June 7, 2012

Comanche Peak Nuclear Power Plant, Units 3 & 4
COL Application

Part 2

FSAR Revision 2

Update Tracking Report

Revision 1

Revision History

Revision	Date	Update Description
-	6/28/2011	COLA Revision 2 Transmittal See Luminant Letter no. TXNB-11044 Date 6/28/2011
-	4/13/2011	Updated Chapters: Ch. 9. 10, 12 See Luminant Letter no. TXNB-11020 Date 4/13/2011 Incorporated responses to following RAIs: No. 135 Supplemental 02
-	5/20/2011	Updated Chapters: Ch. 1 See Luminant Letter no. TXNB-11035 Date 5/20/2011 Incorporated responses to following RAIs: No. 206
-	6/23/2011	Updated Chapters: Ch. 9 See Luminant Letter no. TXNB-11043 Date 6/23/2011 Incorporated responses to following RAIs: No. 220
-	7/14/2011	Updated Chapters: Ch. 2 See Luminant Letter no. TXNB-11046 Date 7/14/2011 Incorporated responses to following RAIs: No. 147 Supplemental
-	7/28/2011	Updated Chapters: Ch. 2 See Luminant Letter no. TXNB-11049 Date 7/28/2011

		Incorporated responses to following RAIs: No. 223
-	7/28/2011	Updated Chapters: Ch. 9 See Luminant Letter no. TXNB-11050 Date 7/28/2011 Incorporated responses to following RAIs: No. 135 Supplemental 03
-	8/4/2011	Updated Chapters: Ch. 1, 9 See Luminant Letter no. TXNB-11053 Date 8/4/2011 Incorporated responses to following RAIs: No. 16 Supplemental
-	8/9/2011	Updated Chapters: Ch. 8 See Luminant Letter no. TXNB-11055 Date 8/9/2011 Incorporated responses to following RAIs: No. 9 Supplemental S01
-	8/29/2011	Updated Chapters: Ch. 2, 3 See Luminant Letter no. TXNB-11057 Date 8/29/2011 Incorporated responses to following RAIs: No. 22 Supplemental, 145 Supplemental, 147 Supplemental
-	9/16/2011	Updated Chapters: Ch. 8 See Luminant Letter no. TXNB-11060 Date 9/16/2011 Incorporated responses to following RAIs: No. 182 Supplemental 01
-	9/29/2011	Updated Chapters: Ch. 2, 11 See Luminant Letter no. TXNB-11061 Date 9/29/2011 Incorporated responses to following RAIs: No. 224

-	10/10/2011	Updated Chapters: Ch. 1, 6 See Luminant Letter no. TXNB-11063 Date 10/10/2011 Incorporated responses to following RAIs: No. 231, 229
-	10/16/2011	Updated Chapters: Ch. 5, 9, 12 See Luminant Letter no. TXNB-11058 Date 10/16/2011 Incorporated responses to following RAIs: No. 225
-	10/17/2011	Updated Chapters: Ch. 8 See Luminant Letter no. TXNB-11065 Date 10/17/2011 Incorporated responses to following RAIs: No. 9 Supplemental 02
-	10/21/2011	Updated Chapters: Ch. 2 See Luminant Letter no. TXNB-11066 Date 10/21/2011 Incorporated responses to following RAIs: No. 139 Supplemental
-	10/27/2011	Updated Chapters: Ch. 3 See Luminant Letter no. TXNB-11068 Date 10/27/2011 Incorporated responses to following RAIs: No. 226
-	11/7/2011	Updated Chapters: Ch. 2, 11 See Luminant Letter no. TXNB-11076 Date 11/7/2011 Incorporated responses to following RAIs: No. 224 Supplemental 01
-	11/7/2011	Updated Chapters: Ch. 3, 13

		See Luminant Letter no. TXNB-11077 Date 11/7/2011 Incorporated responses to following RAIs: No. 228
-	11/14/2011	Updated Chapters: Ch. 11 See Luminant Letter no. TXNB-11074 Date 11/14/2011 Incorporated responses to following RAIs: No. 39 Supplemental 01
-	11/14/2011	Updated Chapters: Ch. 1 See Luminant Letter no. TXNB-11079 Date 11/14/2011 Incorporated responses to following RAIs: No. 235
-	12/1/2011	Updated Chapters: Ch. 2, 3 See Luminant Letter no. TXNB-11081 Date 12/1/2011 Incorporated responses to following RAIs: No. 223
-	11/14/2011	Updated Chapters: Ch13 See Luminant Letter no. TXNB-11080 Date 11/14/2011 Incorporated responses to following RAIs: No. 198 Supplemental 01
-	12/6/2011	Updated Chapters: Ch. 1 See Luminant Letter no. TXNB-11083 Date 12/6/2011 Incorporated responses to following RAIs: No. 236

-	12/8/2011	Updated Chapters: Ch. 2, 10, 12, 19 See Luminant Letter no. TXNB-11084 Date 12/8/2011 Incorporated responses to following RAIs: No. 232, 237
0	12/19/2011	Updated Chapters: Ch 1, 2, 3, 5, 7, 8, 9, 10, 11, 14, 19
-	1/9/2012	Updated Chapters: Ch. 2, See Luminant Letter no. TXNB-12001 Date 1/9/2012 Incorporated responses to following RAIs: No. 242
-	2/27//2012	Updated Chapters: Ch. 9, 14 See Luminant Letter no. TXNB-12006 Date 2/27/2012 Incorporated responses to following RAIs: No. 243
-	2/27/2012	Updated Chapters: Ch. 3, 13 See Luminant Letter no. TXNB-12006 Date 2/27/2012 Incorporated responses to following RAIs: No. 244
-	3/2/2012	Updated Chapters: Ch. 3 See Luminant Letter no. TXNB-12006 Date 2/27/2012 Incorporated responses to following RAIs: No. 239
-	3/9/2012	Updated Chapters: Ch. 12, 13 See Luminant Letter no. TXNB-12007 Date 3/9/2012 Incorporated responses to following RAIs: No. 246
-	3/9/2012	Updated Chapters: Ch 3 See Luminant Letter no. TXNB-12007 Date 3/9/2012

		Incorporated responses to following RAIs: No. 244
-	3/29/2012	Updated Chapters: Ch 6 See Luminant Letter no. TXNB-12008 Date 3/29/2012 Incorporated responses to following RAIs: No. 240
-	10/10/2011	Updated Chapters: Ch 6 See Luminant Letter no. TXNB-11063 Date 10/10/2011 Incorporated responses to following RAIs: No. 240
1	6/7/2012	Updated Chapters: Ch 1, 2, 3, 6, 8, 9, 10, 11, 12, 13, 14, 17, 19

Chapter 1

Chapter 1 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_01-5	1.1	1.1-1	Response to RAI No. 206 Luminant Letter no.TXNB-11035 Date 5/20/2011	Added the information about possession and rights to proprietary and safeguards information referenced in the US-APWR DCD.	-
RCOL2_09.02.05-4 S01	Table 1.8-201 (Sheet 41 of 68)	1.8-52	Supplemental Response to RAI No. 196 Luminant Letter no.TXNB-11053 Date 8/4/2011	Deleted COL Items COL 9.5(7) and COL 9.5(9). Added “”Deleted from the DCD” in their places.	-
RCOL2_01-6	Table 1.9-201 (Sheet 1 of 12)	1.9-4	Response to RAI No. 231 Luminant Letter no.TXNB-11063 Date 10/10/2011	Added RG 1.26 to Table 1.9-201.	-
RCOL2_01-7	Table 1.8-201 (68[69] of 68)	1.8-79 [1.8-80]	Response to RAI No. 235 Luminant Letter no.TXNB-11079 Date 11/14/2011	Deleted the term “Holder Item” from Table 1.8-201.	-
RCOL2_01-8	Table 1.9-201 (Sheet 7[8] of 12)	1.9-10 [1.9-11]	Supplemental Response to RAI No. 236 Luminant Letter no.TXNB-11083 Date 12/6/2011	Added RG 1.143 to FSAR Table 1.9-201 to reflect full conformance.	-
CTS-01384	Table 1.8-201 (Sheet 3 of 68)	1.8-14	Editorial	Added the cross section reference.	0
DCD_03.03.02-5	Table 1.8-201 (Sheet 4 of 63)	1.8-15	Reflect Response to DCD RAI No.817	Added the sentence to COL item.	0

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
DCD_03.06.01-9	Table 1.8-201 (Sheet 7 of 68)	1.8-18	Reflect Response to DCD RAI No.795	Added the sentence to COL item.	0
DCD_03.07.02-88	Table 1.8-201 (Sheet 10 of 68)	1.8-21	Reflect Response to DCD RAI No.810	Changed the COL item for clarification.	0
DCD_03.07.02-102	Table 1.8-201 (Sheet 10 of 68)	1.8-21	Reflect Response to DCD RAI No.810	Reinstated the COL item for clarification.	0
DCD_03.07.02-107	Table 1.8-201 (Sheet 12[13] of 68)	1.8-23 [1.8-24]	Reflect Response to DCD RAI No.810	Changed COL item for clarification.	0
DCD_07.09-23	1.8-201 (Sheet 28 of 68)	1.8-39	Reflect Response to DCD RAI No. 710	Deleted COL 7.9(1).	0
DCD_10.04.06-17	Table 1.8-201 (Sheet 42[43] of 68)	1.8-53 [1.8-54]	Reflect Response to DCD RAI No. 807	Added the new COL Item 10.3(4).	0
DCD_11.04-19	Table 1.8-201 (Sheet 45[46] of 68	1.8-56 [1.8-57]	Reflect Response to DCD RAI No. Amend 518	Corrected reference number in COL 11.2(8).	0
CTS-01363	Table 1.8-201 (Sheet 50[51] of 68)	1.8-61 [1.8-62]	Correction	Changed the resolution category for COL 12.2(1) from 3b to 3a.	0
DCD_06.02.06-45	Table 1.8-201 (Sheet 68[69] of 68)	1.8-79 [1.8-80]	Reflect Response to DCD RAI No. 803	Added new COL item 19.3(7)	0
CTS-01364	1.9.3	1.9-2	Correction	Revised Subsection 1.9.3 to delete the wording referring to the most recent revision of NUREG-0933.	0

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01365	1.10 Table 1.10-201	1.10-1 Through 1.10-9 [1.10-10]	Conformance to ISG-22	Revised Section 1.10 and Table 1.10-201 to address potential impacts of construction of CPNPP Unit 4 on CPNPP Unit 3 when Unit 3 begins operation	0
CTS-01418	ACRONYMS AND ABBREVIATIONS	1-xi 1-xii 1-xiii 1-xiv 1-xviii 1-xxiii 1-xxix	Consistency with DCD	Deleted CTS, ECS, ELS, FDS, FTS, LMS, PWS, and VDS from ACRONYMS AND ABBREVIATIONS.	1
DCD_07.01-35	1.4.2.4 1.4.2.5 1.4.2.6 1.4.3	1.4-2 1.4-3	Reflect Response to DCD RAI 733	Reflected addition of new DCD Subsection 1.4.2.4.	1
CTS-01431	Table 1.8-201 (Sheet 1 of 68[72])	1.8-12	Consistency with FSAR Ch 2	Deleted FSAR 2.0 to FSAR as location for COL 2.1(1).	1
CTS-01428	Table 1.8-201 (Sheet 3 of 68[72])	1.8-14	Consistency with FSAR Ch 2	Added FSAR 2.0 to FSAR location for COL 2.4(1).	1
DCD_03.09.06-66 DCD_03.09.06-68	Table 1.8-201 (Sheet 18 of 68[72])	1.8-29	Reflect response to DCD RAI 801	Revised COL 3.9(6) description.	1
DCD_03.09.06-53 DCD_03.09.06-55 DCD_03.09.06-68	Table 1.8-201 (Sheet 18[19] of 68[72])	1.8-29 [1.8-30]	Reflect response to DCD RAI 801	Deleted “plan” on COL Item 3.9(8).	1
DCD_03.12-25	Table 1.8-201 (Sheet 21[22] of 68[72])	1.8-32 [1.8-33]	Reflect response to DCD RAI No.742 Amend	Added COL 3.12(5) in consistent with DCD RAI response.	1
MAP-01-401	Table 1.8-201 (Sheet 26[27] of 68[72])	1.8-37 [1.8-38]	Consistency with DCD	Revised COL 6.2(5) description in consistency with DCD.	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
MAP-01-402	Table 1.8-201 (Sheet 26[27] of 68[72])	1.8-37 [1.8-38]	Consistency with DCD	Revised COL 6.2(6) description in consistency with DCD.	1
CTS-01496	Table 1.8-201 (Sheet 28[30] of 68[72])	1.8-39 [1.8-41]	Consistency with FSAR CH8	Added “8.2.1.2.1” to COL 8.2(3).	1
CTS-01497	Table 1.8-201 (Sheet 30[31] of 68[72])	1.8-41 [1.8-42]	Consistency with FSAR CH8	Added “8.2.1.2.3” to COL 8.2(11). Deleted “8.2.2.2”.	1
CTS-01497	Table 1.8-201 (Sheet 30[32] of 68[72])	1.8-41 [1.8-43]	Consistency with FSAR CH8	Added “8.3.1.3.2” to COL 8.3(3).	1
CTS-01498	Table 1.8-201 (Sheet 31[32] of 68[72])	1.8-42 [1.8-43]	Consistency with FSAR CH8	Replaced “8.3.2.3” to “8.3.2.3.2” to COL 8.3(8). Deleted “8.3.2.3.4” to COL 8.3(10). Added COL 8.3(12).	1
CTS-01457	Table 1.8-201 (Sheet 32[34] of 68[72])	1.8-43 [1.8-45]	Consistency with FSAR Ch9	Deleted “9.1.5” and added “9.1.5.3” to COL 9.1(6).	1
CTS-01457	Table 1.8-201 (Sheet 33[35,36] of 68[72])	1.8-44 [1.8-46,47]	Consistency with FSAR Ch9	Revised “9.1.2” and added “9.1.2.1” to COL 9.1(9). Added “9.2.5.2.1” and “13.5.2.1” to COL 9.2(1). Added “9.2.5.2.1, 9.2.5.2.2 and 9.2.5.2.3” to COL 9.2(3). Added “9.2.5.2.1, 9.2.5.2.2 and 9.2.5.2.3” to COL 9.2(4). Added ”9.2.5.2.1, 9.2.5.2.2 and 9.2.5.2.3 to COL 9.2(5).	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01457	Table 1.8-201 (Sheet 34[36,37] of 68[72])	1.8-45 [1.8-47,48]	Consistency with FSAR Ch9	Deleted “9.4.5.1.1.6” from COL 9.2(6). Deleted “9.2.1.2.1” and added “9.2.1.2.5, 9.2.1.2.3.1, 13.4 and Table 13.4-201” to COL 9.2(7). Deleted “9.2.4.2.2” and added “9.2.4.2.2.1, 9.2.4.2.2.2 and 9.2.4.2.2.3” to COL 9.2(9).	1
CTS-01457	Table 1.8-201 (Sheet 35[37,38] of 68[72])	1.8-46 [1.8-48,49]	Consistency with FSAR Ch9	“Added "9.2.4.2.2.4, 9.2.4.2.3, 9.2.4.4, 9.2.4.5, 9.2.4.2 and Figure 9.4-201” to COL 9.2(11). Added "9.2.4.2.2.1 and 9.2.4.2.2.3" to COL 9.2(15). Added "9.2.5.2.1, 9.2.5.2.2 and 9.2.5.2.3" to COL 9.2(18).	1
CTS-01457	Table 1.8-201 (Sheet 36[38,39] of 68[72])	1.8-47 [1.8-49,50]	Consistency with FSAR Ch9	Added "9.2.5.2.1, 9.5.2.2 and 9.2.5.2.3" to COL 9.2(19). Added "9.2.5.2.1, 9.2.5.2.2, 9.2.5.2.3, Table 9.2.5-3R and Figure 9.2.5-1R" to COL 9.2(20) and deleted “Table 9.2.5-201 and Figure 9.2.5-201". Added "9.2.5.2.1, 9.2.5.2.2 and 9.2.5.2.3" to COL 9.2(21). Deleted “Table 9.2.5-	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
				202 and added “Table 9.2.5-4R” to COL 9.2 (22). Added “13.5” to COL 9.2(23).	
CTS-01457	Table 1.8-201 (Sheet 37[39,40] of 68[72])	1.8-48 [1.8-50,51]	Consistency with FSAR Ch9	Added “9.2.1.3” to COL 9.2(26). Deleted “9.2.2.2.2” and added “9.2.7.2.1 and 13.5.2.1” to COL 9.2(27). Added “9.2.5.2.3” to COL 9.2(28). Added “13.5.2.1” to COL 9.2(29).	1
CTS-01457	Table 1.8-201 (Sheet 38[40] of 68[72])	1.8-49 [1.8-51]	Consistency with FSAR Ch9	Added "13.4, 13.5 and 13.5.2.1" to COL 9.2(30). Added "9.2.5.2.2 and 9.2.5.2.3" to COL 9.2(31).	1
CTS-01457	Table 1.8-201 (Sheet 39[42] of 68[72])	1.8-50 [1.8-53]	Consistency with FSAR Ch9	Deleted “Table 9.4-202 and Figure 9.4-203” Added “Table 9.4-203 and Figure 9.4-201” to COL 9.4(6).	1
DCD_09.04.03-19	Table 1.8-201 (Sheet 39[42] of68 [72])	1.8-50 [1.8-53]	Reflect response to DCD RAI No.831	Added “COL 9.4(7)” and description of COL Item in consistency with DCD.	1
CTS-01455	Table 1.8-201 (Sheet 42,43[45,46] of 68[72])	1.8-53,54 [1.8-56,57]	Consistency with FSAR Ch10.	Changed FSAR Location from 10.4.5 to 10.4.5, Table 10.4.5-1R, Figure	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
				10.4.5-1R and Figure 10.4.5-201 on COL 10.4(1). Changed FSAR Location from 10.4.8.1, 10.4.8.2 and 10.4.8.5 to 10.4.8.1, 10.4.8.2, 10.4.8.5, Table 10.4.8-1R and Figure 10.4.8-1R, 2R and 10.4.8-201 on COL 10.4(2).	
MAP-01-403	Table 1.8-201 (Sheet 44[47] of 68[72])	1.8-55 [1.8-58]	Consistency with DCD	Added “and” to COL 11.2(3).	1
CTS-01434	Table 1.8-201 (Sheet 45[48] of 68[72])	1.8-56 [1.8-59]	Editorial	Corrected reference which was addressed on FSAR UTR Rev0 DCD_11.04-19.	1
MAP-01-404	Table 1.8-201 (Sheet 45[48] of 68[72])	1.8-56 [1.8-59]	Consistency with DCD	Revised description of COL 11.3(3) in consistency with DCD.	1
CTS-01500	Table 1.8-201 (Sheet 45[48] and 47[50] of 68[72])	1.8-56 [1.8-59] 1.8-58 [1.8-61]	Editorial	Revised to have consistency between Ch1 and Ch11.	1
CTS-01437	Table 1.8-201 (Sheet 47[50] of 68[72])	1.8-58 [1.8-61]	Consistency with FSAR CH1 and Ch11	Added 11.4.2.3 on COL Item 11.4(7) FSAR Location.	1
MAP-01-405	Table 1.8-201 (Sheet 50[53] of 68[72])	1.8-61 [1.8-64]	Consistency with DCD	Added “are tracked” to COL 12.1(7)	1
CTS-01449	Table 1.8-201 (Sheet 52[55] of 68[72])	1.8-63 [1.8-66]	Correction	Added FSAR Locations for COL item 13.1(1).	1
CTS-01450	Table 1.8-201 (Sheet 53[56,57] of 68[72])	1.8-64 [1.8-67,68]	Correction	Added FSAR Locations for COL items 13.1(3), 13.1(4), 13.1(5), and 13.1(6). Deleted Table 13.1-203 and Figure 13.1-204 from COL item 13.1(6).	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01451	Table 1.8-201 (Sheet 54[57,58] of 68[72])	1.8-65 [1.8-68,69]	Correction	Added FSAR Locations for COL items 13.2(1), 13.2(2), 13.2(3), and 13.2(4), and 13.2(5).	1
CTS-01452	Table 1.8-201 (Sheet 55[59] of 68 [72])	1.8-66 [1.8-70]	Correction	Added FSAR Location for COL item 13.4(2).	1
CTS-01453	Table 1.8-201 (Sheet 56[59] of 68[72])	1.8-67 [1.8-70]	Correction	Added FSAR Locations for COL items 13.5(3), 13.5(5), and 13.5(6).	1
CTS-01454	Table 1.8-201 (Sheet 57[60] of 68[72])	1.8-68 [1.8-71]	Correction	Added FSAR Location for COL item 13.6(2).	1
DCD_03.12-25	Table 1.8-201 (Sheet 59[62] of 68[72])	1.8-70 [1.8-73]	Reflect response to DCD RAI No.742 Amend	Added section number in consistency with DCD RAI response.	1
MAP-01-406	Table 1.8-201 (Sheet 59[62] of 68[72])	1.8-70 [1.8-73]	Consistency with DCD	Deleted “proposed” and added “the” to COL 14.3(2)	1
DCD_14.03.03-27	Table 1.8-201 (Sheet 59[63] of 68[72])	1.8-70 [1.8-74]	Reflect Response to DCD RAI No 892	Added COL 14.3(4) to address DAC closure.	1
DCD_19-518	Table 1.8-201 (Sheet 68[70] of 69[72])	1.8-79 [1.8-81]	Reflect Response to DCD RAI No. 750	Reflected COL item changes for Chapter 19.	1
DCD_19-564	Table 1.8-201 (Sheet 68[71] of 68[72])	1.8-79 [1.8-82]	Reflect Response to DCD RAI No. 898	Reworded COL 19.3(6) and changed FSAR Location.	1
DCD_19-564	Table 1.8-201 (Sheet 68[71,72] of 68[72])	1.8-79 [1.8-82,83]	Reflect Response to DCD RAI No. 898	Reflected COL item changes for Chapter 19	1
DCD_10.04.08-11	Table 1.9-201 (Sheet 7[8] of 12[13])	1.9-10 [1.9-11]	Reflect Response to DCD RAI No. 862	Revised the column of COLA FSAR Status for RG 1.143 to be consistent with DCD.	1

