second paragraph of DCD
1.1-3	Changed "ABWR SSAR" to "Tier 2 in beginning of DCD Section 1.1.5 and removed "final design approval (FDA) and"
1.2-1	Removed white space from DCD
1.3-6	Item 3 in footnote modified to fit DCD needs
1.6-1	Introductory sentence modified to meet needs of DCD
1.6-2 thru 1.6-6	Changed "SSAR" to "Tier 2" in right-hand columns of DCD
1.7-1	Replaced "...the ABWR SSAR" with "Tier 2" in second line of DCD
1.7-2	Removed white space from DCD
1.7-3	Removed white space from DCD
1.8-12, 13	Bracketed and Italicized SRP 3.5.3, 3.8.1 and 4.2 Appendices and added "(1)" and "(2)" superscript in DCD
1.8-24	Added two footnotes to Table 1.8-19 in DCD
1.8-25,26	Removed white space from DCD
1.8-27	Italicized 1.47 and added superscript (4) in DCD
1.8-29	Italicized 1.75 and added superscript (4) in DCD
1.8-29	Italicized 1.84 and added Superscript (1) in DCD
1.8-30	Italicized 1.89 and added superscript (2) in DCD
1.8-30	Italicized 1.92 and added superscript (1) in DCD
1.8-30	Italicized 1.100 and added superscript (2) in DCD
1.8-31	Italicized 1.105 and added superscript (3) in DCD
1.8-34	Italicized 1.153 and added superscript (4) in DCD
1.8-34.1	Added notes to Table 1.8-20 in DCD
1.8-42	Referenced footnote (9) under IEEE 338 and added footnote (9) to page 1.8-47 in DCD
1.8-45	Removed white space from DCD
1.8-46	Removed white space from DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference																																																												
	Italicized IEC 801-2 and referenced note (3) in DCD																																																												
1.8-35 thru 1.8-87	<p>Italicized and bracketed the following codes and standards in DCD:</p> <table border="0"> <tr><td>ACI 349</td><td>IEEE 830</td></tr> <tr><td>AISC N690</td><td>IEEE 845</td></tr> <tr><td>ANS 7-4.3.2</td><td>IEEE 1012</td></tr> <tr><td>ANS 57.5</td><td>IEEE 1023</td></tr> <tr><td>ANS 58.2</td><td></td></tr> <tr><td>ANSI/HFS-100</td><td>IEEE 1042</td></tr> <tr><td></td><td>IEEE 1050</td></tr> <tr><td>X3.139</td><td>IEEE 1228 (Draft)</td></tr> <tr><td>X3.148</td><td>DOD 5000.2</td></tr> <tr><td>X3.166</td><td>DOD AD/A223168</td></tr> <tr><td>X3T9.5/84/49</td><td>DOE AR602-1</td></tr> <tr><td>ANSI/NQA-2a</td><td>DOE DI-HFAC-80740</td></tr> <tr><td>ASTM C776</td><td>DOE ESD-TR-86-278</td></tr> <tr><td>ASTM C934</td><td>DOE HDBK-761A</td></tr> <tr><td>IEEE C37.90.2</td><td>DOE HDBK-763</td></tr> <tr><td>IEEE C62.41</td><td>DOE-STD-2167A</td></tr> <tr><td>IEEE C62.45</td><td>DOD TOP 1-2-610</td></tr> <tr><td>IEEE C63.12</td><td>MIL-H-46855B</td></tr> <tr><td>IEEE 279</td><td>MIL-HDBK-217</td></tr> <tr><td>IEEE 323</td><td>MIL-HDBK-251</td></tr> <tr><td>IEEE 338</td><td>MIL-HDBK-759A</td></tr> <tr><td>IEEE 344</td><td>MIL-STD-461C</td></tr> <tr><td>IEEE 384</td><td>MIL-STD-462</td></tr> <tr><td>IEEE 518</td><td>MIL-STD-1472D</td></tr> <tr><td>IEEE 603</td><td>MIL-STD-1478</td></tr> <tr><td>IEEE 730</td><td>IEC 801-2</td></tr> <tr><td>IEEE 802.2</td><td>IEC 880</td></tr> <tr><td>IEEE 802.5</td><td>IEC 964</td></tr> <tr><td>IEEE 828</td><td>ISO 7498</td></tr> <tr><td>IEEE 829</td><td></td></tr> </table> <p>and added the corresponding nine notes to page 1.8-47</p>	ACI 349	IEEE 830	AISC N690	IEEE 845	ANS 7-4.3.2	IEEE 1012	ANS 57.5	IEEE 1023	ANS 58.2		ANSI/HFS-100	IEEE 1042		IEEE 1050	X3.139	IEEE 1228 (Draft)	X3.148	DOD 5000.2	X3.166	DOD AD/A223168	X3T9.5/84/49	DOE AR602-1	ANSI/NQA-2a	DOE DI-HFAC-80740	ASTM C776	DOE ESD-TR-86-278	ASTM C934	DOE HDBK-761A	IEEE C37.90.2	DOE HDBK-763	IEEE C62.41	DOE-STD-2167A	IEEE C62.45	DOD TOP 1-2-610	IEEE C63.12	MIL-H-46855B	IEEE 279	MIL-HDBK-217	IEEE 323	MIL-HDBK-251	IEEE 338	MIL-HDBK-759A	IEEE 344	MIL-STD-461C	IEEE 384	MIL-STD-462	IEEE 518	MIL-STD-1472D	IEEE 603	MIL-STD-1478	IEEE 730	IEC 801-2	IEEE 802.2	IEC 880	IEEE 802.5	IEC 964	IEEE 828	ISO 7498	IEEE 829	
ACI 349	IEEE 830																																																												
AISC N690	IEEE 845																																																												
ANS 7-4.3.2	IEEE 1012																																																												
ANS 57.5	IEEE 1023																																																												
ANS 58.2																																																													
ANSI/HFS-100	IEEE 1042																																																												
	IEEE 1050																																																												
X3.139	IEEE 1228 (Draft)																																																												
X3.148	DOD 5000.2																																																												
X3.166	DOD AD/A223168																																																												
X3T9.5/84/49	DOE AR602-1																																																												
ANSI/NQA-2a	DOE DI-HFAC-80740																																																												
ASTM C776	DOE ESD-TR-86-278																																																												
ASTM C934	DOE HDBK-761A																																																												
IEEE C37.90.2	DOE HDBK-763																																																												
IEEE C62.41	DOE-STD-2167A																																																												
IEEE C62.45	DOD TOP 1-2-610																																																												
IEEE C63.12	MIL-H-46855B																																																												
IEEE 279	MIL-HDBK-217																																																												
IEEE 323	MIL-HDBK-251																																																												
IEEE 338	MIL-HDBK-759A																																																												
IEEE 344	MIL-STD-461C																																																												
IEEE 384	MIL-STD-462																																																												
IEEE 518	MIL-STD-1472D																																																												
IEEE 603	MIL-STD-1478																																																												
IEEE 730	IEC 801-2																																																												
IEEE 802.2	IEC 880																																																												
IEEE 802.5	IEC 964																																																												
IEEE 828	ISO 7498																																																												
IEEE 829																																																													
1.9-1	Replaced "ABWR SSAR" with "Tier 2" 3 places in DCD																																																												
1.9-2	Removed white space from DCD																																																												
1.9-4	Changed Item 3.8 to "Not Used" in DCD																																																												
1.9-5	Changed Items 3.31-3.36 to "Not Used" in DCD																																																												
1.9-6	Changed Item 8.7 to "Not Used" in DCD																																																												
1.9-7	Changed "Deleted" to "Not Used" 9 places in DCD																																																												
1.9-8	Removed white space from DCD																																																												
1.9-9	Changed Item 9.29 to "Not Used" in DCD																																																												
1.9-10	Removed white space from DCD																																																												
1.9-10	Changed Item 14.3 to "Not Used" in DCD																																																												

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
1.9-10	Changed Item 15.8 to "Not Used" in DCD
1A-2, 3	Unitalicized submittal list title names and added quotes in DCD
1A-5	Unitalicized "General Design Criteria" in DCD
1A-11	Italicized "Plant specific models..." added footnote in DCD
1A-19	Unitalicized "Additional information..." and added quotes in DCD
1A-36, 37	Unitalicized references and added quotes in DCD
1AA-3	Replaced "SSAR" with "Tier 2" 2 places in DCD
1AA-6 1AA.4.3	In second paragraph, replaced "0.983", with "estimated to be v high" in DCD
1B	Changed Title to "Not Used" in DCD
1C-1	Changed italics to underline in DCD
1C-2	Changed italics to underline in DCD
1C-5/1C.2.3.1.3	Changed "SSAR" to "Tier 2" in DCD
1C-9	Unitalicized references in DCD
1C-10	Unitalicized requirements in DCD
1C-12	Unitalicized Item (b) and (c) in DCD
Chapter 3	
3.0-iii/iv	Removed listing for Att. 3AA and added title for Appendix 3K in DCD
3.1-63	Third paragraph unitalicized "Radioactive Waste Mgmt + Process Rad. Mon." in DCD
3.2-8, 9	Italicized first paragraph of Item (3), added footnote, italicized Item (4) (a)(b) and added footnote in DCD
3.2-9	Italicized last paragraph of section 3.2.5.3 and added footnote in DCD
3.2-17	Changed items 8, 9, 10 to "Not Used" in DCD
3.2-19	Changed Items 8, and 9 to "Not Used" in DCD
3.2-20	Changed Item 19 to "Not Used" in DCD
3.2-24	Changed Items 3, and 4 to "Not Used" in DCD
3.2-33	Changed items 5, and 6 to "Not Used" in DCD
3.2-36	Changed items 2, 3(k1) and N1(1) (2) to "Not Used" in DCD
3.2-52	Changed item 6 to "Not Used" in DCD
3.2-63	Italicized text six places added footnote in DCD
3.3-3	Unitalicized references in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
3.4-16	Unitalicized references in DCD
3.5-14	Unitalicized references in DCD
3.6-1	Last paragraph removed "this SSAR" replaced with "Tier 2" in DCD
3.6-2	Unitalicized title of Criterion 4 in DCD
3.6.1.1.1	
3.6-12-17	Italicized text added footnote in DCD
3.6-20	Unitalicized item 2 in DCD
3.6.2.2.1	
3.6-22-26	Italicized text added footnote in DCD
3.6-29	Changed "ABWR SSAR" to "Tier 2" in second paragraph in DCD
3.6-33, 34	Unitalicized references in DCD
3.7-8, 9	Italicized text, added footnote in DCD
3.7-21	Italicized text 3 places, added footnote in DCD
3.7-22, 23	Italicized text, added footnote in DCD
3.7-24	First paragraph changed "SSAR" to "Tier 2" in DCD
3.73.3.3.14	
3.7-25	Italicized text, added footnote in DCD
3.7-26	Italicized text, added footnote in DCD
3.7-27	Italicized text, added footnote in DCD
3.7-28	Italicized text, added footnote in DCD
3.7-29	Italicized text, added footnote in DCD
3.7-30, 31	Italicized text, added footnote in DCD
3.7-32, 33	Italicized text, added footnote in DCD
3.7-35-41	Italicized text, added footnote in DCD
3.7-40	Item (3) Changed "of this SSAR" to "of Tier 2" in DCD
3.7.3.12	
3.7-40, 41	Italicized text two places, added footnote on page 3.7-41 in DCD
3.7.3.13	
3.7-46	Item (b) changed "the SSAR" to "Tier 2" in DCD
3.7-47	Unitalicized references Changed "Deleted" to "Not Used" in DCD
3.7-73	Changed "Deleted" to "Not Used" in DCD
3.8-2	Added italicized paragraph and footnote in DCD
3.8-3	Added italicized paragraph and footnote in DCD
3.8-20	Italicized text, added footnote in DCD
3.8.2.2.3	

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
3.8-22 3.8.2.4.1.4	Italicized text, added footnote in DCD
3.8-27	Added italicized paragraph and footnote in DCD
3.8-28	Added italicized paragraph and footnote in DCD
3.8-30	Italicized text, added footnote in DCD
3.8-32 3.8.3.8	Unitalicized NCIG titles, put in quotes in DCD
3.8-35	Italicized Item (1), added footnote in DCD
3.8-36	Italicized Item (2), added footnote in DCD
	Unitalicized the rest of the Items in DCD
3.8-37	Unitalicized Items in DCD
3.8-38	Unitalicized first line in DCD
	Italicized text in two places in DCD
	Unitalicized last items in DCD
3.8-44 3.8.4.4.1	Italicized first paragraph in DCD
3.8-46	Added italicized sentence, 3 places, added footnote in DCD
3.8-47 3.8.5.2	Italicized text, added footnote in DCD
3.8-54	Italicized Items 13, 14, 15 - Changed designation of item 15, and Changed "Deleted" to "Not Used" in DCD
3.8-55	Added footnotes in DCD
3.8-60	Italicized (1) thru (6), added footnote in DCD
3.8-61, 62	Italicized text, added footnote in DCD
3.8-72	Changed "Deleted" to "Not Used" in DCD
3.8-74	Changed "Deleted" to "Not Used" in DCD
3.8-77	Changed "Deleted" to "Not Used" in DCD
3.9-1	Italicized text, added footnote in DCD
3.9-7	Added Subsection and footnote in DCD
3.9-14	Italicized text three places and added footnote in DCD
3.9-23	Unitalicized Item (1) in DCD
3.9-24	Unitalicized Items (2) and (3) in DCD
3.9-28	Italicized text, added footnote in DCD
3.9-29	Italicized text, added footnote in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
3.9-32	Italicized text, added footnote in DCD
3.9-36	Italicized text, added footnote in DCD
3.9-37	Italicized text, added footnote in DCD
3.9-41	Italicized text, added footnote in DCD
3.9-42	Italicized text, added footnote in DCD
3.9-45	Italicized sentences, added footnote in DCD
3.9-50	Italicized text, added footnote in DCD
3.9-51	Italicized text, added footnote in DCD
3.9-52	Italicized text, added footnote in DCD
3.9-53	Italicized text, added footnote in DCD
3.9-54	Italicized text, added footnote in DCD
3.9-55	Italicized sentence, added footnote in DCD
3.9-56	Italicized text, added footnote in DCD
3.9-77	Added first paragraph in DCD
3.9-77, 78	Italicized text, added footnote in DCD
3.9-84	Italicized references 3.9-6, 7, 9, 10, 11 and unitalicized the rest of references in DCD
3.9-86	Italicized Event 12 and Note 6, added footnote in DCD
3.9-87	Removed commas from Heading 2 in DCD
	Italicized Event 3, Added footnote in DCD
3.9-87	Event 4 change "Deleted" to "Not Used" in DCD
3.9-88	Italicized Notes 7 and 9 and 12, added footnote in DCD
3.9-99	Changed "SSAR" to "Tier 2" in table heading in DCD
3.9-139	Deleted "SSAR" under notes (a) and (d) in DCD
3.10-1	Added italicized paragraph and footnote in DCD
3.10-2	Italicized text, added footnote in DCD
3.10-3	Italicized text, added footnote in DCD
3.11-5	Italicized reference 2, added footnote in DCD
3.13-11	Changed "SSAR" to "Tier 2" in DCD
3.13-14	Replaced "are less that 1% of" with "is a very small percentage of" in the last paragraph in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
Att 3AA	Removed Att 3AA from DCD
3B-27 3B.4.4.1	Replaced "SSAR" with "Tier 2" in first paragraph in DCD
3B-31, 32	Unitalicized references in DCD
3B-34, 78	Replaced "provided under separate cover" with "not part of DCD (Refer to SSAR)" in appropriate places in DCD
3D-4	Changed "Deleted" to "Not Used", 2 places in DCD
3D-5	Changed "Deleted" to "Not Used" in DCD
3E-24 3E.6.1.2	Unitalicized paragraph headings in DCD
3E-25	Unitalicized references and changed reference 10 to "Not Used" in DCD
3F-1	Changed title to "Not Used" in DCD
3H.0-vii	Changed "Deleted" to "Not Used" all places in DCD
3H.0-viii	Changed "Deleted" to "Not Used" all places in DCD
3H.1-3	Italicized text, added footnote in DCD
3H.1-57/58	Removed blank pages from DCD
3H.1-62/63	Removed blank pages from DCD
3H.1-65	Removed blank pages from DCD
3H.1-68	Removed blank pages from DCD
3H.1-70	Removed blank pages from DCD
3H.1-73	Removed blank pages from DCD
3H.1-75	Removed blank pages from DCD
3H.1-77	Removed blank pages from DCD
3H.1-88	Changed "Deleted" to "Not Used" in DCD
3H.1-104	Changed "Deleted" to "Not Used" in DCD
3H.2-2	Italicized text, added footnote in DCD
3H.2-21	Changed "Deleted" to "Not Used" in DCD
3H.3-2	Italicized text, added footnote in DCD
3H.4-6-13	Figures have been recreated in DCD
3K	Added entire appendix to DCD
3L-1	First paragraph replaced "SSAR" with "Tier 2" in DCD
3L-10	Removed Figure 3L-3 from DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
3M-3	Unitalicized "3 meter board" in DCD
3M-5	Changed "SSAR Figure No." to "Tier 2 Figure No." in DCD
3M-6 3M.7(1)	Changed "in the SSAR" to "in Tier 2" in DCD
3M-7 3M.8	Replaced "SSAR" with "Tier 2", 2 places in DCD
3M-8 3M.10	Added space between "approximately" and "0.93" last line in DCD
3M-9	Unitalicized references in DCD
3MA-3	Replaced "SSAR" with "Tier 2" first line in DCD
3MA-10	Replaced "SSAR" with "Tier 2" first line in DCD
3MA-13 to end	Changed "SSAR Figure" to "Tier 2 Figure" in DCD
3MA-32	Removed white space at top of page from DCD
3MA-34	Removed white space at top of page from DCD
Chapter 4	
4.0-v	Removed Figure 4.2-3 entry from DCD
4.1-2 4.1.2.1.1	Removed period from title from DCD
4.1-8	Unitalicized references in DCD
4.2-1	Added italicized paragraph with footnote; and italicized sentences added footnote in DCD
4.2-3-5	Italicized text , added footnote in DCD
4.2-5, 6	Italicized text, added footnote in DCD
4.2-6	Italicized text, added footnote in DCD
4.2-7 4.2.3.1.2, 4.2.4	Italicized second sentence of Section 4.2.4 in DCD
4.2-8, 9/10	Italicized figure titles, added footnote in DCD
4.3-2	Italicized sentence of first paragraph added footnote in DCD
4.3-7	Unitalicized references in DCD
4.3-9	Italicized figure title, added footnote in DCD
4.3-10	Replaced "provided under separate cover" with "not part of DCD (Refer to SSAR section 4.3)" in DCD
4.4-10 4.4.3.5	Changed "Deleted" to "Not Used" in DCD
4.4-17, 18	Unitalicized references in DCD
4.5-5 4.5.2.1	Unitalicized headings in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
4A-1	Italicized text, added footnote and unitalicized references in DCD
4A-3-42	Proprietary title was changed in DCD
4B-1/2	Added paragraph, italicized sentences, added footnote in DCD
4C-1, 2	Italicized text, added footnote in DCD
4D-1	Substituted DCD proprietary statement so that it refers to the SSAR
Chapter 5	
5.0-v	Changed "Deleted" to "Not Used" in DCD
5.1-1-3	Unitalicized heading in DCD
5.2-49, 50	Unitalicized references in DCD
5.2-51-53	Italicized selected code cases in DCD
5.3-20	Unitalicized references in DCD
5.4-19	Removed white space from DCD
5.4-58	Unitalicized references in DCD
5A-1 5A.2	Removed white space from DCD
Att 5AA, 5AB	Removed Attachments from DCD
Chapter 6	
6.0-LOF	Changed "Deleted" to "Not Used" in DCD
6.1-2	Changed "Deleted" to "Not Used" in DCD
6.1.1.1.3.6	
6.2-6	Removed white space from DCD
6.2-19	Unitalicized headings in DCD
6.2-10	Unitalicized headings in DCD
6.2-27	Changed "Deleted" to "Not Used" in DCD
6.2-71	Removed period after title in DCD
6.2-81-87	Replaced numerical values with word values for consistency with Appendix 19E in DCD
6.2-102	Unitalicized references in DCD
6.2-125-167	Changed "SSAR" to "Tier 2" in DCD
6.2-211-212	Changed "Deleted" to "Not Used" in DCD
6.3-14/15	Unitalicized headings in DCD
6.3-25	Unitalicized references in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
6.3-32	Substituted DCD proprietary statement to refer to SSAR
6.3-45	Changed "Deleted" to "Not Used" in DCD
6.3-49	Changed "Deleted" to "Not Used" in DCD
6.3-50-87	Substituted DCD proprietary statement so that it refers to the SSAR
6.5-13	Changed "Deleted" to "Not Used" in DCD
6.5-13	Unitalized references in DCD
6.6-2	Changed "Deleted" to "Not Used" in DCD
6A-1	Unitalized heading in DCD
6B-2-9/10	Unitalized table headings in DCD
6C-1-5	Removed white space from DCD
6E-1	Removed white space from DCD
Chapter 7	
7.1-2	Added italicized paragraph and footnote in DCD
7.1-7-11	Italicized text added footnote in DCD
7.1-12	Changed item (k) from "Deleted" to "Not Used" in DCD
7.1-27	Changed "Deleted" to "Not Used" in DCD
7.1-31	Added italicized paragraph and footnote in DCD
7.2-5	Changed Item (8) to "Not Used" in DCD
7.2-11	Changed Item (5) to "Not Used" in DCD
7.2-32	Italicized Reg. Guide 1.105, added footnote in DCD
7.2-40	Changed Item (12)(d) to "Not Used" in DCD
7.2-56	Changed "Deleted" to "Not Used" in DCD
7.3-56	Removed blank line from top of page in DCD
7.3-70	Unitalized 3(a) in DCD
7.3-7	Unitalized items (b), (c), (d) in DCD
7.3-72	Unitalized (e), italicized (f) and added footnote in DCD
7.3-73-end	Unitalized all list items in DCD
7.3-96	Italicized reference 7.3-2 in DCD
7.4	Unitalized list items in DCD
7.4-24	Italicized Reg Guide 1.105 added footnote in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
7.5-11	Removed comma after "drywell" in first line of paragraph (j) in DCD
7.5-14	Unitalicized titles in first paragraph in table in DCD
7.5-24-27	Changed "Safety Analysis" to "Tier 2" in third column in DCD
7.5-28	Replaced "S" with "T" in the right hand column and "S=SSAR" with "T=Tier 2" in footnote in DCD
7.6-15	Changed "Deleted" to "Not Used" in DCD
7.6-23-end	Unitalicized list items in DCD
7.6-23	Italicized Item 3f and added footnote in DCD
7.6-27	Replaced "SSAR" with "Tier 2"
7.6-29	Changed "Deleted" to "Not Used" in DCD
7.6-30	Italicized item (f) added footnote in DCD
7.6-46	Changed "Deleted" to "Not Used" in DCD
7.7-26-end	Unitalicized list items in DCD
7.7-54	Removed white space from DCD
7.7-67	Removed white space from DCD
7.7-77	Replaced "of the SSAR" with "of Tier 2" in first line of DCD
7.7-87	Moved this section from page 7.7-88 in DCD
7.7.2.11	
7.7-90	Changed "Deleted" to "Not Used" in DCD
7A-1	Added two italicized paragraphs with footnotes
7A-2-12	Italicized all of section 7A.2 and added footnotes on pages 7A-4 and 7A-7 in DCD
7A-8	Changed "the SSAR" to "Tier 2" in response (11) in DCD
7A-12-15	Italicized all of Section 7A.3 and added footnote in DCD
7A-16-20	Italicized Sections 7A.5 thru &a.7 and added footnote in DCD
7B-1-7/8	Italicized Sections 7B.1 thru 7B.3 added footnote in DCD
7C-2-5	Italicized Section 7C.2 and 7C.3 added footnote in DCD
7C-5	In first paragraph changed "less than 10E-6" to "extremely low" in DCD
7C-11-13	Italicized Section 7C.5 added footnote in DCD
7C-14	Unitalicized references in DCD
Chapter 8	
8.1-4	Changed item 3(d) to "Not Used" in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
8.2-6	Removed white space from DCD
8.2-9	Changed "the SSAR" to "Tier 2" in first paragraph in DCD
8.2-15	Changed "SSAR" to "Tier 2" on first line in DCD
8.3-2	Removed white space from DCD
8.3-23	Removed extra comma after outputs in fourth line of paragraph in DCD
8.3-55	Changed "Deleted" to "Not Used" in DCD
8.3-56	Changed "Deleted" to "Not Used" 8 places in DCD
8.3-56	Removed white spaces from DCD
8.3-57	Changed "Deleted" to "Not Used" in DCD
8.3-59	Changed "Deleted" to "Not Used" in DCD
Chapter 9	
9.0-iii	Changed "Deleted" to "Not Used" in DCD
9.0-vii	Changed "Deleted" to "Not Used", 2 places in DCD
9.0-viii	Changed "Deleted" to "Not Used" 2 places in DCD
9.1-2	Changed "Deleted" to "Not Used" in DCD
9.1-4	Removed white space from DCD
9.1-14	Removed white space from DCD
9.1-35	Removed white space from DCD
9.1-42	Removed white space from DCD
9.1-43	Removed white space from DCD
9.1-48	Changed "Deleted" to "Not Used" in DCD
9.1-54	Unitalicized 2 lines in DCD
9.1-55	Unitalicized 1 line in DCD
9.2-12	Removed white space from DCD
9.2-25	Removed white space from DCD
9.2-45	Removed white space from DCD
9.2-46	Removed white space from DCD
9.2-61	Changed "Deleted" to "Not Used" in DCD
9.2-67	Changed "Deleted" to "Not Used" in DCD
9.3-33	Changed "Deleted" to "Not Used" 3 places in DCD

Attachment 2 (Continued)

Difference between DCD, Revision: 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
9.4-46	Changed "Deleted" to "Not Used" in DCD
9.4-55	Changed "Deleted" to "Not Used" 2 places in DCD
	Unitalicized "Requirement" and "Compliance" throughout section in DCD
9.5-9	Changed Item (5) to "Not Used" in DCD
9.5-10	Changed "Deleted" to "Not Used" in DCD
9.5-13	Changed "Deleted" to "Not Used" in DCD
9.5-22	Removed white space from DCD
9.5-69	Removed probabilities from DCD at end of first paragraph
9.5.12.3.3	
9.5-71	Changed "Deleted" to "Not Used" in Item (1) in DCD
9.5-74	Changed "Deleted" to "Not Used" in DCD
9.5.13.12	
9.5-76	Unitalicized references in DCD
9A-TOC	Changed "Deleted" to "Not Used" 48 places in DCD
9A.2-4	Removed white space from DCD
9A.2-5	Item (10) Changed "Deleted" to "Not Used" in DCD
9A.2-7	Changed "SSAR" to "Tier 2" last line in DCD
9A.2-8, 9	Changed "SSAR" to "Tier 2" at top of fifth column and footnote in DCD
9A.3-2	Changed "Deleted" to "Not Used" in DCD
9A.4	Changed "Deleted" to "Not Used" throughout
	Unitalicized "Water level (Flood) Design throughout in DCD
9A.4-239	Removed white space from DCD
9A.5-13	Changed "Deleted" to "Not Used" in DCD
9A.5-16, 17	Changed "Deleted" to "Not Used" and unitalicized paragraph headings in DCD
9A.5-16	Removed "of the SSAR" from two places in DCD
9A.5-17	Removed Section 9A.5.8 from DCD
9B	Unitalicized paragraph titles in DCD
9B-10	Unitalicized references in DCD
9C-9	Removed white space from DCD
Chapter 10	
10.2-7	Removed Table 10.2-1 from DCD
10.2-16	Unitalicized references in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
10.3-4	Unitalicized 5 titles in DCD
10.4-19	Removed section numbers 10.4.5.9, 10.4.5.9.1, 10.4.5.9.2, 10.4.5.10, 10.4.5.10.1, 10.4.5.10.2 from DCD
10.4-34	Changed orientation of table in DCD
Chapter 11	
11.0-iv	Removed 11A table listings from DCD
11.0-v/vi	Removed 11A figure listings from DCD
11.1-7	Unitalicized references in DCD
11.1-7	Removed reference 11.1-5 from DCD
11.3-25, 26	Unitalicized references in DCD
11A	Removed DCD 11A List of Tables and List of Figures
Chapter 12	
12.2-12	Unitalicized references in DCD
12.3-23	In first paragraph replaced "Certified Design Material (GE Document 25A5447)" with "Tier 1" in DCD
12.3-26	Replaced "DAC 3.7b" with "Table 3.2b of Tier 1" for DCD and "DAC3.7b" with "Table 3.2b of the CDM" for the SSAR
12.3-30	Unitalicized references in DCD
12.3-35	Changed "Deleted" to "Not Used" in DCD
12.3-36	Changed "Deleted" to "Not Used" in DCD
12.3-37	Changed "Deleted" to "Not Used" in DCD
12.4-8	Unitalicized references in DCD
12.4-9/10	Replaced "SSAR" with "Tier 2" in DCD
12A-3	Unitalicized paragraph heading in DCD
12A-4	Unitalicized references in DCD
Chapter 13	
13.0-iii/iv	Removed Table 13.6-1 and 13.6-2 listings from DCD
	Removed List of Figures from DCD
13.5-4-7	Unitalicized paragraph titles in DCD
Chapter 14	
14.0-ii	Changed "Deleted" to "Not Used" in DCD
14.0-iv	Changed CDM to Tier 1, 5 places, and revised title of Section 14.3 in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
14.2-7	Unitalicized Reg. Guides in DCD
14.2-60	Removed deleted paragraph section 14.2.12.1.30 from DCD
14.2-159	Changed "SSAR" to "Tier 2" 2 places in DCD
14.2-190	Removed "deleted" paragraph section 14.2.12.2.41 from DCD
14.2-191	Removed "deleted" paragraph section 14.2.13.3 from DCD
14.3	Relabeling consistent with change from CDM/SSAR to Tier 1/ Tier 2 in DCD
14.3-1	Changed Section Title in DCD
14.3-1	Modified first paragraph to better reflect the Tier 1 information in DCD
14.3-24-58	Changed "SSAR entry" to "Tier 2 entry" and "SSAR value" to "Tier 2 value" in DCD
Chapter 15	
15.0-ii	Changed "Deleted" to "Not Used" in DCD
15.0-vii	Changed "Deleted" to "Not Used" in DCD
15.0-ix/x	Removed 15C table listings from DCD
15.0-xiv	Changed "Deleted" to "Not Used" in DCD
15.0-xv	Removed Figure 15B-8 for DCD and replaced Figure 15B-8 title with "Deleted" for SSAR
15.0-xvi	Removed 15C figure listings from DCD
15.0-10	Changed font of table body in DCD
15.0-17	Changed page from portrait to landscape in DCD
15.1-4	Removed the phrase (...less than 0.0088 failure per reactor year..) from DCD
	Removed the phrase (less than 7×10^{-5} failure per reactor year) from DCD
	Changed phrase (...less than once per reactor year...) to "very low" in DCD
15.1-5	Replaced "less than once per 10,000 years" with "so low that it" in DCD
15.1-8	Removed less than 7×10^{-5} failure per reactor year in next to last sentence in DCD
	Replaced "less than 0.0088 times per year" with "very low frequency" in DCD
	Replaced "less than once per 10,000 years" with "extremely low" in DCD
15.1-20	Cleaned up figure in DCD
15.2-1	Deleted "less than 7×10^{-5} failures per reactor year" in DCD
15.2-1	Deleted "(0.0088 failures per reactor year)" in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
15.2-2	Replaced "(less than one failure every 11 years)" in DCD
15.2-5	Removed probability numbers 4 places from DCD
15.2-7	Removed white space from DCD
15.2-9	Modified paragraph and removed probability numbers 4 places in DCD
15.2-26	Unitalicized references in DCD
15.2-36	Cleaned up figure in DCD
15.3-5	Replaced "(less than 7×10^{-5} failures per year)" with "very low" in DCD
15.3-5	Replaced "about 0.0088 failures per reactor year" with "very low" in DCD
15.4-8	Replaced "(less than 7×10^{-5} failures per reactor year)" with "very low"
15.4-8	Replaced "About 0.0088 failure per reactor year" with "very low" in DCD
15.4-11	Replaced numerical value of probability with "expected frequency is low" in DCD
15.4-13	Removed probability numbers (3 places) from DCD
15.4-17	Changed "Deleted" to "Not Used" in DCD
15.6-17	Changed "the SSAR" to "Tier 2" in DCD
15.6-22	Removed deleted paragraph 15.6.7.2 from DCD
15.6-22, 23	Unitalicized references in DCD
15.7-11	Unitalicized references in DCD
15.7-14	Changed "Deleted" to "Not Used" in DCD
15A-1	Changed "the SSAR" to "Tier 2" in DCD
15A	Unitalicized paragraph headings in DCD
15A-111	Changed "Deleted" to "Not Used" in DCD
15B-4	Unitalicized paragraph headings in DCD
15C-1/2	Changed "Deleted" to "Not Used" in DCD
15D-2	Removed "(processor flow rate = 10^{-5} /h)" from DCD
15D-2	Revised text to eliminate probability in DCD
15D-3, 15D-5-8	Eliminated DCD figure/table contents and refer to SSAR
15E	Unitalicized paragraph headings in DCD
15E-10	Unitalicized references in DCD
15E-33	Cleaned up figure in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
15F-1	Unitalicized paragraph heading in DCD
Chapter 16	
Throughout	The header and footer on each page of the DCD are changed as follows: The GE document number in the header from the SSAR, 23A6100 Rev. x, is deleted. The SSAR amendment number in the footer is replaced with "Rev. 0, Design Control Document/ Tier 2"
	Where the phrase "of the SSAR" is used to describe information in the SSAR, it is replaced in the DCD with the phrase "of the DCD Tier 2"
4.0 5.0	Where the phrase "of the SSAR" is used to describe the applicant's SSAR, it is replaced in the DCD with the phrase "of the FSAR"
Throughout	Where the phrase "in the SSAR, Chapter (or Section) x" is used to point to the section of the SSAR, it is replaced in the DCD with the phrase "in DCD Tier 2, Chapter (or Section) x"
	Where the phrase "ABWR SSAR analysis" is used to describe the safety analyses in the SSAR, it is replaced in the DCD with the phrase "ABWR safety analysis"
	Where the phrase "transient or accident analysis in the ABWR SSAR" is used with no specific chapter or section reference, it is replaced in the DCD with the phrase "transient or accident analysis for the ABWR"
B 3.8	Where the phrase "described in the SSAR" is used to refer to Chapter 8 of the SSAR, it is replaced in the DCD with the phrase "described in DCD Tier 2, Chapter 8"
	Where the phrase "requirement of Section x of the SSAR" is used to refer to certain requirement specified in the SSAR, it is replaced in the DCD with the phrase "requirements of DCD Tier 2, Section x"
Chapter 17	
17.0-TOC	Removed blank spaces throughout in DCD
17.0-1	Deleted "of this Standard Safety Analysis Report" from first sentence in DCD
17.1-5/6	Unitalicized references in DCD
17.3-5 17.3.9	Added period to last sentence of section in DCD
Chapter 18	
18.0-i	Moved Appendices heading to top of following page in DCD
18.4-11	Unitalicized text in DCD
18B-1	Unitalicized text in footnote in DCD
18C-8	Page layout change in DCD
18E-1	Added italicized second paragraph and footnote in DCD
	Added "Staff" after "NRC" in third line of second paragraph in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
18E-1 thru 18E-5	Italicized entire sections and added footnote in DCD.
18E-7 thru 18E-28	Italicized entire table and added footnote in DCD
18E-29 thru 18E-35	Italicized entire attachment and added footnote in DCD
18E-36 thru 18E-40	Italicized entire tables and added footnote in DCD
18H-7/8	Substituted DCD proprietary notice to reference SSAR
Chapter 19	
19-ii	Changed "Deleted" to "Not Used" in DCD
19-iii	Removed listing for 19.14 from DCD
19-iv	Removed listing for 19D from DCD
19-ix	Removed listing for tables 19.3-7-19.3-9 from DCD
19-ix	Removed listing for 19D tables from DCD
19-xi	Removed listing for Table 19E.3-8 from DCD
	Removed listing for 19FA from DCD
19-xiii	Removed listing for table 19P-1 thru 19P-7 from DCD
19-xv	Removed listing for 19D tables from DCD
19-xxiv	Changed DCD Figures 19I-1 thru 19I-25 listing referencing SSAR
19-xxiv	Changed "Deleted" to "Not Used" in DCD
19-xxiv	DCD 19Q figure listing replaced with reference to SSAR
19-xxiv	DCD 19QA figure listings replaced with reference to SSAR
19.1-2	Deleted numerical probabilities (4 places) and substituted word values (2 places) in DCD
19.1-2	Unitalicized references in DCD
19.2-1 and 19.2-2	Replaced "this SSAR" with "Tier 2" in DCD
19.2-4	Unitalicized references in DCD
19.2-8/9	Unitalicized references in DCD
19.3-1	Removed "two events per year. This total consists of one planned reactor shutdown and one transient which results in reactor scram. The expected number of planned shutdowns is" from the second paragraph of the DCD. Removed "are the same as those used in the GESSARII PRA (Reference 19.3.3) and" from the third paragraph of the DCD.

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
19.3-1	Deleted Subsections 19.3.1.2.1 through 19.3.1.2.3 and inserted statement "not part of DCD (refer to SSAR)" in DCD
19.3-6	Unitalicized references in DCD
19.3-12	Eliminated probability values in first paragraph in DCD
19.3-18	Replaced "no more than 10%" with "a small percentage" in last paragraph in DCD
19.3-20	Replaced "of 1.6E-7 per year" with "is extremely small" in DCD
19.3-22	Unitalicized references in DCD
19.3-23, 19.3-29 thru 19.3-31	Deleted DCD frequencies and added footnote referring to SSAR
19.3-31	Deleted tables from DCD
19.3-33	Deleted body of figure and added footnote referring to SSAR in DCD
19.4-3	Removed probabilities in three places and inserted word values in two places in DCD
19.4-4	Unitalicized references in DCD
19.4-5	Removed "of the SSAR" two places in DCD
19.4-11	Removed last two sentences of second paragraph in DCD
19.4-12	Eliminated two probability values in last paragraph in DCD
19.4-12 and 19.4-13	Eliminated six probability values in DCD
19.4-13	Replaced "10 ⁻⁷ per year" with "very small" in DCD
19.5-3/4	Deleted "Examining the data in Table 19.3-6, the CCFP PI is 0.007. Therefore," from the fourth paragraph in DCD
19.6-1	Eliminated probability values in 5 places in DCD
19.6-3	Eliminated probability values in 2 places in the next to last paragraph in DCD
19.6-4 thru 19.6-5	Eliminated probability values in ten places in DCD
19.6-6	Unitalicized references in DCD
19.7-3	Replaced two numerical probabilities with word values in DCD
19.7-10	Unitalicized reference in DCD
19.8-1	Replaced "the Certified Design Material (Section 14.3)" with "Tier 1 in DCD
19.8-2 thru 19.8-23	Eliminated all probability values in DCD
19.8-24	Changed "Section" to "Attachment" and deleted "of the ABWR SSAR" under "vessel depressurization" in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
19.9-6	Unitalicized references in DCD
19.9-7	Replaced "(i.e., less than one foot) and also prevent accumulation in one area flowing to "with in" under item (3) (b) in DCD
19.9-7	Removed "with an unavailability of 1E-3 per demand or less" from DCD
19.10-3	Deleted second sentence in DCD
19.10-3 and 19.10-4	Deleted "as 0.99" in second sentence, and deleted from third sentence on in DCD
19.14	Removed section 19.14 from DCD
19A-1	Replaced "SSAR" with "Tier 2" in 2 places in DCD
19A-1	Unitalicized references throughout in DCD
19A-21 thru 19A-23/24	Changed "SSAR" to "Tier 2" in right hand column in DCD
19B	Changed "SSAR" to "Tier 2" throughout in DCD
	Unitalicized references and headings throughout in DCD
19B-9	Removed "Deleted" sections in DCD
19B-119	Removed "For the SSAR" in DCD
19C-1/2	Replaced "Safeguards information provided under separate cover" with "This section is not part of the DCD (refer to SSAR)."
19D-1/2	Removed entire Appendix 19D and replaced with "This section not part of the DCD (refer to SSAR)" in DCD
19E-vi	Removed table 19E.3-8 from DCD
19E-xvi	Removed Figure 19E.3-2 from DCD
19E.2-5	Changed "Deleted" to "Not Used" in DCD
	Removed "deleted" items from DCD
19E.2-11 thru 19.E.2-13	Modified statement pertaining to probabilities in DCD
19E.2-19	Deleted "of the SSAR" in DCD
19E.2-25	Modified second sentence to eliminate failure rate and melded the second and third sentence for clarification in DCD
19E.2	Eliminated probability values and replaced them with word values throughout in DCD
19E.2-87	Unitalicized references in DCD
19E.2-101	Deleted "the ABWR SSAR" from the first sentence in DCD
19E.2-154-157	Unitalicized references in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
19E.2-158	Extra page added with statement " In order to maintain consistency with the SSAR, this page has been intentionally left blank" in DCD
19E.2-188	Cleaned up figure in DCD
19E.2-259 thru 19E.2-274	Eliminated probabilities and added note "probabilities not part of DCD (refer to SSAR)" in DCD
19E.3-1	Removed information from body of figures and added note "Not part of DCD (refer to SSAR)" in DCD
19E.3-3	Replaced "98.6%" with "a very large percentage" in second paragraph in DCD
19E.3-5	Unitalicized references in DCD
19E.3-3	Replaced "the SSAR" with "Tier 2" in first paragraph in DCD
19E.3-10	Removed table 19E.3-8 from DCD
19E.3-3 19E.3-9 19E.3-10	Removed probabilities from DCD and added note "Probabilities not part of DCD (refer to SSAR)"
19E.3-11	Removed body of figure from DCD and added note "Figure is not part of DCD (refer to SSAR)"
19E.3-12	Removed Figure 19E.3-2 from DCD
19EA	Removed numerical probabilities from DCD and, where applicable, replaced with word values throughout
19EA-29	Unitalicized references in DCD
19EA-32 thru 19EA-37, 19EA-39 19EA-40, 19EA-45 19EA-46	Deleted body of figures from DCD and added note "Figures not part of DCD (refer to SSAR)"
19EB-2, 19EB-3	Replaced numerical probabilities with word values in DCD
19EC-4	Unitalicized References in DCD
19EC-4	Removed probabilities from DCD and added note "Probabilities not part of DCD (refer to SSAR)"
19EC-5 thru 19EC-14	Removed numerical probabilities from DCD and, where applicable, replaced with word values
19EC-26	Unitalicized references in DCD
19EC-29, 19EC-30 19EC-36	Removed body of figures from DCD and added note "Probabilities not part of DCD (refer to SSAR)"
19ED-26, 27	Unitalicized references in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
19EE-3, 19EE-5 19EE-6	Removed vacuum breaker related probabilities from DCD
19EE-11, 19EE-12 19EE-13	Replaced numerical probabilities with word values in DCD
19EE-13	Unitalicized references in DCD
19EE-17	Removed probabilities from DCD and added note "Probabilities not part of DCD (refer to SSAR)"
19EE-16 19EE-17/18	Removed body of figures from DCD and added note "Probabilities not part of DCD (Refer to SSAR)"
19F-16, 17	Unitalicized references in DCD
19F Figures	Cleaned up several figures in DCD
19FA-1/2	Removed attachment 19FA from DCD and added note "This attachment is not part of the DCD (refer to SSAR)."
19G-1/2	Changed "Deleted" to "Not Used" in DCD
19H-4	Removed "of 3G (Table 19H-1)" from DCD
19H-14	Deleted last sentence of first paragraph from DCD
19H-15	Deleted DCD last sentence of last paragraph and last sentence of fourth to last paragraph.
19H-17	Changed "the SSAR" to "Tier 2" and "ITAAC" to "Tier 1" in DCD
19H-20, 21	Unitalicized references in DCD
19H-23	Changed "probability" to "fragility" in footnote 1 and modified footnote 5 to eliminate specific values in DCD
19H-24 thru 19H-32	Removed fragilities from DCD and added note "Fragility not part of DCD. Refer to SSAR"
19I-2, 19I-3 19I-4, 19I-5 19I-8, 19I-9 19I-10	Removed fragilities and corresponding probabilities in DCD
19I-10	Unitalicized references in DCD
19I-11, 19I-12 19I-13	Removed fragilities and HCLPF values from table of DCD and extended note to read "Fragilities and HCLPF values are not part of DCD (refer to SSAR)"
19I-14	Removed body of tables from DCD and added note "This table is not part of DCD (refer to SSAR)"
19I-15	Fragilities and HCLPF values deleted from table of DCD and added note "Fragilities and HCLPF values are not part of DCD (refer to SSAR)"

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
19I-16	Body of table deleted from DCD and added note "This table is not part of DCD (refer to SSAR)"
19I-17/18	Deleted figures from DCD and added note "Figures 19I-1 through 19I-25 are not part of DCD (refer to SSAR)"
19J-1/2	Changed "Deleted" to "Not Used" in DCD
19K-2, 19K-5 19K-8, 19K-12 19K-17	Replaced numerical probability values with word values in DCD
19K-17, 18	Unitalicized references in DCD
19K-19 thru 19K-21	Removed numerical values from tables of DCD and added note "Not part of DCD (refer to SSAR)"
19K-22 thru 19K-31/32	Removed numerical values in right hand column of DCD and added note "Not part of DCD (refer to SSAR)"
19L-1	Replaced "the ABWR Safety Analysis Report (SSAR)" with "Tier 2" in DCD
19L-2	Replaced numerical probability value with word value in DCD
19L-3	Removed "SSAR" from DCD
19L-8	Removed last sentence from item (3) from DCD
19L-8	Removed probability statement in last paragraph from DCD
19L-21	Deleted probabilities in second paragraph of DCD
19L-21/22	Deleted "SSAR" in DCD
19L-23 19L-24	Replaced numerical values of probabilities with word values in DCD
19L-26	Unitalicized references in DCD
19M-1, 19M-2 19M-3, 19M-7 19M-8	Replaced numerical probability values with word values in DCD
19M-1	Changed "1.0E-06 per year" to "an acceptably small criterion" in DCD
19M-9 19M-10	Removed frequencies from DCD and added note "Not part of DCD (refer to SSAR)".
19M-10, 19M-11 19M-12	Replaced numerical values of probabilities with word values in DCD
19M-12	Unitalicized references in DCD
19M-13, 19M-33 thru 19M-35	Removed frequencies from DCD and added note "Not part of DCD (refer to SSAR)".

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
19M-16 thru 19M-33	Deleted body of tables from DCD and added note "Not part of DCD (refer to SSAR)".
19M-38 thru 19M-48	Deleted body of figures from DCD and added note "Not a part of DCD (refer to SSAR)".
19N-4	Unitalicized text in DCD
19N-1, 19N-12 19N-13	Removed numerical probabilities from DCD
19N-15, 19N-17 19N-18	Replaced numerical probabilities with word values in DCD
19N-19	Unitalicized references in DCD
19P-1/2	Removed Appendix 19P in its entirety from the DCD and the SSAR and added notes appropriate to both
19Q-2	In last paragraph of DCD replaced "the SSAR" with "Tier 2" and replaced "the Inspections, Test, Analysis, and Acceptance Criteria (ITAAC Requirement)" with "Tier 1".
19Q	Replaced numerical probability values with word values throughout in DCD
19Q-39	Unitalicized references in DCD
19Q-45	Removed unavailability values from table of DCD and added note "Not a part of DCD (refer to SSAR)"
19Q-57 thru 19Q-75/76	Removed all figures from DCD and replaced with note "Figures 19Q-1 through 19Q-19 are not part of DCD (refer to SSAR)"
19QA-1 thru 19QA-412	Removed all figures from DCD and replaced with note "Figures 19A-1a through 19QA-20 are not part of DCD (refer to SSAR)"
19QB-4	Unitalicized references in DCD
19QB-5, 19QB-6	Removed probabilities from DCD and added note "Not part of DCD (refer to SSAR)".
19QC-1	Unitalicized references in DCD
19R-1, 19R-2 19R-3	Replaced numerical values of probability with word values in DCD
19R-7	Unitalicized references in DCD
19R-4 19R-24	Replaced "SSAR" with "Tier 2" in DCD
19R-9	Replaced "2 hours" with "several hours" in fourth paragraph in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
19R-21, 19R-22 19R-25, 19R-27 19R-28, 19R-29 19R-30, 19R-31	Replaced numerical probabilities with word values in DCD
19R-31	Deleted reliability goals from DCD and added note "Not a part of DCD (refer to SSAR)".
19R-35 thru 19R-37	Frequency/probability deleted from DCD and added note "Not a part of DCD (refer to SSAR)".
19R-47 thru 19R-53/54	Removed body of figures from DCD and added note "Not a part of DCD (refer to SSAR)".
Chapter 20	
	Unitalicized text throughout DCD
20.1-1	Added new paragraph on relationship of SSAR and Tier 2 "names" in Chapter 20 in DCD
20.1-32, 33	Removed extra space from DCD
20.3.3-60	Cleaned up image in DCD
20.3.2-62	Cleaned up image in DCD
20.3.3-24	Changed "Deleted" to "Not Used" in DCD
20.3.4-38, 39	Removed from DCD
20.3.6-27	Removed from DCD
20.3.8-37	Italicized item (1) and added footnote in DCD
20.3.8-51 and 20.3.8-52	Italicized third and last paragraphs of response and added footnotes in DCD
20.3.8-96	Changed "Deleted" to "Not Used" in DCD
20.3.9-1 thru 20.3.9-15/16	Deleted responses from DCD and added "Response to Chapter 19" questions not part of DCD (see SSAR Subsection 20.3.9)".
20.3.11-10 thru 20.3.11- 11/12	Deleted responses from DCD and added "Response to Chapter 19" questions not part of DCD (See SSAR Subsection 20.3.11)".
20.3.12-1 thru 20.3.12- 9/10	Deleted responses from DCD and added "Response to Chapter 19" questions not part of DCD (see SSAR Subsection 20.3.12)".
20.3.12-5	Removed event/frequency table from end of response in DCD
20.3.14-15	Unitalicized text in footnote in DCD
20.3.14-29 thru 20.3.14-32	Deleted responses from DCD and added "Response to Chapter 19" questions not part of DCD (see SSAR Subsection 20.3.14)".
20.3.14-33	Cleaned up figure in DCD

Attachment 2 (Continued)

Difference between DCD, Revision 3 and SSAR Amendment 37 (Revision 9)

DCD Section/Pg	Difference
20.3.15-37 thru 20.3.15-39	Changed notation "Response to this question is provided under separate cover" to "Safeguards Information not part of DCD (see SSAR Subsection 20.3.15)" in DCD
20.3.16-30	Removed extra space from DCD
20.4-1	Unitalicized references in DCD
Chapter 21	
21-103 and 21-127	Italicized note 32 and 29 of DCD, respectively, and added footnotes in figures 5.4-10 and 6.3-7

Attachment 3

ABWR Design Control Document Revision 3 - Page Change Instruction

The following pages have been changed, please make the changes in your copy of the Design Control Document. Pages are listed below as page pairs (front and back), except Chapter 16, which is single-sided.

Remove Pages

Add Pages

Replace the cover sheet and insert DCD TOC in each volume

Insert Effective Pages 1 thru 9 before DCD Introduction tab in Volume 1.

Tier 1

2.2.4-1, 2	2.2.4-1, 2
2.11.3-1,2	2.11.3-1,2
5,6	5,6
9, 10	9, 10
2.11.5-1, 2	2.11.5-1, 2
2.11.6-1 thru 6	2.11.6-1 thru 6
2.15.5-1 thru 10	2.15.5-1 thru 10
13 thru 26	13 thru 26
33, 34	33, 34
2.15.10-7, 8	2.15.10-7, 8
11 thru 14	11 thru 14
2.15.12-3, 4	2.15.12-3, 4
9, 10	9, 10
3.2-5, 6	3.2-5, 6
9 thru 12	9 thru 12
17, 18	17, 18
23, 24	23, 24
App A-5, 6	App A-5, 6

Tier 2

Chapter 1

1.2-29, 30	1.2-29, 30
1.9-11, 12	1.9-11, 12

Chapter 3

3.2-43, 44	3.2-43, 44
------------	------------

Remove Pages

Add Pages

Chapter 3 (Cont)

3.8-31, 32	3.8-31, 32
3.9-97, 98	3.9-97, 98
117, 118	117, 118
123, 124	123, 124
127 thru 130	127 thru 130
3I-17, 18	3I-17, 18
3MA-13 thru 16	3MA-13 thru 16

Chapter 5

5.4-21, 22	5.4-21, 22
27, 28	27, 28
61, 62	61, 62

Chapter 6

6.2-11, 12	6.2-11, 12
183, 184	183, 184
6.4-7, 8	6.4-7, 8

Chapter 7

7.3-57 thru 60	7.3-57 thru 60
91, 92	91, 92

Chapter 9

9.0-v/vi	9.0-v/vi
9.2-5, 6	9.2-5, 6
19, 20	19, 20
31 thru 34	31 thru 34
49 thru 52	49 thru 52
57 thru 60	57 thru 60
67, 68	67, 68
9.3-13, 14	9.3-13, 14

ABWR Design Control Document Revision 3 - Page Change Instruction

The following pages have been changed, please make the changes in your copy of the Design Control Document. Pages are listed below as page pairs (front and back), except Chapter 16, which is single-sided.

<u>Remove Pages</u>	<u>Add Pages</u>	<u>Remove Pages</u>	<u>Add Pages</u>
<u>Chapter 9 (Cont)</u>		<u>Chapter 15 (Cont)</u>	
9.4-1 thru 6	9.4-1 thru 6	15.6-31 thru 34	15.6-31 thru 34
9, 10	9, 10	37 thru 40	37 thru 40
17, 18	17, 18	45, 46	45, 46
21 thru 24	21 thru 24		
33, 34	33, 34	<u>Chapter 16</u>	
43 thru 48	43 thru 48	2.0-1	2.0-1
9.5-9 thru 14	9.5-9 thru 14	3.3-12	3.3-12
9A.0-v, vi	9A.0-v, vi	42	42
vii, viii	vii, viii	3.4-3	3.4-3
9A.4-263, 264	9A.4-263, 264	3.5-6	3.5-6
287, 288	287, 288	3.7-3	3.7-3
291, 292	291, 292	6	6
293, 294	293, 294	8	8
305, 306	305, 306	4.0-2	4.0-2
313, 314	313, 314	B3.4-8	B3.4-8
319, 320	319, 320	9	9
417, 418	417, 418	B3.5-4	B3.5-4
437, 438	437, 438	7	7
449 thru 452	449 thru 452	17	17
457 thru 460	457 thru 460	B3.7-4	B3.7-4
9A.6-77 thru 96	9A.6-77 thru 96	5	5
101 thru 106	101 thru 106	6	6
9C-1, 2	9C-1, 2	7	7
9, 10	9, 10	13	13
<u>Chapter 14</u>		17	17
14.2-59 thru 62	14.2-59 thru 62	<u>Chapter 19</u>	
14.3-27 thru 30	14.3-27 thru 30	19-i, ii	19-i, ii
<u>Chapter 15</u>		19.4-11 thru 14	19.4-11 thru 14
15.1-9, 10	15.1-9, 10	19.8-7, 8	19.8-7, 8
15.2-15, 16	15.2-15, 16	19.9-11, 12	19-11, 12
15.6-7, 8	15.6-7, 8		
15 thru 18	15 thru 18		
25 thru 28	25 thru 28		

ABWR Design Control Document Revision 3 - Page Change Instruction

The following pages have been changed, please make the changes in your copy of the Design Control Document. Pages are listed below as page pairs (front and back), except Chapter 16, which is single-sided.

Remove Pages

Add Pages

Chapter 19 (Cont)

19I-3 thru 10
13, 14

19I-3 thru 10
13, 14

19P-1/2

19P-1/2

19QC-3, 4

19QC-3, 4

Chapter 21

21-11

21-11

12

12

26

26

32

32

33

33

73

73

100

100

102

102

259

259

260

260

261

261

263

263

264

264

267

267

488

488

489

489

495

495

509

509

510

510

513

513

518

518

519

519

526

526

535

535

536

536

537

537

538

538

539

539

542.1

542.1

542.2

542.2

542.3

542.3

543

543

544

544

545

545

Remove Pages

Add Pages

Chapter 21 (Cont.)