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

ACRONYMS AND ABBREVIATIONS (Continued)

CSNI	Committee on the Safety of Nuclear Installations
CSS	containment spray system
CSTF	condensate storage and transfer facilities
CT	compact tension
~~CTS~~	~~condenser tube cleaning equipment~~ CTS-01418
CTW	cooling tower
CV	control valve
CVCS	chemical and volume control system
CVDP	C/V reactor coolant drain pump
CVDT	containment vessel reactor coolant drain tank
CVN	charpy v-notch
CVTR	Carolinas-Virginia Tube Reactor
CVVS	containment ventilation system
CWS	circulating water system
DAAC	diverse automatic actuation cabinet
DAS	diverse actuation system
DBA	design-basis accident
DBE	design-basis event
DBFL	design-basis flooding level
DBPB	design-basis pipe break
dc	direct current
DC/PS	dc power system
DCD	Design Control Document
DCH	direct containment heating
DCS	Data communication system
DDE	deep dose equivalent
DDT	deflagration to detonation transition
DE	Dose equivalent
DEGB	double-ended guillotine break
DEH	digital electro-hydraulic
DF	decontamination factor
DFR	digital fault recorder
DHP	diverse HSI panel
DICS	digital instrumentation and control system
DIF	dynamic impact factor
DL	disconnect link

ACRONYMS AND ABBREVIATIONS (Continued)

DLF	dynamic load factor
DMIMS	digital metal impact monitoring system
DNB	departure from nucleate boiling
DNBR	departure from nucleate boiling ratio
DOF	degree of freedom
DOP	dioctyl phthalate
DOT	Department of Transportation
D-RAP	design reliability assurance program
DRS	storm drain system
DS	decontamination system
DSS	digital safety system
DTM	design team manager
DV	depressurization valve
DVI	direct vessel injection
DWS	demineralized water system
DWTSS	demineralized water transfer and storage system
E/O	electrical to optical (or optical to electrical)
EAB	exclusion area boundary
EAC/PSS	emergency ac power supply system
EARWS	evacuation alarm and remote warning system
ECC	emergency core cooling
ECCS	emergency core cooling system
ECOM	error of commission
ECP	electrical corrosion potential
~~ECS~~	~~emergency communications system~~ CTS-01418
ECT	eddy current test
ECWS	essential chilled water system
EDE	effective dose equivalent
EDS	equipment drain system
EF	error factor
EFPD	effective full power days
EFH	Energy Future Holdings Corp.
EFW	emergency feedwater
EFWPAVS	emergency feedwater pump area HVAC system
EFWS	emergency feedwater system
EH/C	electric heating coil

ACRONYMS AND ABBREVIATIONS (Continued)

EHGS	turbine electro-hydraulic governor control system
EIF	electrical interface system
~~ELS~~	~~emergency letdown system~~ CTS-01418
EMI	electromagnetic interference
EOC	end-of-cycle
EOF	emergency operations facility
EOL	end-of-life
EOM	error of omission
EOP	emergency operating procedure
EOST	electrical overspeed trip device
EPG	emergency procedure guideline
EPRI	Electric Power Research Institute
EPS	emergency power source
EQ	environmental qualification
EQDP	equipment qualification data package
EQSDS	equipment qualification summary data sheet
ERAC	electrical rigid aluminum conduit
ERCOT	Electric Reliability Council of Texas
ERDA	Energy Research and Development Administration (now U.S. DOE)
ERDS	emergency response data system
ERSC	electrical rigid steel conduit
ESF	engineered safety features
ESFAS	engineered safety features actuation system
ESFVS	engineered safety features ventilation system
ESLS	electrical system logic system
ESP	early site permit
ESQDSR	Equipment Qualification Data Summary Report
ESQR	Equipment Seismic Qualification Report
ESW	essential service water
ESWP	essential service water pump
ESWPT	essential service water pipe tunnel
ESWS	essential service water system
ESX	ex-vessel steam explosion
ET	event tree
ETAP	Electrical Transient Analyzer Program

ACRONYMS AND ABBREVIATIONS (Continued)

ETSB	effluent treatment system branch	
EV	elevartor	
EX	excitation transformer	
EZB	exclusion zone boundary	
FA	function allocation	
FAB	feed and bleed	
FAC	flow-accelerated corrosion	
FATT	fracture appearance transit temperature	
FCV	feedwater control valve	
~~FDS~~	~~fire detection systems~~	CTS-01418
FE	finite element	
Fe	iron	
FEM	finite element method	
FHA	fire hazard analysis	
FHS	fuel handling system	
FIRS	foundation input response spectra	
FLB	feedwater line break	
FLML	failure to maintain water level	
FMEA	failure modes and effects analysis	
FO	fiber-optic	
FP	fission product	
FPP	fire protection program	
FPS	fire protection system	
FR	fire-rated	
FRA	functional requirements analysis	
FS	fuel system	
FSAR	Final Safety Analysis Report	
FSHS	fuel storage and handling system	
FSS	fire protection water supply system	
FT	fault tree	
~~FTS~~	~~fuel transfer system~~	CTS-01418
FV	Fussell Vesely	
FVW	Fussell Vesely worth	
FW	feedwater	
FWLB	feedwater line break	

ACRONYMS AND ABBREVIATIONS (Continued)

LER	licensee event report
LERF	large early release frequency
LHR	linear heat rate
LHSI	low-head safety injection
LiOH	lithium hydride
~~LMS~~	~~leak monitoring system~~ CTS-01418
LOCA	loss-of-coolant accident
LOESW	loss of essential service water
LOF	left-out-force
LOFF	loss of feedwater flow
LOOP	loss of offsite power
LOP	loss of power
LPDS	large panel display (LPD) system
LPMS	loose parts monitoring system
LPSD	low-power and shutdown
LPT	low-pressure turbine
LPZ	low-population zone
LRB	last rotation blade
LRF	large release frequency
LRT	leakage rate testing
LS	lighting system
LSS	low safety significance
LSSS	limiting safety system settings
LTOP	low temperature overpressure protection
Luminant	Luminant Generation Company LLC
LV	low voltage
LWMS	liquid waste management system
LWR	light-water reactor
M signal	main control room isolation signal
M/D	motor-driven
M/G	motor generator
MAAP	modular accident analysis program
MACCS2	MELCOR accident Consequence Code system 2
MCC	motor control center
MCCB	molded case circuit breaker
MCCI	molten core concrete interaction
MCES	main condenser evacuation system

ACRONYMS AND ABBREVIATIONS (Continued)

PLSS	primary liquid sampling system
PM	project manager
PMF	probable maximum flood
PMP	probable maximum precipitation
PMW	primary makeup water
PMWS	primary makeup water system
POL	problem oriented language
POS	plant operational state
POV	power-operated valve
PPASS	process and post-accident sampling systems
PPS	preferred power supply
PRA	probabilistic risk assessment
PRDF	probabilistic risk assessment fundamental
PRDS	pressurizer and relief discharge system
PRS	pressure relief system
PRSV	pressurizer safety valve
PRT	pressurizer relief tank
PS	Prestress
PS/B	power source building
PSB	power systems branch
PSF	performance shaping factor
PSFSV	power source fuel storage vault
PSI	preservice inspection
PSMS	protection and safety monitoring system
PSS	process and post-accident sampling system
PST	preservice testing
PSWS	potable and sanitary water system
PT	liquid penetrant examination method
PTFE	polytetrafluoroethylene
PTLR	pressure and temperature limits report
PTS	pressurized thermal shock
PUCT	Public Utility Commission of Texas
PWR	pressurized-water reactor
~~PWS~~	~~potable water system~~
PWSCC	primary water stress corrosion cracking
QA	quality assurance
QAP	quality assurance program

CTS-01418

ACRONYMS AND ABBREVIATIONS (Continued)

UCC	underclad cracking
UFSAR	Updated Final Safety Analysis Report
UG	underground
UHS	ultimate heat sink
UHSRS	ultimate heat sink related structures
UHSS	ultimate heat sink system
UPS	uninterruptible power supply
URD	Utility Requirement Document
US, U.S.	United States
USA	United States of America
USE	upper shelf energy
USM	uniform support motion
UT	ultrasonic examination method
UTS	ultimate tensile strength
UV/IR	ultraviolet/infrared
V&V	verification and validation
VA	vital area
VAC	volts alternating current
VAS	auxiliary building ventilation system
VCS	containment ventilation system
VCT	volume control tank
~~VDS~~	~~vent drain system~~ CTS-01418
VDU	visual display unit
VE	vital equipment
VFTP	ventilation filter testing program
VRS	engineered safety features ventilation system
Vs	shear wave velocity
VSL	VSI International, ltd.
VT	voltage transformer
VWO	valve wide open
VWS	chilled water system
WCAP	Westinghouse Commercial Atomic Power (report)
WG	water gauge
WHP	waste holdup tank pump
WHT	waste holdup tank
WMS	waste management system

1.4.2.3 Washington Division of URS Corporation

CP COL 1.4(1) Add the following sentence to the end of first sentence in DCD Subsection 1.4.2.3.

The Washington Division of URS Corporation provides consultation and engineering services in support of the design of the CPNPP Units 3 and 4 site and systems. The Washington Division of URS Corporation has entered into a contract with MHI to provide these services.

CP COL 1.4(1) Add the following subsections after DCD Subsection ~~1.4.2.3~~1.4.2.4. DCD_07.01-35

1.4.2.~~4~~5 Mitsubishi Nuclear Energy Systems, Inc.

Mitsubishi Nuclear Energy Systems, Inc. (MNES) is the primary contractor to Luminant for developing the CPNPP Units 3 and 4 COL Application, and provides overall project management and project control functions, as well as regulatory oversight. Various subcontractors support MNES.

MNES, established in July 2006, is a subsidiary of MHI that serves as a comprehensive business base for MHI's nuclear power business in the U.S., taking orders for new plants and handling business to supply large-size replacement components for existing nuclear power plants.

1.4.2.~~5~~6 Enercon Services Inc. DCD_07.01-35

Enercon Services, Inc. is an engineering, environmental, technical, and management services firm providing a broad range of professional services to private and government sector clients throughout the U.S. The primary roles of Enercon Services, Inc are developing the Environmental Report and related FSAR Chapter 2 for CPNPP Units 3 and 4, and providing services in document development and coordination.

1.4.2.~~6~~7 Other Participants in the Construction DCD_07.01-35

No construction contractors have been identified in this section because an architect engineer, balance of plant supplier and constructor have not been selected at this time. Each contractor will be selected based on the experience in the nuclear industry or equivalent, the relevant experience with engineering, procurement and construction, and the available resources. The identification and technical qualification of the primary contractor for construction will be made available prior to commencement of construction.

1.4.3 Combined License Information

Replace the content of DCD Subsection 1.4.3 with the following.

CP COL 1.4(1) ***1.4(1)*** *Identification of major agents, contractors, and participants*

This COL item is addressed in Subsections 1.4.1, 1.4.2.3, and 1.4.2.~~3~~5 through 1.4.2.~~6~~7. DCD_07.01-35

CP COL 1.8(2)

Table 1.8-201 (Sheet 1 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category
COL 1.1(1)	The COL Applicant is to provide scheduled completion date and estimated commercial operation date of nuclear power plants referencing the US-APWR standard design.	1.1.5	3a
COL 1.1(2)	The COLApplicant is to identify the actual plant location.	1.1.1	3a
COL 1.2(1)	The COL Applicant is to develop a complete and detailed site plan in the site-specific licensing process.	1.2.1.6 1.2.1.7.1 Figure 1.2-1R	3a
COL 1.4(1)	The COL Applicant is to identify major agents, contractors, and participants for the COL application development, construction, and operation.	1.4.1 1.4.2.3 – 1.4.2.6	4
COL 1.8(1)	The COL Applicant is to demonstrate that the interface requirements established for the design have been met.	1.8 Table 1.8-1R	3a
COL 1.8(2)	The COL Applicant is to provide the cross-reference identifying specific FSAR sections that address each COL information item from the DCD	1.8.1.2 Table 1.8-201	3a
COL 1.8(3)	The COL Applicant is to provide a summary of plant specific departures from the DCD, and conformance with site parameters.	1.8.1.3 1.8.1.4	3a
COL 1.9(1)	The COL Applicant is to address an evaluation of the applicable RG, SRP, Generic Issues including Three Mile Island (TMI) requirements, and operational experience for the site-specific portion and operational aspect of the facility.	1.9 1.9.1-1.9.4 Table 1.9-201 - 220	3a
COL 2.1(1)	The COL Applicant is to describe the site geography and demography including the specified site characteristics.	~~2.0~~ 2.1	3a

CTS-01431

CP COL 1.8(2)

Table 1.8-201 (Sheet 3 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 2.4(1)	The COL Applicant is to provide sufficient site-specific information to verify that hydrologic events will not affect the safety-basis for the US-APWR.	2.0 2.4	3a	CTS-01428
COL 2.5(1)	The COL Applicant is to provide sufficient information regarding the seismic and geologic characteristics of the site and the region surrounding the site.	2.0 2.5	3a	
COL 3.1(1)	The COL Applicant is to provide a design that allows for the appropriate inspections and layout features of the ESWS.	3.1.4.16.1	3a	
COL 3.2(1)	Deleted from the DCD.			
COL 3.2(2)	Deleted from the DCD.			
COL 3.2(3)	Deleted from the DCD.			
COL 3.2(4)	The COL Applicant is to identify the site-specific, safety-related systems and components that are designed to withstand the effects of earthquakes without loss of capability to perform their safety function; and those site-specific, safety-related fluid systems or portions thereof; as well as the applicable industry codes and standards for pressure-retaining components.	3.2.1.2 Table 3.2-201 Table 3.2-202	3a	CTS-01384
COL 3.2(5)	The COL Applicant is to identify the equipment class and seismic category of the site-specific, safety-related and non safety-related fluid systems, components (including pressure retaining), and equipment as well as the applicable industry codes and standards.	3.2.2 Table 3.2-201	3a	
COL 3.2(6)	The COL Applicant is to apply DCD methods of equipment classification and seismic categorization of risk-significant, non-safety related SSCs based on their safety role assumed in the PRA and treatment by the D-RAP.	3.2.2.5 Table 3.2-201	3a	

CP COL 1.8(2)

Table 1.8-201 (Sheet 18 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category
COL 3.8(29)	The COL Applicant is to provide design and analysis procedures for the ESWPT, UHSRS, and PSFSVs.	3.8.4.4.3 Appendix 3KK Appendix 3LL Appendix 3MM	3a
COL 3.8(30)	When a coefficient of friction of 0.7 is used in calculating sliding resistance F_s, roughening of fill concrete is required per criteria given in Section 11.7.9 of ACI 349 (Reference 3.8-8). If a coefficient of friction of less than 0.7 is used by the COL Applicant, roughening of fill concrete is not required.	3.8.4.4.3 3.8.5.5.2	3a
COL 3.9(1)	The COL Applicant is to assure snubber functionality in harsh service conditions, including snubber materials (e.g., lubricants, hydraulic fluids, seals).	3.9.3.4.2.5	3a
COL 3.9(2)	The first COL Applicant is to complete the vibration assessment program, including the vibration test results, consistent with guidance of RG 1.20. Subsequent COL Applicant need only provide information in accordance with the applicable portion of position C.3 of RG 1.20 for Non-Prototype internals.	3.9.2.4.1	2
COL 3.9(3)	Deleted from the DCD.		
COL 3.9(4)	Deleted from the DCD.		
COL 3.9(5)	Deleted from the DCD.		
COL 3.9(6)	~~The COL Applicant is to provide the program plan for IST of dynamic restraints in accordance with Nonmandatory Appendix A of ASME OM Code.~~The COL Applicant is to provide the program for IST of dynamic restraints in accordance with the ASME OM Code.	3.9.6.4	1b

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DCD_03.09.06-68

CP COL 1.8(2)

Table 1.8-201 (Sheet 19 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category
COL 3.9(7)	Deleted from the DCD.		
COL 3.9(8)	The COL Applicant is to administratively control the edition and addenda to be used for the IST program ~~plan~~, and to provide a full description of their IST program ~~plan~~ for pumps, valves, and dynamic restraints.	3.9.6	3a
COL 3.9(9)	Deleted from the DCD.		
COL 3.9(10)	The COL Applicant is to identify the site-specific active pumps.	3.9.3.3.1	3a
COL 3.9(11)	The COL Applicant is to provide site-specific, safety-related pump IST parameters and frequency.	3.9.6.2 Table 3.9-202	3a
COL 3.9(12)	The COL Applicant is to provide type of testing and frequency of site-specific valves subject to IST in accordance with the ASME Code.	3.9.6.3 Table 3.9-203	3a
COL 3.10(1)	The COL Applicant is to document and implement an equipment qualification program for seismic category I equipment and provide milestones and completion dates.	3.10.4.1	1a
COL 3.10(2)	Deleted from the DCD.		
COL 3.10(3)	The COL Applicant is to develop and maintain an equipment qualification file that contains a list of systems, equipment, and equipment support structures and summary data sheets referred to as an equipment qualification summary data sheet (EQSDS) of the seismic qualification for each piece of safety-related seismic category I equipment (i.e., each mechanical and electrical component of each system), which summarize the component's qualification.	3.10	1a
COL 3.10(4)	Deleted from the DCD.		