21-547

21-547

548

548

560

560

561

561

565

565

571

571

572

572

588

588

590

590

591

591

598

598

600

600

601

601

616

616

617

617

623

623

629

629

630

630

633

633

Attachment 4

ABWR Certified Design Material Rev. 8 - Page Change Instruction

The following pages have been changed, please make the changes in your copy of the CDM. Pages are listed below as page pairs (front and back).

Remove Pages	Add Pages	Remove Pages	Add Pages
2.2.4-1, 2	2.2.4-1, 2		
2.11.3-1, 2	2.11.3-1, 2		
5, 6	5, 6		
9, 10	9, 10		
2.11.5-1, 2	2.11.5-1, 2		
2.11.6-1 thru 6	2.11.6-1 thru 6		
2.15.5-1 thru 10	2.15.5-1 thru 10		
13 thru 26	13 thru 26		
33, 34	33, 34		
2.15.10-7, 8	2.15.10-7, 8		
11 thru 14	11 thru 14		
2.15.12-3, 4	2.15.12-3, 4		
9, 10	9, 10		
3.2-5, 6	3.2-5, 6		
9 thru 12	9 thru 12		
17, 18	17, 18		
23, 24	23, 24		
App A-5, 6	App A-5, 6		

Attachment 5

ABWR Standard Safety Analysis Report, Amendment 37 Rev. 9 - Page Change Instruction

The following pages have been changed, please make the changes in your copy of the SSAR. Pages are listed below as page pairs (front and back), except Chapter 16, which is single-sided pages only.

Remove Pages	Add Pages	Remove Pages	Add Pages
Replace the cover sheet in each volume		<u>Chapter 9 (Cont)</u>	
<u>Chapter 1</u>		9.2-5, 6	9.2-5, 6
1.2-31, 32	1.2-31, 32	19, 20	19, 20
1.9-11, 12	1.9-11, 12	31 thru 34	31 thru 34
		51 thru 54	51 thru 54
		59 thru 62	59 thru 62
		69, 70	69, 70
<u>Chapter 3</u>		9.3-13, 14	9.3-13, 14
3.2-43, 44	3.2-43, 44	9.4-1 thru 6	9.4-1 thru 6
3.8-29, 30	3.8-29, 30	9, 10	9, 10
3.9-97, 98	3.9-97, 98	17, 18	17, 18
117, 118	117, 118	21 thru 24	21 thru 24
123, 124	123, 124	31 thru 34	31 thru 34
127 thru 130	127 thru 130	43 thru 48	43 thru 48
3I-17, 18	3I-17, 18	9.5-9 thru 14	9.5-9 thru 14
3MA-13 thru 16	3MA-13 thru 16	9A.0-v, vi	9A.0-v, vi
		vii, viii	vii, viii
<u>Chapter 5</u>		9A.4-263, 264	9A.4-263, 264
5.4-21, 22	5.4-21, 22	287, 288	287, 288
27, 28	27, 28	291, 292	291, 292
61, 62	61, 62	293, 294	293, 294
		307, 308	307, 308
		315, 316	315, 316
		321, 322	321, 322
<u>Chapter 6</u>		417 thru 420	417 thru 420
6.2-12, 13	6.2-12, 13	437 thru 440	437 thru 440
183, 184	183, 184	451, 452	451, 452
		459, 460	459, 460
6.4-7, 8	6.4-7, 8	9A.6-77 thru 96	9A.6-77 thru 96
		101 thru 106	101 thru 106
<u>Chapter 7</u>		9C-1, 2	9C-1, 2
7.3-57 thru 60	7.3-57 thru 60	11, 12	11, 12
91, 92	91, 92		
<u>Chapter 9</u>		<u>Chapter 14</u>	
9.0-v/vi	9.0-v/vi	14.2-59 thru 62	14.2-59 thru 62
		169, 170	169, 170

ABWR Standard Safety Analysis Report, Amendment 37 Rev. 9 - Page Change Instruction

The following pages have been changed, please make the changes in your copy of the SSAR. Pages are listed below as page pairs (front and back), except Chapter 16, which is single-sided pages only.

<u>Remove Pages</u>	<u>Add Pages</u>	<u>Remove Pages</u>	<u>Add Pages</u>
<u>Chapter 14 (Cont)</u>		<u>Chapter 19</u>	
14.3-1, 2 29, 30	14.3-1, 2 29, 30	19-i, ii vii/viii	19-i, ii vii, viii
<u>Chapter 15</u>		19.4-11 thru 14	19.4-11 thru 14
15.1-9, 10	15.1-9, 10	19.8-7, 8	19.8-7, 8
15.2-15, 16	15, 16	19.9-11, 12	19-11, 12
15.6-7, 8 15 thru 18 25 thru 28 31 thru 34 37 thru 40 45, 46	15.6-7, 8 15 thru 18 25 thru 28 31 thru 34 37 thru 40 45, 46	19D.3-5, 6 17, 18	19D.3-5, 6 17, 18
<u>Chapter 16</u>		19D.4-7, 8	19D.4-7, 8
2.0-1	2.0-1	19D.6-5 thru 8 231, 232	19D.5-5 thru 8 231, 232
3.3-12	3.3-12	19I-3 thru 6 9, 10 13 thru 20 33, 34	19I-3 thru 6 9, 10 13 thru 20 33, 34
3.4-3	3.4-3	19P-1/2	19P-1/2
3.5-6	3.5-6	19QC-3, 4	19QC-3, 4
3.7-3 6 8	3.7-3 6 8	<u>Chapter 21</u>	
4.0-2	4.0-2	21-11	21-11
B3.4-8 9	B3.4-8 9	12	12
B3.5-4 7 17	B3.5-4 7 17	26	26
B3.7-4 5 6 7 13 17	B3.7-4 5 6 7 13 17	32	32
		33	33
		73	73
		100	100
		102	102
		259	259
		260	260
		261	261
		263	263
		264	264
		267	267
		488	488

ABWR Standard Safety Analysis Report, Amendment 37 Rev. 9 - Page Change Instruction

The following pages have been changed, please make the changes in your copy of the SSAR. Pages are listed below as page pairs (front and back), except Chapter 16, which is single-sided pages only.

Remove Pages	Add Pages	Remove Pages	Add Pages
<u>Chapter 21 (Cont)</u>			
21-489	21-489		
495	495		
509	509		
510	510		
513	513		
518	518		
519	519		
526	526		
535	535		
536	536		
537	537		
538	538		
539	539		
542.1	542.1		
542.2	542.2		
542.3	542.3		
543	543		
544	544		
545	545		
547	547		
548	548		
560	560		
561	561		
565	565		
571	571		
572	572		
588	588		
590	590		
591	591		
598	598		
600	600		
601	601		
616	616		
617	617		
623	623		
629	629		
630	630		
633	633		

2.2.4 Standby Liquid Control System

The Standby Liquid Control (SLC) System injects neutron absorbing poison into the reactor using a boron solution, thus providing the safety-related function of backup reactor shutdown capability independent of the normal reactivity control system based on insertion of control rods into the core. The SLC System is designed to bring the reactor from full power to a subcritical condition without control rod movement, at any time in a core cycle, and at design basis conditions with the reactor in the most reactive xenon-free state. The SLC System operates over a range of reactor pressure conditions which bound the elevated pressures associated with an anticipated transient without scram (ATWS). Figure 2.2.4 shows the basic system configuration and scope.

The SLC System consists of a boron solution storage tank, two positive displacement pumps, two motor-operated injection valves which are provided in parallel for redundancy, and associated piping and valves used to transfer borated water from the storage tank to the reactor pressure vessel (RPV). The borated solution is discharged through the high pressure core flooders (HPCF) Division B subsystem sparger.

The SLC System uses a dissolved solution of sodium pentaborate as the neutron-absorbing poison. This solution is held in the storage tank which has a heater to maintain solution temperature above the saturation temperature. The heater has automatic actuation and automatic shutoff.

A test tank and associated piping and valves permit testing of the SLC System during plant operation. The tank is supplied with demineralized water, which is pumped in either a closed loop or is injected into the reactor.

Key SLC System equipment performance requirements are:

- | | |
|--|--|
| (1) Pump flow (minimum) | 378 L/min with both pumps operating
189 L/min with one pump operating |
| (2) Maximum reactor pressure
(for injection) | 8.72 MPaA |
| (3) Pumpable volume in storage
tank (minimum) | 23.1 m ³ |

The SLC System can be manually initiated from the main control room. Each of the two divisions is controlled by a separate switch. When it is manually initiated to inject a liquid neutron absorber into the reactor, the following devices and actions are initiated by each divisional switch:

- (1) The specified division injection valve is opened.

- (2) The specified division storage tank discharge valve is opened.
- (3) The specified division injection pump is started.
- (4) The reactor water cleanup isolation valves are closed.

Both divisions of the SLC System are automatically initiated during an ATWS condition by safety system and logic control (SSLC) logic. With the storage tank at minimum level and both pumps operating, the system is designed to inject the minimum required boron solution.

Each SLC System pump has an interlock which prevents operation if both the test tank outlet valve and the pump suction valve are closed.

The SLC System provides borated water to the reactor core to compensate for the various reactivity effects. These effects are xenon decay, elimination of steam voids, changing water density due to the reduction in water temperature, Doppler effect in uranium, changes in neutron leakage, and changes in control rod worth. To meet this objective, it is necessary to inject a quantity of boron which produces a minimum concentration of 850 parts per million (ppm) by weight of natural boron in the reactor core at 20°C. To allow for potential leakage and imperfect mixing in the reactor system, an additional approximately 25% (220 ppm) is added to the above requirement, resulting in a total requirement of greater than or equal to 1070 ppm. The required concentration is thus achieved in a mass of water equal to the sum of the mass of water in the RPV at normal water level (equal to or less than 455×10^3 kg) plus the mass of water in the RPV shutdown cooling piping (equal to or less than 130×10^3 kg). The quantity of boron solution contained in the storage tank above the pump suction shutoff level provides the required concentration of 1070 ppm when injected into the reactor.

The SLC System pumps have sufficient net positive suction head (NPSH) available at the pump. The SLC System pumps are designed to produce discharge pressure to inject the solution into the reactor when the reactor is at pressure conditions corresponding to the system relief valve (10.79 MPaG), which is above peak ATWS pressure in the RPV.

SLC System components required for RPV injection are classified as Seismic Category I.

Figure 2.2.4 shows the ASME Code class for the SLC System piping and components.

The SLC System is located in the Reactor Building. The storage tank, test water tank, the two positive displacement pumps, and associated valving are located in the secondary containment on the floor elevation below the operating floor.

Each of the two SLC System divisions is powered from the respective Class 1E division as shown on Figure 2.2.4. The power supplied to one motor-operated injection valve,

2.11.3 Reactor Building Cooling Water System

Design Description

The Reactor Building Cooling Water (RCW) System distributes cooling water through three physically separated and electrically independent divisions. The system removes heat from plant auxiliaries and transfers it to the Ultimate Heat Sink (UHS) via the Reactor Service Water (RSW) System. The RCW System removes heat from emergency core cooling equipment, including the emergency diesel generators (DGs) during a safe reactor shutdown cooling function. RCW System configurations are shown in Figures 2.11.3a, 2.11.3b, and 2.11.3c. Figure 2.11.3d shows the RCW System control interfaces. All components cooled by the RCW System are parts of other systems and are not part of the RCW System. Each RCW division includes two pumps which circulate cooling water through the equipment cooled by the RCW System and through three heat exchangers which transfer the RCW heat to the UHS via the RSW System.

The RCW System performs a safe reactor shutdown cooling function following either a loss-of-coolant accident (LOCA) or a loss-of-preferred-power (LOPP) or both. Assuming a single active failure in any mechanical or electrical division or RCW support system, which disables any one of the three RCW divisions, the other two divisions perform safe reactor shutdown cooling.

Tables 2.11.3a, 2.11.3b, and 2.11.3c show which equipment receives RCW flow during various plant operating and emergency conditions. The tables also indicate how many heat exchangers are in service under each condition.

The RCW System is classified as safety-related except for those portions as shown on Figures 2.11.3a, 2.11.3b, and 2.11.3c as non-nuclear safety.

The RCW System responses to a LOCA signal are the following:

- (1) Starts any standby RCW pumps.
- (2) Opens any closed standby RCW heat exchanger outlet valves.
- (3) Opens all Residual Heat Removal (RHR) System heat exchanger cooling water outlet valves.
- (4) Closes all RCW containment isolation valves.
- (5) Closes valves to the following non-safety-related components (to Reactor Water Cleanup System (CUW) and reactor internal pump (RIP) MG sets).

- (6) Opens the RCW water temperature pneumatic control valves (located downstream of RCW heat exchangers) and closes the RCW heat exchanger bypass valves.
- (7) Overrides the RCW pump trip signal from low surge tank and low stand pipe level.

Safety-related valves separate the safety-related portions of the RCW System from the non-safety-related portions of the system. The separation valves to the non-safety-related RCW System are automatically or remote-manually operated, and their positions are indicated in the main control room.

Component design parameters are:

	Division A/B	Division C
Discharge flow rate (per pump)	$\geq 1420 \text{ m}^3/\text{h}$	$\geq 1237 \text{ m}^3/\text{h}$
Heat exchanger design basis heat removal capacities: (per heat exchanger)	$\geq 47.73 \text{ GJ/h}$	$\geq 44.38 \text{ GJ/h}$

These heat removal capabilities include a 20% margin above the minimum required for design basis accident conditions. Consequently, plant operation is acceptable with heat exchanger capacities greater than or equal to 80% of these values.

Figures 2.11.3a, 2.11.3b, and 2.11.3c show the ASME Code Class for the RCW System piping and components. The safety-related portions of the RCW divisions are classified as Seismic Category I. The piping to the fuel pool cooling (FPC) system heat exchangers and room coolers are classified as Seismic Category I.

The RCW pumps and heat exchangers are located in the lower floors of the Control Building. The equipment cooled by the RCW divisions are located in the Control Building, Reactor Building, Turbine Building, and Radwaste Building, (Figures 2.11.3a, 2.11.3b, and 2.11.3c).

Each of the three RCW divisions is powered from its respective Class 1E division as shown in Figures 2.11.3a, 2.11.3b, and 2.11.3c. In the RCW System, independence is provided between the Class 1E divisions and also between the Class 1E divisions and non-Class 1E equipment. The safety-related portion of each mechanical division of the RCW System (Divisions A, B, C) is physically separated from the safety-related portions of the other divisions.

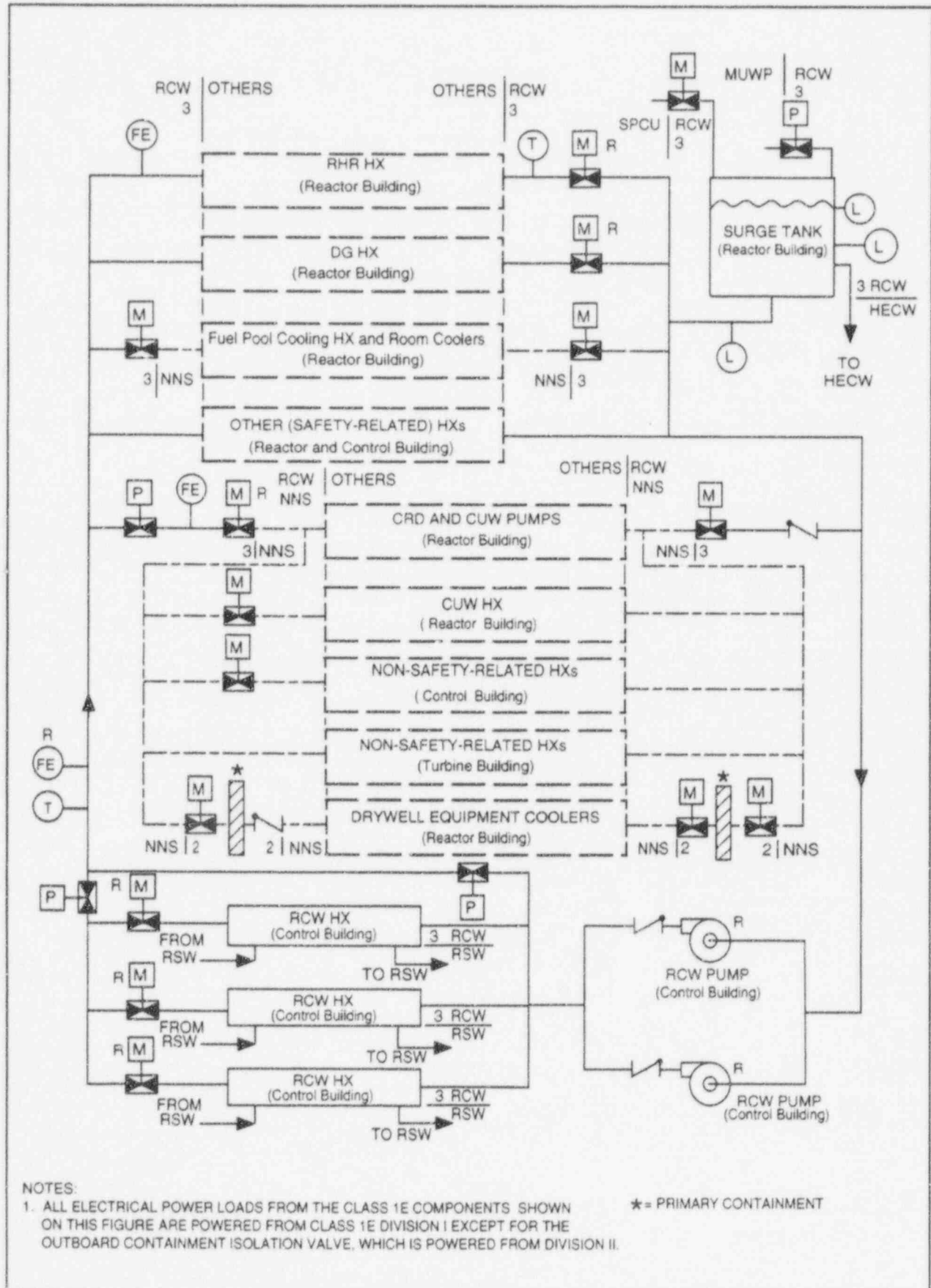


Figure 2.11.3a Reactor Building Cooling Water System (RCW-A)

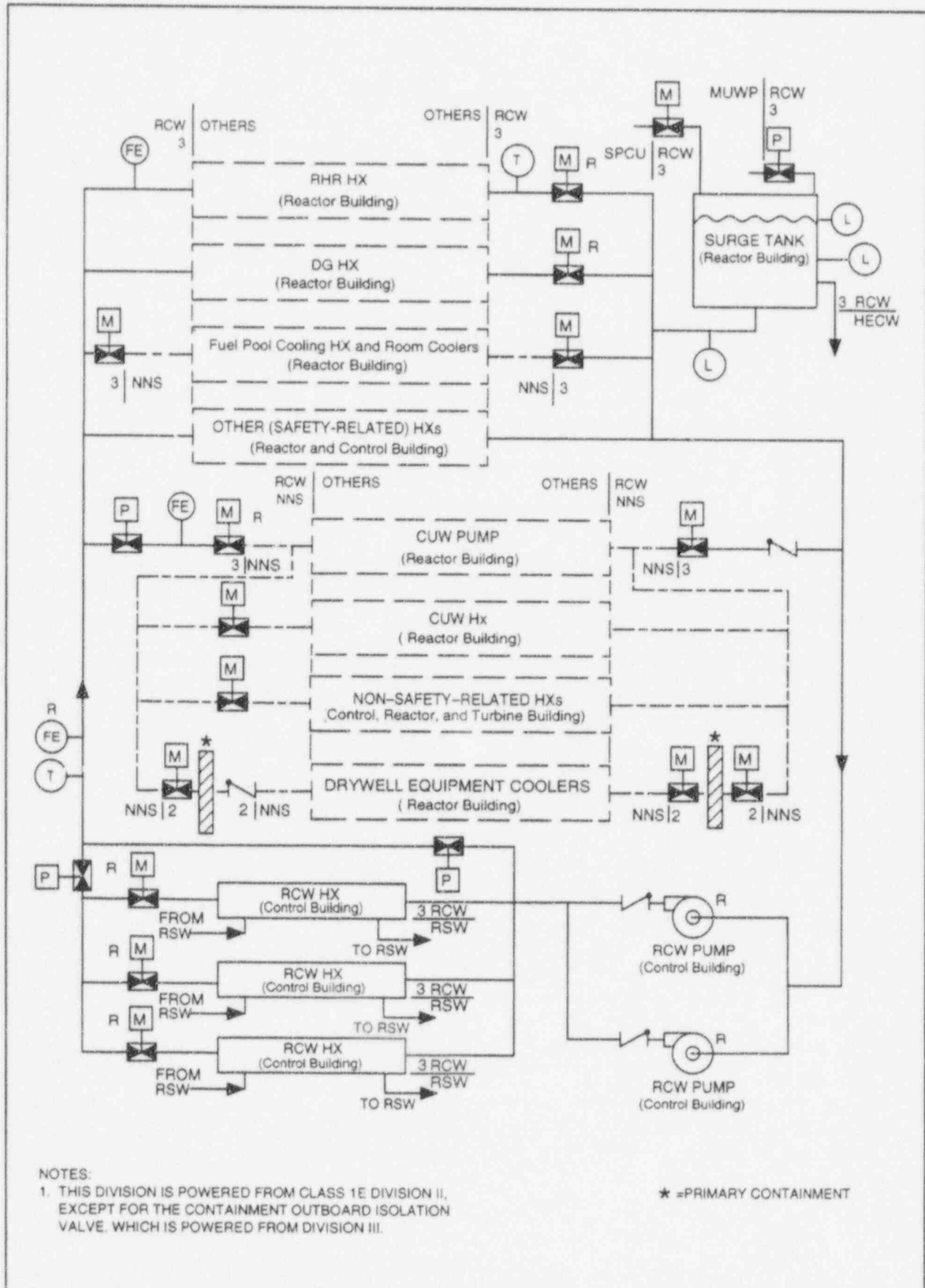


Figure 2.11.3b Reactor Building Cooling Water System (RCW-B)

**Table 2.11.3a Reactor Building Cooling Water Cooling Loads
Division A**

Operating Mode/Components*	Normal Operating Conditions	Shutdown	Hot Standby (loss of AC Power)	Emergency (LOCA)
RCW/RSW Heat Exchangers In Service	2	3	3	3
SAFETY-RELATED				
Emergency Diesel Generator A	†	†	‡	‡
RHR Heat Exchanger A	†	‡	‡	‡
Others (safety-related) ^f	‡	‡	‡	‡
NON-SAFETY-RELATED				
CUW Heat Exchanger	‡	‡	‡	†
FPC Heat Exchanger A**	‡	‡	‡	‡
Inside Drywell	‡	‡	‡	†
Others (non-safety-related)	‡	‡	‡	‡

* Some of these cooling loads are serviced by only one or two RCW divisions. These components may be reassigned to other RCW divisions if redundancy and divisional alignment of supported and supporting systems is maintained and the design basis cooling capacity of the RCW divisions is assured.

† Equipment does not receive RCW in this mode.

‡ Equipment receives RCW in this mode.

^f HECW refrigerators, room coolers (RHR, RCIC, CAMS), RHR motor bearing and seal coolers, and CAMS cooler.

** Includes FPC room cooler.

**Table 2.11.3b Reactor Building Cooling Water Cooling Loads
Division B**

Operating Mode/Components*	Normal Operating Conditions	Shutdown	Hot Standby (loss of AC Power)	Emergency (LOCA)
RCW/RSW Heat Exchangers In Service	2	3	3	3
SAFETY-RELATED				
Emergency Diesel Generator B	†	†	‡	‡
RHR Heat Exchanger B	†	‡	‡	‡
Others (safety-related) ^f	‡	‡	‡	‡
NON-SAFETY-RELATED				
RWCU Heat Exchanger	‡	‡	‡	†
FPC Heat Exchanger B**	‡	‡	‡	‡
Inside Drywell	‡	‡	‡	†
Others (non-safety-related)	‡	‡	‡	‡

* Some of these cooling loads are serviced by only one or two RCW divisions. These components may be reassigned to other RCW divisions if redundancy and divisional alignment of supported and supporting systems is maintained and the design basis cooling capacity of the RCW divisions is assured.

† Equipment does not receive RCW in this mode.

‡ Equipment receives RCW in this mode.

^f HECW refrigerators, room coolers (RHR, HPCF, SGTS, FCS, CAMS), RHR and HPCF motor bearing and seal coolers, and CAMS cooler.

** Includes FPC room cooler.

2.11.5 HVAC Normal Cooling Water System

Design Description

The Heating Ventilating and Air Conditioning (HVAC) Normal Cooling Water (HNCW) System delivers chilled water to the Drywell Cooling System and to non-safety-related fan coil units of building HVAC systems. Figure 2.11.5 shows the basic system configuration and scope.

The HNCW System is classified as non-safety-related with the exception of the primary containment isolation function.

The HNCW System pumps and refrigerators are located in the Turbine Building.

The primary containment penetrations and isolation valves are classified as Seismic Category I, and ASME Code Class 2.

The inboard containment isolation valves is powered from Class 1E Division II, and the outboard isolation valves are powered from Class 1E Division I. In the HNCW System, independence is provided between Class 1E divisions, and also between the Class 1E divisions and non-Class 1E equipment.

The main control room has control and open/close status indication for the primary containment isolation valves.

The safety-related electrical equipment that provides primary containment isolation and is located in the primary containment and the Reactor Building is qualified for a harsh environment.

The primary containment isolation motor-operated valves (MOVs) shown on Figure 2.11.5 have active safety-related function to close and perform this function under differential pressure, fluid flow, and temperature conditions.

The check valve (CV) for containment isolation shown on Figure 2.11.5 has an active safety-related function to close under system pressure, fluid flow, and temperature conditions.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.11.5 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be undertaken for the HNCW System.

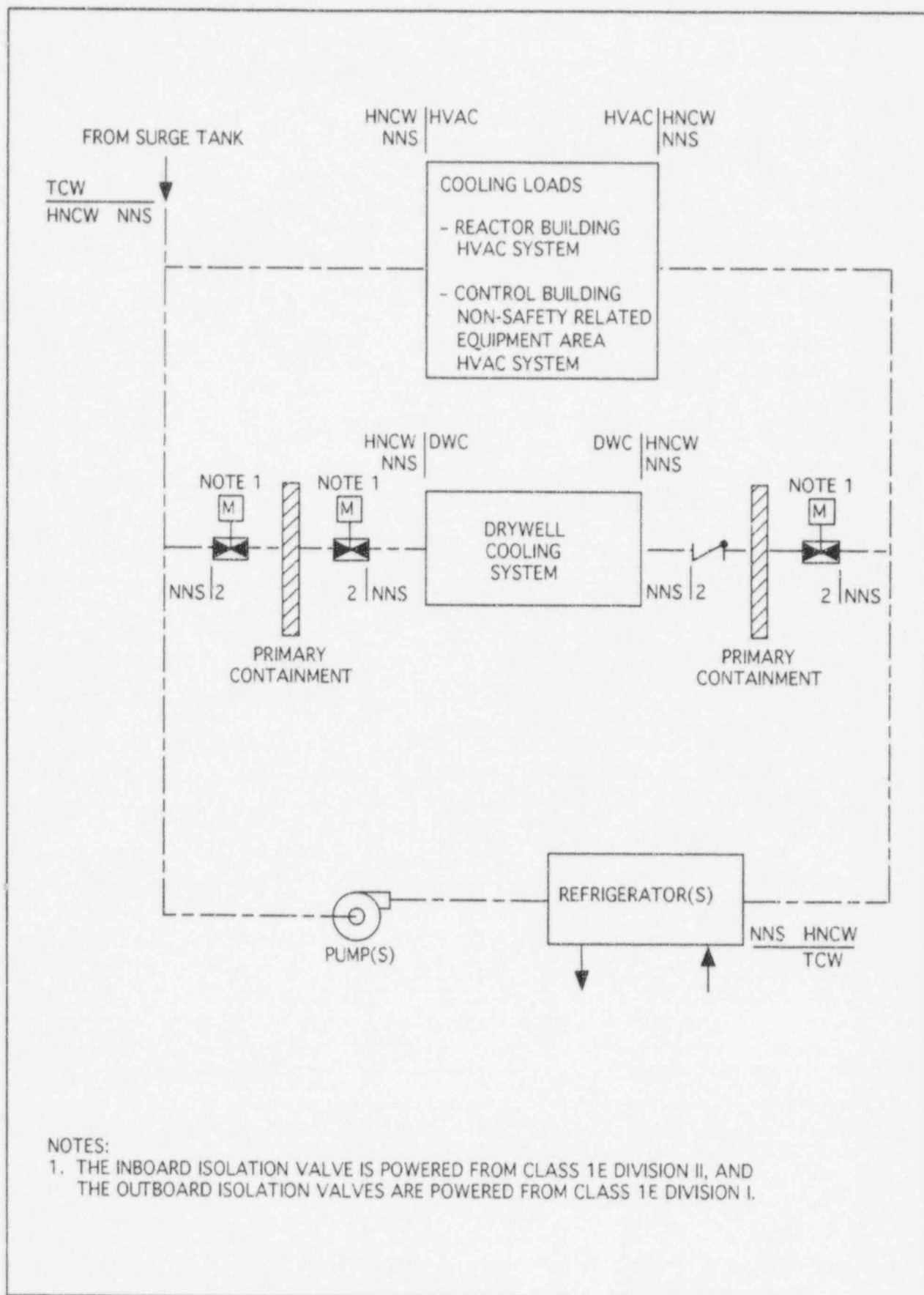


Figure 2.11.5 HVAC Normal Cooling Water System

2.11.6 HVAC Emergency Cooling Water System

Design Description

The Heating Ventilating and Air Conditioning (HVAC) Emergency Cooling Water (HECW) System delivers chilled water to the:

- (1) Control Room Habitability Area HVAC System.
- (2) Control Building Safety-Related Equipment Area HVAC System.
- (3) Reactor Building HVAC System (safety-related electrical equipment HVAC).