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DCD_03.09.06-55
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CP COL 1.8(2)

Table 1.8-201 (Sheet 22 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category
COL 3.12(2)	If any piping is routed in tunnels or trenches in the yard, the COL Applicant is to generate site-specific seismic response spectra, which may be used for the design of these piping systems.	3.12.5.1	3a
COL 3.12(3)	If the COL Applicant finds it necessary to lay ASME Code, Section III (Reference 3.12-2), Class 2 or 3 piping exposed to wind or tornado loads, then such piping must be designed to the plant design basis loads.	3.12.5.3.6	3a
COL 3.12(4)	The COL Applicant is to screen piping systems that are sensitive to high frequency modes for further evaluation.	3.12.5.6	3a
COL 3.12(5)	The COL holder for the first plant is to perform the pressurizer surge line monitoring subsequent to the COL item 14.2(11).	3.12.5.10	3a
COL 3.13(1)	Deleted from the DCD.		
COL 3.13(2)	Deleted from the DCD.		
COL 3.13(3)	The COL Applicant is to retain quality records including certified material test reports for all property test and analytical work performed on nuclear threaded fasteners in accordance with the requirements of 10 CFR 50.71.	3.13.1.5	3a
COL 3.13(4)	The COL Applicant is to address compliance with ISI requirements as summarized in Subsection 3.13.2.	3.13.2	1b
COL 3.13(5)	The COL Applicant is to commit to complying with the requirements of ASME Code, Section XI, IWA-5000 (Reference 3.13-14), and the requirements of 10 CFR 50.55a(b)(2)(xxvi) (Reference 3.13-11), Pressure Testing Class 1, 2, and 3 Mechanical Joints, and Paragraph (xxvii) Removal of Insulation.	3.13.2	3a

DCD_03.12-25

CP COL 1.8(2)

Table 1.8-201 (Sheet 27 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 6.2(5)	Preparation of a cleanliness, housekeeping and foreign materials exclusion program is the responsibility of the COL applicant. This program ~~addresses other debris sources such as latent debris inside containment. This program minimizes foreign materials in the containment.~~will be established to limit 200lbs of latent debris, and to limit the allocated 200ft^2 of miscellaneous debris per sump.	6.2.2.3 Table 6.2.2-2R	2	MAP-01-401
COL 6.2(6)	~~Deleted from the DCD.~~Preparation of administrative procedures is the responsibility of the COL Applicant. The procedures will ensure that RMI and fiber insulation debris within ZOIs will be consistent with the design basis debris specified in the Table 6.2.2-4, and will ensure that the aluminum in containment exposed to water in containment in post-LOCA condition (i.e., spray and blowndown water) is limited to equal or less than 810 ft^2.			MAP-01-402
COL 6.2(7)	Deleted from the DCD.			
COL 6.2(8)	The COL applicant is responsible for identifying the implementation milestone for the containment leakage rate testing program described under 10CFR50, Appendix J.	6.2.6.1	1b	
COL 6.2(9)	Deleted from the DCD.			
COL 6.2(10)	Deleted from the DCD.			
COL 6.3(1)	Deleted from the DCD.			
COL 6.3(2)	Deleted from the DCD.			
COL 6.3(3)	Deleted from the DCD.			
COL 6.3(4)	Deleted from the DCD.			

CP COL 1.8(2)

Table 1.8-201 (Sheet 30 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category
COL 8.2(3)	The COL applicant is to address the plant switchyard which includes layout, control system and characteristics of circuit breakers and buses, and lightning and grounding protection equipment.	8.1.1 8.1.5.3.5 8.2.1.2.1 8.2.1.2.1.1 8.2.1.2.1.2 8.2.1.2.2 Figure 8.1-1R Figures 8.2-202 – 8.2-208 Figure 8.3.1-1R Figure 8.3.1-2R	3a
COL 8.2(4)	The COL applicant is to provide detail description of normal preferred power.	8.2.1.2 Figure 8.2-202 Figure 8.2-203 Figure 8.2-207 Figure 8.2-208	3a
COL 8.2(5)	The COL applicant is to provide detail description of alternate preferred power.	8.2.1.2 Figure 8.2-202 Figure 8.2-204 Figure 8.2-207 Figure 8.2-208	3a
COL 8.2(6)	Deleted from the DCD.		

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CP COL 1.8(2)

Table 1.8-201 (Sheet 31 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category
COL 8.2(7)	The COL applicant is to address protective relaying for each circuit such as lines and buses.	8.2.1.2.1.1 8.2.1.2.1.2 Figure 8.2-203 Figure 8.2-204 Figure 8.2-209 Figure 8.2-210	3a
COL 8.2(8)	The COL applicant is to address switchyard dc power as part of switchyard design description.	8.2.1.2.1.1 8.2.1.2.1.2	3a
COL 8.2(9)	The COL applicant is to address switchyard ac power as part of switchyard design description.	8.2.1.2.1.1 8.2.1.2.1.2	3a
COL 8.2(10)	The COL applicant is to address transformer protection corresponded to site-specific scheme.	8.2.1.2	3a
COL 8.2(11)	The COL applicant is to address the stability and reliability study of the offsite power system. The stability study is to be conducted in accordance with BTP 8-3 (Reference 8.2-17). The study should address the loss of the unit, loss of the largest unit, loss of the largest load, or loss of the most critical transmission line including the operating range, for maintaining transient stability. A failure modes and effects analysis (FMEA) is to be provided. The grid stability study shows in part that, with no external electrical system failures, the grid will remain stable and the transmission system voltage and frequency will remain within the interface requirements (±10% for voltage and ±5% for frequency) to maintain the RCP flow assumed in the Chapter 15 analysis for a minimum of 3 seconds following reactor/turbine generator trip.	8.2.1.2.1.1 8.2.1.2.3 ~~8.2.2.2~~ 8.2.3 Table 8.2-203	3a

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CP COL 1.8(2)

Table 1.8-201 (Sheet 32 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 8.2(12)	Deleted from the DCD.			
COL 8.3(1)	The COL applicant is to provide transmission voltages. This includes also MT and RAT voltage ratings.	8.3.1.1 Table 8.3.1-1R	3a	
COL 8.3(2)	The COL applicant is to provide ground grid and lightning protection.	8.3.1.1.11	3a	
COL 8.3(3)	The COL applicant is to provide short circuit analysis for ac power system, since the system contribution is site specific.	8.3.1.1.9 8.3.1.3.2 8.3.1.3	3a	CTS-01497
COL 8.3(4)	Deleted from the DCD.			
COL 8.3(5)	Deleted from the DCD.			
COL 8.3(6)	Deleted from the DCD.			
COL 8.3(7)	Deleted from the DCD.			
COL 8.3(8)	The COL applicant is to provide short circuit analysis for dc power system.	8.3.2.1.1 8.3.2.1.2 8.3.2.3.2	3a	CTS-01498
COL 8.3(9)	Deleted from the DCD.			
COL 8.3(10)	The COL applicant is to provide protective devise coordination.	8.3.1.3.4 ~~8.3.2.3.4~~	3a	CTS-01498
COL 8.3(11)	The COL applicant is to provide insulation coordination (surge and lightning).	8.3.13.5	3a	
COL 8.3(12)	Cable Monitoring Program	8.2.3	3a	CTS-01498
COL 9.1(1)	Deleted from the DCD.			
COL 9.1(2)	Deleted from the DCD.			

CP COL 1.8(2)

Table 1.8-201 (Sheet 34 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category
COL 9.1(6)	To assure proper handling of heavy loads during the plant life, the COL Applicant is to establish a heavy load handling program, including associated procedural and administrative controls, that satisfies commitments made in Subsection 9.1.5 of the DCD, and that meets the guidance of ANSI/ASME B30.2, ANSI/ASME B30.9, ANSI N14.6, ASME NOG-1, CMAA Specification 70-2000, NUREG-0554, NUREG-0612, and NUREG-0800, Section 9.1.5 and RG 1.206 C.I.9.1.5. During the operating life of the plant, it is anticipated that temporarily installed hoists and mobile cranes will also be used for plant maintenance. The heavy load handling program will include all cranes and hoists on site capable of handling heavy loads, including temporary cranes and hoists. The heavy load handling program will adopt a defense-in-depth strategy to enhance safety when handling heavy loads. For instance, the program will restrict lift heights to practical minimums and limit lifting activities as much as practical to plant modes in which load drops have the smallest potential for adverse consequences, particularly when critical loads are being handled. Further, prior to the lifting of heavy loads after initial fuel loading, the program will institute any additional reviews as necessary to assure that potential drops of these loads due to inadvertent operations or equipment malfunctions, separately or in combination, will not jeopardize safe shutdown functions, cause a significant release of radioactivity, a criticality accident, or inability to cool fuel within the reactor vessel or spent fuel pool. The COL Applicant will prepare a non-critical heavy load procedure that includes sections, on the Design Bases, System Descriptions, Safety Evaluation, Inspection and Testing Requirements, and Instrumentation Requirements for the program. The heavy load program will include requirements for sufficient operator training, system design, load handling instructions, and	9.1.5.3	3a	CTS-01457

CP COL 1.8(2)

Table 1.8-201 (Sheet 35 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
	equipment inspections. Safe load paths will be defined so that heavy loads avoid being moved over or near irradiated fuel or critical equipment. Mechanical stops or electrical interlocks to prevent movement of heavy loads near irradiated fuel or safe shutdown equipment may also be employed.			
COL 9.1(7)	Deleted from the DCD.			
COL 9.1(8)	Deleted from the DCD.			
COL 9.1(9)	The COL applicant is to create a procedure that will instruct operators to perform formal inspection of the integrity of the spent fuel racks.	9.1.2.1	2	CTS-01457
COL 9.2(1)	The COL Applicant is to provide the evaluation of the ESWP at the lowest probable water level of the UHS. The COL Applicant is to develop recovery procedures in the event of approaching low water level of UHS.	9.2.1.3 9.2.5.2.1 13.5.2.1	3a	CTS-01457
COL 9.2(2)	The COL Applicant is to provide protection of the site-specific portions of the ESWS against adverse environmental, operating, and accident conditions that can occur, such as freezing, low temperature operation, and thermal overpressurization.	9.2.1.3	3a	
COL 9.2(3)	The COL Applicant is to determine source and location of the UHS.	9.2.5.2 9.2.5.2.1 9.2.5.2.2 9.2.5.2.3	3a	CTS-01457
COL 9.2(4)	The COL Applicant is to determine location and design of the ESW intake structure.	9.2.5.2 9.2.5.2.1 9.2.5.2.2 9.2.5.2.3	3a	CTS-01457

CP COL 1.8(2)

Table 1.8-201 (Sheet 36 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 9.2(5)	The COL Applicant is to determine location and design of the ESW discharge structure.	9.2.5.2 9.2.5.2.1 9.2.5.2.2 9.2.5.2.3	3a	CTS-01457
COL 9.2(6)	The COL Applicant is to provide ESWP design details – required total dynamic head with adequate margin, NPSH available, and the mode of cooling the ESWP motor. The COL Applicant is to assure that the sum of the shut-off head of the selected ESW pumps and the static head will not result in system pressure that exceeds the ESWS design pressure at any location within the system. The COL Applicant is to evaluate the potential for vortex formation based on the most limiting assumptions that apply.	9.2.1.2.2 9.2.1.2.2.1 Table 9.2.1-1R ~~9.4.5.1.1.6~~	3a	CTS-01457
COL 9.2(7)	The COL Applicant is to address the piping, valves, lining material specifications for piping and fittings as applicable, including those at the boundary between the safety-related and nonsafety-related portions, and other design of the ESWS related to the site specific conditions. The COL Applicant is also to design the pipes entering and exiting the pipe tunnel based on the location of the UHSRS.	~~9.2.1.2.1~~ 9.2.1.2.2.5 9.2.1.2.3.1 13.4 Table 13.4-201 9.2.1.3 Figure 9.2.1-1R	3a	CTS-01457
COL 9.2(8)	The COL Applicant is to specify the following ESW chemistry requirements • A chemical injection system to provide non-corrosive, non-scale forming conditions to limit biological film formation. • Type of biocide, algaecide, pH adjuster, corrosion inhibitor, scale inhibitor and silt dispersant based on the site conditions.	9.2.1.2.1	3a	

CP COL 1.8(2)

Table 1.8-201 (Sheet 37 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 9.2(9)	The COL Applicant is to confirm the storage capacity and usage of the potable water.	9.2.4.1 9.2.4.2.2.1 9.2.4.2.2.2 9.2.4.2.2.3	3a	CTS-01457
COL 9.2(10)	The COL Applicant is to confirm that all State and Local Department of Health and Environmental Protection Standards are applied and followed.	9.2.4.1	3a	
COL 9.2(11)	The COL Applicant is to identify the potable water supply and describe the system operation.	9.2.4.1 9.2.4.2.1 9.2.4.2.2.4 9.2.4.2.3 9.2.4.4 9.2.4.5 9.2.4.2 Figure 9.4-201 Figure 9.2.4-1R	3a	CTS-01457
COL 9.2(12)	The COL Applicant is to confirm that the sanitary waste is sent to the onsite plant treatment area or they will use the city sewage system.	9.2.4.1 9.2.4.2.1	3a	
COL 9.2(13)	Deleted from the DCD.			
COL 9.2(14)	The COL Applicant is to confirm Table 9.2.4-1 for required components and their values.	9.2.4.2.1 Table 9.2.4-1R	3a	
COL 9.2(15)	The COL Applicant is to determine the total number of people at the site and identify the usage capacity. Based on these numbers the COL Applicant is to size the potable water tank and associated pumps.	9.2.4.1 9.2.4.2.2 9.2.4.2.2.1 9.2.4.2.2.3	3a	CTS-01457

CP COL 1.8(2)

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Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 9.2(16)	Deleted from the DCD.	Table 9.2.4-1R	3a	
COL 9.2(17)	The COL Applicant is to determine the total number of sanitary lift stations and is to size the appropriate interfaces.	9.2.4.1 9.2.4.2.3	3a	
COL 9.2(18)	The COL Applicant is to determine the type of the UHS based on specific site conditions and meteorological data.	9.2.5.1 9.2.5.2 9.2.5.2.1 9.2.5.2.2 9.2.5.2.3	3a	CTS-01457
COL 9.2(19)	The COL Applicant is to design the UHS to receive its electrical power supply, if required by the UHS design, from safety busses so that the safety functions are maintained during LOOP. The UHS also receives its standby electrical power from the onsite emergency power supplies during a LOOP.	9.2.5.2 9.2.5.2.1 9.2.5.2.2 9.2.5.2.3	3a	CTS-01457
COL 9.2(20)	The COL Applicant is to provide a detailed description and drawings of the UHS, including water inventory, temperature limits, heat rejection capabilities, instrumentation, and alarms.	9.2.5.2 ~~Table 9.2.5-201~~ ~~Figure 9.2.5-201~~ 9.2.5.2.1 9.2.5.2.2 9.2.5.2.3 Table 9.2.5-3R Figure 9.2.5-1R	3a	CTS-01457
COL 9.2(21)	The COL Applicant is to determine the source of makeup water to the UHS inventory and the blowdown discharge location based on specific site conditions.	9.2.5.2 9.2.5.2.1 9.2.5.2.2 9.2.5.2.3	3a	CTS-01457

CP COL 1.8(2)

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Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 9.2(22)	The COL Applicant is to provide results of UHS capability and safety evaluation of the UHS based on specific site conditions and meteorological data. The COL Applicant is to use at least 30 years site specific meteorological data and heat loads data for UHS performance analysis per Regulatory Guide 1.27.	9.2.5.3 ~~Table 9.2.5-202~~ Table 9.2.5-4R	3a	CTS-01457
COL 9.2(23)	The COL Applicant is to provide test and inspection requirements of the UHS. These include inspection and testing requirements necessary to demonstrate that fouling and degradation mechanisms are adequately managed to maintain acceptable UHS performance and integrity.	9.2.5.4 13.5	3a	CTS-01457
COL 9.2(24)	The COL Applicant is to provide the required alarms, instrumentation and controls details based on the type of UHS to be provided.	9.2.5.5	3a	
COL 9.2(25)	The COL Applicant is to develop system filing, venting, keeping full, and operational procedures to minimize the potential for water hammer; to analyze the system for water hammer impacts; to design the piping system to withstand potential water hammer forces; and to analyze water hammer events in accordance with NUREG-0927.	9.2.1.2.1 13.5.2.1	2	
COL 9.2(26)	The COL applicant is to specify appropriate sizes of piping and pipe fittings such as restriction orifices to prevent potential plugging due to debris buildup, and develop maintenance and test procedures to monitor debris build up and flush out debris.	9.2.1.2.1 9.2.1.3 13.5.2.1	2	CTS-01457
COL 9.2(27)	The COL Applicant is to develop a milestone schedule for implementation of the operating and maintenance procedures for water hammer prevention.	~~9.2.2.2.2~~9.2.7.2.1 13.5.2.1	2	CTS-01457

CP COL 1.8(2)