Figures 2.11.6a and 2.11.6b show the basic system configuration and scope.

The HECW System is classified as safety-related except for the chemical addition tank and associated piping and valves.

The HECW System is manually initiated.

Each HECW System refrigerator unit has a capacity of not less than 2.43 GJ/h. In Division A, the refrigerator unit on standby automatically starts if the other refrigerator unit is stopped. In Divisions B and C, any refrigerator unit on standby automatically starts if any of the other refrigerator units in Divisions B or C is stopped.

Safety-related portions of the HECW System are classified as Seismic Category I. Figures 2.11.6a and 2.11.6b show the ASME Code class for the HECW System piping and components.

The HECW System pumps and refrigerator units are located in the Control Building.

Each of the three HECW System divisions is powered from the respective Class 1E divisions as shown on Figures 2.11.6a and 2.11.6b. In the HECW System, independence is provided between Class 1E divisions, and also between Class 1E divisions and non-Class 1E equipment.

Except for the connections to the chemical addition tanks, each mechanical division of the HECW System (Divisions A, B, C) is physically separated from the other divisions.

The HECW System has the following main control room (MCR) displays and controls:

- (1) Control and status indications for the refrigerator units and pumps shown on Figure 2.11.6a and 2.11.6b.
- (2) Parameter displays for instruments shown on Figures 2.11.6a and 2.11.6b.

The check valves (CVs) shown on Figures 2.11.6a and 2.11.6b have active safety-related functions to open, close, or both open and close under system pressure, fluid flow, and temperature conditions.

The pneumatic-operated valves shown in Figures 2.11.6a and 2.11.6b fail as follows in the event that either electric power to the valve-actuating solenoid is lost or pneumatic pressure to the valve is lost: the differential pressure control valves fail closed, and the flow control valves to the cooling coils fail open.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.11.6 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be undertaken for the HECW System.

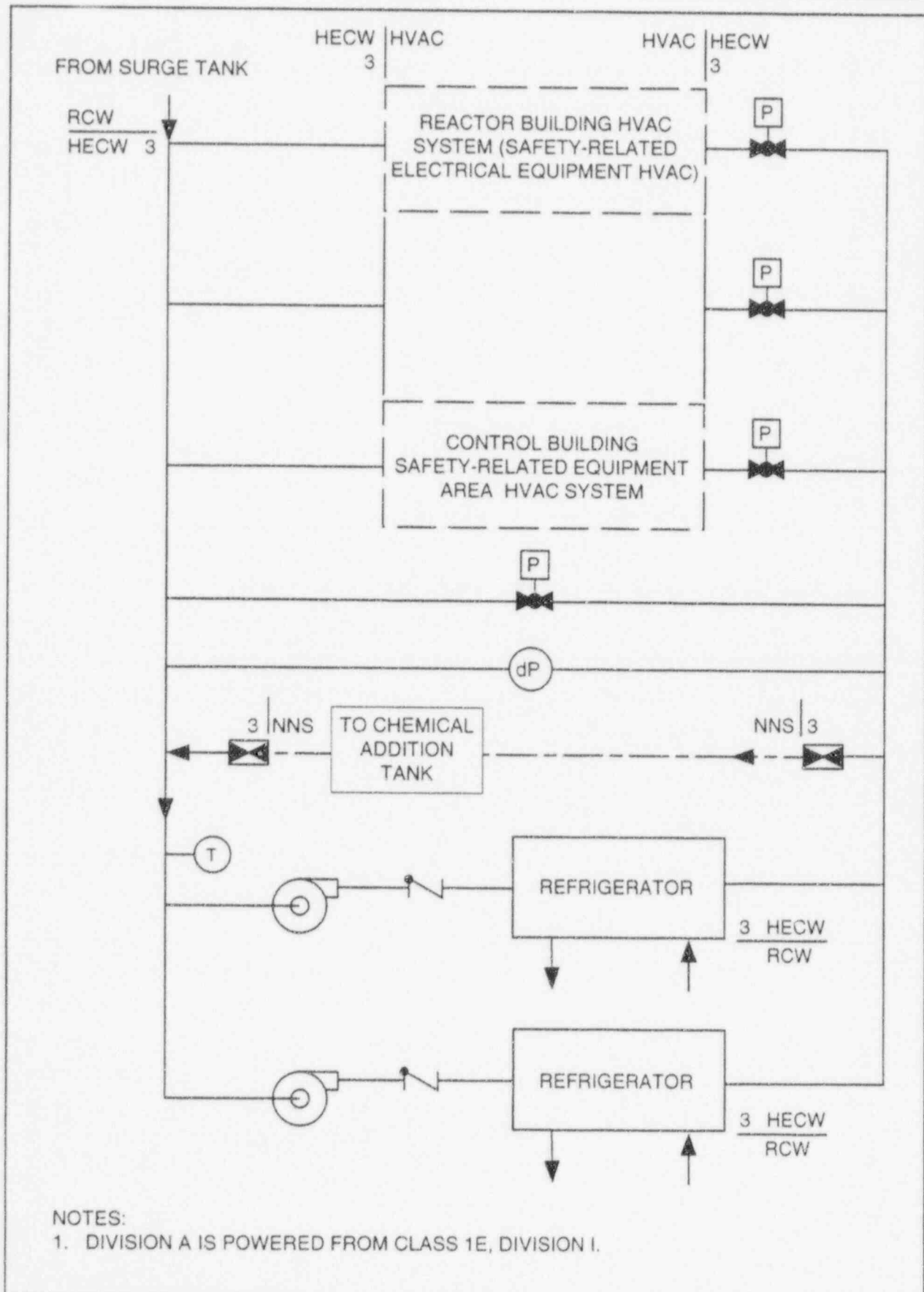


Figure 2.11.6a HVAC Emergency Cooling Water System (HECW-A)

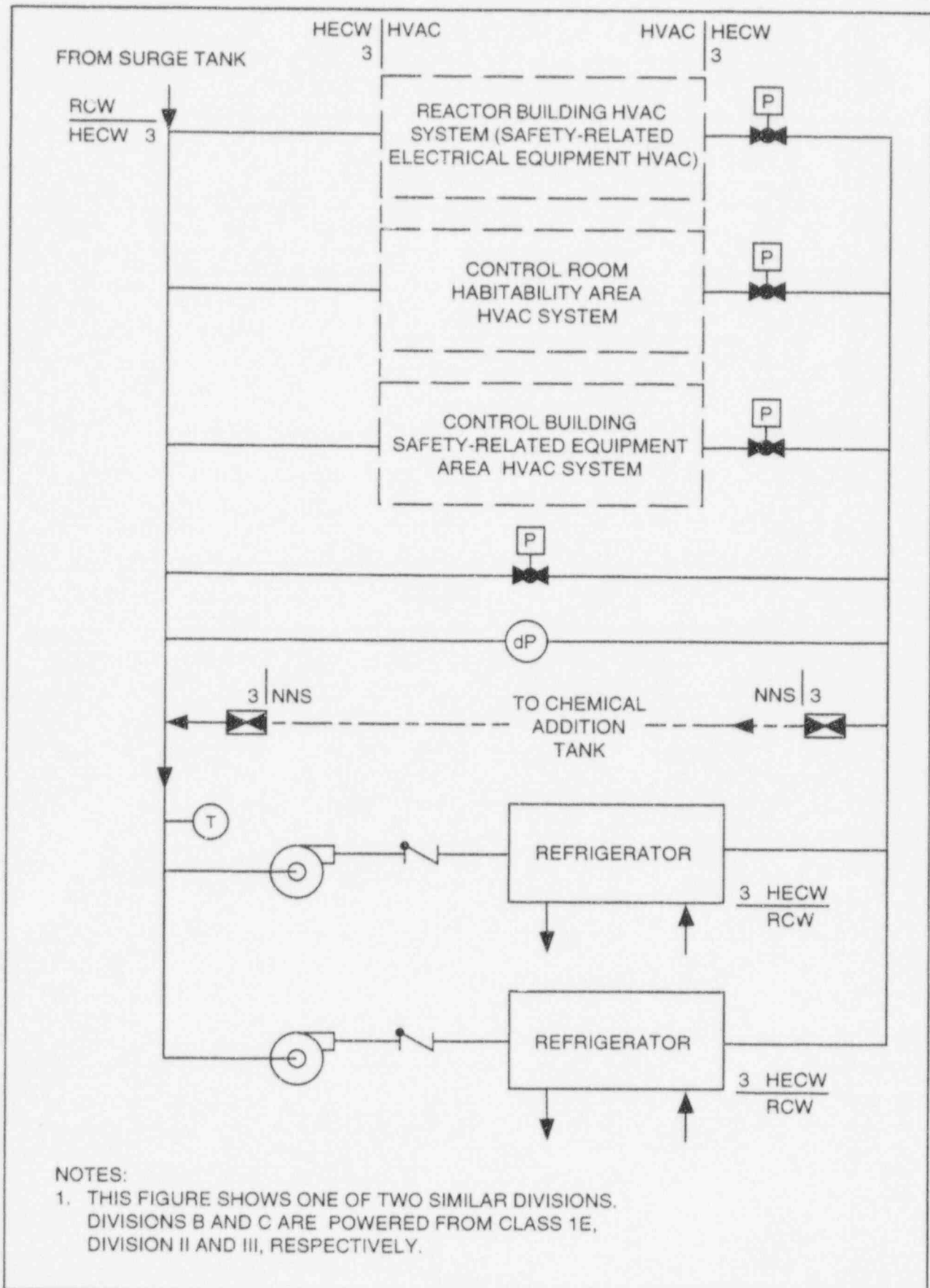


Figure 2.11.6b HVAC Emergency Cooling Water System (HECW-B and C)

Table 2.11.6 HVAC Emergency Cooling Water System

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The basic configuration for the HECW System is shown on Figures 2.11.6a and 2.11.6b.	1. Visual inspections of the as-built system configuration will be conducted.	1. The as-built configuration of the HECW System is in accordance with Figures 2.11.6a and 2.11.6b.
2. The ASME Code components of the HECW System retain their integrity under internal pressures that will be experienced during service.	2. A hydrostatic test will be conducted on those Code components of the HECW System required to be hydrostatically tested by the ASME Code.	2. The results of the hydrostatic test of the ASME Code components of the HECW System conform with the requirements in the ASME Code, Section III.
3. Each HEWC System refrigerator unit has a capacity of not less than 2.43 GJ/h.	3. Type tests will be conducted on an as-built HECW System refrigerator units at a test facility.	3. Each HEWC System refrigerator unit has a capacity of not less than 2.43 GJ/h.
4. In Division A, the refrigerator unit on standby automatically starts if the other refrigerator unit is stopped. In Divisions B and C, any refrigerator unit on standby automatically starts if any of the other refrigerator units in Division B or C is stopped.	4. Tests will be conducted on each as-built HECW System refrigerator unit in Divisions A, B and C, using simulated signals indicating another refrigerator unit is stopped.	4. In Division A, the refrigerator unit on standby automatically starts upon receipt of a simulated signal indicating that the other refrigerator unit is stopped. In Divisions B and C, the refrigerator unit on standby automatically starts upon receipt of a simulated signal indicating that any of the other refrigerator units in Divisions B or C is stopped.
5. Each of the three HECW System divisions is powered from the respective Class 1E divisions as shown on Figures 2.11.6a and 2.11.6b. In the HECW System, independence is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E equipment.	5. <ul style="list-style-type: none"> a. Tests will be performed on the HECW System by providing a test signal in only one Class 1E division at a time. b. Inspections of the as-built Class 1E divisions in the HECW System will be performed. 	5. <ul style="list-style-type: none"> a. The test signal exists only in the Class 1E division under test in the HECW System. b. In the HECW System, physical separation or electrical isolation exists between Class 1E divisions. Physical separation or electrical isolation exists between these Class 1E divisions and non-Class 1E equipment.

Table 2.11.6 HVAC Emergency Cooling Water System (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
6. Except for the connections to the chemical addition tank, each mechanical division of the HECW System (Divisions A, B, C) is physically separated from the other divisions.	6. Inspections of the as-built HECW System will be conducted.	6. Each mechanical division of the HECW System is physically separated from the other mechanical divisions of the HECW System by structural and/or fire barriers, with the exception connections to the chemical addition tank.
7. Main control room displays and controls provided for the HECW System are as defined in Section 2.11.6.	7. Inspections will be performed on the main control room displays and controls for the HECW System.	7. Displays and controls exist or can be retrieved in the main control room as defined in Section 2.11.6.
8. CVs designated in Section 2.11.6 as having an active safety-related function open, close, or both open and close under system pressure, fluid flow, and temperature conditions.	8. Tests of installed valves for opening, closing, or both opening and closing, will be conducted under system preoperational pressure, fluid flow, and temperature conditions.	8. Based on the direction of the differential pressure across the valve, each CV opens, closes, or both opens and closes, depending upon the valve's safety functions.
9. The pneumatic-operated valves shown in Figures 2.11.6a and 2.11.6b fail as follows in the event that either electric power to the valve actuating solenoid is lost or pneumatic pressure to the valve is lost: the differential pressure control valves fail closed, and the flow control valves to the cooling coils fail open.	9. Tests will be performed on the as-built valves by initiating loss of pneumatic pressure and power to the actuating solenoids.	9. The pneumatic actuated valves listed below fail as specified when either electric power to the valve actuating solenoid is lost or pneumatic pressure to the valve is lost: the differential pressure control valves fail closed, and the flow control valves to the cooling coils fail open.

2.15.5 Heating, Ventilating and Air Conditioning Systems

Design Description

Control Room Habitability Area HVAC System

The Control Room Habitability Area (CRHA) Heating, Ventilating and Air Conditioning (HVAC) System provides a controlled environment for personnel comfort and safety, and for the operation of equipment in the main control area envelope (MCAE). The system consists of two (redundant) divisions. Each division consists of an air conditioning unit with two supply fans, two exhaust fans, and an emergency filtration unit with two circulating fans. The emergency filtration unit will have at least 99% removal efficiency for all forms of iodine (elemental, organic, particulate, and hydrogen iodide) from the influent system.

Toxic gas monitors may be required in the outside air intakes of the CRHA HVAC System; these sensors are not in the Certified Design.

Figure 2.15.5a shows the basic configuration and scope for the CRHA HVAC System.

The CRHA HVAC System is classified as safety-related.

The CRHA HVAC System operates in the following modes:

- (1) Normal operating.
- (2) High radiation.
- (3) Outside smoke.
- (4) Smoke removal.

Normal Operating Mode

In the normal operating mode, one air conditioning unit, one supply fan, and one exhaust fan operate in each division. The exhaust fan automatically starts when the supply fan is started.

The MCAE is maintained at a minimum pressure of 3.2 mm water gauge above the outside atmosphere.

High Radiation Mode

On receipt of a Process Radiation Monitoring (PRM) System signal for high radiation in the outside air intake of the operating division, the normal outside air intake dampers close, the exhaust air dampers close, the exhaust fan stops, the minimum outside air intake dampers open, and one fan of the emergency filtration unit starts.

In the high radiation mode, a positive pressure of at least 3.2 mm water gauge is maintained in the MCAE relative to the outside atmosphere. Each emergency filtration unit treats a mixture of MCAE recirculated air and outside makeup air to maintain the positive pressure with not more than 3400 m³ per hour (@ one atmosphere absolute pressure, 0°C) of outside air.

The redundant division of the CRHA HVAC System starts on a low flow signal from the operating emergency filtration unit. The redundant division is connected to an outside air intake, which is separated from the other intake by a minimum of 50m.

Outside Smoke Mode

When smoke detection sensors in the operating outside air intake detect smoke, a signal will initiate MCAE air recirculation by isolating the outside air intake, closing the exhaust damper and stopping the exhaust fan.

Smoke Removal Mode

The smoke removal mode is manually initiated by closing the recirculation damper and starting both exhaust fans at high speed in conjunction with a supply fan.

The remaining discussion in this section is not mode-specific and applies (unless stated otherwise) to the entire CRHA HVAC System.

MCAE temperature is maintained between 21°C and 26°C, with a relative humidity between 10% and 60%, except when in the smoke removal mode.

The CRHA HVAC System is classified as Seismic Category I. The CRHA HVAC System is located in the Control Building.

Each of the two CRHA HVAC System divisions, with the exception of the motor operated dampers, is powered from the respective Class 1E division as shown on Figure 2.15.5a. Each pair of motor operated isolation dampers in series is powered from two independent Class 1E divisions (one damper is powered from Class 1E division II and the other damper is from Class 1E division III). In the CRHA HVAC System, independence is provided between Class 1E divisions, and also between the Class 1E divisions and non-Class 1E equipment.

Each mechanical division of the CRHA HVAC System (Divisions B and C) is physically separated from the other division, except for the common ducts in the MCAE.

Fire dampers with fusible links in HVAC duct work close under air flow conditions.

The CRHA HVAC System has the following displays and controls in the main control room:

- (1) Controls and status indication for the active safety-related components shown on Figure 2.15.5a.

- (2) Parameter displays for the instruments shown on Figure 2.15.5a, except for the smoke detectors.

Interface Requirements

Toxic gas monitors will be located in the outside air intakes of the CRHA HVAC System, if the site is adjacent to toxic gas sources with the potential for releases of significance to plant operating personnel in the MCAE. These monitors should have the following requirements:

- (1) Be located in the outside air intakes of each division of the CRHA HVAC System.
- (2) Be capable of detecting toxic gas concentrations at which personnel protective actions must be initiated.

Control Building Safety-Related Equipment Area HVAC System

The Control Building Safety-Related Equipment Area (CBSREA) HVAC System provides a controlled temperature environment for the operation of equipment in the Control Building, excluding the MCAE. The system also limits hydrogen concentration in the battery rooms. The CBSREA HVAC System consists of three independent safety-related divisions, each serving a designated area. Each division consists of an air conditioning unit with two supply fans, and two exhaust fans.

The CBSREA HVAC System also ventilates rooms that contain non-safety-related equipment and provides supplemental cooling in these rooms using non-safety-related fan coil units (FCUs).

The basic system configuration and scope for the CBSREA HVAC System is shown on Figures 2.15.5b, 2.15.5c and 2.15.5d.

The CBSREA HVAC System is classified as safety-related except for the FCUs.

The CBSREA HVAC System operates in the following modes:

- (1) Normal operating mode, including accident conditions.
- (2) Smoke removal mode.

Normal Operating Mode

In the normal operating mode, one air conditioning unit, one supply fan, and one exhaust fan of each division operate. The exhaust fan automatically starts when the supply fan is started.

In the areas served by the CBSREA HVAC System, the temperature is maintained below 40°C.

Hydrogen concentration is maintained at less than 2% by volume in the battery rooms.

Smoke Removal Mode

The smoke removal mode is manually initiated by closing the recirculation damper, and starting both exhaust fans in conjunction with a supply fan to allow outside air purging of the affected Control Building area. The normal operating mode is used to remove smoke from the battery rooms.

The remaining discussion in this section is not mode-specific and applies (unless stated otherwise) to the entire CBSREA HVAC System.

The CBSREA HVAC System is classified as Seismic Category I, except for the non-safety-related fan coil units. The CBSREA HVAC System is located in the Control Building.

Each of the three CBSREA HVAC System divisions is powered from the respective Class 1E division as shown on Figures 2.15.5b, 2.15.5c and 2.15.5d. In the CBSREA HVAC System, independence is provided between Class 1E divisions, and also between the Class 1E divisions and non-Class 1E equipment.

Each mechanical division of the CBSREA HVAC System (Divisions A, B and C) is physically separated from the other divisions. CBSREA HVAC System Division B duct penetrations of Division IV firewalls are provided with fire dampers.

Fire dampers with fusible links in HVAC duct work close under air flow conditions.

The CBSREA HVAC System has the following displays and controls in the main control room:

- (1) Controls and status indication for the active safety-related components shown on Figures 2.15.5b, 2.15.5c and 2.15.5d.
- (2) Parameter displays for the instruments shown on Figures 2.15.5b, 2.15.5c and 2.15.5d.

Reactor Building HVAC System

The Reactor Building (R/B) HVAC System provides a controlled environment for the operation of equipment in the Reactor Building.

The Reactor Building HVAC System consists of three independent safety-related divisions. Each division is composed of the following systems:

- (1) R/B Safety-Related Equipment HVAC System.
- (2) R/B Safety-Related Electrical Equipment HVAC System.

- (3) R/B Safety-Related Diesel Generator HVAC System.

The Reactor Building HVAC System includes the following non-safety-related systems:

- (1) R/B Secondary Containment HVAC System.
- (2) R/B Primary Containment Supply/Exhaust System.
- (3) R/B Main Steam Tunnel HVAC System.
- (4) R/B Non-Safety-Related Equipment HVAC System.
- (5) R/B Reactor Internal Pump (RIP) Adjustable Speed Drive (ASD) Control Panel HVAC System

R/B Safety-Related Equipment HVAC System

The R/B Safety-Related Equipment HVAC System provides cooling of safety-related equipment areas, and consists of independent fan coil units. Figure 2.15.5e shows the basic system configuration and scope.

The R/B Safety-Related Equipment HVAC System is classified as safety-related.

The Residual Heat Removal (RHR) System, High Pressure Core Flooder (HPCF) System and Reactor Core Isolation Cooling (RCIC) System pump room FCUs are automatically initiated upon startup of their respective room process pump. The Containment Atmospheric Monitoring System (CAMS) and Standby Gas Treatment System (SGTS) room FCUs are automatically initiated upon isolation of the Reactor Building Secondary Containment HVAC System. The Flammability Control System (FCS) room FCUs are also initiated upon a manual FCS start signal.

The temperature in the safety-related equipment areas is maintained below 40°C, except for the RHR, HPCF, and RCIC pump rooms, which are maintained below 66°C during pump operation.

The R/B Safety-Related Equipment HVAC System is classified as Seismic Category I. The R/B Safety-Related Equipment HVAC System is located in the Reactor Building.

Each of the three divisions of the R/B Safety-Related Equipment HVAC System is powered from the respective Class 1E division as shown on Figure 2.15.5e. In the R/B Safety-Related Equipment HVAC System, independence is provided between Class 1E divisions, and also between the Class 1E divisions and non-Class 1E equipment.

Each mechanical division (Divisions A, B, C) of the R/B Safety-Related Equipment HVAC System is physically separated from the other divisions.

The R/B Safety-Related Equipment HVAC System has the following displays and controls in the main control room:

- (1) Controls and status indication for the FCUs shown on Figure 2.15.5e.

The safety-related electrical equipment shown on Figure 2.15.5e located in the Reactor Building is qualified for a harsh environment.

R/B Safety-Related Electrical Equipment HVAC System

The R/B Safety-Related Electrical Equipment HVAC System provides cooling of safety-related electrical equipment areas, and consists of three independent divisions. Each division consists of an air conditioning unit with two supply fans, and two exhaust fans. Figures 2.15.5f, 2.15.5g, and 2.15.5h show the basic system configuration and scope.

The R/B Safety-Related Electrical Equipment HVAC System is classified as safety-related.

Normal Operating Mode

In the normal operating mode, the air conditioning unit, one supply fan, and one exhaust fan of each division operate. The exhaust fan automatically starts when the supply fan is started.

In the areas served by the R/B Safety-Related Electrical Equipment HVAC System temperature is maintained below 40°C, except in the diesel generator (DG) engine rooms during DG operation.

Smoke Removal Mode

The smoke removal mode is manually initiated by closing the recirculation damper, stopping the exhaust fan, opening the exhaust fan bypass damper to allow outside air purging of the affected area, and starting the smoke removal fan in conjunction with the supply fan. The normal operating mode is used to remove smoke from the DG day tank rooms.

The R/B Safety-Related Electrical Equipment HVAC System is classified as Seismic Category I. The R/B Safety-Related Electrical Equipment HVAC System is located in the Reactor Building.

Each of the three divisions of the R/B Safety-Related Electrical Equipment HVAC System is powered from the respective Class 1E division as shown on Figures 2.15.5f, 2.15.5g, and 2.15.5h. In the R/B Safety-Related Electrical Equipment HVAC System, independence is provided between Class 1E divisions, and also between the Class 1E divisions and non-Class 1E equipment.

Each mechanical division of the R/B Safety-Related Electrical Equipment HVAC System (Divisions A, B, C) is physically separated from the other divisions.

Fire dampers with fusible links in HVAC duct work close under air flow conditions.

The R/B Safety-Related Electrical Equipment HVAC System has the following displays and controls in the main control rooms:

- (1) Controls and status indication for the active safety-related components shown on Figures 2.15.5f, 2.15.5g, and 2.15.5h.
- (2) Parameter displays for the instruments shown on Figures 2.15.5f, 2.15.5g and 2.15.5h.

R/B Safety-Related Diesel Generator HVAC System

The R/B Safety-Related DG HVAC System provides ventilation for the DG rooms when the DGs operate, and consists of three independent divisions. Each division consists of a filter unit and two supply fans. Figure 2.15.5i shows the basic system configuration and scope.

The R/B Safety-Related DG HVAC System is classified as safety-related.

On receipt of a DG start signal, both DG supply fans start. When the DG is operating, the R/B Safety-Related DG HVAC System and the R/B Safety-Related Electrical Equipment HVAC System maintain the temperature below 50°C.

The R/B Safety-Related DG HVAC System is classified as Seismic Category I. The R/B Safety-Related DG HVAC System is located in the Reactor Building.

Each of the three divisions of the R/B Safety-Related DG HVAC System is powered from the respective Class 1E division as shown on Figure 2.15.5i. In the R/B Safety-Related DG HVAC System, independence is provided between Class 1E divisions, and also between the Class 1E divisions and non-Class 1E equipment.

Each mechanical division of the R/B Safety-Related DG HVAC System (Divisions A, B, C) is physically separated from the other divisions.

The R/B Safety-Related DG HVAC System has the following displays and controls in the main control room:

- (1) Controls and status indication for the active safety-related components shown on Figure 2.15.5i.

R/B Secondary Containment HVAC System

The R/B Secondary Containment HVAC System provides heating and cooling for the secondary containment. Figure 2.15.5j shows the basic system configuration and scope.

Except for the secondary containment isolation dampers, the R/B Secondary Containment HVAC System is classified as non-safety-related.

Normal Operating Mode

In the normal operating mode, two supply fans and two exhaust fans operate. The supply fans operate only when the exhaust fans are operating.

The R/B Secondary Containment HVAC System maintains a negative pressure in the secondary containment relative to the outside atmosphere.

The R/B Secondary Containment HVAC System isolation dampers are closed upon receipt of an isolation signal from the Leak Detection System (LDS) or a signal indicating loss of secondary containment supply and exhaust fans.

Smoke Removal Mode

The smoke removal mode is manually initiated by starting the standby exhaust and supply fans, opening the exhaust filter unit bypass dampers, and partially closing exhaust dampers for divisions not affected by fire.

The R/B Secondary Containment HVAC System penetrations of secondary containment and isolation dampers are classified as Seismic Category I. The R/B Secondary Containment HVAC System is located in the Reactor Building, except for some of the R/B secondary containment HVAC supply and exhaust air components which are located in the Turbine Building.