Table 1.8-201 (Sheet 40 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 9.2(28)	The COL Applicant is to provide the piping, valves, materials specifications, and other design details related to the site-specific UHS.	9.2.5.2.2 9.2.5.2.3	3a	CTS-01457
COL 9.2(29)	The COL Applicant is to provide the safety evaluation of the capability of the ESWS to: (1) isolate its site-specific, nonsafety-related portions; and (2) provide measures to prevent long-term corrosion and organic fouling that may degrade its performance, per Generic Letter (GL) 89-13.	9.2.1.3 13.5.2.1	3a	CTS-01457
COL 9.2(30)	The COL Applicant shall conduct periodic inspection, monitoring, maintenance, performance and functional testing of the ESWS and UHS piping and components, including the heat transfer capability of the CCW heat exchangers and essential chiller units, consistent with GL 89-13 and GL.89-13 Supplement 1. The COL Applicant is to develop operating procedures to periodically alternate the operation of the trains to ensure performance of all trains is regularly monitored.	9.2.1.4 13.4 13.5 13.5.2.1	3a	CTS-01457
COL 9.2(31)	The COL Applicant is to verify the system layout of the ESWS and UHS and is to develop operating procedures to assure that the ESWS and UHS are above saturation conditions for all operating modes.	9.2.1.2.1 9.2.5.2.2 9.2.5.2.3	3a	CTS-01457
COL 9.2(32)	The COL Applicant is to provide a void detection system with alarms to detect system voiding.	9.2.1.2.3.1 9.2.5.5	3a	
COL 9.2(33)	The COL Applicant is to provide the design details of the strainer blowdown line, vent line, and their discharge locations.	9.2.1.2.2.2	3a	
COL 9.3(1)	The COL Applicant is to provide the high pressure nitrogen gas, low pressure nitrogen gas, the hydrogen gas, carbon dioxide, and oxygen supply systems.	9.3.1.2.1.3 9.3.1.2.2.3 Figure 9.3.1-201	3a	

CP COL 1.8(2)

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Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 9.4(6)	The COL Applicant is to provide a system information and flow diagram of ESW pump area ventilation system if the ESW pump area requires the heating, ventilating and air conditioning.	9.4.5 9.4.5.1.1.6 9.4.5.2.6 9.4.5.3.6 9.4.5.4.6 9.4.5.5.6 ~~Table 9.4-202~~ ~~Figure 9.4-203~~ Table 9.4-203 Figure 9.4-201	3a	CTS-01457
COL 9.4(7)	The COL Applicant is to determine the frequency of performance of periodic auxiliary building HVAC system ventilation flow balancing.	9.4.3.4.1	2	DCD_09.04.03-19
COL 9.5(1)	The COL applicant establishes a fire protection program, including organization, training and qualification of personnel, administrative controls of combustibles and ignition sources, firefighting procedures, and quality assurance.	9.5.1 9.5.1.6 Table 9.5.1-1R Table 9.5.1-2R	1a	
COL 9.5(2)	The COL Applicant addresses the design and fire protection aspects of the facilities, buildings and equipments, such as cooling towers and a fire protection water supply system, which are site specific and/or are not a standard feature of the US-APWR.	9.2.1.2.1 9.5.1.2.1 9.5.1.2.2 9.5.1.2.3 9.5.1.2.4 Table 9.5.1-1R Table 9.5.1-2R Figure 9.5-201 Figure 9.5-202 Appendix 9A	3a	

CP COL 1.8(2)

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Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 10.3(1)	FAC monitoring program The Combined License Applicant will provide a description of the FAC monitoring program for carbon steel portions of the steam and power conversion systems that contain water or wet steam and are susceptible to erosion-corrosion damage. The description will address consistency with Generic Letter 89-08 and NSAC-202L-R2 and will provide a milestone schedule for implementation of the program.	10.3.6.3	2	
COL 10.3(2)	Deleted from the DCD.			
COL 10.3(3)	Operating and maintenance procedures for water hammer prevention The Combined License Applicant is to provide operating and maintenance procedures including adequate precautions to prevent water (steam) hammer, relief valve discharge loads and water entrainment effects in accordance with NUREG-0927 and a milestone schedule for implementation of the procedure.	10.3.2.4.3	2	
COL 10.3(4)	The COL applicant will provide secondary side water chemistry threshold values and recommended operator actions for chemistry excursions, or provide a commitment to the latest version of the EPRI "PWR Secondary Water Chemistry Guidelines" in effect at the time of COLA submittal.	10.3.5.5	1a	DCD_10.04.06-17
COL 10.4(1)	Circulating Water System; The Combined License Applicant is to determine the site specific final system configuration and system design parameters for the CWS including makeup water and blowdown.	10.4.5 Table 10.4.5-1R Figure 10.4.5-1R Figure 10.4.5-201	3a	CTS-01455

CP COL 1.8(2)

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Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category
COL 10.4(2)	Steam Generator Blowdown System; The Combined License applicant is to address the discharge to Waste Water System including site specific requirements.	10.4.8.1 10.4.8.2 10.4.8.5 Table 10.4.8-1R Figure 10.4.8-1R Figure 10.4.8-2R Figure 10.4.8-201	3a
COL 10.4(3)	Deleted from the DCD.		
COL 10.4(4)	Deleted from the DCD.		
COL 10.4(5)	System Design for Steam Generator Drain; The Combined License applicant is to address the nitrogen or equivalent system design for Steam Generator Drain Mode. (This is dependent on Waste water system design)	10.4.8.2.2.4	3a
COL 10.4(6)	Operating and maintenance procedures for water hammer prevention The combined License Applicant is to provide operating and maintenance procedures in accordance with NUREG-0927 and a milestone schedule for implementation of the procedure.	10.4.7.7 10.4.9.2.2	2
COL 11.2(1)	The COL applicant is responsible for ensuring that mobile and temporary liquid radwaste processing equipment and its interconnection to plant systems conforms to regulatory requirements and guidance such as 10 CFR 50.34a (Ref. 11.2-5), 10 CFR 20.1406 (Ref.11.2-7) and RG 1.143 (Ref. 11.2-3), respectively.	11.2.1.6	3a

CTS-01455

CP COL 1.8(2)

Table 1.8-201 (Sheet 47 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category
COL 11.2(2)	Site-specific information of the LWMS, e.g., radioactive release points, effluent temperature, shape of flow orifices, etc., is provided in the COLA.	11.2.2 11.2.3.1	3a
COL 11.2(3)	The COL applicant is responsible for the site-specific hydrogeological data and for performing an analysis to demonstrate that the potential groundwater or surface water contamination concentration resulting from radioactive release due to liquid containing tank failure meets the 10 CFR 20, Appendix B, Table2 ECL.	11.2.3.2	3a
COL 11.2(4)	The COL applicant is to calculate doses to members of the public following the guidance of RG 1.109 (Ref 11.2-15) and RG 1.113 using site-specific parameters, and compares the doses due to the liquid effluents with the numerical design objectives of Appendix I to 10 CFR 50 (Ref 11.2-10) and compliance with requirements of 10 CFR 20.1302, 40 CFR 190.	11.2.3.1 Table 11.2-10R Table 11.2-11R Table 11.2-12R Table 11.2-13R Table 11.2-14R Table 11.2-15R	3a
COL 11.2(5)	The COL applicant is to perform a site-specific cost benefit analysis to demonstrate compliance with the regulatory requirements.	11.2.1.5	3a
COL 11.2(6)	The COL applicant is to provide piping and instrumentation diagrams (P&IDs).	11.2.2 Figure 11.2-201	3a
COL 11.2(7)	The COL Applicant is responsible for identifying the implementation milestones for the coatings program used in the LWMS. The coatings program addresses RG 1.54 Revision 1, recognizing that more recent standards may be used if referenced in DCD Section 11.2.	11.2.4	1b

MAP-01-403

CP COL 1.8(2)

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COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 11.2(8)	The COL Applicant is to describe mobile/portable LWMS connections that are considered non-radioactive but later may become radioactive through contact or contamination with radioactive systems (i.e., a non-radioactive system becomes contaminated due to leakage, valving errors, or other operating conditions in the radioactive systems), and operational procedures of the mobile/portable LWMS connections. The COL Applicant is to prepare a plan to develop and use operating procedures so that the guidance and information in Inspection and Enforcement (IE) Bulletin 80-10 (Ref. ~~11.4-25~~11.2-25) is followed.	11.2.1.6	3a	DCD_11.04-19 CTS-01434
COL 11.3(1)	Deleted from the DCD.			
COL 11.3(2)	Deleted from the DCD.			
COL 11.3(3)	The COL applicant is to provide a discussion of the onsite vent stack ~~design parameters and~~ released point height.	11.3.2	3a	MAP-01-404
COL 11.3(4)	Deleted from the DCD.			
COL 11.3(5)	Deleted from the DCD.			
COL 11.3(6)	The COL applicant is to calculate doses to members of the public following the guidance of RG 1.109(Ref. 11.3-19) and RG 1.111(Ref. 11.3-22), and compare the doses due to the gaseous effluents with the numerical design objectives of 10 CFR 50, Appendix I (Ref. 11.3-3) and compliance with requirements of 10 CFR 20.1302(Ref. 11.3-24), 40 CFR 190(Ref. 11.3-25).	11.3.3.1 Table 11.3-8R Table 11.3-9R Table 11.3-201 Table 11.3-202 Table 11.3-203 Table 11.3-204 Table 11.3-205 Table 11.3-206	3a	CTS-01500

CP COL 1.8(2)

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Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 11.4(5)	The current design provides collection and packaging of potentially contaminated clothing for offsite shipment and/or disposal. Depending on site-specific requirements, the COL applicant can send the wastes to an offsite laundry facility processing and/or bring in a mobile compaction unit for volume reduction. The laundry services, including contracted services and/or a temporary mobile compaction subsystem are COL items.	11.4.1.3 11.4.1.6	3a	
COL 11.4(6)	The COL applicant is required to perform a site-specific cost benefit analysis to demonstrate compliance with the regulatory requirements.	11.4.1.5	3a	
COL 11.4(7)	The SWMS design does not include solid waste processing facility (e.g. de-watering system, compactor for reducing waste volume) but provides the flexibility for the site-specific utilities to add compaction equipment or to adopt contract services from specialized facilities. This is the responsibility of the COL applicant.	11.4.1.6 11.4.2.3 11.4.4.5	3a	CTS-01437
COL 11.4(8)	The COL applicant is to provide piping and instrumentation diagrams (P&IDs).	11.4.2.2.1 Figure 11.4-201	3a	
COL 11.4(9)	The COL Applicant is responsible for identifying the implementation milestones for the coatings program used in the SWMS. The coatings program addresses RG 1.54 Revision 1, recognizing that more recent standards may be used if referenced in DCD Section 11.4.	11.4.6	1b	
COL 11.4(10)	The COL Applicant is responsible for ensuring that mobile and temporary solid radwaste processing and its interconnection to plant systems conforms to regulatory requirements and guidance such as 10 CFR 50.34a (Ref. 11.4-11), 10 CFR 20.1406 (Ref.11.4-16) and RG 1.143 (Ref. 11.4-1).	11.4.1.~~5~~6	3a	CTS-01500

CP COL 1.8(2)

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Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 12.1(7)	The COL applicant is to describe implementation of requirements for record retention are tracked according to 10 CFR50.75(g) and 10 CFR70.25(g) as applicable.	12.1.3 12.3.1.3.2	3a	MAP-01-405
COL 12.1(8)	The COL Applicant is responsible for the development of the operational procedures, following the guidance of RG 4.21 (Reference 12.1-27), for the operation and handling of all structure, system, and components (SSC) which could be potential sources of contamination within the plant. These procedures will be developed according to the objective of limiting leakage and the spread of contamination within the plant.	12.1.3 12.3.1.3.2	3a	
COL 12.2(1)	The COL Applicant is to list any additional contained radiation sources that are not identified in Subsection 12.2.1, including radiation sources used for instrument calibration or radiography.	12.2.1.1.10	~~3b~~3a	CTS-01363
COL 12.2(2)	The COL Applicant is to address the radiation protection aspects associated with additional storage space for radwaste and/or additional radwaste facilities for dry active waste.	12.2.1.1.10 12.5	3a	
COL 12.2(3)	The COL Applicant is to include the conduct of regular surveillance activities and provisions to maintain the dose rate at 2 meters from the surface of both the RWSAT and PMWTs under 0.25 mrem/h in the Radiation Protection Program.	12.5	3a	
COL 12.2(4)	The COL Applicant is to implement a method of ensuring that the radioactivity concentration in both the RWSAT and the PMWTs remain under the specified concentration level described in the DCD.	12.5	3a	

CP COL 1.8(2)

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Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category
COL 12.3(8)	If the COL Applicant adopts the Mobile Liquid Waste Processing System, the COL Applicant is to confirm the radiation zone(s) where the system is installed in and to revise Figure 12.3-1, if necessary.	12.3.1.1.1.2	3a
COL 12.3(9)	In order to ensure that the B.A. evaporator room does not become a VHRA during the end of cycle, the COL Applicant is to stipulate a need for routine surveillance in the Radiation Protection Program. In the event that the routine surveillance shows an increase in dose level, the COL Applicant must provide an appropriate strategy to sufficiently reduce the dose rate below the criteria for a VHRA.	12.5	3a
COL 12.3(10)	The COL Applicant will address the site-specific design features, operational, postconstruction objectives, and conceptual site model guidance of Regulatory Guide 4.21.	12.3.1.3.1.1 12.3.1.3.2 Table 12.3-201 Figure 12.3-201	3a
COL 12.4(1)	For multiunit plants, the COL Applicant is to provide estimated annual doses to construction workers in a new unit construction area, as a result of radiation from onsite radiation sources from the existing operating plant(s).	12.4.1.9 Table 12.4-201	3a
COL 13.1(1)	The COL Applicant is to provide a description of the corporate or home office organization, its functions and responsibilities, and the number and qualifications of personnel. The COL Applicant directs attention to activities that include facility design, design review, design approval, construction management, testing, and operation of the plant.	13.1-13.1.1.2.5 Figures 13.1-201 – 204 Appendix 13AA 13.1.2 Table 13.1-201 Table 13.1-202	3a

CTS-01449

CP COL 1.8(2)

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Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 13.1(2)	The COL Applicant is to develop a description of past experience in the design, construction, and operation of nuclear power plants and past experience in activities of similar scope and complexity.	13.1.1.1	3a	
COL 13.1(3)	The COL Applicant is to describe its management, engineering, and technical support organizations. The description includes organizational charts for the current headquarters and engineering structure and any planned modifications and additions to those organizations that reflect the added functional responsibilities with the nuclear power plant.	13.1.1.2.2 Figure 13.1-204	3a	CTS-01450
COL 13.1(4)	The COL Applicant is to develop a description of the organizational arrangement. This description shows how the added functional responsibilities associated with the addition of the nuclear power plant to the Applicant's power generation capacity are delegated and assigned (or expected to be assigned) to each of the working or performance-level organizational units to implement these responsibilities. The description includes organizational charts reflecting the current corporate structure and the specific working- or performance-level organizational units that provide technical support for the operation.	13.1-13.1.1.2.5 Figures 13.1-201 - 204 13.1.2 Table 13.1-201 Table 13.1-202	3a	CTS-01450
COL 13.1(5)	The COL Applicant is to develop the description of the general qualification requirements in terms of educational background and experience for positions or classes of positions depicted in the organizational arrangement.	13.1.3 13.1.1.3	3a	CTS-01450

CP COL 1.8(2)

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Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 13.1(6)	The COL Applicant is to develop the organizational structure for the plant organization, its personnel responsibilities and authorities, and operating shift crews.	13.1.2 - 13.1.2.6 ~~Table 13.1-203~~ Figures 13.1-202 ~~-~~and ~~204~~203 13.1.1.1 Table 13.1-201 Table 13.1-202	3a	CTS-01450 CTS-01450
COL 13.1(7)	The COL Applicant is to develop the description of education, training, and experience requirements established for management, operating, technical, and maintenance positions for the operating organization.	13.1.3	3a	
COL 13.2(1)	The COL Applicant is to develop the training program description.	13.2 Figure 13.1-205	3a	CTS-01451
COL 13.2(2)	The COL Applicant is to develop training programs for reactor operators in accordance with NUREG-0800, Section 13.2.1.I.3 (Ref. 13.2-4).	13.2 Figure 13.1-205	1a	CTS-01451
COL 13.2(3)	The COL Applicant is to develop training programs for non-licensed plant staff in accordance with NUREG-0800, Section 13.2.2.I.3 (Ref. 13.2-4).	13.2 Figure 13.1-205	1b	CTS-01451
COL 13.2(4)	The COL Applicant is to develop training programs. These programs include a chart, which shows the schedule of each part of the training program for each functional group of employees in the organization in relation to the schedule for preoperational testing, expected fuel loading, and expected time for examinations prior to plant criticality for licensed operators.	13.2 Figure 13.1-205	3a	CTS-01451

CP COL 1.8(2)

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COL Item No.	COL Item	FSAR Location	Resolution Category
COL 13.2(5)	The COL Applicant is to determine the extent to which portions of applicable NRC guidance is used in the facility training program or the justification of exceptions.	13.2 Figure 13.1-205	3a
COL 13.3(1)	The COL Applicant is to develop interfaces of design features with site specific designs and site parameters.	13.3	3a
COL 13.3(2)	The COL Applicant is to develop a comprehensive emergency plan as a physically separate document.	13.3.1	3a
COL 13.3(3)	The COL Applicant is to develop an emergency classification and action level scheme.	13.3.1	3a
COL 13.3(4)	The COL Applicant is to develop the security-related aspects of emergency planning.	13.3.1	3a
COL 13.3(5)	The COL Applicant is to develop a multi-unit site interface plan depending on the location of the new reactor on, or near, an operating reactor site with an existing emergency plan.	13.3.2	3a
COL 13.3(6)	The COL Applicant is to develop an emergency planning inspections, tests, analyses, and acceptance criteria.	13.3.3	3a
COL 13.3(7)	The COL Applicant is to develop the description of the operation support center.	13.3	3a
COL 13.4(1)	The COL Applicant is to develop a description and schedule for the implementation of operational programs. The COL Applicant is to “fully describe” the operational programs as defined in SECY-05-0197 (Ref. 13.4-1) and provide commitments for the implementation of operational programs required by regulation. In some instances, programs may be implemented in phases. The COL Applicant is to include the phased implementation milestones in their submittal.	13.4 Table 13.4-201 FSAR sections referenced therein	1a

CTS-01451

CP COL 1.8(2)

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COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 13.4(2)	The COL Applicant is to develop a leakage monitoring and prevention program for the systems specified in TS 5.5.2. The leakage monitoring and prevention program will include the appropriate methods and acceptance criteria as defined in NUREG-0737 Item III.D.1.1 (Ref 13.4-2).	Table 13.4-201 13.4.1	1b	CTS-01452
COL 13.5(1)	The COL Applicant is to develop administrative procedures describing administrative controls over activities that are important to safety for the operation of a facility.	13.5-13.5.1.2	2	
COL 13.5(2)	Deleted from the DCD.			
COL 13.5(3)	The COL Applicant is to develop procedures performed by licensed operators in the main control room. Operating procedures that are used by the operating organization to ensure routine operating, off-normal, and emergency activities are conducted in a safe manner are described. The plan includes the implementation of these procedures (Ref. 13.5-3).	13.5.2 13.5.2.1	2	CTS-01453
COL 13.5(4)	The COL Applicant is to describe the different classifications of procedures the operators will use in the main control room and locally in the plant for operations, the operating organization responsible for maintaining the procedures, and the general format and content of the different classifications.	13.5.2 13.5.2.1	3a	
COL 13.5(5)	The COL Applicant is to describe the program for developing operating procedures.	13.5.2 13.5.2.1	3a	CTS-01453
COL 13.5(6)	The COL Applicant is to describe the program for developing and implementing emergency operating procedures.	13.5.2 13.5.2.1	3a	CTS-01453

CP COL 1.8(2)

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COL Item No.	COL Item	FSAR Location	Resolution Category
COL 13.5(7)	The COL Applicant is to describe the classifications of maintenance and other operating procedures, the operating organization group or groups responsible for following each class of procedure, and the general objectives and character of each class and subclass.	13.5.2.2	3a
COL 13.6(1)	The COL Applicant is to develop and provide the plant overall security plan (consisting of the physical security plan, safeguards contingency plan, and the guard training and qualification plan) and the cyber security plan and the implementation schedule for security programs.	13.6 Table 13.4-201	1a 3a
COL 13.6(2)	The COL applicant is to develop and provide as part of its physical security plan site specific physical security features and capabilities, such as (i) the physical barrier surrounding the protected area boundary; (ii) the isolation zone in areas adjacent to the protected area boundary, (iii) security lighting, or use of low-light technology, for the isolation zone and protected area; (iv) the vehicle barrier system, (v) controlled access points to control entry of personnel, vehicles and materials into the protected area, (vi) the intrusion detection system, and (vii) the closed circuit television camera and video assessment systems to provide monitoring and assessment of the protected area perimeter.	13.6.1 13.6.2 Physical Security Plan	3a
COL 13.6(3)	The COL applicant is to revise the non-standard plant vital area and vital equipment information contained in the US-APWR Design Certification, Physical Element Review to be consistent with its site-specific design.	13.6.2.2	3a
COL 13.6(4)	The COL applicant is to make provision for the secondary alarm station in accordance with the requirements of 10 CFR 73.55(i)(4).	13.6.2.2	3a

CTS-01454

CP COL 1.8(2)

Table 1.8-201 (Sheet 62 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 14.2(8)	Deleted from the DCD.			
COL 14.2(9)	Deleted from the DCD.			
COL 14.2(10)	The COL applicant is responsible for the testing outside scope of the certified design in accordance with the test criteria described in subsection 14.2.1. [14.2.12]	14.2.12.1.90.C.8 14.2.12.1.112 14.2.12.1.113 14.2.12.1.114 Table 14.2-201 Appendix 14A	3a	
COL 14.2(11)	The COL holder for the first plant is to perform the first plant only tests and prototype test. For subsequent plants, either these tests are performed, or the COL applicant provides a justification that the results of the first-plant only tests are applicable to the subsequent plant and are not required to be repeated. [14.2.8]	14.2.8.1 14.2.8.2.1 14.2.8.2.2	3a	DCD_03.12-25
COL 14.2(12)	The COL holder makes available approved test procedures for satisfying testing requirements described in Section 14.2 to the NRC approximately 60 days prior to their intended use. [14.2.3, 14.2.11, 14.2.12.1]	14.2.3	2	
COL 14.3(1)	The COL applicant provides the ITAAC for the site specific portion of the plant systems specified in Subsection 14.3.5, Interface Requirements. [14.3.4.6,14.3.4.7]	14.3.4.7	5	
COL 14.3(2)	The COL applicant provides ~~proposed~~the ITAAC for the facility's emergency planning not addressed in the DCD in accordance with RG 1.206 (Reference 14.3-1) as appropriate. [14.3.4.10]	14.3.4.10	5	MAP-01-406

CP COL 1.8(2)

Table 1.8-201 (Sheet 63 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category
COL 14.3(3)	The COL applicant provides ITAAC for the facility's physical security hardware not addressed in the DCD in accordance with RG 1.206 (Reference 14.3-1) as appropriate, and provides abstracts describing the specific inspections, tests and analysis for the facility's physical security hardware ITAAC not addressed in the DCD.	14.3.4.12	5
COL 14.3(4)	The COL Applicant provides a DAC closure schedule and declares whether the standard approach is used for closure of DAC ITAAC, as described by Appendix 14.B.1	14.3.4.3	
COL 15.0(1)	In the COLA, if the site-specific χ/Q values exceed DCD χ/Q values, then the COL Applicant is to demonstrate how the dose reference values in 10 CFR 50.34 and 10 CFR 52.79 and the control room dose limits in 10 CFR 50, Appendix A, General Design Criterion 19 are met for affected events using site-specific χ/Q values. Additionally, the Technical Support Center (TSC) dose should be evaluated against the habitability requirements in Paragraph IV.E. 8 to 10 CFR Part 50, Appendix E, and 10 CFR 50.47(b)(8) and (b)(11).	15.0.3.3	3a
COL 16.1(1)	Adoption of RMTS is to be confirmed and the relevant descriptions are to be fixed.	16.1.1.2 COLA Part 4, Section A	3a
COL 16.1(2)	Adoption of SFCP is to be confirmed and the relevant descriptions are to be fixed.	16.1.1.2 COLA Part 4, Section A	3a
COL 16.1_3.3.1(1)	Deleted from the DCD.		

DCD_14.03.03-27

CP COL 1.8(2)

Table 1.8-201 (Sheet 70 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 19.3(4)	The Probabilistic Risk Assessment and Severe Accident Evaluation is updated as necessary to assess specific site information and ~~associated site specific external events (high winds and tornadoes, external floods, transportation, and nearby facility accidents).~~all potential site specific external hazards (both natural and man-made hazards) that may affect the facility are screened out or subjected to analysis.	19.1.1.2.1 19.1.4.1.2 19.1.4.2.2 19.1.5 19.1.5.2.2 19.1.5.3.2 19.1.6.2 19.2.6.1 19.2.6.1.1 19.2.6.2 19.2.6.4 19.2.6.5 19.2.6.6 Table 19.1-201 Table 19.1-202 Table 19.1-203 Table 19.2-9R Figure 19.1-201	3a	DCD_19-518
COL 19.3(5)	~~Deleted from the DCD.~~The COL Applicant will identify a milestone for completing a comparison of the as-built SSC HCLPFs to those assumed in DCD Subsection 19.1.5.1. Deviations from the HCLPF values or other assumptions in the seismic margins evaluation shall be analyzed to determine if any new vulnerability has been introduced.	19.1.5.1.1 19.1.5.1.2 Table 19.1-206	4	RCOL2_19-8 S01

CP COL 1.8(2)

Table 1.8-201 (Sheet 71 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 19.3(6)	~~The COL applicant develops an accident management program which includes severe accident management procedures that capture important operator actions. Training requirements are also included as part of the accident management program.~~The COL Applicant develops or describes an accident management program which includes emergency operating procedures, consideration of risk-significant operator actions listed in DCD Table 19.1-119, training, and human reliability related severe accident guidance programs. Insights gained from the design specific PRA, including insights created by the incorporation of site and plant-specific information available at the COL application phase (for aspects of the design which are not bounded by the Standard Plant PRA), are to be reflected appropriately.	19.2.5 Table 19.1-119R	2	DCD_19-564
COL 19.3(7)	The COL Applicant will provide a milestone for completing the equipment survivability assessment of the as-built equipment required to mitigate severe accidents (electrical penetrations, hydrogen igniters and containment pressure (wide range)) to provide reasonable assurance that they will operate in the environmental conditions resulting from hydrogen burns associated with severe accidents for which they are intended and over the time span for which they are needed.	19.2.3.3.7	3a	DCD_06.02.06-45
COL 19.3(8)	The COL applicant will describe the uses of PRA in support of licensee programs and identify and describe risk-informed applications being implemented during the operational phase.	19.1.1.4.1 19.1.1.4.2	1b	DCD_19-564

CP COL 1.8(2)

Table 1.8-201 (Sheet 72 of 72)

Resolution of Combined License Items for Chapters 1 - 19

COL Item No.	COL Item	FSAR Location	Resolution Category	
COL 19.3(9)	The COL applicant will describe the PRA maintenance and upgrade programs.	19.1.2.4	1b	DCD_19-564

Note:
The designation of the resolution category indicates the resolution status of each COL item categorized to 1a, 1b, 2, 3a, 3b, 3c, 4, or 5
1. Operational programs
   1a. Applicant item as License Condition for Operational program
   1b. Applicant item as Commitment for Operational program
2. Plant procedures
3. Design information
   3a. Applicant item Design information provided in FSAR
   3b. Applicant item as Commitment for Design information to be provided before COL issuance
   3c. ~~Holder item~~Not used RCOL2_01-7
4. Detailed schedule information
5. The inspections, tests, analyses, and acceptance criteria (ITAAC)
(See Subsection 1.8.1.2 for further discussion.)

Table 1.9-201 (Sheet 8 of 13)
Comanche Peak Nuclear Power Plant Units 3 & 4 Conformance with Division 1 Regulatory Guides

RG Number	RG Title	Revision/Date	COLA FSAR Status	Corresponding Chapter/ Section
1.143	Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants	Revision 2 November 2001	Conformance	3.2 10.4.8 11.2.1.6 11.2.3.1 11.4.1.6 11.4.4.5
1.145	Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants	Revision 1 November 1982	Conformance	2.3.4
1.147	In-service Inspection Code Case Acceptability, ASME Section XI, Division 1	Revision 15 October 2007	Conformance	3.8.1.7 5.2.1.2
1.149	Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations	Revision 3 October 2001	Conformance	13.2
1.150	Ultrasonic Testing of Reactor Vessel Welds During Preservice and In-service Examinations	Revision 1 February 1983	Not applicable (This RG has been withdrawn by NRC.)	N/A
1.159	Assuring the Availability of Funds for Decommissioning Nuclear Reactors	Revision 1 October 2003	Not applicable (This RG is outside the scope of the FSAR. COLA Part 1 addresses this information.)	N/A
1.160	Monitoring the Effectiveness of Maintenance at Nuclear Power Plants	Revision 2 March 1997	Conformance	3.8.4.7 17.6
1.161	Evaluation of Reactor Pressure Vessels with Charpy Upper-Shelf Energy Less Than 50 Ft-Lb	Revision 0 June 1995	Not applicable (Materials for new units are procured with specifications so that the expected USE will be greater than 50 ft-lb throughout the reactor pressure vessel life.)	N/A

RCOL2_01-8

DCD_10.04.08-11

Chapter 2

Chapter 2 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_2.4. 12-09 S01	2.4.12.4	2.4-81	Supplemental Response to RAI No 147 Luminant letter TXNB-11046 Date 7/14/2011	Added paragraph to clarify that a seismic event will not result in seismically induced rise on groundwater.	-
RCOL2_2.4. 12-09 S01	2.4.16	2.4-112	Supplemental Response to RAI No 147 Luminant letter TXNB-11046 Date 7/14/2011	Added reference regarding earthquakes and groundwater.	-
RCOL2_02.05.04-25	2.5.4.5.4	2.5-194	Response to RAI No 223 Luminant letter TXNB-11049 Date 7/28/2011	Section 2.5.4.5.4, 3rd paragraph, 2nd sentence, remove"major" because it is not appropriate to seismic category I and II buildings and structures. Same sentence, replace "structure" with "structures"	-
RCOL2_02.05.04-25	2.5.4.5.4.1.1 2.5.4.5.4.1.2 2.5.4.5.4.2	2.5-196 2.5-197 2.5-198	Response to RAI No 223 Luminant letter TXNB-11049 Date 7/28/2011	Inserted reference numbers following citation of standards	-
RCOL2_02.05.04-25	2.5.7	2.4-259	Response to RAI No 223 Luminant letter TXNB-11049 Date 7/28/2011	Added references 2.5-480 through 2.5-484	-
ROCL2_02.05.04-11 S01	2.5.4.5.4.1.2	2.5-197	Response to RAI No 22 Luminant letter	Removed discussion of	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
			TXNB- 11057 Date 8/29/2011	maximum groundwater elevation and underground drains. Added discussion of protection of Category I buildings.	
ROCL2_02.05.04-11 S01	2.5.4.6.2	2.5-202	Supplemental Response to RAI No 22 Luminant letter TXNB- 11057 Date 8/29/2011	Added sentence regarding maximum confined groundwater level.	-
ROCL2_02.05.04-11 S01	2.5.4.6.4	2.5-202 2.5-203	Supplemental Response to RAI No 22 Luminant letter TXNB- 11057 Date 8/29/2011	Clarified discussion on hydrostatic pressure.	-
ROCL2_02.05.04-11 S01	2.5.4.8	2.5-207	Supplemental Response to RAI No 22 Luminant letter TXNB- 11057 Date 8/29/2011	Removed bullet points and discussion regarding liquefaction.	-
RCOL2_02.04.13-5,6,7 S01	2.4.13.1	2.4-95	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Deleted statement on contaminant transport retention.	-
RCOL2_02.04.13-5,6,7 S01	2.4.13.2	2.4-95 through 2.4-96	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057	Revised subsection to include discussion on vertical release	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
			Date 8/29/2011	pathway.	
RCOL2_02.04.13-5,6,7 S01	2.4.13.3	2.4-97	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Added discussion on location of rainwater infiltration effects, stormwater overflows, and hydrostatic loading,	-
RCOL2_02.04.13-5,6,7 S01	2.4.13.4	2.4-98 through 2.4-99	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Revised subsection to "Vertical Release Pathway" and revised discussion accordingly.	-
RCOL2_02.04.13-5,6,7 S01	2.4.13.4.1	2.4-99 through 2.4-100	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Created new subsection "Vertical Release Pathway Elimination" and revised subsection accordingly	-
RCOL2_02.04.13-5,6,7 S01	2.4.13.4..2	2.4-100 though 2.4-110	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Inserted new subsection "hypothetical vertical release"	-
RCOL2_02.04.13-5,6,7 S01	2.4.13.5	2.4-111	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Added "entire 80% of the BAT," "Pathway #1" and "Pathway #2" throughout the discussion.	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_02.04.13-5,6,7 S01	2.4.13.5	2.4-112	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Added bullet on source term chemical composition and assumptions.	-
RCOL2_02.04.13-5,6,7 S01	2.4.13.5	2.4-113 2.4-114	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Added bullets and discussion to dilution discussion and explanation.	-
RCOL2_02.04.13-5,6,7 S01	2.4.13.5.3	2.4-118	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Added discussion on SCR elevation changes throughout the subsection.	-
RCOL2_02.04.13-5,6,7 S01	2.4.13.5.3	2.4-119 2.4-120	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Added explanation of conservative assumptions of source term and infiltration rates.	-
RCOL2_02.04.13-5,6,7 S01	2.4.13.5.4	2.4-120	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Removed statement on 25% dilution assumption and added statement of motive force for infiltration.	-
RCOL2_02.04.13-5,6,7 S01	2.4.13.5.7	2.4-123	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Added “elevation” to bullet.	-
RCOL2_02.04.13-5,6,7 S01	2.4.13.5.7	2.4-124	Supplemental Response to RAI No 145	Edited bullet to include discussion of SCR elevation	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
			Luminant letter TXNB- 11057 Date 8/29/2011	changes.	
RCOL2_02.04.13-5,6,7 S01	References	2.4-136	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Added reference 2.4-299.	-
RCOL2_02.04.13-5,6,7 S01	Table 2.4.13-210	2.4-259	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Added new table of vertical migration source term concentration	-
RCOL2_02.04.13-5,6,7 S01	Table 2.4.13-211	2.4-260	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Added new table on source term concentration of vertical then horizontal decay.	-
RCOL2_02.04.13-5,6,7 S01	Table 2.4.13-212	2.4-261	Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Added new table of Twins Mountains Formation Groundwater Elevation	-
CTS-01351	2.4.13.1	2.4-92	Editorial changes identified in Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Added space, deleted period.	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01351	2.4.13.3	2.4-98	Editorial changes identified in Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Removed 'to'	-
CTS-01351	2.4.12.4.1	2.4-99	Editorial changes identified in Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Added the words 'and,' 'downgradient.' And 'CPNPP'	-
CTS-01351	2.4.12.4.1	2.4-100	Editorial changes identified in Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Added space.	-
CTS-01351	2.4.13.5.3	2.4-119	Editorial changes identified in Supplemental Response to RAI No 145 Luminant letter TXNB- 11057 Date 8/29/2011	Changed sentence to read " The BAT DCD general arrangement drawing is shown in Figure 1.2-29)"	-
RCOL2_02.04.12-8 S01	2.4.12.2.4	2.4-75	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057 Date 8/29/2011	Added discussion to explain perched and permanent groundwater. Deleted paragraph on	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
				groundwater location.	
RCOL2_02.04.12-8 S01	2.4.12.2.5.2	2.4-77	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057 Date 8/29/2011	Added discussion on slug tests, hydraulic conductivity of wells, and groundwater communication with SCR.	-
RCOL2_02.04.12-8 S01	2.4.12.3	2.4-77 through 2.4-80	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057 Date 8/29/2011	Entire discussion on subsurface pathways was revised	-
RCOL2_02.04.12-8 S01	2.4.12.3.1	2.4-80 through 2.4-84	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057 Date 8/29/2011	Entire section on Groundwater Pathways was revised.	-
RCOL2_02.04.12-8 S01	2.4.12.3.1.1	2.4-85 through 2.4-88	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057 Date 8/29/2011	Section on Groundwater Travel Times was added.	-
RCOL2_02.04.12-8 S01	2.4.12.3.2	2.4-88	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057 Date 8/29/2011	Edited Twin Mountain Formation to Twin Mountains Formation	-
RCOL2_02.04.12-8 S01	2.4.12.5	2.4-89 through 91	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057	Revised section on site characteristics for subsurface	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
			Date 8/29/2011	hydrostatic loading to include upward recharge discussion.	
RCOL2_02.04.12-8 S01	Table 2.4.12-211	2.4-241	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057 Date 8/29/2011	Revised Table to include Path 3.	-
RCOL2_02.04.12-8 S01	Figure 2.4.12-212	-	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057 Date 8/29/2011	Revised groundwater flow path figure.	-
RCOL2_02.04.12-8 S01	Figure 2.4.12-213	-	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057 Date 8/29/2011	Revised post construction release flow path# 1 figure to account for correct groundwater elevation and include retaining walls.	-
RCOL2_02.04.12-8 S01	Figure 2.4.12-214	-	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057 Date 8/29/2011	Revised post construction release flow to account for correct groundwater elevation and retaining walls path# 2 figure.	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_02.04.12-8 S01	Figure 2.4.12-215	-	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057 Date 8/29/2011	Added new figure on vertical pathway (path #3).	-
RCOL2_02.04.12-8 S01	Figure 2.4.12-216	-	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057 Date 8/29/2011	Added new figure on conceptual groundwater model	-
RCOL2_02.04.12-8 S01	Figure 2.4.13-201	-	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057 Date 8/29/2011	Revised figure to incorporate changes of grading and drainage.	-
CTS-01353	Acronyms	2-lix 2-lx	Supplemental Response to RAI No 147 Luminant letter TXNB- 11057 Date 8/29/2011	Added CSW and ESW to acronym list.	-
RCOL2_11.02-18	2.4.13.1	2.4-93	Response to RAI No 224 Luminant letter TXNB- 11061 Date 9/29/2011	Editorial change to re-locate discussion of evaporation pond impact on tank failure analysis from Subsection 11.2.3.4 to Subsection 2.4.13.1	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_02. 4.02-2 S01	Table 2.0-1R (sheet 8 of 13)	2.0-9	Supplemental Response to RAI No 139 Luminant letter TXNB-11066 Date 10/21/2011	Changed maximum flood level for CPNPP to 820.98 ft msl	-
RCOL2_02. 4.02-2 S01	2.4.2.3	2.4-20 through 2.4-28	Supplemental Response to RAI No 139 Luminant letter TXNB-11066 Date 10/21/2011	Revised section on effects of Local Intense Precipitation to reflect findings from the response.	-
RCOL2_02. 4.02-2 S01	Table 2.4.2-207	2.4-167 2.4-168	Supplemental Response to RAI No 139 Luminant letter TXNB-11066 Date 10/21/2011	Revised title, area, and peak runoff values of table. Added drainage sub basin and peak runoff. Delete Total Tc, PMP Intensity, Runoff Coefficient.	-
RCOL2_02. 4.02-2 S01	Table 2.4.2-208	2.4-169 2.4-170	Supplemental Response to RAI No 139 Luminant letter TXNB-11066 Date 10/21/2011	Revised title and deleted categories on the table. Added “Feature,” “Max Water Surface Elevation,” and “Adjacent Unit” category.	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_02. 4.02-2 S01	Table 2.4.2-209	2.4-171	Supplemental Response to RAI No 139 Luminant letter TXNB-11066 Date 10/21/2011	Added New Table: “Summary of Results Identifying Super critical velocities and hydraulic jumps”	-
RCOL2_02. 4.02-2 S01	Figure 2.4.2-202	-	Supplemental Response to RAI No 139 Luminant letter TXNB-11066 Date 10/21/2011	Revised Site Grading and Drainage Plan	-
RCOL2_02. 4.02-2 S01	Figure 2.4.2-206	-	Supplemental Response to RAI No 139 Luminant letter TXNB-11066 Date 10/21/2011	Added new figure “Local Site Analysis HEC-RAS Channels”	-
RCOL2_02. 4.02-2 S01	Figure 2.4.2-207	-	Supplemental Response to RAI No 139 Luminant letter TXNB-11066 Date 10/21/2011	Added new figure “CPNPP Units 3 and 4- Supercritical Flow and Hydraulic Jump Locations”	-
RCOL2_02. 4.02-2 S01	2.4.16	2.4-140	Supplemental Response to RAI No 139 Luminant letter TXNB-11066 Date 10/21/2011	Added reference 2.4-300 and 24-301	-
RCOL2_11.02-18 S01	2.4.13.1	2.4-83	Supplemental Response to RAI No.224 Luminant Letter	Removed redundant information about evaporation pond	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
			no. TXNB-11076 Date 11/7/2011	in Chapter 2 that exists in Chapter 11.	
RCOL2_02.05.04-26	Acronyms and Abbreviations	2-lxvii [2-lxvill]	Response to RAI No 233 Luminant letter no . TXNB-11081 Date 12/1/2011	Added VBS-Vehicle Barrier System to the acronym list.	-
RCOL2_02.05.04-26	2.5.4.5.4.1.2	2.5-197	Response to RAI No 233 Luminant letter no . TXNB-11081 Date 12/1/2011	Removed the use of “perched” and removed “the low groundwater elevation”	-
RCOL2_02.05.04-26	2.5.4.10.4	2.5-198	Response to RAI No 233 Luminant letter no . TXNB-11081 Date 12/1/2011	Edited sentence to read: “Typical examples of a lateral active and at rest earth pressures for select granular backfill are summarized on Figures 2.5.4-242 and 2.5.4-2143.	-
RCOL2_02.05.04-26	2.5.4.10.4	2.5-199	Response to RAI No 233 Luminant letter no . TXNB-11081 Date 12/1/2011	Added “Detailed methodology and calculations for lateral earth pressures are provided in Chapter 3” to the end of subsection of 2.5.4.10.4	-
RCOL2_02.05.04-26	2.5.5.2.1	2.5-225 2.5-226 [2.5-227]	Response to RAI No 233 Luminant letter no . TXNB-11081	Clarified that there are five representative post-construction cross sections (D-	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
			Date 12/1/2011	D', E-E', F-F', G-G', and H-H' and described each of the five cross sections	
RCOL2_02.05.04-26	2.5.5.2.1	2.5-226 [2.5-227]	Response to RAI No 233 Luminant letter no . TXNB-11081 Date 12/1/2011	Added clarification of retaining wall and engineered buttress.	-
RCOL2_02.05.04-26	2.5.5.2.3	2.5-229 [2.5-230]	Response to RAI No 233 Luminant letter no . TXNB-11081 Date 12/1/2011	Added discussion of maximum potential groundwater level (813.5 ft)	-
RCOL2_02.05.04-26	2.5.5.2.6	2.5-230 [2.5-232]	Response to RAI No 233 Luminant letter no . TXNB-11081 Date 12/1/2011	Deleted "on top of the fill slopes"	-
RCOL2_02.05.04-26	2.5.5.2.7	2.5-231 [2.5-232]	Response to RAI No 233 Luminant letter no . TXNB-11081 Date 12/1/2011	Revised section to correctly list cross sections and figures.	-
RCOL2_02.05.04-26	2.5.5.2.7	2.5-233	Response to RAI No 233 Luminant letter no . TXNB-11081	Edited safety range, changed 'slope' to 'cross sections' and added discussion	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
			Date 12/1/2011	of undocumented fill.	
RCOL2_02.05.04-26	Table 2.5.5-201	2.5-440	Response to RAI No 233 Luminant letter no . TXNB-11081 Date 12/1/2011	Revised slope heights, maximum slope inclination, minimum distance to slope crest/toe, deleted “Northeast of Unit 3” and deleted “North” from “Northwest of Unit 4”	-
RCOL2_02.05.04-26	Table 2.5.5-203	2.4-442	Response to RAI No 233 Luminant letter no . TXNB-11081 Date 12/1/2011	Revised table to reflect 5 cross sections.	-
RCOL2_02.05.04-26	Figure 2.5.4-242	-	Response to RAI No 233 Luminant letter no . TXNB-11081 Date 12/1/2011	Figure was revised to include groundwater table (GWT) and provide static , seismic, hydrostatic, and hydrodynamic lateral pressures due to GWT.	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_02.05.04-26	Figure 2.5.4-243	-	Response to RAI No 233 Luminant letter no . TXNB-11081 Date 12/1/2011	Figure was revised to include groundwater table (GWT) and provide static , seismic, hydrostatic, and hydrodynamic lateral pressures due to GWT.	-
RCOL2_02.05.04-26	Figure 2.5.5-201	-	Response to RAI No 233 Luminant letter no . TXNB-11081 Date 12/1/2011	Revised figure to include 5 cross sections (D through H).	-
RCOL2_02.05.04-26	Figure 2.5.5-204	-	Response to RAI No 233 Luminant letter no . TXNB-11081 Date 12/1/2011	Revised figure to indicate retaining walls	-
RCOL2_02.05.04-26	Figure 2.5.5-205	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Revised figure to indicate retaining wall and GWT	-
RCOL2_02.05.04-26	Figure 2.5.5-206	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Revised to account for change in compacted fill and GWT.	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_02.05.04-26	Figure 2.5.5-207	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Changed figure to cross section F-F' and revised figure to account for change in GWT , undocumented fill and include VBS.	-
RCOL2_02.05.04-26	Figure 2.5.5-208	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Revised figure to cross section G-G', included VBS, change in GWT.	-
RCOL2_02.05.04-26	Figure 2.5.5-209	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Revised figure to Post-Construction Cross Section H-H'	-
RCOL2_02.05.04-26	Figure 2.5.5-210	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Revised figure to Cross Section D-D'	-
RCOL2_02.05.04-26	Figure 2.5.5-211	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Revised figure to cross section E-E'	-
RCOL2_02.05.04-26	Figure 2.5.5-212	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Revised figure to include VBS and change in GWT.	-
RCOL2_02.05.04-26	Figure 2.5.5-213	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Revised figure to Static Stability Analysis Cross Section G-G'	-
RCOL2_02.05.04-26	Figure 2.5.5-214	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Revised figure to Static Stability Analysis Cross Section H-H'	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_02.05.04-26	Figure 2.5.5-215	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Revised figure to cross section D-D'	-
RCOL2_02.05.04-26	Figure 2.5.5-216	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Revised figure to cross section E-E'	-
RCOL2_02.05.04-26	Figure 2.5.5-217	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Revised figure to Seismic Stability Analysis Cross Section F-F'	-
RCOL2_02.05.04-26	Figure 2.5.5-218	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Revised figure to Seismic Stability Analysis Cross Section G-G'	-
RCOL2_02.05.04-26	Figure 2.5.5-219	-	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Revised figure to Seismic Stability Analysis Cross Section H-H'	-
RCOL2_19-17	2.4.2.2	2.4-20	Response to RAI No 232 Luminant letter no .TXNB-11084 Date 12/8/2011	Corrected typographical error, changed 810.87 ft msl to 810.64 ft msl.	-
MAP-02-401	Table 2.0-1R (Sheet 8 of 13)	2.0-9	Consistency with DCD Revision	Changed seismic category "I/II" to seismic category "I and II".	0
CTS-01356	2.2.3.1.3.2.2	2.2-18	Correction	Changed "RG 1.75" to "RG 1.78"	0