Each R/B Secondary Containment HVAC System isolation damper requiring electrical power is powered from the Class 1E division, as shown on Figure 2.15.5j. In the R/B Secondary Containment HVAC System, independence is provided between Class 1E divisions, and also between Class 1E divisions and non-Class 1E equipment.

Fire dampers with fusible links in HVAC duct work close under air flow conditions.

The R/B Secondary Containment HVAC System has the following displays and controls in the main control room:

- (1) Control and status indication for the active components shown on Figure 2.15.5j.
- (2) Parameter displays for the instruments shown on Figure 2.15.5j.

The exhaust duct secondary containment isolation dampers are located in the secondary containment and qualified for a harsh environment.

The pneumatically-operated secondary containment isolation dampers, shown on Figure 2.15.5j, fail to the closed position in the event of loss of pneumatic pressure or loss of electrical power to the valve actuating solenoids.

R/B Primary Containment Supply/Exhaust System

The R/B Primary Containment Supply/Exhaust System removes inert atmosphere and provides air for primary containment prior to personnel entry, and consists of a supply fan, a filter unit, and an exhaust fan as shown on Figure 2.15.5j.

The R/B Primary Containment Supply/Exhaust System is classified as non-safety-related. The R/B Primary Containment Supply/Exhaust System is located in the secondary containment

R/B Main Steam Tunnel HVAC System

The R/B Main Steam Tunnel HVAC System provides cooling to the main steam tunnel and consists of two FCUs. Each FCU has two fans. The FCUs are started manually.

The R/B Main Steam Tunnel HVAC System is classified as non-safety-related. The R/B Main Steam Tunnel HVAC System is located in the Reactor Building.

R/B Non-Safety-Related Equipment HVAC System

The R/B Non-Safety-Related Equipment HVAC System provides cooling to the non-safety-related equipment rooms. There are six air handling units in the system. Each consists of a cooling coil, fan(s) and filter, as required.

The R/B Non-Safety-Related Equipment HVAC System is classified as non-safety-related, and is located in the Reactor Building.

Reactor Internal Pump ASD HVAC System

The Reactor Internal Pump ASD HVAC System provides cooling to the RIP ASD power panels. The system consists of a two recirculating air conditioning units with cooling coils and four supply fans.

The RIP ASD HVAC System is classified as non-safety-related, and is located in the Reactor Building.

Turbine Island HVAC System

The Turbine Island HVAC System provides heating, cooling, and ventilation for the Turbine Island. The Turbine Island HVAC System consists of the following non-safety-related systems.

- (1) Turbine Building (T/B) HVAC System.
- (2) Electrical Building (E/B) HVAC System.

Turbine Building (T/B) HVAC System

The T/B HVAC System provides cooling and ventilation for the Turbine Building. The T/B HVAC System consists of:

- (1) T/B supply system with an air conditioning unit and three supply fans.
- (2) T/B exhaust system with three exhaust fans.
- (3) T/B compartment exhaust system with two exhaust fans.
- (4) T/B lube oil area exhaust system with two fans.
- (5) T/B unit coolers and electric unit heaters.

The T/B HVAC System is classified as non-safety-related. The T/B HVAC System is located in the Turbine Building.

Electrical Building (E/B) HVAC System

The E/B HVAC System provides cooling and ventilation for the electrical equipment rooms. The system consists of two air conditioning units, supply fans, two exhaust fans, unit coolers and electric unit heaters.

The E/B HVAC System is classified as non-safety-related. The E/B HVAC System is located in the Electrical Building of the Turbine Island.

Radwaste Building HVAC System

The Radwaste Building HVAC System provides a controlled environment for personnel comfort and safety for the Radwaste Building areas. The system consists of:

- (1) An air conditioning unit and two supply fans for the Radwaste Building control room
- (2) An air conditioning unit with, two supply fans, and three exhaust fans for the process areas of the Radwaste Building.

The Radwaste Building HVAC System is classified as non-safety-related, and is located in the Radwaste Building.

Service Building HVAC System

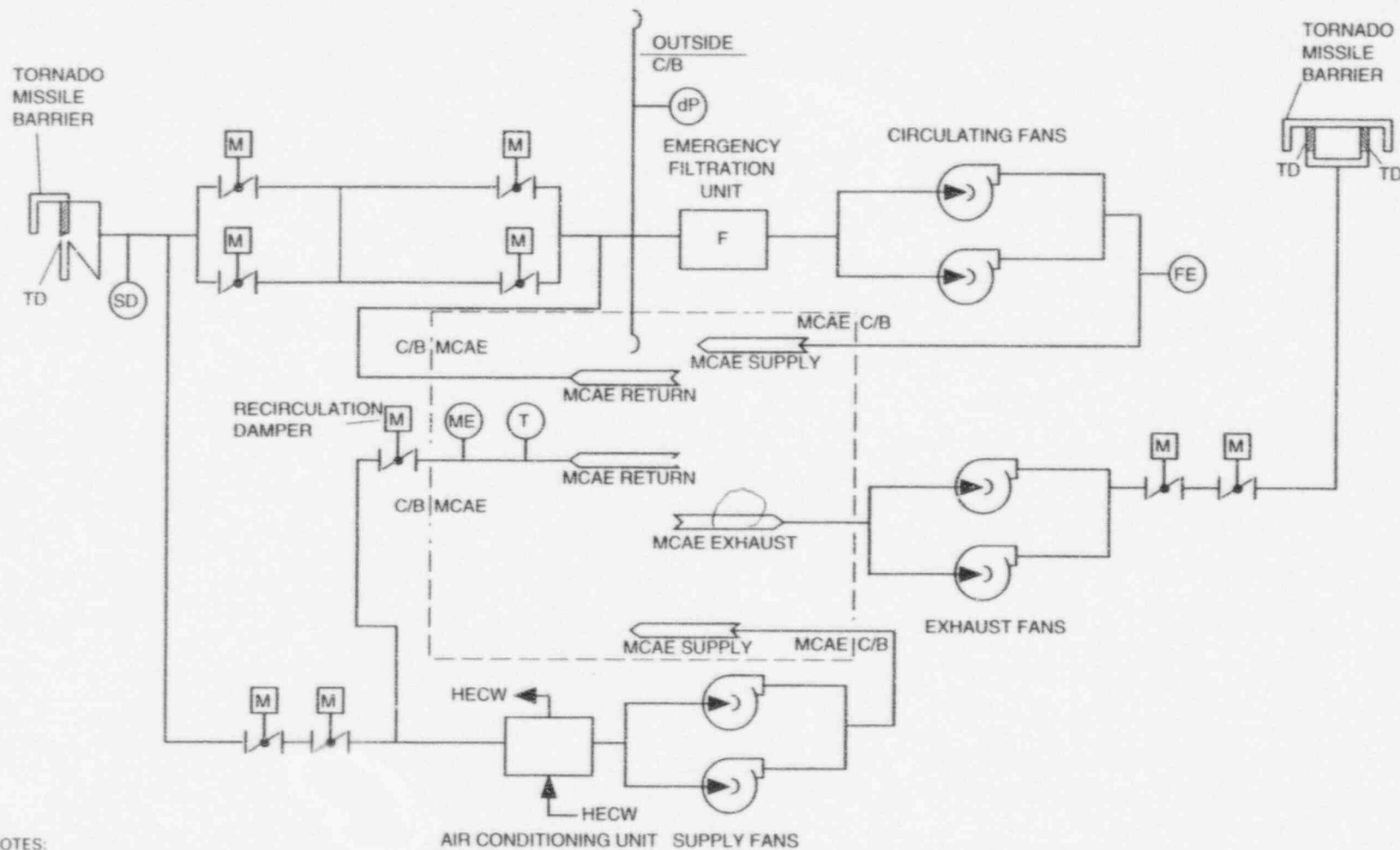
The Service Building (S/B) HVAC System provides controlled environment for personnel comfort in the S/B.

The S/B HVAC System consists of two non-safety-related systems:

- (1) Clean Area HVAC System.

Table 2.15.5l provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be undertaken for the Radwaste Building HVAC System.

Table 2.15.5m provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be undertaken for the Service Building HVAC System.



NOTES:

1. THIS FIGURE SHOWS ONE OF TWO IDENTICAL DIVISIONS. ELECTRICAL POWER LOADS FOR THE COMPONENTS OF DIVISION B EXCEPT MOTOR OPERATED ISOLATION DAMPERS ARE POWERED FROM CLASS 1E DIVISION II. ELECTRICAL POWER LOADS FOR THE COMPONENTS OF DIVISION C EXCEPT MOTOR OPERATED ISOLATION DAMPERS ARE POWERED FROM CLASS 1E DIVISION III.
2. EACH PAIR OF MOTOR OPERATED ISOLATION DAMPERS HAS ONE DAMPER POWERED FROM CLASS 1E DIVISION II AND THE OTHER DAMPER FROM CLASS 1E DIVISION III

Figure 2.15.5a Control Room Habitability Area HVAC System

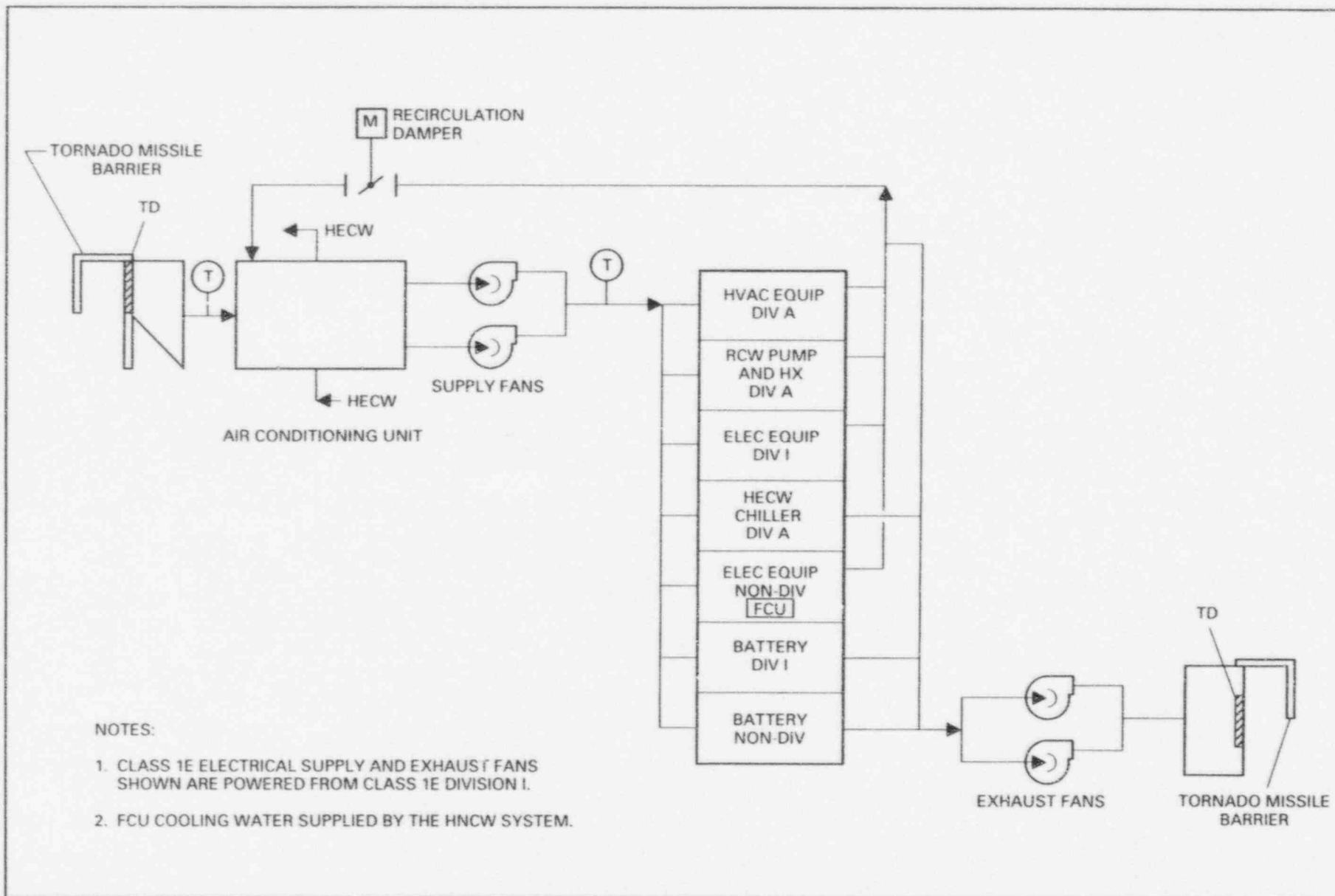


Figure 2.15.5b Control Building Safety-Related Equipment Area HVAC System (Division A)

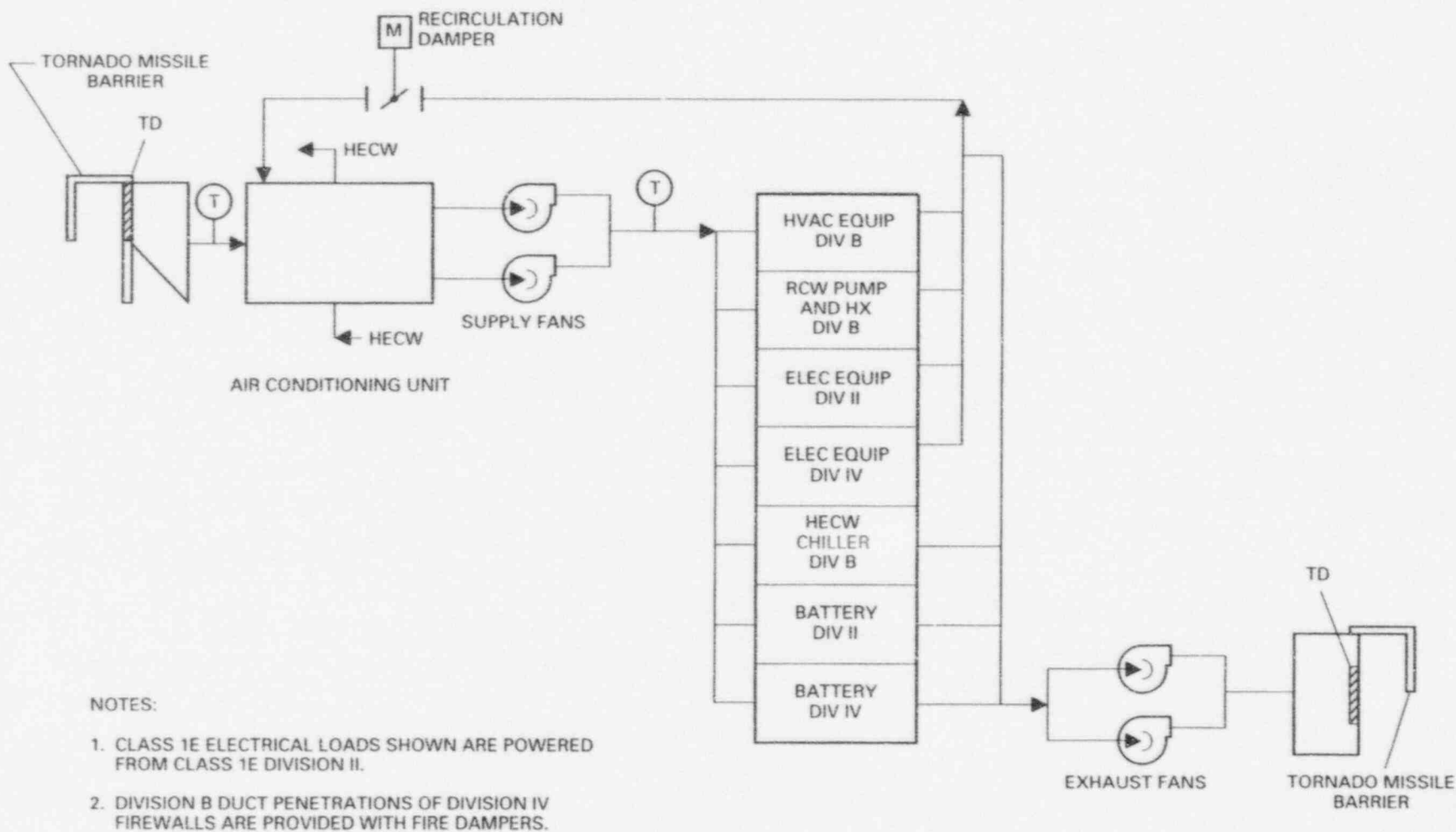
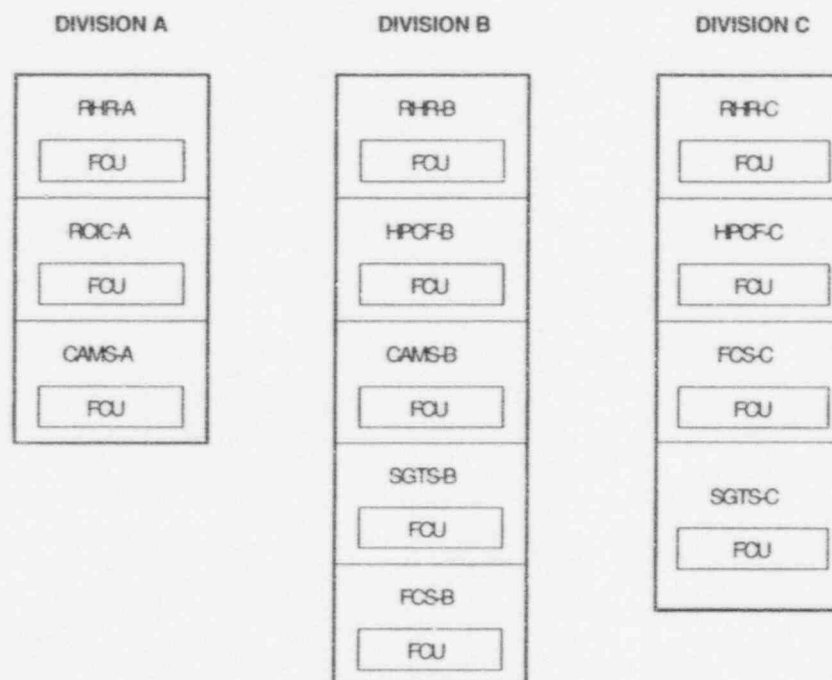


Figure 2.15.5c Control Building Safety-Related Equipment Area HVAC System (Division B)



1. CLASS 1E ELECTRICAL LOADS SHOWN ARE POWERED FROM CLASS 1E DIVISION III.
2. FCU COOLING WATER SUPPLIED BY THE HNCW SYSTEM.

Figure 2.15.5d Control Building Safety-Related Equipment Area HVAC System (Division C)



NOTES:

1. FCU COOLING WATER IS SUPPLIED BY THE RCW SYSTEM.
2. NORMAL VENTILATION AND SMOKE REMOVAL IS PROVIDED BY THE RB SECONDARY CONTAINMENT HVAC SYSTEM.
3. ELECTRICAL POWER LOADS FROM DIVISIONS A, B, AND C ARE POWERED FROM CLASS 1E DIVISIONS I, II, AND III, RESPECTIVELY.

Figure 2.15.5e Reactor Building Safety-Related Equipment HVAC System

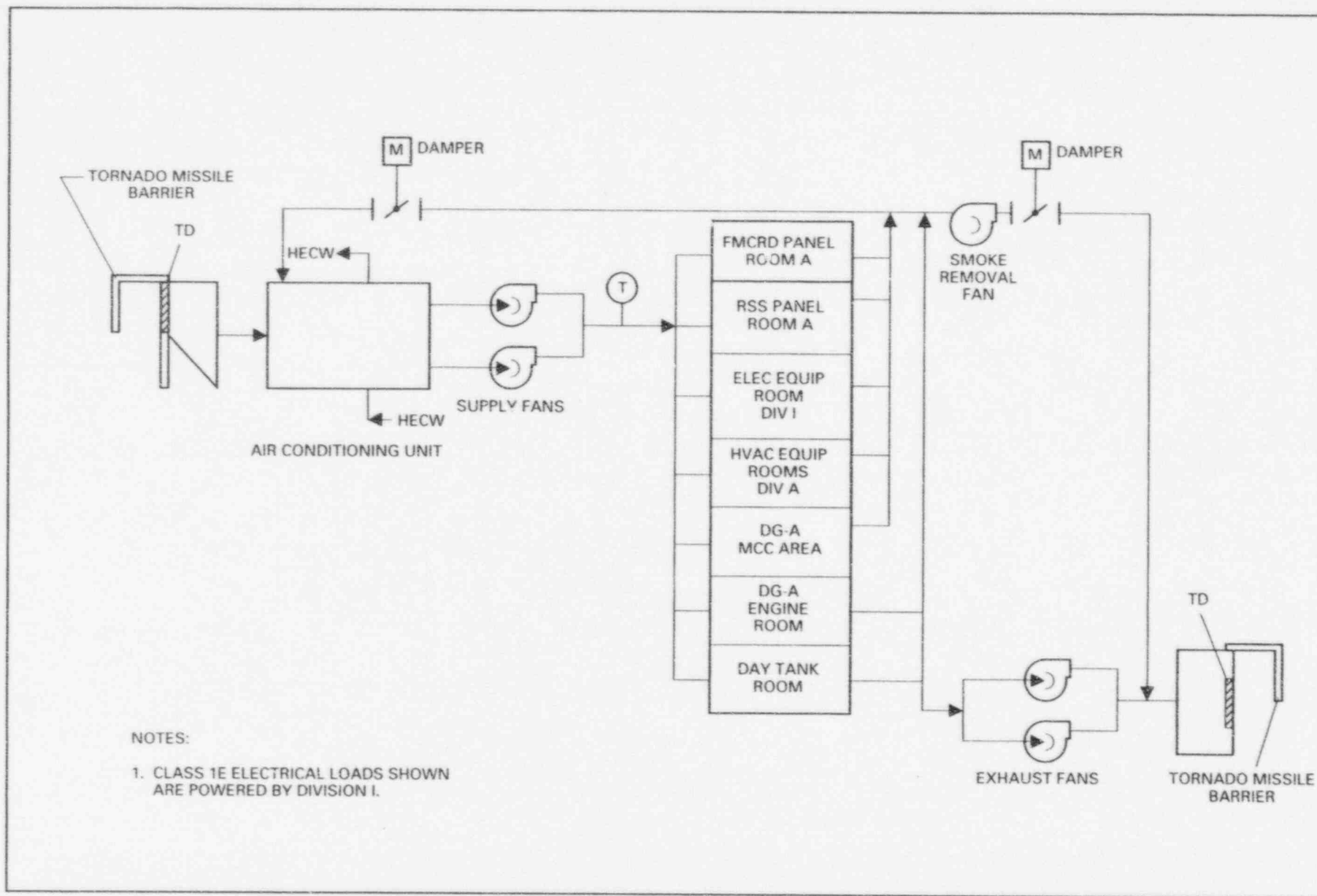


Figure 2.15.5f Reactor Building Safety-Related Electrical Equipment HVAC System (Division A)

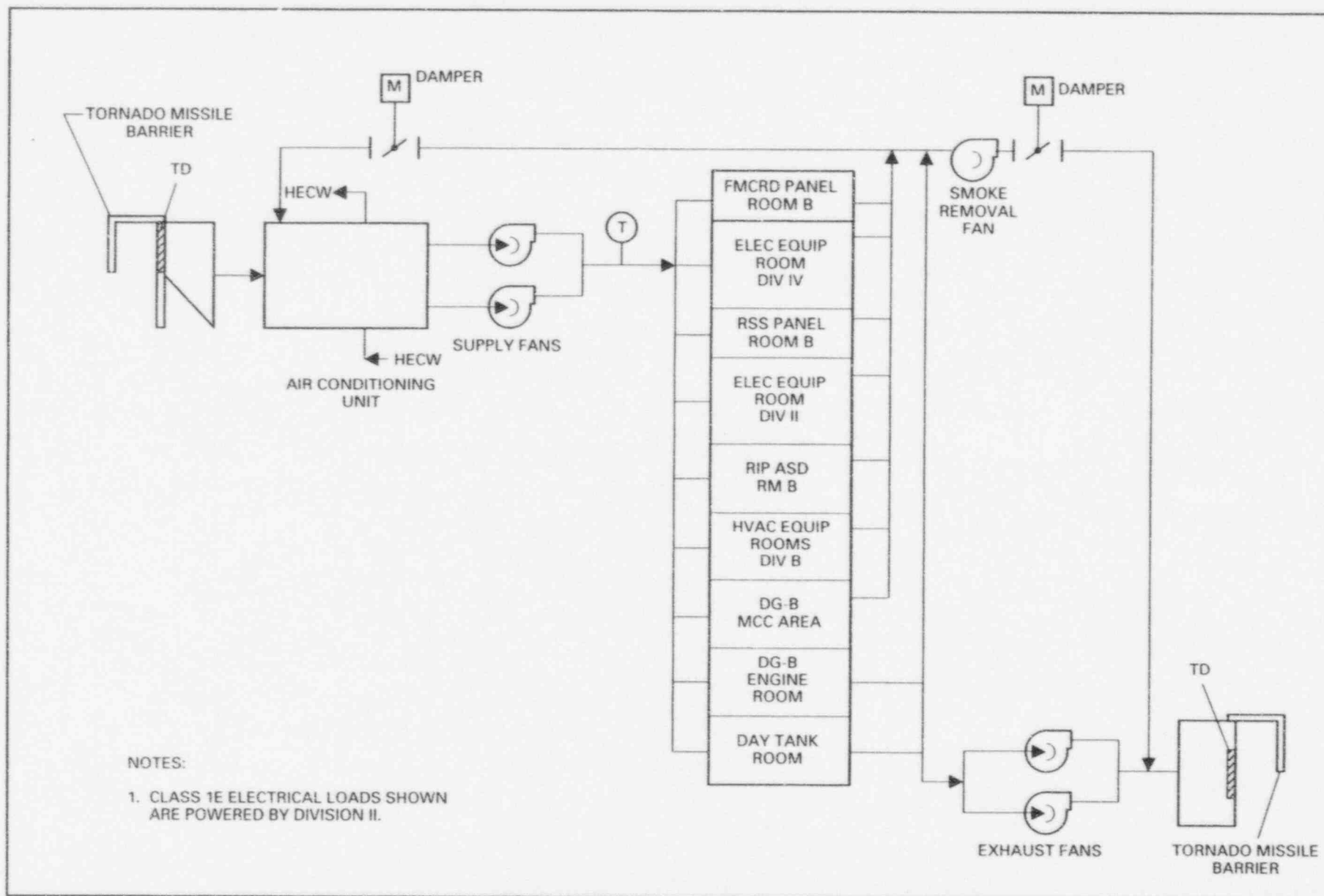


Figure 2.15.5g Reactor Building Safety-Related Electrical Equipment HVAC System (Division B)

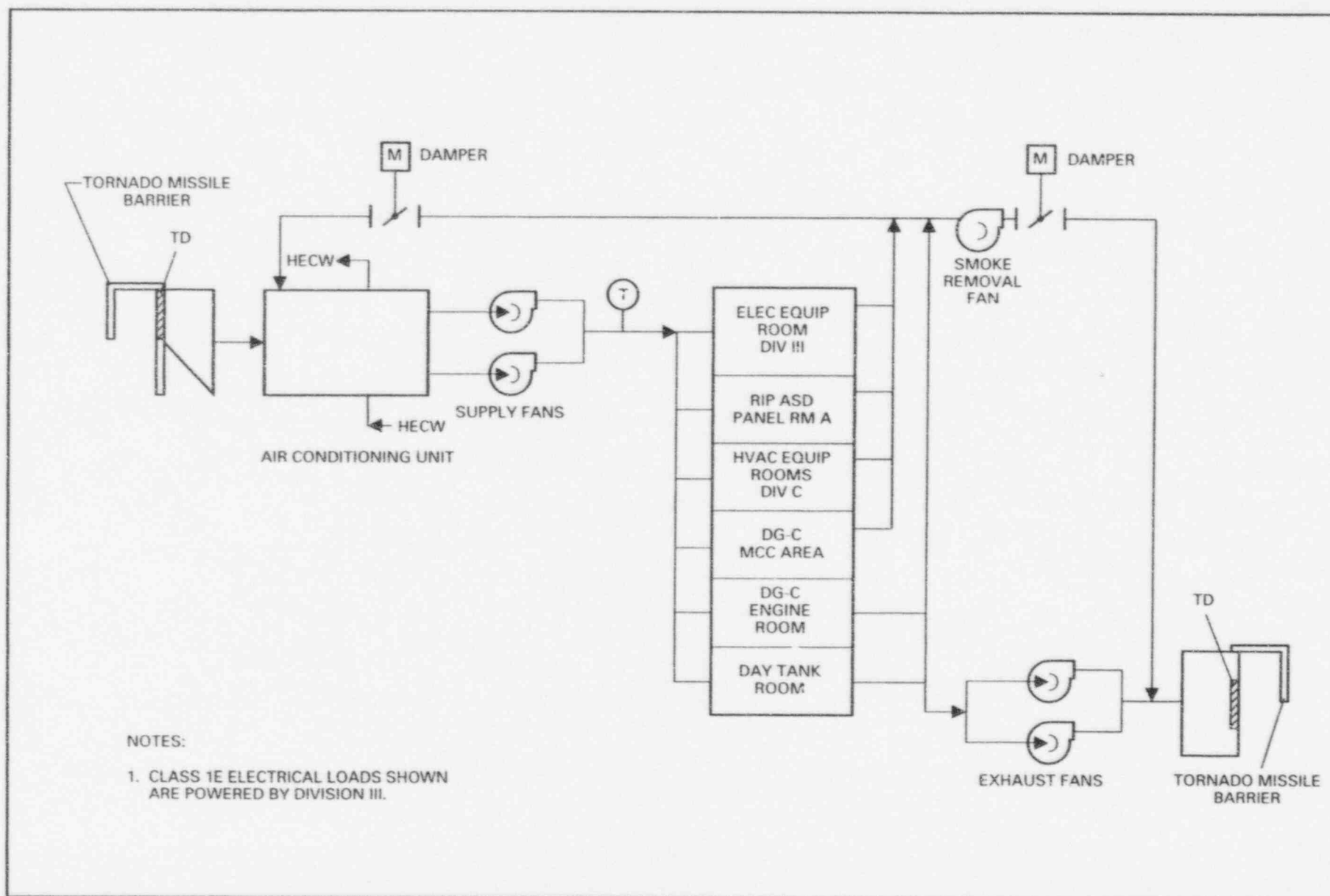
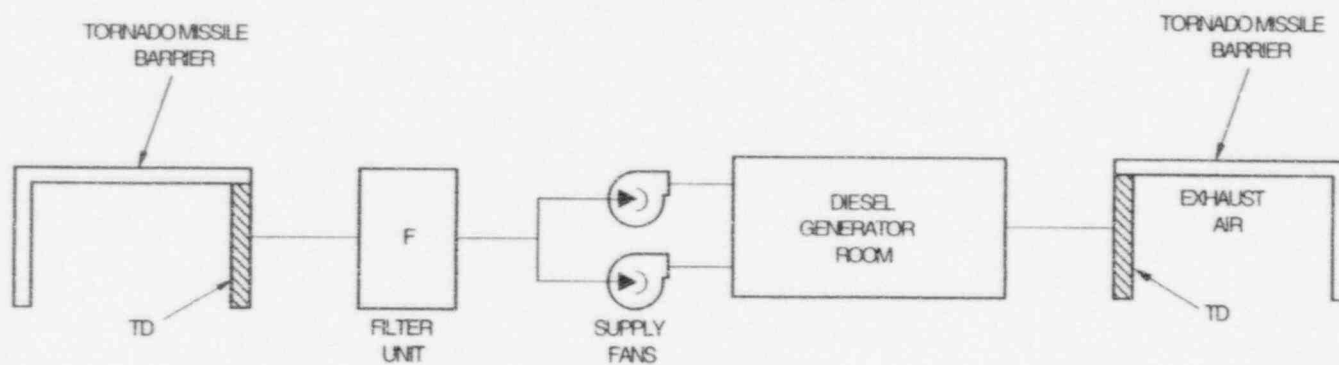


Figure 2.15.5h Reactor Building Safety-Related Electrical Equipment HVAC System (Division C)



NOTES:

1. THIS FIGURE SHOWS ONE OF THREE IDENTICAL DIVISIONS. ELECTRICAL POWER LOADS FOR DIVISIONS A, B, AND C ARE POWERED FROM CLASS 1E DIVISIONS I, II, AND III, RESPECTIVELY.