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01176	2.3.6	2.3-52	Editorial	The word “resolved” was changed to “addressed”	0
CTS-01181	Table 2.3-337 (sheet 2 of 2)	2.3-243	Editorial	Corrected spelling of “LPXZ” to “LPZ”	0
CTS-01354	2.4.13.4.2 (new section)	2.4-89 [2.4-106 through 2.4-108]	Consistency within FSAR Ch. 2	Made all subscripts (except for elevation of the reactor building base mat) lower case: vertical groundwater flow, hydraulic conductivity, etc.	0
CTS-01354	2.4.13.4.2 (new section)	2.4-89 [2.4-109]	Editorial	Changed ft3 to ft^3	0
CTS-01354	2.4.13.4.2 (new section)	2.4-89 [2.4-112]	Editorial	Changed VBATV2 to V_{BATv2}	0
CTS-01177	2.4.14	2.4-102 [2.4-130]	Editorial	The t and s in “technical specifications” were capitalized	0
CTS-01354	Table 2.4.12-211	2.4-216 [2.4-248]	Consistency within FSAR Ch. 2	Made subscripts for hydraulic gradient lower case.	0
RCOL2_02.03.01-14	2.3.1.2.10	2.3-23	Response to RAI No. 242 Luminant Letter	FSAR Subsection was revised to clarify the wet	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
			no. TXNB-12001 Date 1/9/2012	bulb temperature used in the UHS design and surveillance requirements.	
CTS-01425	Table 2.0-1R (Sheet 1 of 13) (Sheet 2 of 13) 2.3.6	2.0-2 2.0-3 2.3-52	Correction	Deleted the following LMN: CP COL 2.1(1), CP COL 2.2(1), CP COL 2.4(1), and CP COL 2.5(1). Deleted the following LMN: CP COL 2.1(1), CP COL 2.2(1), CP COL 2.3(2), CP COL 2.3(3), CP COL 2.4(1), and CP COL 2.5(1) Added Subsection 2.0 addressed to COL 2.3(1).	1
MAP-02-404	Table 2.0-1R (Sheet 2 of 13)	2.0-3	Consistency with DCD Table 2.0-1	Added 'annual' to 1% exceedance ambient design temperature	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01427	Table 2.0-1R (Sheet 2 of 13)	2.0-3	Correction	Under ambient air temperature, added the following LMN: CP COL 2.3(3).	1
	(Sheet 10 of 13)	2.0-11		Deleted the following LMN: CP COL 2.3(1), And CP COL 2.3(2). Added the following LMN: CP COL 2.3(3).	
	(Sheet 11, 12, 13 of 13)	2.0-12 2.0-13 2.0-14		Added the following LMN: CP COL 2.3(3) as a LMN.	
	2.3.6	2.3-52		Added Subsection 2.0 addressed to COL 2.3(3).	

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01426	Table 2.0-1R (Sheet 3 though 7 of 13) (Sheet 8 of 13) 2.3.6	2.0-4 through 2.0-8 2.0-9 2.3-52	Correction	Deleted the following LMN: CP COL 2.1(1), CP COL 2.2(1), CP COL 2.3(1), CP COL 2.3(3), CP COL 2.4(1), and CP COL 2.5(1). Added the following LMN: CP COL 2.3(2). Added Subsection 2.0 addressed to COL 2.3(2).	1
CTS-01428	Table 2.0-1R (Sheet 8 of 13) 2.4.15	2.0-9 2.4-131	Correction	Added the following LMN: CP COL 2.4(1). Added Subsection 2.0 addressed to COL 2.4(1).	1
CTS-01429	Table 2.0-1R (Sheet 8 of 13) (Sheet 9 of 13)	2.0-9 2.0-10	Correction	Deleted the following LMN: CP COL 2.1(1), CP COL 2.2(1). Deleted the following LMN: CP COL 2.1(1), CP COL 2.2(1), CP COL 2.3(1),	

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
	(Sheet 10 of 13) 2.5.6	2.0-11 2.5-235		CP COL 2.3(2), CP COL 2.3(3), CP COL 2.4(1). and CP COL 2.5(1). Added the following LMN: CP COL 2.5(1). Added Subsection 2.0 addressed to COL 2.5(1).	
CTS-01401	2.2.3.1	2.2-11	Erratum	Deleted “Add the following subsections after DCD Subsection 2.2.3”	1
CTS-01430	2.3.1.2.8	2.3-22	Editorial	Changed “If” to “if”	1
CTS-01488	2.3.4.2	2.3-46	Correction, Configuration of Prestressed Concrete Containment Vessel (PCCV) information is no longer presented in DCD Tier 1 Table 2.2-2. PCCV information is now presented in DCD Tier 1 Figure 2.11.1-1.	Changed referenced of DCD Tier 1 Table 2.2-2 to DCD Tier 1 Figure 2.11.1-1 and provided additional clarification of the conservative cross sectional area.	1
CTS-01389	2.3.5.2.1	2.3-50	Correction	Changed “Table 2.3-241” “Table 2.3-244” “Table	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
				2.3-245" to "Table 2.3-341", Table 2.3-344" and "Table 2.3-345"	
CTS-01392	Table 2.3-342 (Sheet 2[2,3] of 2[3])	2.3-256 [2.3-256 2.3-257]	Include SCR location	Added X/Q and D/Q values for Squaw Creek Reservoir to Table.	1
CTS-01392	Table 2.3-344 (Sheet 2 of 3)	2.3-261	Correction	Corrected ENE Sector value from 9.48 E-09 to 9.48 E-10	1
CTS-01392	Table 2.3-346 (Sheet 2[2,3] of 2[3])	2.3-267 [2.3-267 2.3-268]	Include SCR location	Added X/Q and D/Q values for Squaw Creek Reservoir to Table.	1
MAP-02-402	2.4	2.4-1	Consistency with DCD	Changed " Probable Maximum Flood on Streams and Rivers" to "Probable Maximum Flood (PMF) on Streams and Rivers" and Changed "Accidental Releases of Liquid Effluent in Ground and Surface Waters" to "Accidental Releases of Liquid Effluents in	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
				Ground and Surface Waters	
CTS-01402	2.4.2.1	2.4-18	Editorial	Corrected “NGDV29” to “NGVD29”	1
MAP-02-402	2.4.13	2.4-82 [2.4-96]	consistency with DCD	Changed “Accidental Releases of Radioactive Liquid Effluent in Ground and Surfacewaters” to read “Accidental Releases of Radioactive Liquid Effluents in Ground and Surface Waters”	1
CTS-01405	2.4.13.1	2.4-83 [2.4-97]	Correction	Changed “ms” to “msl”	1
CTS-01412	2.4.13.1	2.4-83 [2.4-97]	Editorial	Removed “-“	1
CTS-01404	2.4.16	2.4-104 [2.4-132]	Clarify DCD reference section to IBR	Changed sentence to read: “Add the following references after the last reference in DCD Section 2.4.16”	1
CTS-01407	2.5.1.1.4.3.1	2.5-24	Editorial	Deleted extra parentheses	1
CTS-01413	2.5.1.1.4.3.4.1	2.5-26	Editorial	Changed information in parentheses to read: “(Figure 2.5.1-202a and 2.5.1-202b) (Reference 2.5-257).”	1
CTS-01411	2.5.1.1.4.3.7.1	2.5-42	Erratum	Deleted “Figure 2.5.1-240” referenced in the text	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01408	2.5.2.5.2.1	2.5-120	Editorial	Change “in” to ‘of’	1
CTS-01403	2.5.2.5.2.3	2.5-121	Editorial	Corrected ‘calculalion’ to ‘calculations’ and ‘eqivalent’ to ‘equivalent’	1
CTS-01403	2.5.2.5.2.3	2.5-123	Editorial	Corrected ‘conservantive’ to ‘conservative’	1
CTS-01409	2.5.4.10.1	2.5-210	Consistency with DCD Table 2.0-1 and FSAR Table 2.0-1R	Change “95 ksf” to “60 ksf”	1
CTS-01410	2.5.5	2.5-222	Erratum	Removed “the DCD” for sentence to read: “As specified in RG 1.206 (pages C.I.2-35 to C.I.2-37), this subsection is organized into the following subsections”	1
CTS-01406	2.5.7	2.5-234 [2.5-236]	Clarify DCD reference section to IBR	Changed sentence to read: “Add the following references after the last reference in DCD Section 2.5.7”	1
CTS-01416	Figure 2.4.6-201	-	Erratum	Corrected source, changed to Reference 2.4-242	1
CTS-01417	Figure 2.4.7-201	-	Erratum	Corrected source, changed to Reference 2.4-245	1
CTS-01414	Figure 2.5.1-229	-	Editorial	Revised the Note on the figure to correct “incresea’ to ‘increase’ and “Poliastro” to “Pollastro”	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01415	Figure 2.5.1-230	-	Editorial	Revised Explanation note on figure to correct typo; “subsurfaceas” was changed to “subsurfaces”.	1
CTS-01390	Figure 2.5.4-244	-	Editorial	Changed “Seismic earth pressure and compaction earth pressure not included” to “Seismic earth pressure not included” in Notes.	1

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

Table 2.0-1R (Sheet 1 of 13)
Key Site Parameters

~~CP COL 2.1(1)~~ ~~CP COL 2.2(1)~~ CP COL 2.3(1) ~~CP COL 2.4(1)~~ ~~CP COL 2.5(1)~~ CTS-01425 CTS-01425

Meteorology		
Parameter Description	**Parameter Value**	
	DCD	**CPNPP 3 and 4**
Normal winter precipitation roof load(11)	50 lb/ft^2	11.7 lb/ft^2
Extreme winter precipitation roof load(12)	75 lb/ft^2	37.8 lb/ft^2
48-hr probable maximum winter precipitation (PMWP)	36 in	31 in
Tornado maximum wind speed	230 mph	230 mph
	184 mph maximum rotational	184 mph maximum rotational
	46 mph maximum translational	46 mph maximum translational
Radius of maximum rotational speed	150 ft	150 ft
Rate of Pressure drop	0.5 psi/s	0.5 psi/s
Tornado maximum pressure drop	1.2 psi	1.2 psi
Tornado-generated missile spectrum and associated velocities	15 ft long schedule 40 steel pipe moving horizontally at 135 ft/s(1)	15 ft long schedule 40 steel pipe moving horizontally at 135 ft/s(1)
	4000 lb automobile moving horizontally at 135 ft/s(1)	4000 lb automobile moving horizontally at 135 ft/s(1)
	1 in diameter steel sphere moving horizontally at 26 ft/s(1)	1 in diameter steel sphere moving horizontally at 26 ft/s(1)
Extreme wind speed (other than in tornado)	155 mph for 3-second gusts at 33 ft aboveground level based on 100-year return period, with importance factor of 1.15 for seismic category I and II structures	96 mph for-3-second gust wind speed at 33-ft aboveground based on 100-year return period

Table 2.0-1R (Sheet 2 of 13)
Key Site Parameters

	Ambient design air temperature	1% annual exceedance maximum: 100°F dry bulb, 77°F coincident wet bulb, 81°F non-coincident wet bulb	1% annual exceedance maximum: 99°F dry bulb, 75°F coincident wet bulb, 78°F non-coincident wet bulb	MAP-02-404
~~CP COL 2.1(1)~~ ~~CP COL 2.2(1)~~				CTS-01425
CP COL 2.3(1) ~~CP COL 2.3(2)~~		0% exceedance maximum: 115°F dry bulb, 80°F coincident wet bulb, 86°F non-coincident wet bulb, historical limit excluding peaks <2 hr	0% exceedance maximum: 112°F dry bulb, 78°F coincident wet bulb, 83°F non-coincident wet bulb, historical limit excluding peaks <2 hr 100-year return period maximum: 115°F dry bulb, 78°F coincident wet bulb 86°F non-coincident wet bulb	CTS-01425
~~CP COL 2.3(3)~~ ~~CP COL 2.4(1)~~	Ambient design air temperature	1% annual exceedance minimum: -10°F dry bulb	1% annual exceedance minimum: 25°F dry bulb	CTS-01424 MAP-02-404
~~CP COL 2.5(1)~~		0% exceedance minimum: -40°F dry bulb, historical limit excluding peaks <2 hr	0% exceedance minimum: -0.5°F dry bulb, historical limit excluding peaks <2 hr 100-year return period minimum: -5°F dry bulb	
CP COL 2.3(3)	*Atmospheric dispersion factors (χ/Q values) for on-site locations:*			CTS-01427
	Exclusion area boundary (EAB) 0-2 hrs	5.0×10^{-4} s/m^3	3.70×10^{-4} s/m^3	
	EAB annual average	1.6×10^{-5} s/m^3	5.5×10^{-6} s/m^3	
	Atmospheric dispersion factors (χ/Q values) for off-site locations:			

Table 2.0-1R (Sheet 3 of 13)
Key Site Parameters

	Low-population zone (LPZ) boundary 0-8 hrs 8-24 hrs 1-4 days 4-30 days	 2.1×10^{-4} s/m^3 1.3×10^{-4} s/m^3 6.9×10^{-5} s/m^3 2.8×10^{-5} s/m^3	 2.29×10^{-5} s/m^3 1.49×10^{-5} s/m^3 6.34×10^{-6} s/m^3 2.01×10^{-6} s/m^3
	Food production area annual average	5.0×10^{-6} s/m^3	Not calculated as a single value. Annual average χ/Q values provided as a function of distance and direction out to a 50-mile distance.
~~CP COL 2.1(1)~~	*Deposition factor (D/Q value) for on-site and off-site locations:*		
~~CP COL 2.2(1)~~ ~~CP COL 2.3(1)~~	EAB annual average	4.0×10^{-8} 1/m^2	5.5×10^{-8} 1/m^2
CP COL 2.3(2) ~~CP COL 2.3(3)~~	*Atmospheric dispersion factors (χ/Q values) for main control room (MCR) heating, ventilation, and air conditioning (HVAC) intake for specified release points*[2]*:*		
~~CP COL 2.4(1)~~ ~~CP COL 2.5(1)~~	Plant vent[5] 0-8 hrs 8-24 hrs 1-4 days 4-30 days	1.1×10^{-3} s/m^3 6.6×10^{-4} s/m^3 4.2×10^{-4} s/m^3 2.8×10^{-4} s/m^3	East HVAC Intake 0 – 2 hours: 6.3E-04 2 – 8 hours: 4.1E-04 8 – 24 hours: 1.7E-04 1 – 4 days: 1.1E-04 4 – 30 days: 9.0E-05
			West HVAC Intake 0 – 2 hours: 9.4E-04 2 – 8 hours: 7.3E-04 8 – 24 hours: 3.1E-04 1 – 4 days: 1.9E-04 4 – 30 days: 1.6E-04

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Table 2.0-1R (Sheet 4 of 13)
Key Site Parameters

~~CP COL 2.1(1)~~
~~CP COL 2.2(1)~~
~~CP COL 2.3(1)~~
CP COL 2.3(2)
~~CP COL 2.3(3)~~
~~CP COL 2.4(1)~~
~~CP COL 2.5(1)~~

Ground-level containment releases[4] 0-8 hrs 8-24 hrs 1-4 days 4-30 days	 2.2×10^{-3} s/m^3 1.3×10^{-3} s/m^3 8.3×10^{-4} s/m^3 5.5×10^{-4} s/m^3	East HVAC Intake Containment Shell 0 – 2 hours: 7.5E-04 2 – 8 hours: 5.1E-04 8 – 24 hours: 2.2E-04 1 – 4 days: 1.4E-04 4 – 30 days: 1.2E-04	West HVAC Intake Containment Shell 0 – 2 hours: 8.7E-04 2 – 8 hours: 6.1E-04 8 – 24 hours: 2.7E-04 1 – 4 days: 1.7E-04 4 – 30 days: 1.4E-04

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Table 2.0-1R (Sheet 5 of 13)
Key Site Parameters

~~CP COL 2.1(1)~~
~~CP COL 2.2(1)~~
~~CP COL 2.3(1)~~
CP COL 2.3(2)
~~CP COL 2.3(3)~~
~~CP COL 2.4(1)~~
~~CP COL 2.5(1)~~

Main steam relief valve and safety valve releases[6] 0-8 hrs 8-24 hrs 1-4 days 4-30 days	5.3×10^{-3} s/m^3 3.1×10^{-3} s/m^3 2.0×10^{-3} s/m^3 1.3×10^{-3} s/m^3	East HVAC Intake Main Steam Relief Valves 0 – 2 hours: 2.9E-03 2 – 8 hours: 1.7E-03 8 – 24 hours: 6.9E-04 1 – 4 days: 4.9E-04 4 – 30 days: 3.9E-04	West HVAC Intake Main Steam Relief Valves 0 – 2 hours: 3.4E-03 2 – 8 hours: 2.4E-03 8 – 24 hours: 9.9E-04 1 – 4 days: 6.6E-04 4 – 30 days: 4.5E-04
		East HVAC Intake Main Steam Safety Valves 0 – 2 hours: 3.3E-03 2 – 8 hours: 1.9E-03 8 – 24 hours: 7.6E-04 1 – 4 days: 5.4E-04 4 – 30 days: 3.8E-04	West HVAC Intake Main Steam Safety Valves 0 – 2 hours: 4.1E-03 2 – 8 hours: 2.7E-03 8 – 24 hours: 1.1E-03 1 – 4 days: 8.1E-04 4 – 30 days: 5.1E-04

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Table 2.0-1R (Sheet 6 of 13)
Key Site Parameters

~~CP COL 2.1(1)~~
~~CP COL 2.2(1)~~
~~CP COL 2.3(1)~~
CP COL 2.3(2)
~~CP COL 2.3(3)~~
~~CP COL 2.4(1)~~
~~CP COL 2.5(1)~~

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Steam line break releases[8] 0-8 hrs 8-24 hrs 1-4 days 4-30 days	 1.9×10^{-2} s/m^3 1.1×10^{-2} s/m^3 7.1×10^{-3} s/m^3 4.7×10^{-3} s/m^3	East HVAC Intake Main Steam Line 0 – 2 hours: 1.6E-02 2 – 8 hours: 8.3E-03 8 – 24 hours: 3.5E-03 1 – 4 days: 2.5E-03 4 – 30 days: 1.7E-03	West HVAC Intake Main Steam Line 0 – 2 hours: 6.6E-03 2 – 8 hours: 4.3E-03 8 – 24 hours: 1.8E-03 1 – 4 days: 1.3E-03 4 – 30 days: 8.9E-04
Fuel handling area releases[7] 0-8 hrs 8-24 hrs 1-4 days 4-30 days	 1.1×10^{-3} s/m^3 6.4×10^{-4} s/m^3 4.1×10^{-4} s/m^3 2.7×10^{-4} s/m^3	East HVAC Intake 0 – 2 hours: 9.6E-04 2 – 8 hours: 7.5E-04 8 – 24 hours: 3.1E-04 1 – 4 days: 2.0E-04 4 – 30 days: 1.7E-04	West HVAC Intake 0 – 2 hours: 5.4E-04 2 – 8 hours: 4.1E-04 8 – 24 hours: 1.7E-04 1 – 4 days: 1.1E-04 4 – 30 days: 7.8E-05
Atmospheric dispersion factors (χ/Q values) for MCR inleak for specified release points[3]*:*			

Table 2.0-1R (Sheet 7 of 13)
Key Site Parameters

Plant vent[9] 0-8 hrs 8-24 hrs 1-4 days 4-30 days	 1.3×10^{-3} s/m^3 7.8×10^{-4} s/m^3 4.9×10^{-4} s/m^3 3.3×10^{-4} s/m^3	Bounded by the χ/Q values calculated for the Main Control Room HVAC See plant vent to Main Control Room intake (above)[13]
Plant vent[10] 0-8 hrs 8-24 hrs 1-4 days 4-30 days	 1.4×10^{-3} s/m^3 8.0×10^{-4} s/m^3 5.1×10^{-4} s/m^3 3.3×10^{-4} s/m^3	Bounded by the χ/Q values calculated for the Main Control Room HVAC See plant vent to Main Control Room intake (above)[13]
Ground-level containment releases[4] 0-8 hrs 8-24 hrs 1-4 days 4-30 days	 2.4×10^{-3} s/m^3 1.4×10^{-3} s/m^3 9.1×10^{-4} s/m^3 6.0×10^{-4} s/m^3	See ground-level containment releases to Main Control Room intake (above)[13]
Main steam relief valve and safety valve releases[6] 0-8 hrs 8-24 hrs 1-4 days 4-30 days	 5.3×10^{-3} s/m^3 3.1×10^{-3} s/m^3 2.0×10^{-3} s/m^3 1.3×10^{-3} s/m^3	See main steam relief valve and safety valve releases to Main Control Room intake (above)[13]

~~CP COL 2.1(1)~~
~~CP COL 2.2(1)~~
~~CP COL 2.3(1)~~
CP COL 2.3(2)
~~CP COL 2.3(3)~~
~~CP COL 2.4(1)~~
~~CP COL 2.5(1)~~

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Table 2.0-1R (Sheet 8 of 13)
Key Site Parameters

CP COL 2.3(2)

Steam line break releases[8] 0-8 hrs 8-24 hrs 1-4 days 4-30 days	 1.9×10^{-2} s/m^3 1.1×10^{-2} s/m^3 7.1×10^{-3} s/m^3 4.7×10^{-3} s/m^3	See steam line break releases to Main Control Room intake (above)[13]
Fuel handling area releases[7] 0-8 hrs 8-24 hrs 1-4 days 4-30 days	 1.1×10^{-3} s/m^3 6.7×10^{-4} s/m^3 4.3×10^{-4} s/m^3 2.8×10^{-4} s/m^3	See fuel handling area releases to Main Control Room intake (above)[13]

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Hydrologic Engineering

CP COL 2.4(1)

Parameter Description	Parameter Value	
	DCD	CPNPP 3 and 4
Maximum flood (or tsunami) level	1 ft below plant grade	793.66 ft msl for SCR ~~820.90~~820.98 ft msl for a Local Intense Precipitation at units 3 and 4 site.
Maximum rainfall rate (hourly)	19.4 in/hr for seismic category ~~I/~~ and II structures	19.0 in/hr
Maximum rainfall rate (short-term)	6.3 in/5 min for seismic category ~~I/~~ and II structures	6.2 in/5 min
Maximum groundwater level	1 ft below plant grade	1 ft below plant grade

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MAP-02-401

MAP-02-401

~~CP COL 2.1(1)~~
~~CP COL 2.2(1)~~

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Table 2.0-1R (Sheet 9 of 13)
Key Site Parameters

~~CP COL 2.3(1)~~
CP COL 2.5(1)
~~CP COL 2.3(2)~~
~~CP COL 2.3(3)~~
~~CP COL 2.4(1)~~

Geology, Seismology, and Geotechnical Engineering		
Parameter Description	**Parameter Value**	
	DCD	**CPNPP 3 and 4**
Maximum slope for foundation-bearing stratum	20° from horizontal in untruncated strata	Layer C slopes at less than 10 degree across the footprint and the site area.
Safe-shutdown earthquake (SSE) ground motion	0.3 g peak ground acceleration	The SSE is the envelope of the GMRS and the minimum earthquake requirement of 10 CFR 50 Appendix S, based on the shape of the Certified Site Design Response Spectra (CSDRS) scaled down to a PGA of 0.1 g. The CSDRS is itself a modified RG 1.60 shape formed by shifting the control points at 9 Hz and 33 Hz to 12 Hz and 50 Hz, respectively.
SSE (certified seismic design) horizontal ground response spectra	Regulatory Guide (RG) 1.60, enhanced spectra in high frequency range (see Figure 3.7.1-1)	The minimum DCD spectrum envelops all four FIRS, down to frequencies of 0.5 Hz. Values of the horizontal 10^{-5} UHRS and FIRS are shown in Table 2.5.2-229 for the seven spectral frequencies.
SSE (certified seismic design) vertical ground response spectra	RG 1.60, enhanced spectra in high frequency range (see Figure 3.7.1-2)	For vertical FIRS motions, the same considerations used for the GMRS were used for the FIRS. That is, as a conservative assumption the V/H ratio for the FIRS spectra is assumed to be equal to the V/H ratio from RG 1.60.
Potential for surface tectonic deformation at site	None within the exclusion area boundary	No potential tectonic surface deformation has been identified at the site.

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~~CP COL 2.1(1)~~
~~CP COL 2.2(1)~~
~~CP COL 2.3(1)~~
~~CP COL 2.3(2)~~
~~CP COL 2.3(3)~~
~~CP COL 2.4(1)~~
~~CP COL 2.5(1)~~

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Table 2.0-1R (Sheet 10 of 13)
Key Site Parameters

CP COL 2.5(1)	Subsurface stability – minimum allowable static bearing capacity	15,000 lb/ft^2	The minimum allowable bearing capacity of the foundation bearing stratum meets or exceeds the DCD requirement	CTS-01429
	Subsurface stability – minimum allowable dynamic bearing capacity, normal conditions plus SSE	60,000 lb/ft^2	The minimum allowable dynamic bearing capacity of the foundation bearing stratum meets or exceeds the DCD requirement	
	Subsurface stability – minimum shear wave velocity at SSE input at ground surface	1000 ft/s	The site stratigraphy has a measured velocity in excess of 1000 ft/sec	
~~CP COL 2.3(1)~~ ~~CP COL 2.3(2)~~	Subsurface stability – liquefaction potential	None (for seismic category I structures)	The site strata is not prone to liquefaction	CTS-01427
	Settlement	Total settlement of R/B complex foundation(14)(15) 6.0 in. Differential settlement across R/B complex foundation(14)(15) 2.0 in. Maximum differential settlement between buildings(14)(16) 0.5 in. Maximum tilt of R/B complex foundation generated during operational life of the plant(14)(16) 1/2000	Maximum and differential settlement of all the seismic Category I buildings and structures including R/B, PS/B, ESWPT, UHSRS and PSFSV is less than 1/2 in.	
CP COL 2.3(3)	Atmospheric dispersion factors (χ/Q values) for Technical Support Center (TSC) HVAC intake for specified release points(2):			CTS-01427
	Plant Vent(5) 0-8 hrs 8-24 hrs 1-4 days 4-30 days	 1.4×10^{-3} s/m^3 8.0×10^{-4} s/m^3 5.1×10^{-4} s/m^3 3.3×10^{-4} s/m^3	0-2 hrs 0-8 hrs 8-24 hrs 1-4 days 4-30 days	 1.1×10^{-3} s/m^3 6.9×10^{-4} s/m^3 2.8×10^{-4} s/m^3 2.1×10^{-4} s/m^3 1.3×10^{-4} s/m^3

Table 2.0-1R (Sheet 11 of 13)
Key Site Parameters

CP COL 2.3(3)

Ground-level containment releases[4]		0-2 hrs	8.0×10^{-4} s/m^3
0-8 hrs	1.9×10^{-3} s/m^3	0-8 hrs	5.1×10^{-4} s/m^3
8-24 hrs	1.1×10^{-3} s/m^3	8-24 hr	2.3×10^{-4} s/m^3
1-4 days	7.2×10^{-4} s/m^3	1-4 days	1.6×10^{-4} s/m^3
4-30 days	4.8×10^{-4} s/m^3	4-30 days	1.1×10^{-4} s/m^3
Main steam relief valve and safety valve[6]		0-2 hrs	1.3×10^{-3} s/m^3
0-8 hrs	1.7×10^{-3} s/m^3	0-8 hrs	9.6×10^{-4} s/m^3
8-24 hrs	9.9×10^{-4} s/m^3	8-24 hrs	3.9×10^{-4} s/m^3
1-4 days	6.3×10^{-4} s/m^3	1-4 days	2.7×10^{-4} s/m^3
4-30 days	4.2×10^{-4} s/m^3	4-30 days	2.0×10^{-4} s/m^3
Steam line break releases[8]		0-2 hrs	1.3×10^{-3} s/m^3
0-8 hrs	1.4×10^{-3} s/m^3	0-8 hrs	9.6×10^{-4} s/m^3
8-24 hrs	8.4×10^{-4} s/m^3	8-24 hrs	3.9×10^{-4} s/m^3
1-4 days	5.3×10^{-4} s/m^3	1-4 days	3.2×10^{-4} s/m^3
4-30 days	3.5×10^{-4} s/m^3	4-30 days	2.4×10^{-4} s/m^3
Fuel handling area releases[7]		0-2 hrs	4.4×10^{-4} s/m^3
0-8 hrs	6.7×10^{-4} s/m^3	0-8 hrs	2.8×10^{-4} s/m^3
8-24 hrs	3.9×10^{-4} s/m^3	8-24 hrs	1.1×10^{-4} s/m^3
1-4 days	2.5×10^{-4} s/m^3	1-4 days	8.5×10^{-5} s/m^3
4-30 days	1.7×10^{-4} s/m^3	4-30 days	5.0×10^{-5} s/m^3
Atmospheric dispersion factors (χ/Q values) for TSC inleak for specified release points[3]:			

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Table 2.0-1R (Sheet 12 of 13)
Key Site Parameters