Figure 2.15.5i Reactor Building Safety-Related Diesel Generator HVAC System

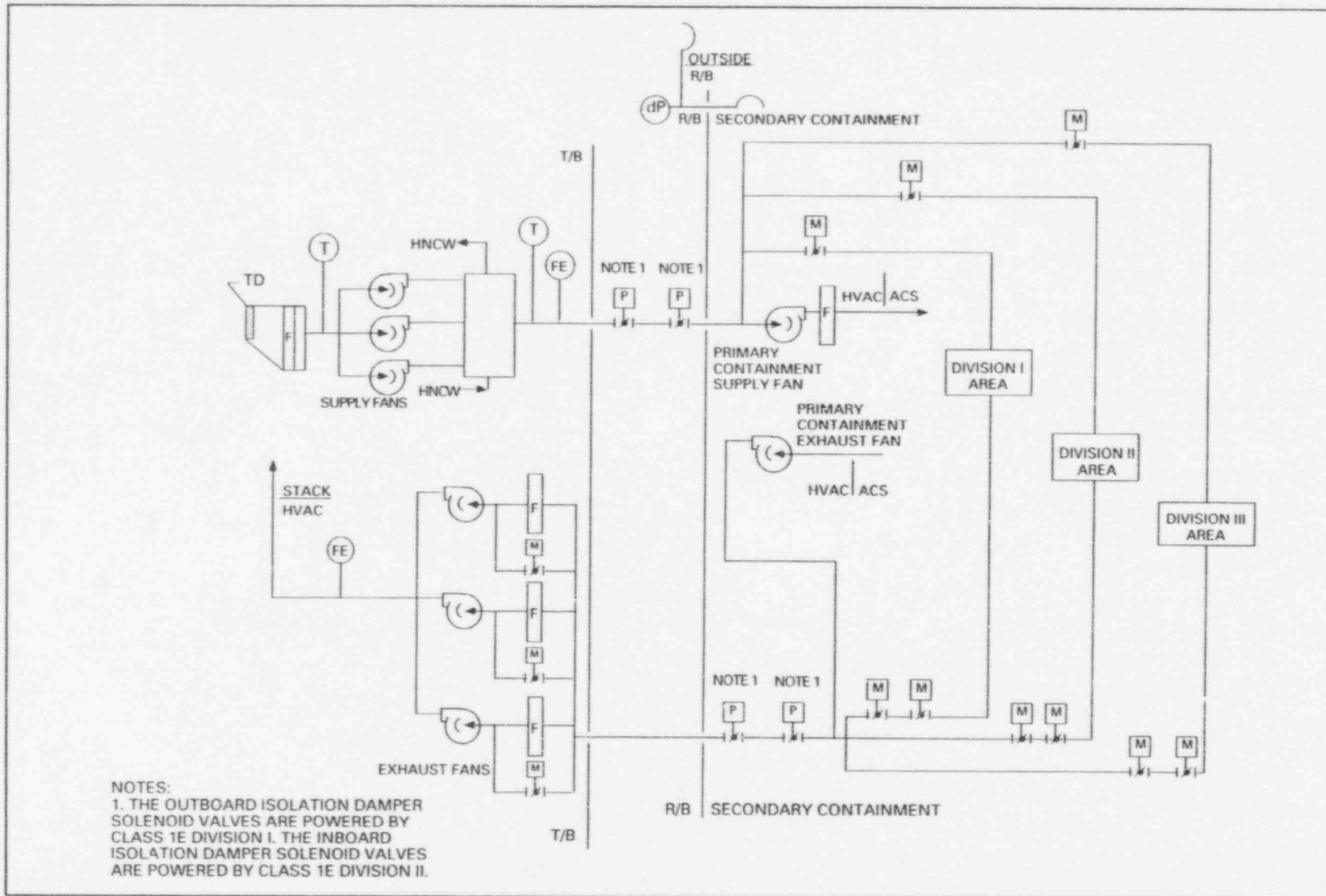


Figure 2.15.5j Reactor Building Secondary Containment HVAC System

Table 2.15.5a Control Room Habitability Area HVAC System

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The basic configuration of the CRHA HVAC System is as shown on Figure 2.15.5a.	1. Inspections of the as-built system will be conducted.	1. The as-built CRHA HVAC System conforms with the basic configuration shown on Figure 2.15.5a.
2. The emergency filtration unit have at least 99% removal efficiency for all forms of iodine (elemental organic, particulate, and hydrogen iodide).	2. <ul style="list-style-type: none"> a. Test will be conducted on each as-built emergency filtration unit. b. Tests in a test facility will be conducted on the iodine absorber material. 	2. The emergency filtration unit iodine removal efficiency is at least 99%.
3. The exhaust fan automatically starts when the supply fan is started.	3. Tests will be conducted on each division of the CRHA HVAC System by starting the supply fan.	3. The exhaust fan automatically starts when the supply fan is started.
4. The MCAE is maintained at a minimum pressure of 3.2 mm water gauge above the outside atmosphere.	4. Tests will be conducted on the as-built CRHA HVAC System in the normal mode of operation.	4. The MCAE is maintained at a minimum pressure of 3.2 mm water gauge above the outside atmosphere.
5. <ul style="list-style-type: none"> a. On receipt of a PRM System signal for high radiation in the outside air intake of the operating division, the normal outside air intake dampers close, the exhaust air dampers close, the exhaust fan stops, the minimum outside air intake dampers open, and one fan of the emergency filtration unit starts. 	5. <ul style="list-style-type: none"> a. Tests will be conducted on each CRHA HVAC System division using a simulated initiation signal. 	5. <ul style="list-style-type: none"> a. Upon receipt of a simulated initiation signal the following occurs: <ul style="list-style-type: none"> (1) Normal outside air intake dampers are closed. (2) Exhaust air dampers are closed. (3) Exhaust fan is stopped. (4) Minimum outside air intake dampers are opened. (5) Emergency filtration unit fan is started.

Table 2.15.5a Control Room Habitability Area HVAC System (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
<p>b. In the high radiation mode, positive pressure of at least 3.2 mm water gauge is maintained in the MCAE relative to the outside atmosphere. Each emergency filtration unit treats a mixture of MCAE recirculated air and outside makeup air to maintain the positive pressure with not more than 3400 m³/h (@ one atmosphere absolute pressure, 0°C) of outside air.</p> <p>c. The redundant division of the CRHA HVAC System starts on a low flow signal from the operating emergency filtration unit.</p> <p>d. The redundant division of the CRHA HVAC System is connected to an outside air intake which is separated from the other by a minimum of 50m.</p>	<p>b. Tests will be conducted on each division of the as-built CRHA HVAC System in the high radiation mode.</p> <p>c. Tests will be conducted on each division of the as-built CRHA HVAC System using simulated low flow signals.</p> <p>d. Inspections will be conducted on the CRHA HVAC System.</p>	<p>b. The MCAE is maintained at a positive pressure of at least 3.2 mm water gauge relative to the outside atmosphere with outside makeup air of not more than 3400 m³/h (@ one atmosphere absolute pressure, 0°C).</p> <p>c. The redundant division of the CRHA HVAC System starts on a low flow signal from the operating emergency filtration unit.</p> <p>d. The CRHA HVAC System outside air intakes are at least 50m apart.</p>
<p>6. When smoke detection sensors in the operating outside air intake detects smoke, a signal will initiate MCAE air recirculation by isolating the outside air intake, closing the exhaust damper, and stopping the exhaust fan.</p>	<p>6. Tests will be conducted on each CRHA HVAC System division using a simulated smoke signal.</p>	<p>6. Upon receipt of a simulated initiation signal the following occurs:</p> <p>a. Outside air intake dampers are closed.</p> <p>b. Exhaust air dampers are closed.</p> <p>c. Exhaust fan is stopped.</p>

Table 2.15.5a Control Room Habitability Area HVAC System (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
7. Each of the two CRHA System divisions is powered from the respective Class 1E division as shown on Figure 2.15.5a. In the CRHA HVAC System, independence is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E equipment.	7. <ol style="list-style-type: none"> Tests will be performed on the CRHA HVAC System by providing a test signal in only one Class 1E division at a time. Inspection of the as-built Class 1E divisions in the CRHA HVAC System will be performed. 	7. <ol style="list-style-type: none"> The test signal exists only in the Class 1E division under test in the CRHA HVAC System. In the CRHA HVAC System, physical separation or electrical isolation exists between Class 1E divisions. Physical separation or electrical isolation exists between these Class 1E divisions and non-Class equipment.
8. Each mechanical division of the CRHA HVAC System (Division B and C) is physically separated from the other division, except for the common ducts in the MCAE.	8. Inspections of the as-built CRHA HVAC System will be performed.	8. Each mechanical division of the CRHA HVAC System is physically separated from the other mechanical division of the CRHA HVAC System by structural and/or fire barriers.
9. Fire dampers with fusible links in HVAC duct work close under air flow conditions.	9. Type tests of fire dampers in a test facility will be performed for closure under system air flow conditions.	9. Fire dampers close under system air flow conditions.
10. Main control room displays and controls provided for CRHA HVAC System are as defined in Section 2.15.5.	10. Inspections will be performed on the main control room displays and controls for the CRHA HVAC System.	10. Displays and controls exist or can be retrieved in the main control room as defined in Section 2.15.5.

Table 2.15.5e Reactor Building Safety-Related Diesel Generator HVAC System

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The basic configuration of the R/B Safety-Related DG HVAC System is as shown on Figure 2.15.5i.	1. Inspections of the as-built system will be conducted.	1. The as-built R/B Safety-Related DG HVAC System conforms with the basic configuration shown on Figure 2.15.5i.
2. On receipt of a DG start signal, both DG supply fans start.	2. Tests will be conducted on each division of the as-built R/B Safety-Related DG HVAC System using a simulated DG start signal.	2. On receipt of a DG start signal, both DG supply fans start.
3. Each of the three divisions of the R/B Safety-Related DG HVAC System is powered from the respective Class 1E division as shown on Figure 2.15.5i. In the R/B safety-related DG HVAC system, independence is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E equipment.	3. <ul style="list-style-type: none"> a. Tests will be performed on the R/B Safety-related DG HVAC System by providing a test signal in only one Class 1E division at a time. b. Inspection of the as-built Class 1E divisions in the R/B Safety-Related DG HVAC System will be performed. 	3. <ul style="list-style-type: none"> a. The test signal exists only in the Class 1E division under test in the R/B Safety-Related DG HVAC System. b. In the R/B Safety-Related DG HVAC System, physical separation or electrical isolation exists between Class 1E divisions. Physical separation or electrical isolation exists between these Class 1E divisions and non-Class 1E equipment
4. Each mechanical division of the R/B Safety-Related DG HVAC System (Divisions A, B and C) is physically separated from the other divisions.	4. Inspections of the as-built R/B Safety-Related DG HVAC System will be conducted.	4. Each mechanical division of the R/B Safety-Related DG HVAC System is physically separated from the other mechanical divisions of the R/B Safety-Related DG HVAC System by structural and/or fire barriers.
5. Main control room displays and controls provided for R/B Safety-Related DG HVAC System are as defined in Section 2.15.5.	5. Inspections will be performed on the main control room displays and controls for the R/B Safety-Related DG HVAC System.	5. Displays and controls exist or can be retrieved in the main control room as defined in Section 2.15.5.

Table 2.15.5f Reactor Building Secondary Containment HVAC System

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The basic configuration of the R/B Secondary Containment HVAC System is as shown on Figure 2.15.5j.	1. Inspections of the as-built system will be conducted.	1. The as-built R/B Secondary Containment HVAC System conforms with the basic configuration shown on Figure 2.15.5j.
2. The R/B Secondary Containment HVAC System maintains a negative pressure in the secondary containment relative to the outside atmosphere.	2. Tests will be conducted on the R/B Secondary Containment HVAC System in the normal mode of operation.	2. The R/B Secondary Containment HVAC System maintains a negative pressure in the secondary containment relative to the outside atmosphere.
3. The R/B Secondary Containment HVAC System isolation dampers are closed upon receipt of an isolation signal from the LDS, or signal indicating loss of secondary containment supply and exhaust fans.	3. Tests will be conducted on the R/B Secondary Containment HVAC System using simulated LDS isolation and loss of secondary containment supply and exhaust fans signals.	3. Upon receipt of a simulated signal, isolation dampers are automatically closed.
4. The smoke removal mode is manually initiated by starting the standby exhaust and supply fans, operating the exhaust filter unit bypass dampers, and partially closing the exhaust dampers for divisions not affected by fire.	4. Tests will be conducted in the smoke removal mode.	4. On manual initiation of smoke removal mode the following occurs: <ol style="list-style-type: none"> The standby exhaust fan starts. The standby supply fan starts. The filter unit bypass damper opens. The exhaust dampers of divisions not affected by fire partially close to a predetermined position. The measured air flow rate and the pressure in the ducts are at least equal to the values of the as-built smoke removal analysis.

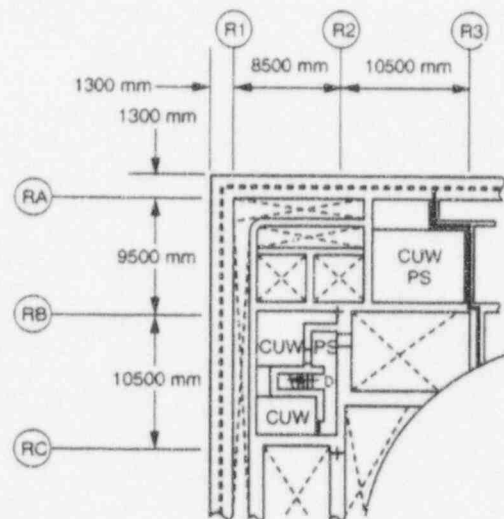


Figure 2.15.10e Reactor Building Arrangement—Elevation -5100 mm

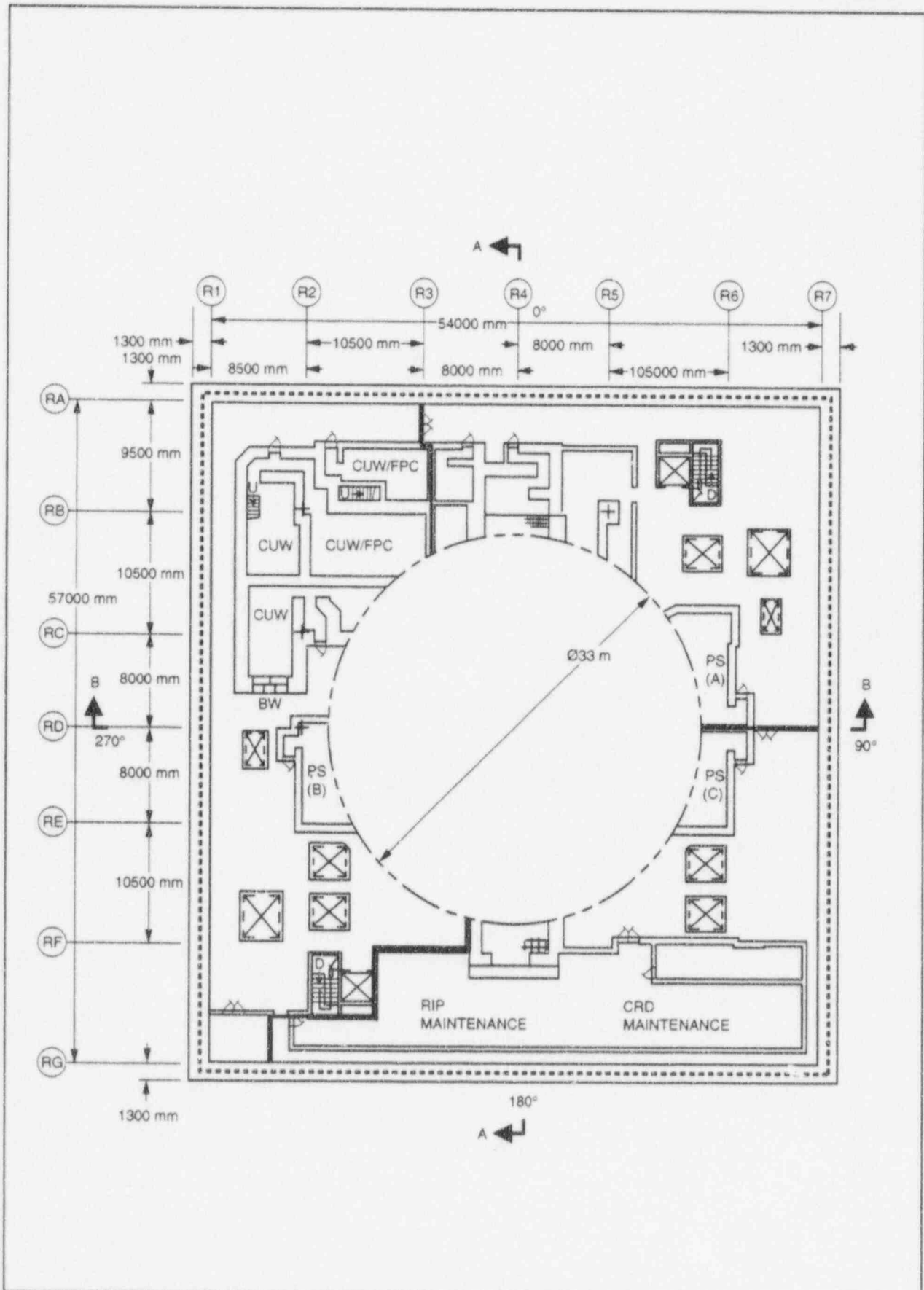


Figure 2.15.10f Reactor Building Arrangement, Floor B2F—Elevation -1700 mm

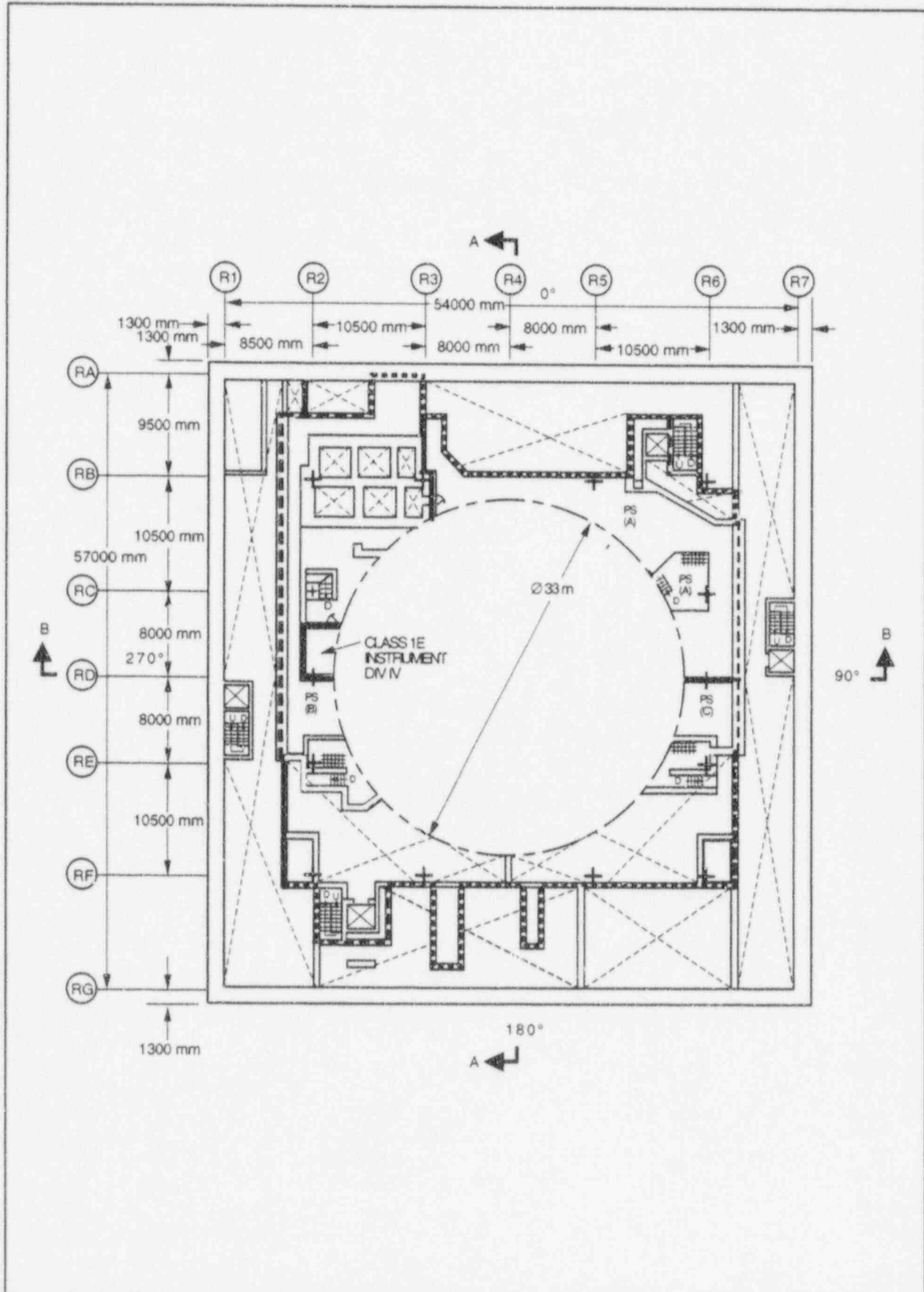


Figure 2.15.10i Reactor Building Arrangement—Elevation 8500 mm

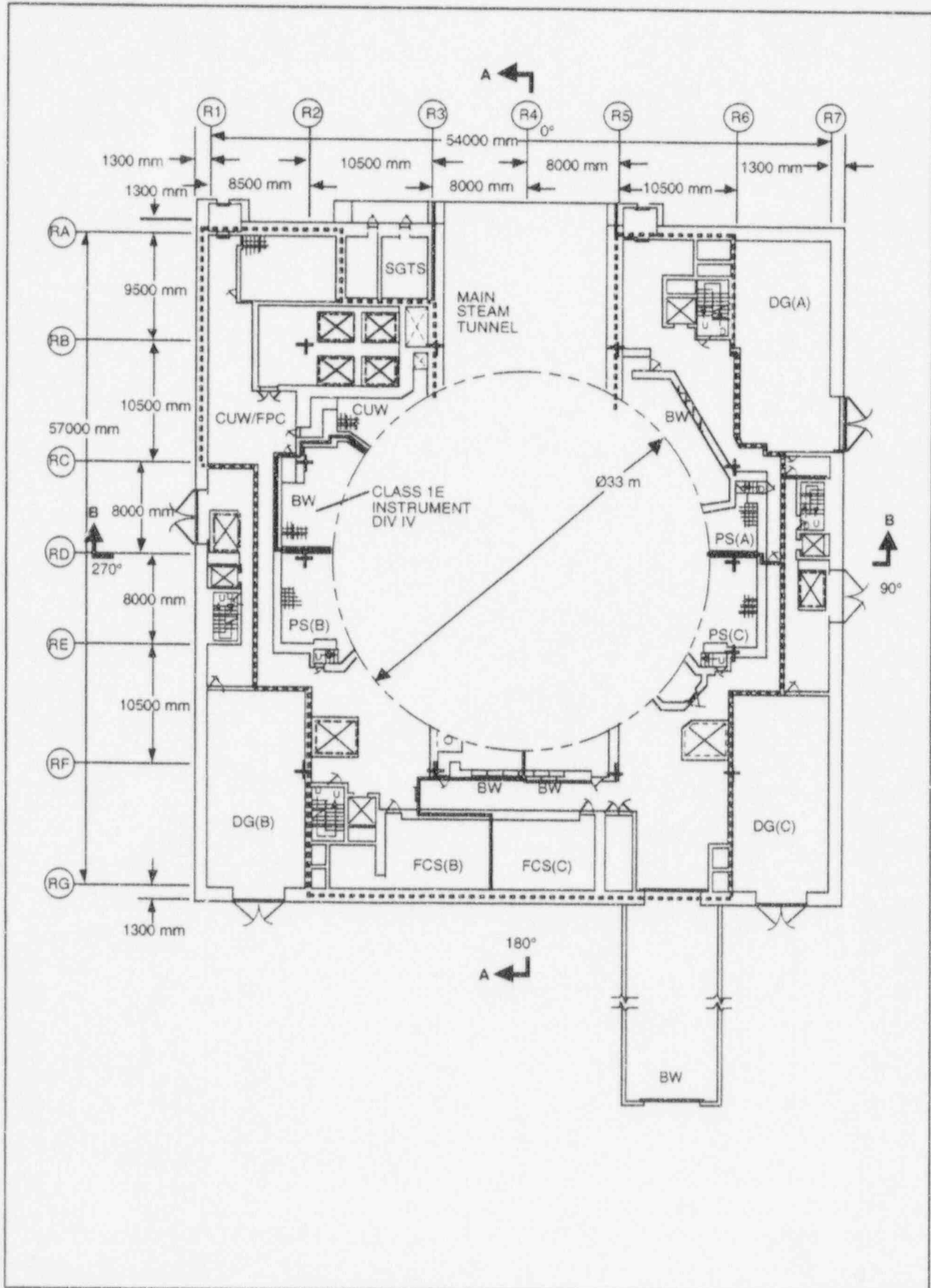


Figure 2.15.10j Reactor Building Arrangement, Floor 1F—Elevation 12300 mm

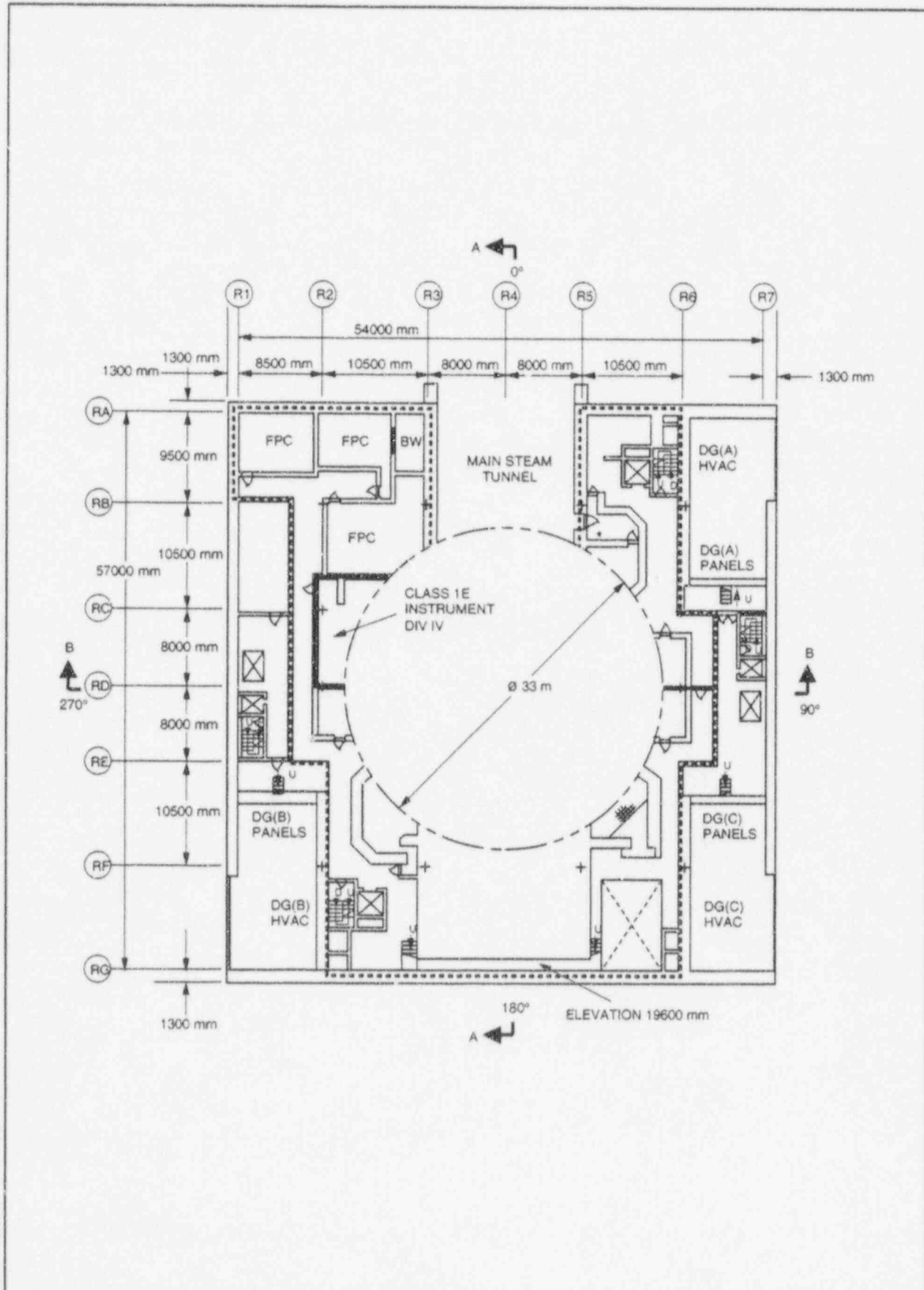


Figure 2.15.10k Reactor Building Arrangement, Floor 2F—Elevation 18100 mm

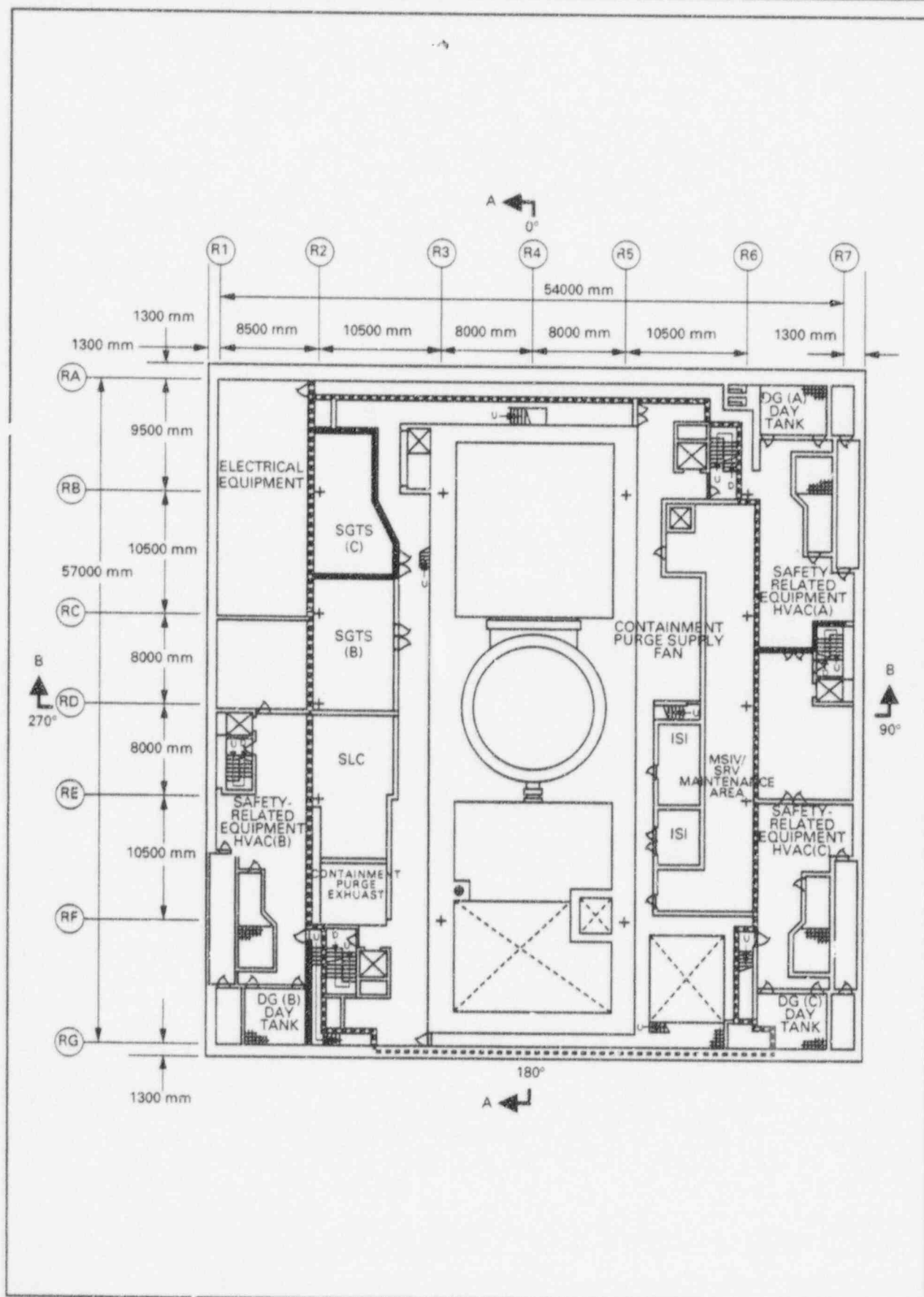


Figure 2.15.10I Reactor Building Arrangement, Floor 3F—Elevation 23500 mm

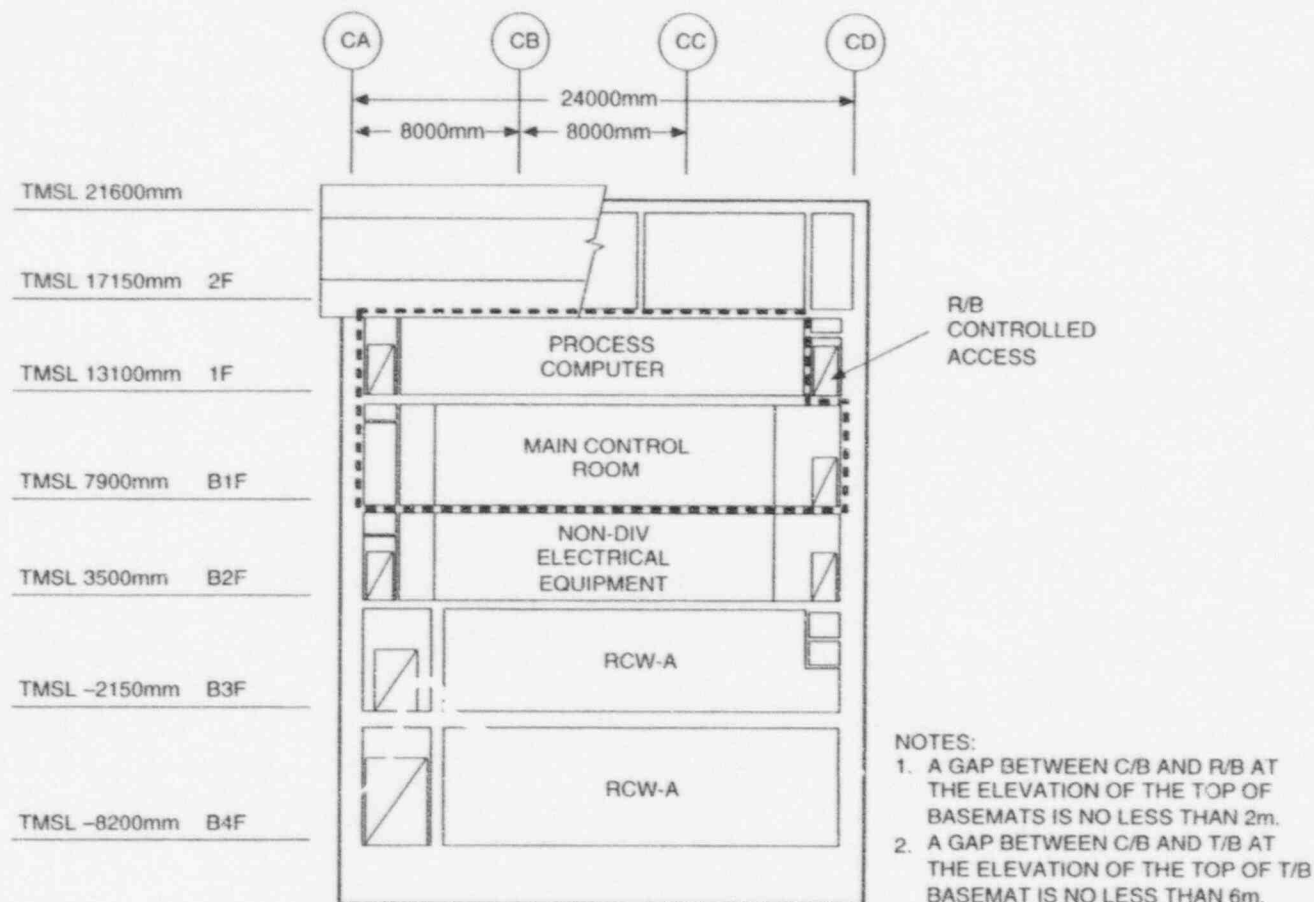


Figure 2.15.12a Control Building Arrangement, Section A-A

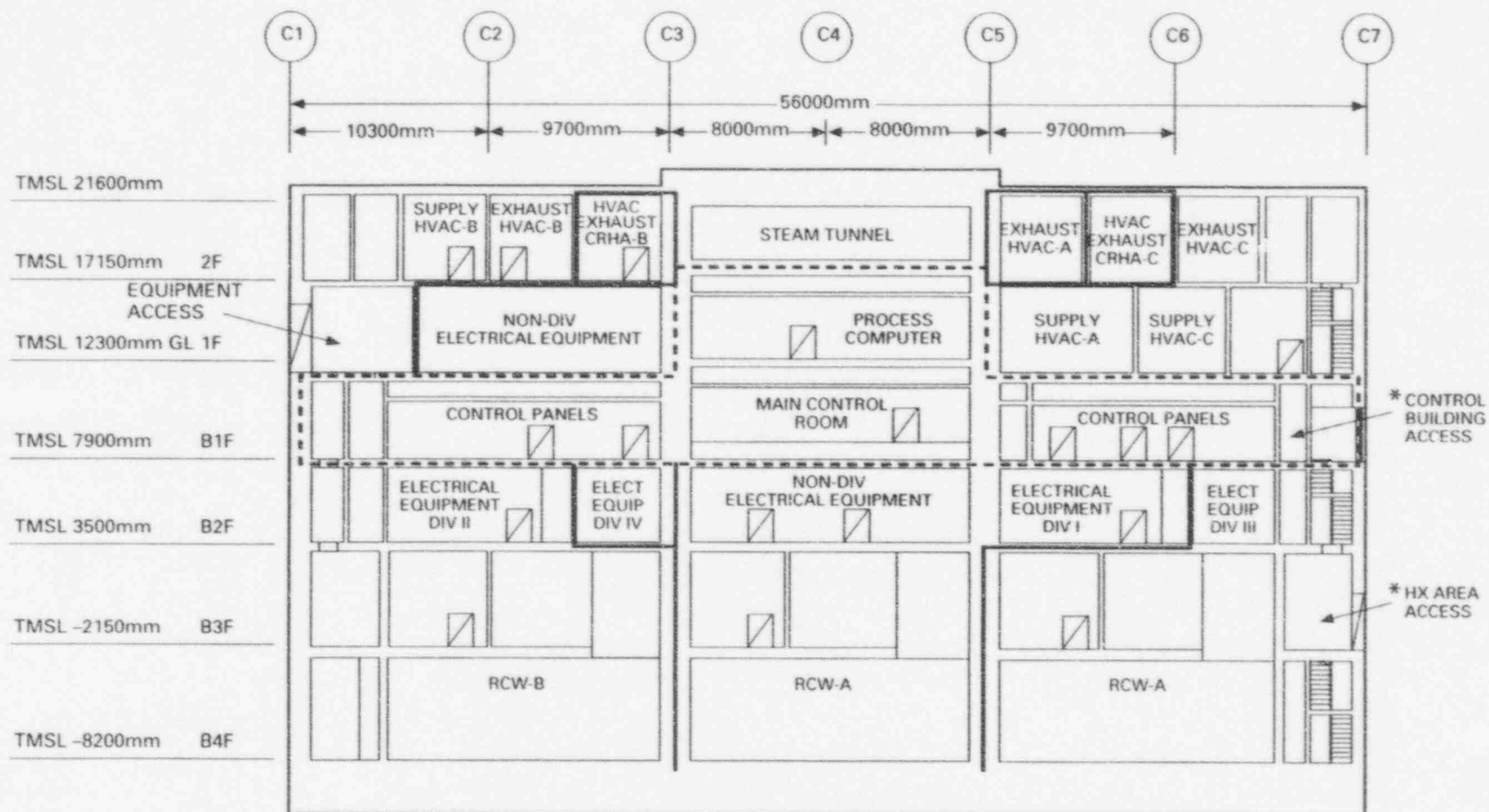


Figure 2.15.12b Control Building Arrangement, Section B-B

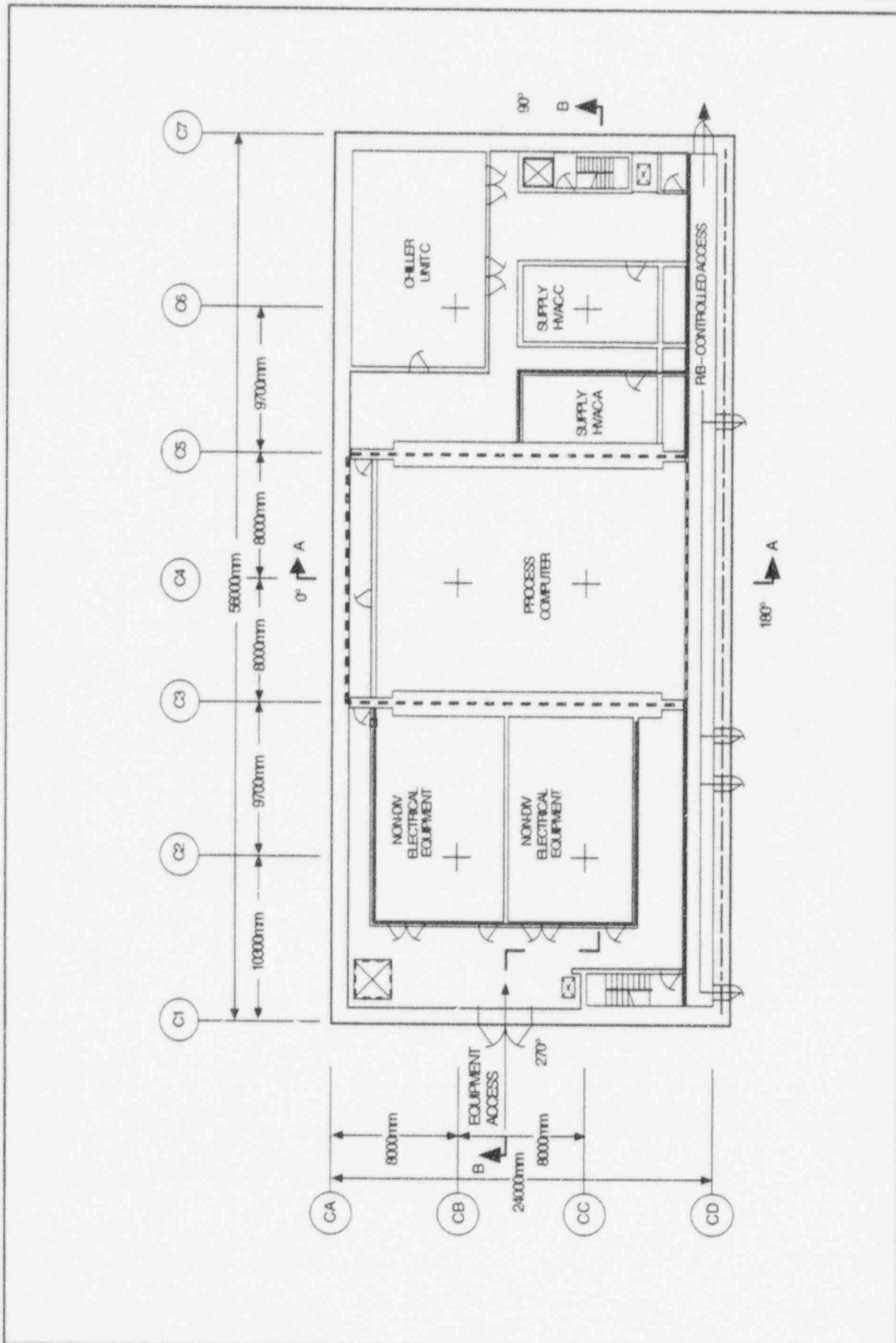


Figure 2.15.12g Control Building Arrangement, Floor 1F—Elevation 12300 mm

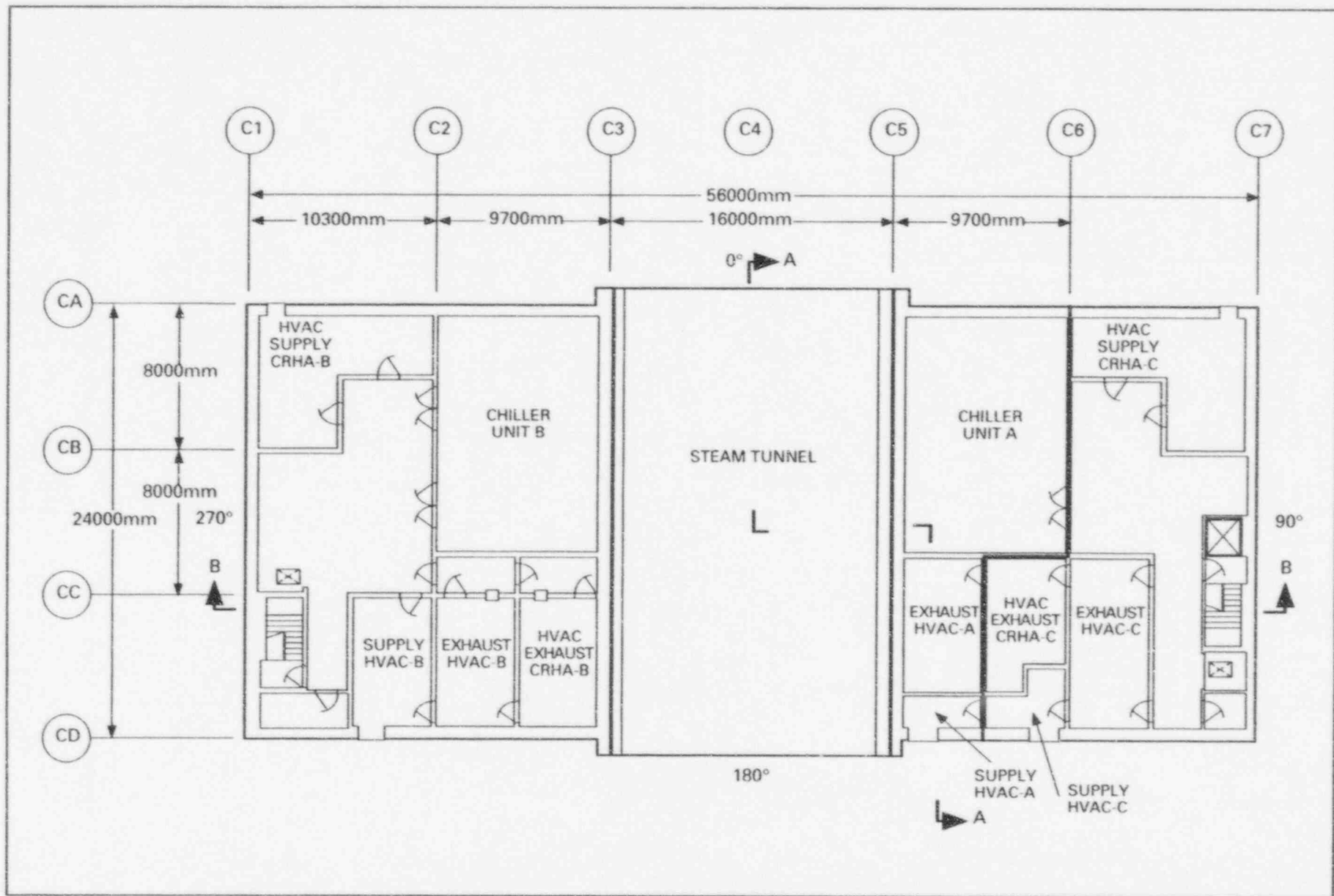
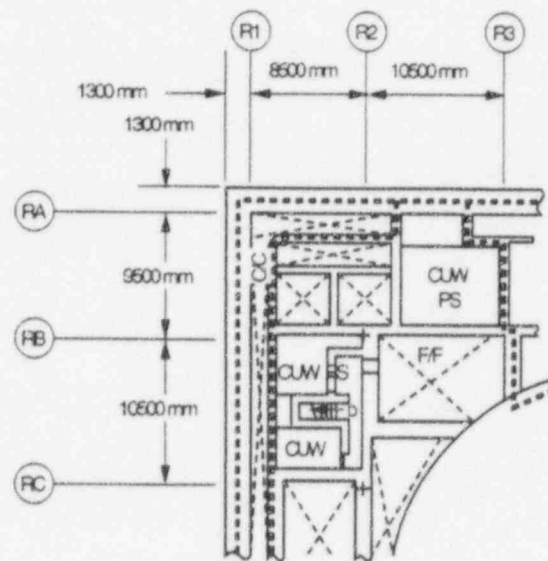


Figure 2.15.12h Control Building Arrangement, Floor 2F—Elevation 17150 mm



FULL POWER SHUTDOWN
OPERATION ($\mu\text{Sv/h}$)

- A ≤ 6
- B < 10
- C < 50
- D < 250
- E < 1000
- F ≥ 1000

Figure 3.2d Reactor Building Radiation Zone Map for Full Power and Shutdown Operations—Elevation -5100 mm

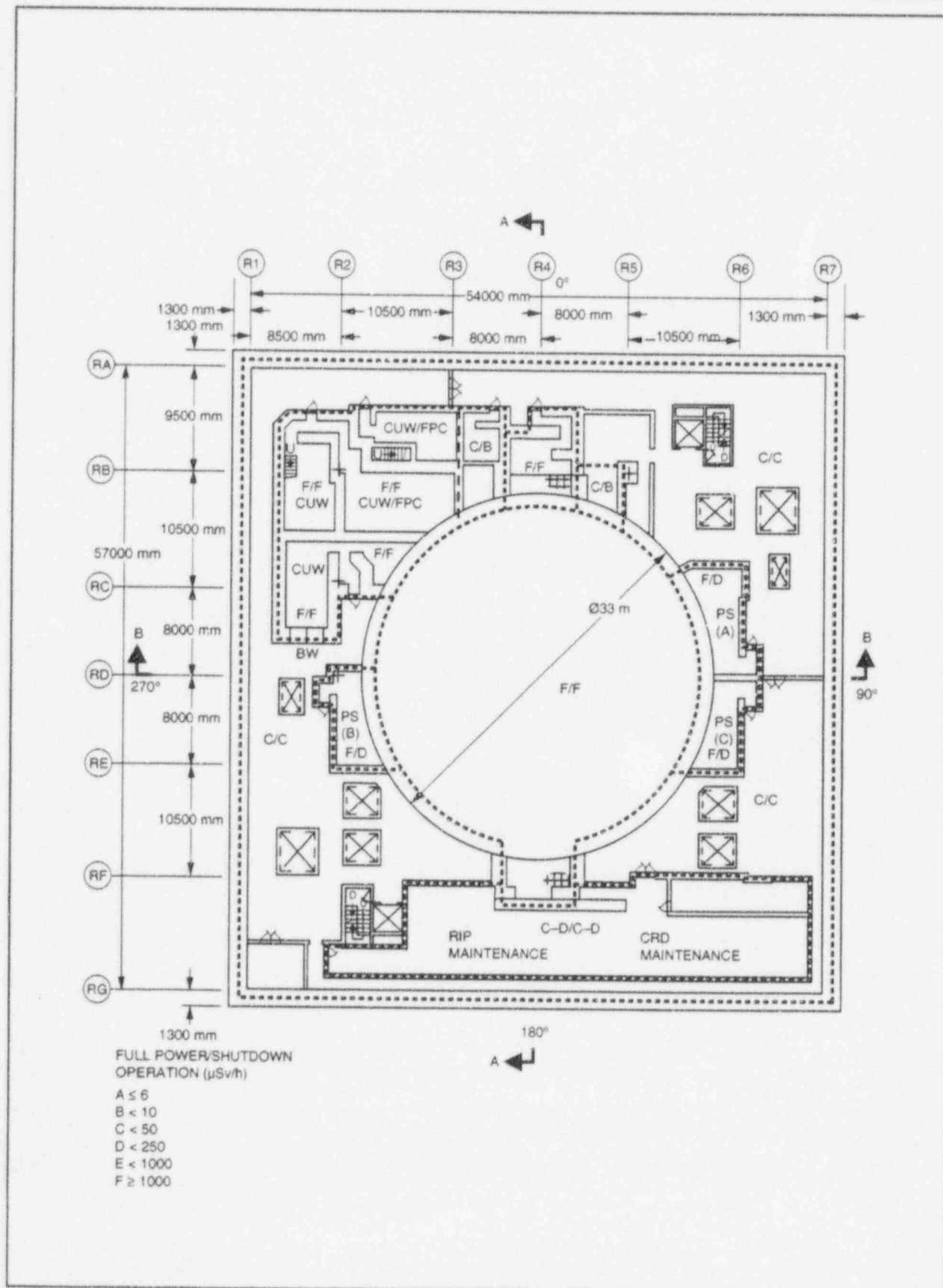


Figure 3.2e Reactor Building Radiation Zone Map for Full Power and Shutdown Operations, Floor B2F—Elevation -1700 mm

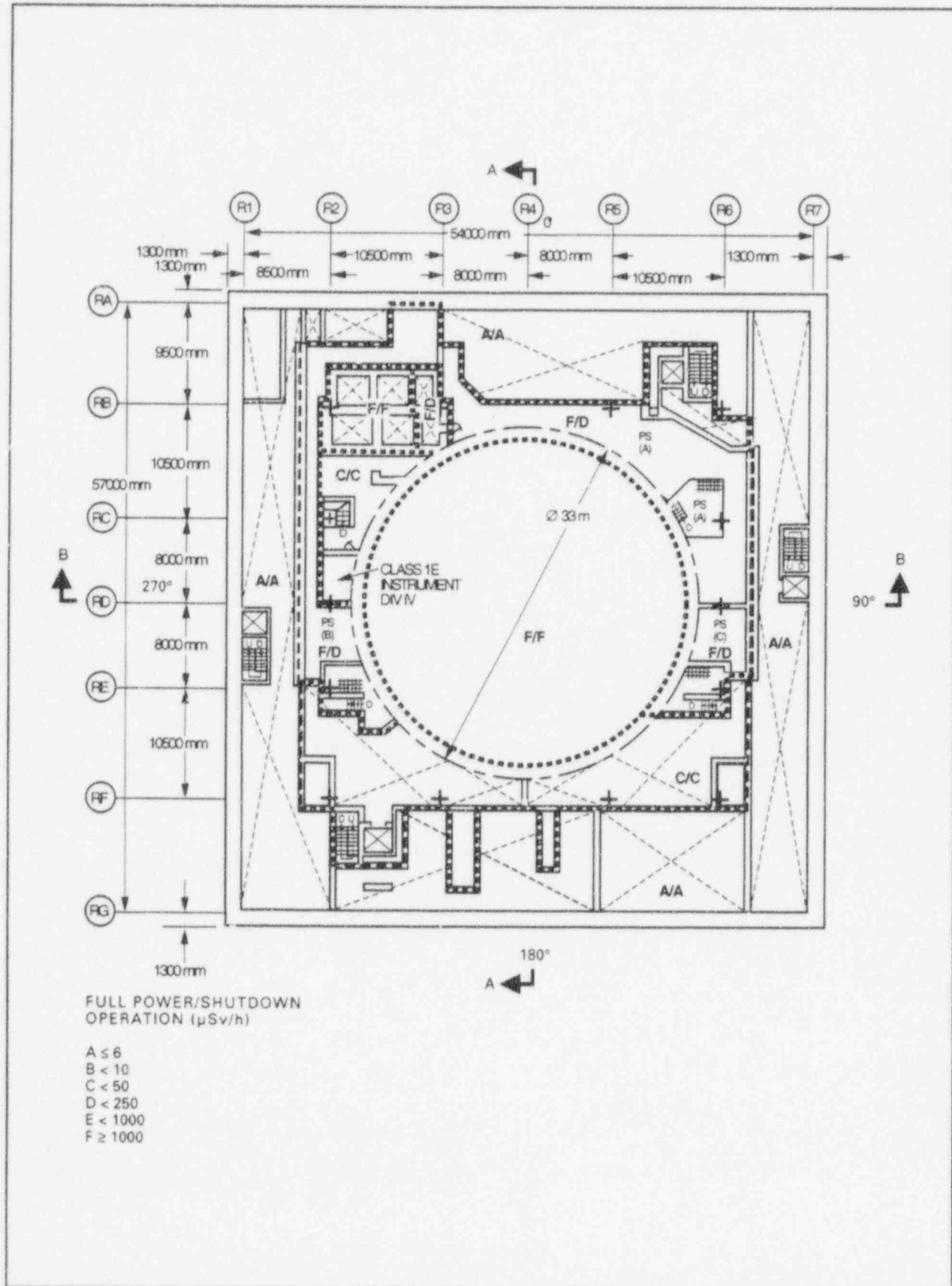


Figure 3.2h Reactor Building Radiation Zone Map for Full Power and Shutdown Operations—Elevation 8500 mm

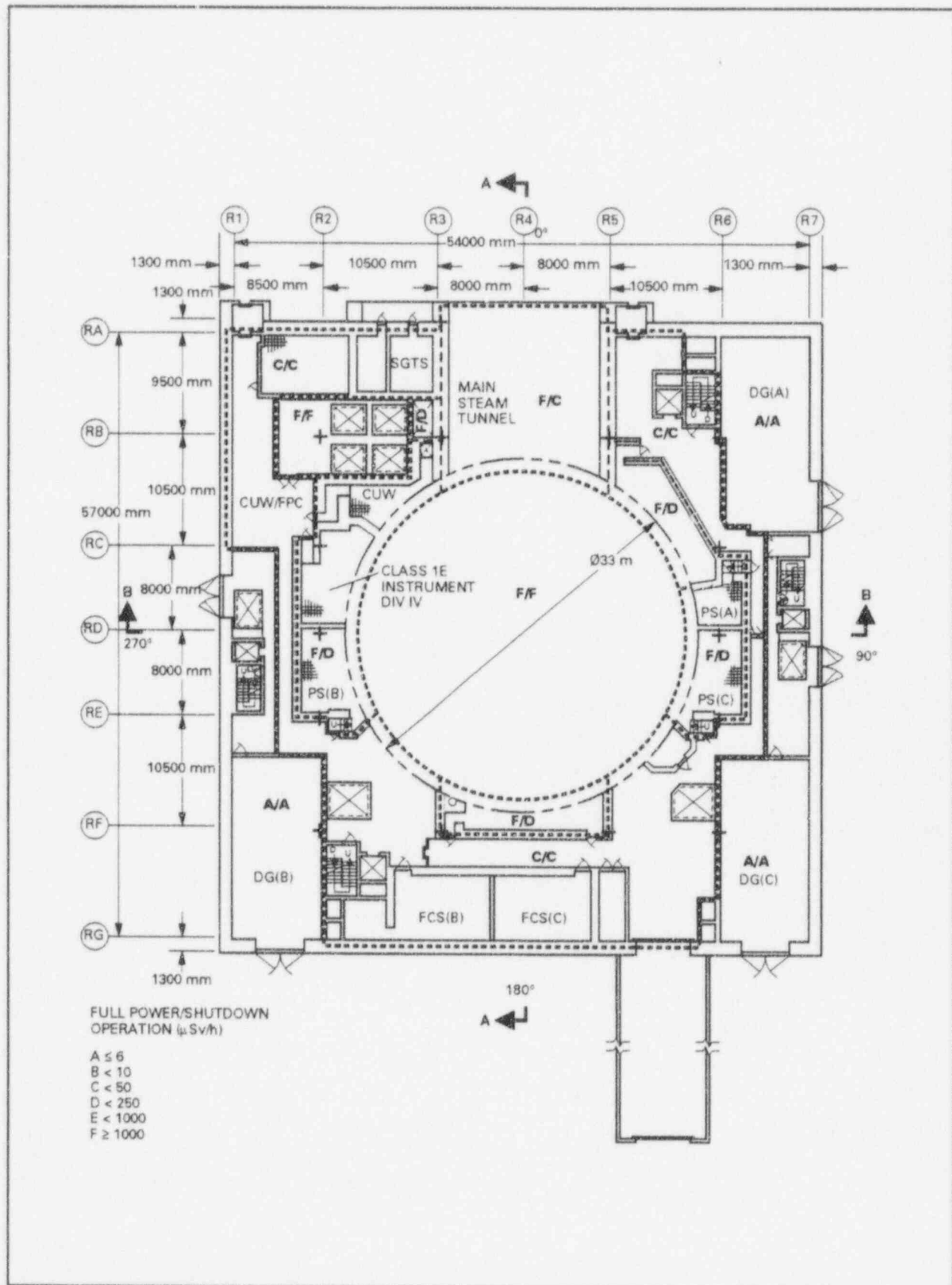
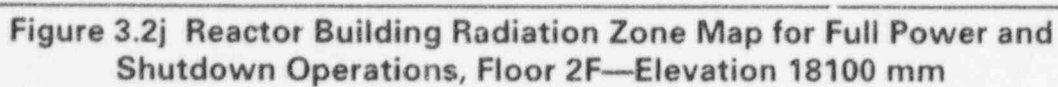


Figure 3.2i Reactor Building Radiation Zone Map for Full Power and Shutdown Operations, Floor 1F—Elevation 12300 mm



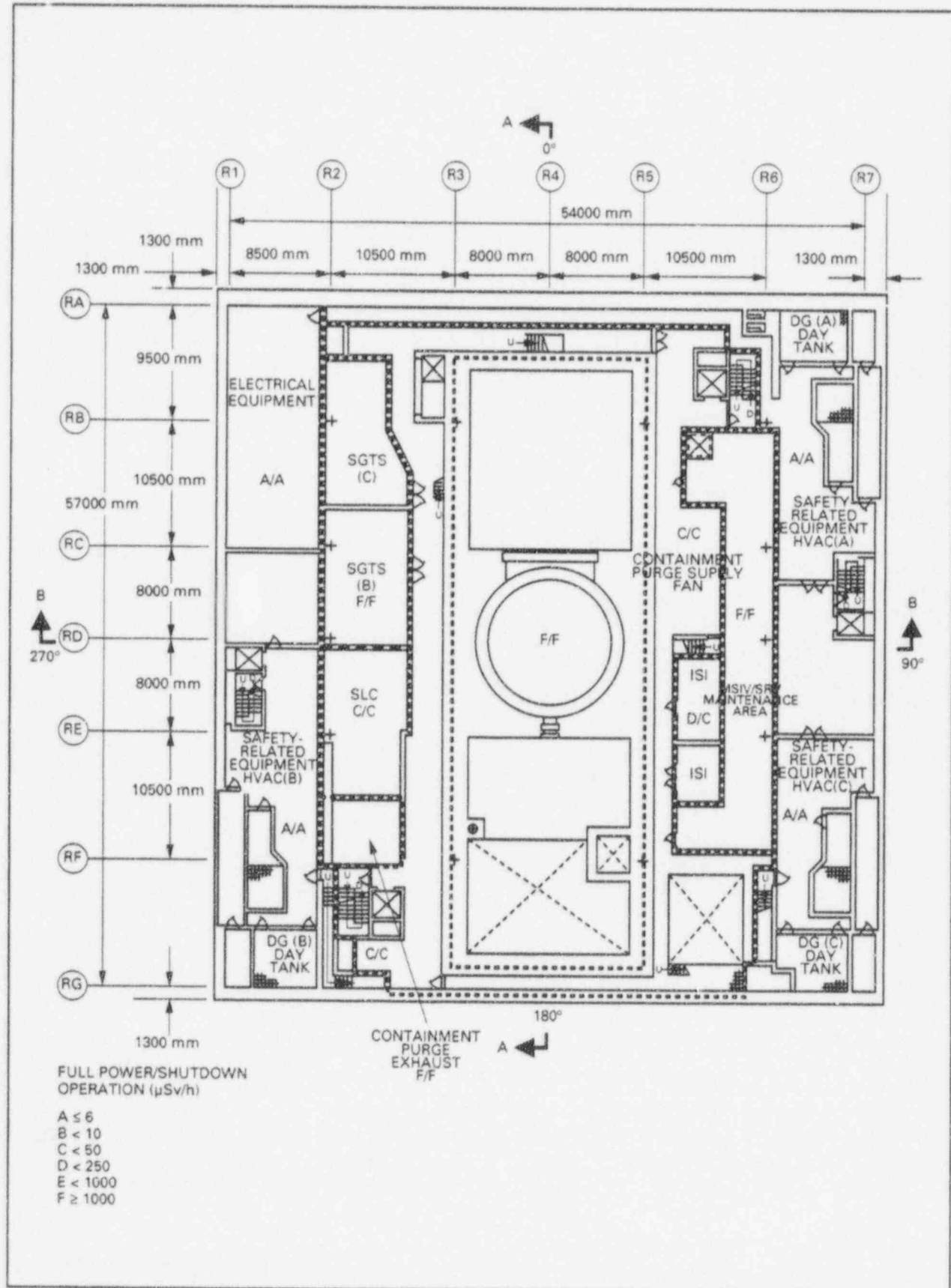


Figure 3.2k Reactor Building Radiation Zone Map for Full Power and Shutdown Operations, Floor 3F—Elevation 23500 mm

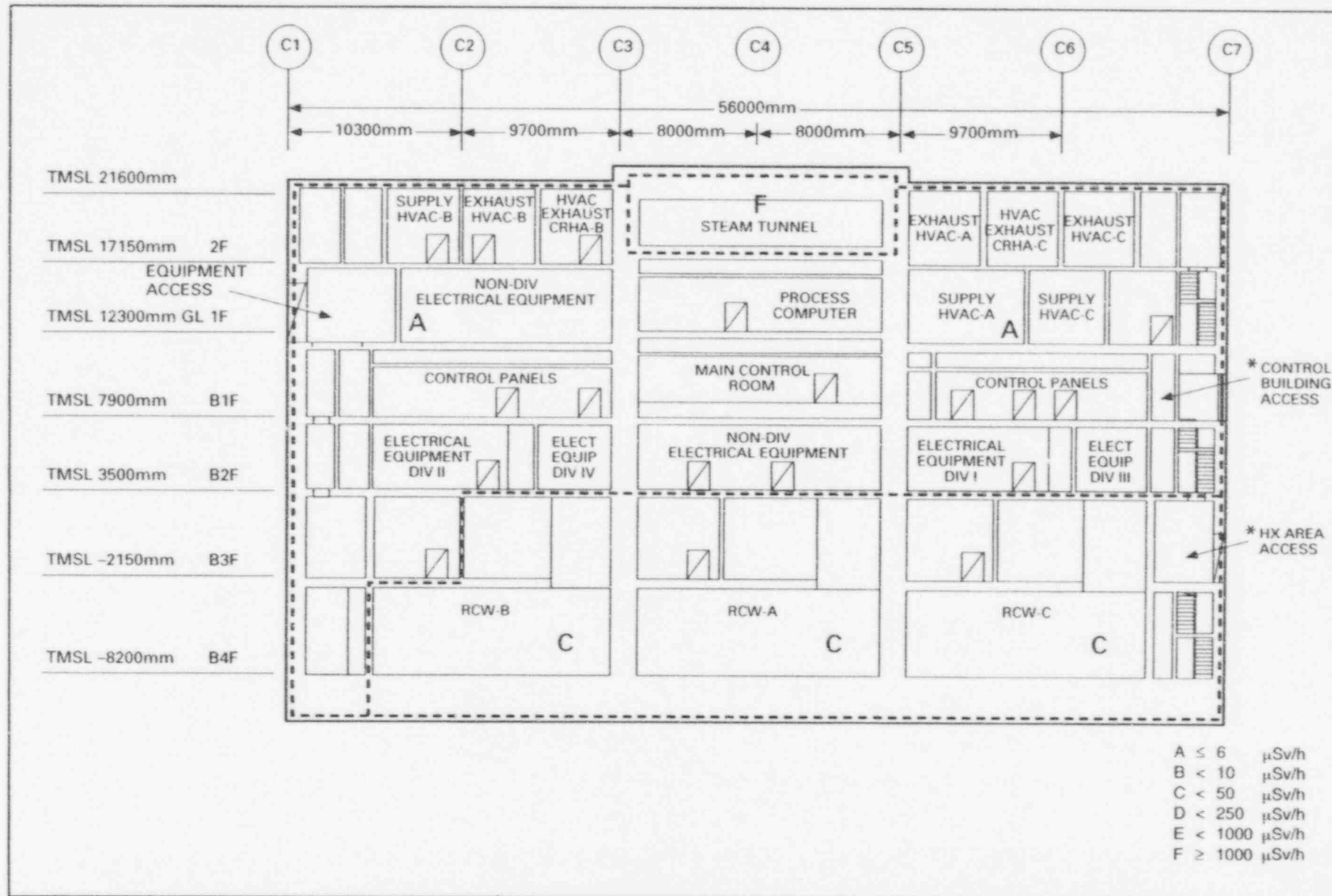


Figure 3.2p Control Building Radiation Zone Map for Full Power Operations, Section B-B

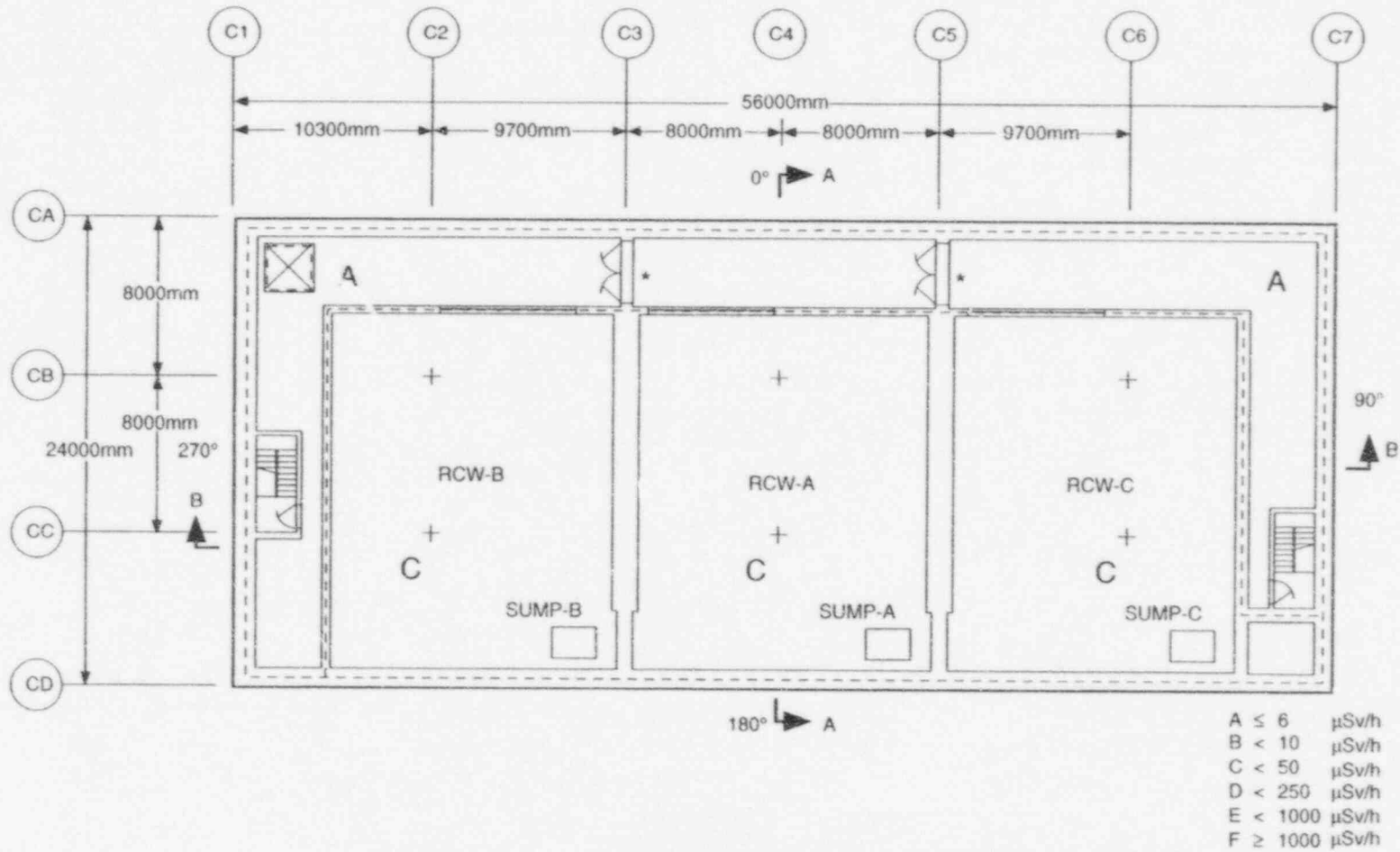


Figure 3.2q Control Building Radiation Zone Map for Full Power Operation, Floor B4F—Elevation -8200 mm

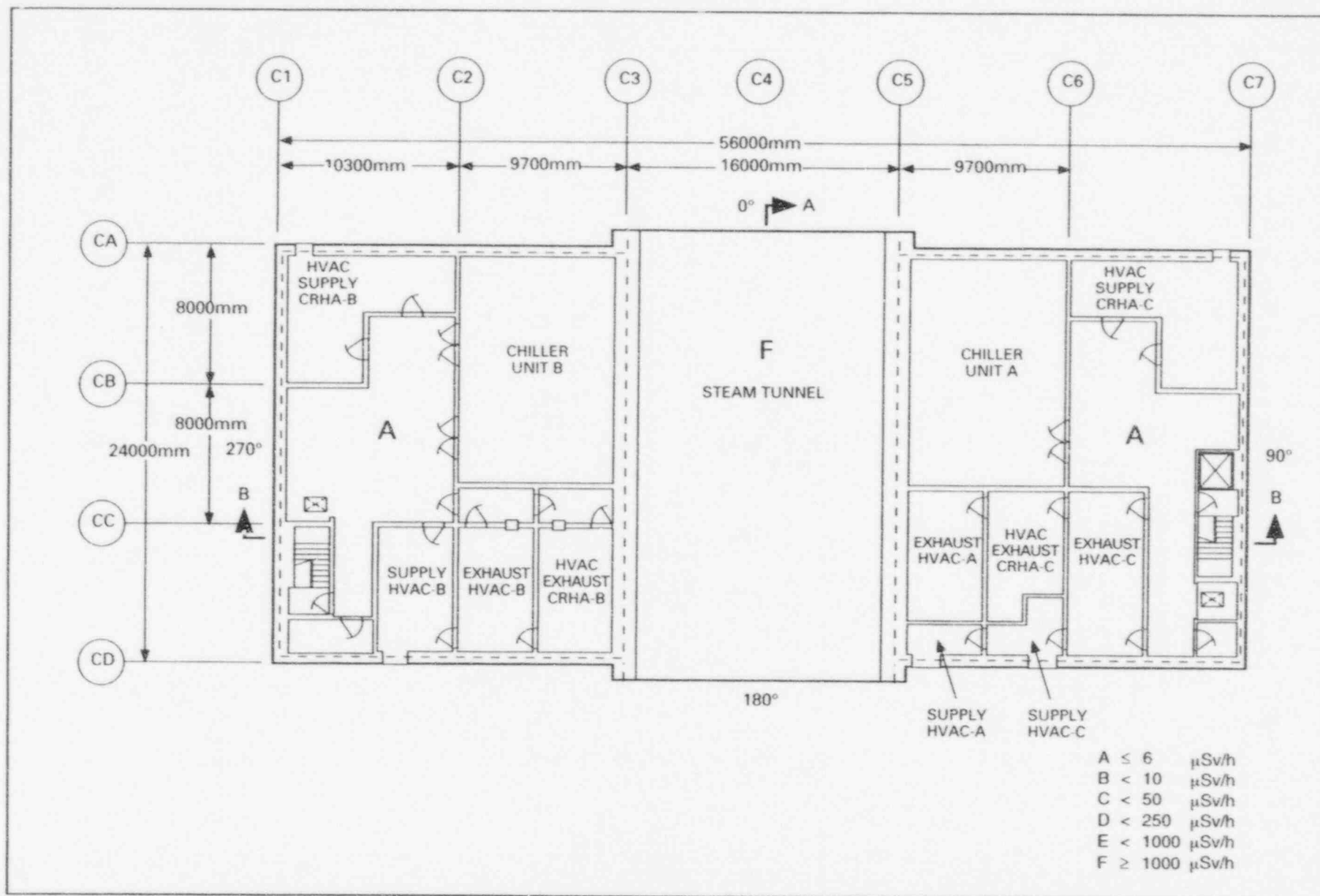
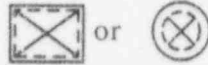


Figure 3.2v Control Building Radiation Zone Map for Full Power Operation, Floor 2F—Elevation 17150 mm

Table 3.2a Plant Shielding Design

Inspections, Tests, Analyses and Acceptance Criteria																						
Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria																				
1. The plant design shall provide radiation shielding for rooms, corridors and operating areas commensurate with their occupancy requirements.	1. An analysis of the expected radiation levels in each plant area will be performed to verify the adequacy of the shielding design. This analysis shall consider the following:	1. Maximum expected radiation dose rates in each plant area (deep dose equivalent measured at 30 cm from the source of the radiation, not contact dose rates) are no greater than the dose rates specified for the following zones, based on the access requirements of that area for plant operation and maintenance.																				
	<p>a. Confirmatory calculations shall consider significant radiation sources (greater than 5% contribution) for an area. Radiation source strength in plant systems and components will be determined based upon an assumed source term of 3,700 MBq/s offgas release rate (after 30 minutes decay), a 11.1 MBq/gram-steam N-16 source term at the vessel exit nozzle, and a core inventory commensurate with a 4005 MW_t equilibrium core at 51.6 kW/liter. Source terms shall be adjusted for radiological decay and buildup of activated corrosion and wear products.</p> <p>b. Commonly accepted shielding codes, using nuclear properties derived from well known references (such as Vitamin C and ANSI/ANS-6.4) shall be used to model and evaluate plant radiation environments.</p> <p>(1) For non-complex geometries, point kernel shielding codes (such as QAD or GGG) shall be used.</p>	<table> <tr> <th>Zone</th><th>Dose Rate (μSv/h)</th><th>Access Requirements</th></tr> <tr> <td>A</td><td>≤ 6</td><td>Uncontrolled, unlimited access.</td></tr> <tr> <td>B</td><td>< 10</td><td>Controlled, unlimited access.</td></tr> <tr> <td>C</td><td>< 50</td><td>Controlled, limited access 20 h/week.</td></tr> <tr> <td>D</td><td>< 250</td><td>Controlled, limited access 4 h/week.</td></tr> <tr> <td>E</td><td>< 1000</td><td>Controlled, limited access 1 h/week.</td></tr> <tr> <td>F</td><td>≥ 1000</td><td>Restricted, infrequent access. Authorization required.</td></tr> </table>	Zone	Dose Rate (μ Sv/h)	Access Requirements	A	≤ 6	Uncontrolled, unlimited access.	B	< 10	Controlled, unlimited access.	C	< 50	Controlled, limited access 20 h/week.	D	< 250	Controlled, limited access 4 h/week.	E	< 1000	Controlled, limited access 1 h/week.	F	≥ 1000
Zone	Dose Rate (μ Sv/h)	Access Requirements																				
A	≤ 6	Uncontrolled, unlimited access.																				
B	< 10	Controlled, unlimited access.																				
C	< 50	Controlled, limited access 20 h/week.																				
D	< 250	Controlled, limited access 4 h/week.																				
E	< 1000	Controlled, limited access 1 h/week.																				
F	≥ 1000	Restricted, infrequent access. Authorization required.																				

Hatch



Opening



Removable block wall



Secondary containment barrier for R/B and MCAE for C/B (Note 2), or radiation zone boundary



Sliding door



Stairway



Sump pit



Typical floor designation:
B3F-Basement, 3rd floor

NOTES:

1. Swing of door can be either way.
2. Divisional and secondary containment barriers and MCAE are fire barriers unless specified otherwise.
3. "*" Denotes watertight door.

Control and Instrumentation

Cables:

Fiber-optic



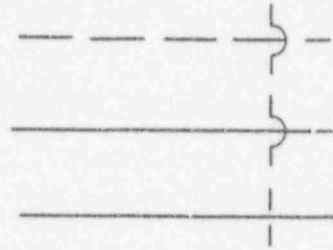
Metallic



Fiber-optic or metallic



Cables not
connected



Sensor



Switch