CP COL 2.3(3)

Plant Vent[5]		0-2 hrs	1.1×10^{-3} s/m^3
0-8 hrs	1.4×10^{-3} s/m^3	0-8 hrs	6.9×10^{-4} s/m^3
8-24 hrs	8.0×10^{-4} s/m^3	8-24 hrs	2.8×10^{-4} s/m^3
1-4 days	5.1×10^{-4} s/m^3	1-4 days	2.1×10^{-4} s/m^3
4-30 days	3.3×10^{-4} s/m^3	4-30 days	1.3×10^{-4} s/m^3
Ground-level containment releases[4]		0-2 hrs	8.0×10^{-4} s/m^3
0-8 hrs	1.9×10^{-3} s/m^3	0-8 hrs	5.1×10^{-4} s/m^3
8-24 hrs	1.1×10^{-3} s/m^3	8-24 hrs	2.3×10^{-4} s/m^3
1-4 days	7.2×10^{-4} s/m^3	1-4 days	1.6×10^{-4} s/m^3
4-30 days	4.8×10^{-4} s/m^3	4-30 days	1.1×10^{-4} s/m^3
Main steam relief valve and safety valve[6]		0-2 hrs	1.3×10^{-3} s/m^3
0-8 hrs	1.7×10^{-3} s/m^3	0-8 hrs	9.6×10^{-4} s/m^3
8-24 hrs	9.9×10^{-4} s/m^3	8-24 hrs	3.9×10^{-4} s/m^3
1-4 days	6.3×10^{-4} s/m^3	1-4 days	2.7×10^{-4} s/m^3
4-30 days	4.2×10^{-4} s/m^3	4-30 days	2.0×10^{-4} s/m^3
Steam line break releases[8]		0-2 hrs	1.3×10^{-3} s/m^3
0-8 hrs	1.4×10^{-3} s/ m^3	0-8 hrs	9.6×10^{-4} s/m^3
8-24 hrs	8.4×10^{-4} s/ m^3	8-24 hrs	3.9×10^{-4} s/m^3
1-4 days	5.3×10^{-4} s/ m^3	1-4 days	3.2×10^{-4} s/m^3
4-30 days	3.5×10^{-4} s/ m^3	4-30 days	2.4×10^{-4} s/m^3

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Table 2.0-1R (Sheet 13 of 13)
Key Site Parameters

CP COL 2.3(3)

Fuel handling area releases(7)		0-2 hrs	4.4×10^{-4} s/m^3
0-8 hrs	6.7×10^{-4} s/m^3	0-8 hrs	2.8×10^{-4} s/m^3
8-24 hrs	3.9×10^{-4} s/m^3	8-24 hrs	1.1×10^{-4} s/m^3
1-4 days	2.5×10^{-4} s/m^3	1-4 daysr	8.5×10^{-5} s/m^3
4-30 days	1.7×10^{-4} s/m^3	4-30 days	5.0×10^{-5} s/m^3

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NOTES:

1. The specified missiles are assumed to have a vertical speed component equal to 2/3 of the horizontal speed.
2. These dispersion factors are chosen as the maximum values at all intake points.
3. These dispersion factors are chosen as the maximum values at all inleak points.
4. These dispersion factors are used for a loss-of-coolant accident (LOCA) and a rod ejection accident.
5. These dispersion factors are used for a LOCA, a rod ejection accident, a failure of small lines carrying primary coolant outside containment and a fuel-handling accident inside the containment.
6. These dispersion factors are used for a steam generator tube rupture, a steam system piping failure, a reactor coolant pump rotor seizure and a rod ejection accident.
7. These dispersion factors are used for a fuel-handling accident occurring in the fuel storage and handling area.
8. These dispersion factors are used for a steam system piping failure.
9. These dispersion factors are used for a LOCA.
10. These dispersion factors are used for a rod ejection accident, a failure of small lines carrying primary coolant outside containment and a fuel-handling accident inside the containment.

plant as well as events and conditions that may occur outside the nuclear power plant.

2.2.3.1 Determination of Design Basis Events

CP COL 2.2(1) ~~Add the following subsections after DCD Subsection 2.2.3.~~ CTS-01401

Design basis events internal and external to the nuclear power plant are defined as those accidents that have a probability of occurrence on the order of about 10^{-7} per year or greater and potential consequences serious enough to affect the safety of the plant to the extent that the guidelines in 10 CFR Part 100 could be exceeded. The following categories are considered for the determination of design basis events: explosions, flammable vapor clouds with a delayed ignition, toxic chemicals, fires, collisions with the intake structure, liquid spills and radionuclide releases at adjacent units.

2.2.3.1.1 Explosions

This subsection addresses potential explosion hazards from nearby transportation routes, and nearby industrial facilities. Nearby pipelines and gas wells are evaluated in Subsections 2.2.3.1.2.3 and 2.2.3.1.2.4.

2.2.3.1.1.1 Transportation Routes

Accidents were postulated for the nearby highways identified in Subsection 2.2.2.5. The nearest commercial traffic is FM 56, which passes approximately 1.4 mi west-southwest of the nearest safety-related structure of CPNPP Units 3 and 4. The accident of concern along FM 56 is one that results in the detonation of a highly explosive cargo carried by a truck. Based on Regulatory Guide 1.91, it is necessary to demonstrate that such an explosion on the highway does not result in a peak positive incident overpressure that exceeds 1 pounds per square inch (psi) at the critical structures on the CPNPP Units 3 and 4 site. The maximum probable hazardous cargo for a single highway truck is presented in terms of equivalent trinitrotoluene (TNT). Regulatory Guide 1.91 states the maximum probable hazardous solid cargo for a single highway truck is 50,000 lb. The TNT equivalency is based on The Departments of The Army, The Navy, and The Air Force TNT equivalency equation (Reference 2.2-220).

The methodology presented in Regulatory Guide 1.91 establishes the safe distance beyond which no damage would be expected (i.e., a peak positive incident overpressure of less than 1 psi at the critical structures on the CPNPP Units 3 and 4 site) from a truck explosion along FM 56 at its closest point. An evaluation performed for materials with a TNT equivalency of 2.24 and using the maximum cargo for two trucks determined the safe distance to be 0.52 mi. There is considerable margin between the required safe distance and the actual distance to the nearest safety-related structure (1.4 mi). The TNT equivalency

Texas is not a heavy snow load region. ANSI/ASCE 7-05, "Minimum Design Loads for Buildings and Other Structures," (Reference 2.3-220) identifies that the ground snowload for the CPNPP area is 4 lbf/ft^2 based on a 50-yr recurrence. This is converted to a 100-yr recurrence weight of 4.9 lbf/ft^2 (psf) using a factor of 1.22 (1/0.82) taken from ANSI/ASCE 7-05 Table C7-3. Local snow measurements support this ANSI/ASCE 7-05 value.

To estimate the weight of the 100-yr snowpack at the CPNPP site, the maximum reported snow depths at the Dallas Fort Worth Airport were determined. Table 2.3-202 shows that the greatest snow depth over the 30-yr record is 8 in. The 100-yr recurrence snow depth is 11.2 in using a factor of 1.4 to convert from a 30 yr recurrence interval to 100-yr interval (Reference 2.3-220).

Freshly fallen snow has a snow density (the ratio of the volume of melted water to the original volume of snow) of 0.07 to 0.15, and glacial ice formed from compacted snow has a maximum density of 0.91 (Reference 2.3-221). In the CPNPP site area, snow melts and/or evaporates quickly, usually within 48 hours, and does so before additional snow is added; thus, the water equivalent of the snowpack can be considered equal to the water equivalent of the falling snow as reported hourly during the snowfall. A conservative estimate of the water equivalent of snowpack in the CPNPP site area would be 0.20 in of water per inch of snowpack. Then, the water equivalent of the 100-yr return snowpack would be 11.2 in snowpack x 0.2 in water equivalent/inch snowpack = 2.24 in of water.

Because one cu in of water is approximately 0.0361 pounds in weight, a one in water equivalent snowpack would exert a pressure of 5.20 pounds per sq ft (0.0361 lb/cu in x 144 sq in). For the 100-yr return snowpack, the water equivalent would exert a pressure of 11.7 pounds per sq ft (5.20 lbm/sq ft/in x 2.24 in). This very conservative estimate is approximately twice the value provided in ANSI/ASCE 7-05.

The 100-yr return period snow and ice pack for the area in which the plant is located, in terms of snow load on the ground and water equivalent, is listed below:

- Snow Load = 11.7 lb/ft^2
- Ice Load = 5.06 in * 5.20 lb/ft^2/in = 26.1 lb/ft^2

From Hydrometeorological Report No. 53, NUREG/CR-1486, the 24-hour Probable Maximum Winter Precipitation (PMWP) for a 10 sq-mi area is estimated to be 27 in. The 72-hour PMWP for a 10 sq-mi area is estimated to be 35 in. Assuming a linear relationship between these values gives a 48-hour PMWP of 31 in. Because of the southern location of the site, almost all of this PMWP occurs as liquid. To ensure safety even in the most extreme winter conditions, an assumption was made to combine the 100-year return valves for ice load and snow pack. This yields a maximum extreme winter loading of 37.8 lb/ft^2. As stated in the US-APWR DCD Subsection 3.4.1.2, ~~If~~if PMWP were to occur, US-APWR CTS-01430

Classification of Atmospheric Stability
(Reference, Regulatory Guide 1.23, Table 1)

Moderately stable	F	$1.5 < \Delta T \leq 4.0$
Extremely stable	G	$\Delta T > 4.0$

Joint frequency distribution tables were developed from the meteorological data with the assumption that if datum required as input to the PAVAN program (i.e., lower level wind direction, lower level wind speed, and temperature differential) was missing from the hourly data record, all data for that hour were discarded. Also, the data in the joint frequency distribution tables were rounded for input into the PAVAN code.

Building area is defined as the smallest vertical-plane cross-sectional area of the reactor building, in sq meters. Building height is the height above plant grade of the containment structure used in the building-wake term for the annual-average calculations. For conservatism, the containment area is used in the determination of building-wake effects. ~~A conservative building cross sectional area of 2500 m^2 and a building height of 69.9 meters were used for building wake calculations based on parameters from Figure 2.2-11 and Table 2.2-2 of the US-APWR DCD Tier 1 material.~~Based on Figure 2.2-11 and Figure 2.11.1-1 of the Tier 1 material of the US-APWR DCD, the reactor building height is 69.9 meters and the reactor building area is calculated to be 3092 m^2. Since χ/Q values increase as reactor building cross sectional area decreases per equation 1.3.1(1) of Regulatory Guide 1.145, a conservatively lower cross sectional area of 2500 m^2 was used to determine building wake effects. CTS-01488

The tower height is the height at which the wind speed was measured. Based on the lower measurement location, the tower height used was 10 meters.

A ground release includes all release points that are effectively lower than two and one-half times the height of adjacent solid structures (Regulatory Guide 1.145). Therefore, as stated above, a ground-release was assumed.

The cumulative frequency of χ/Q at the EAB can be found in Table 2.3-337. Table 2.3-337 also presents the cumulative frequency at the LPZ. A summary of results is provided below. Median (50 percent) values, provided in Table 2.3-337, may be used in making realistic estimates of the environmental effects of potential radiological accidents; conservative estimates are based on calculated 5 percent values. A comparison of the site specific χ/Q values with the DCD χ/Q values is provided in Table 2.3-337. The site-specific χ/Q values were arbitrarily increased by 10% to provide margin.

estimates of radioactive decay, an overall half-life of 2.26 days is acceptable for short-lived noble gases and a half-life of eight days for all iodines released to the atmosphere. At sites where there is not a well-defined rainy season associated with a local grazing season, wet deposition do not have a significant impact. In addition, the dry deposition rate of noble gases is so slow that the depletion is negligible within 50 mi. Therefore, in this analysis only the effects of dry deposition of iodines were considered. The calculation results with and without consideration of dry deposition are identified in the output as "depleted" and "undepleted" respectively.

Terrain recirculation factor was not considered because the meteorological data does not show any conclusive or systematic up and down or cross valley flow.

Off-site receptor locations for the CPNPP site were also evaluated (Table 2.3-336). χ/Q and/or D/Q at points of potential maximum concentration outside the site boundary, at points of maximum individual exposure, and at points within a radial grid of sixteen 22½ degree sectors (centered on true north, north-northeast, northeast, etc.) and extending to a distance of 80 km (50 mi) from the station were determined. A set of data points were located within each sector at increments of 0.4 km (0.25 mi) to a distance of 1.6 km (1 mi) from the plant, at increments of 0.8 km (0.5 mi) from a distance of 1.6 km (1 mi) to 8 km (5 mi), at increments of 4 km (2.5 mi) from a distance of 8 km (5 mi) to 16 km (10 mi), and at increments of 8 km (5 mi) thereafter to a distance of 80 km (50 mi). Estimates of χ/Q (undecayed and undepleted; depleted for radioiodines) and D/Q radioiodines and particulates is provided at each of these grid points. Receptor locations representing recreational users of Squaw Creek Reservoir (SCR) were also evaluated. The limiting SCR receptor locations are given in Table 2.3-336.

The results of the analysis, based on the five years of on-site data for years 2001 through 2004 and 2006, are presented in Tables 2.3-340, 2.3-341, 2.3-342, 2.3-343, 2.3-344, 2.3-345, and 2.3-346.

Annual average undecayed and undepleted dilution factors to a distance of 50 mi from the plant are shown in Table 2.3-340. The maximum value at the actual EAB is 5.5 x 10^{-6} seconds/meter^3 and occurs north-northwest of the plant at a distance of 0.37 mi. There are no higher values beyond the site boundary because for ground level releases concentrations monontonically decrease from the release point to all locations downwind. Annual values for undecayed and depleted χ/Qs are given in ~~Table 2.3-241~~Table 2.3-341. Annual average undecayed and undepleted dilution and deposition factors for special off-site receptor locations, including recreational users of SCR, are given in Table 2.3-342. Values for eight day decay depleted χ/Qs are given in ~~Table 2.3-244~~Table 2.3-344 D/Q values out to a distance of 50 mi are given in ~~Table 2.3-245~~Table 2.3-345. CTS-01389 CTS-01389

2.3.5.2.2 Evaporation Pond

An additional CPNPP Units 3 and 4 gaseous release source is the evaporation pond (EP). The purpose of the EP is to prevent tritium concentration in the SCR

From Table 2.3-348, the highest χ/Q and D/Q values for the EAB occur in the south sector and are 5.2×10^{-5} s/m^3 and 2.3×10^{-7} m^{-2}, respectively. Table 2.3-348 gives the annual average χ/Qand D/Q values for no decay, undepleted, as well as 2.26 day decay, undepleted and 8.00 day decay, depleted.

There are no meat animals identified in the area surrounding the CPNPP site. Therefore, it is assumed that the χ/Q and D/Q values at any location of meat animals within five miles of the plant would be bounded by values determined at other receptors, and no specific χ/Q or D/Q values are provided.

2.3.6 Combined License Information

CP COL 2.3(1)

2.3(1) *Site Meteorology*

This COL item is addressed in Subsections 2.0, 2.3.1 *and* 2.3.2 *and associated tables.* CTS-01425

CP COL 2.3(2)

2.3(2) *Short term atmospheric transport and diffusion*

This COL item is addressed in ~~Subsection~~Subsections 2.0 *and* 2.3.4 *and associated tables.* CTS-01426

CP COL 2.3(3)

2.3(3) *Long term atmospheric transport and diffusion*

This COL item is ~~*resolved*~~*addressed in* Subsections 2.0 *and* 2.3.5 *and associated tables.* CTS-01176 CTS-01427

2.3.7 References

CP SUP 2.3(1) Add the following references after the last reference in DCD Subsection 2.3.7.

2.3-201 Texas Water Development Board, 2007 State Water Plan, Chapter 5, “Climate of Texas”, s.v. "," http://www.twdb.state.tx.us/publications/reports/State_Water_Plan/2007/2007StateWaterPlan/2007StateWaterPlan.htm) (accessed January 6, 2008 7:06 PM). (NOTE: "s.v." stands for sub verbo, "under the word.")

2.3-202 Texas State Historical Association, Handbook of Texas Online, s.v. "," http://www.tsha.utexas.edu/handbook/online/articles/WW/yzw1.html (accessed December 15, 2006).

2.3-203 Climatic Atlas of Texas, LP-192, Texas Department of Water Resources, December 1983.

CP COL 2.3(3)

Table 2.3-342 (Sheet 2 of 3)
χ/Q and D/Q Values for Normal Releases

No Decay, Undepleted and Depleted, at Each Receptor Location

Type of Location	Sector	Distance (mi)	Distance (meters)	χ/Q (m^3) No Decay Undepleted	χ/Q (m^3) No Decay Depleted	D/Q (m^{-2})
Residence	W	1.16	1869	2.60E-07	2.20E-07	1.60E-09
Residence	WNW	2.26	3645	1.60E-07	1.30E-07	8.00E-10
Residence	NW	2.18	3515	3.30E-07	2.70E-07	1.90E-09
Residence	NNW	2.18	3515	4.10E-07	3.40E-07	2.80E-09
Residence	N	1.99	3202	3.20E-07	2.60E-07	2.90E-09
Residence	NNE	1.99	3202	2.70E-07	2.30E-07	1.20E-09
Residence	NE	2.39	3853	1.80E-07	1.50E-07	5.20E-10
Residence	ENE	2.4	3863	1.30E-07	1.10E-07	3.90E-10
Residence	E	2.76	4449	6.10E-08	4.90E-08	1.40E-10
Residence	ESE	2.43	3903	9.80E-08	8.00E-08	3.20E-10
Residence	SE	1.95	3146	1.80E-07	1.50E-07	8.70E-10
Residence	SSE	1.83	2942	1.20E-07	1.00E-07	1.30E-09
Garden	ENE	2.86	4609	1.10E-07	8.50E-08	2.90E-10
Garden	E	2.86	4609	5.80E-08	4.60E-08	1.30E-10
Squaw Creek Reservoir	WNW	0.1	158	2.40E-05	2.30E-05	1.20E-07
Squaw Creek Reservoir	NW	0.1	158	4.80E-05	4.50E-05	2.70E-07
Squaw Creek Reservoir	NNW	0.1	158	6.00E-05	5.60E-05	3.90E-07
Squaw Creek Reservoir	N	0.1	158	4.30E-05	4.00E-05	3.40E-07
Squaw Creek Reservoir	NNE	0.1	158	3.80E-05	3.60E-05	1.40E-07
Squaw Creek Reservoir	NE	0.1	158	3.40E-05	3.10E-05	8.40E-08
Squaw Creek Reservoir	ENE	0.1	158	2.60E-05	2.40E-05	6.40E-08

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Table 2.3-342 (Sheet 3 of 3)
χ/Q and D/Q Values for Normal Releases

No Decay, Undepleted and Depleted, at Each Receptor Location

Type of Location	Sector	Distance (mi)	Distance (meters)	χ/Q (m^3) No Decay Undepleted	χ/Q (m^3) No Decay Depleted	D/Q (m^{-2})
Squaw Creek Reservoir	E	0.1	158	1.40E-05	1.30E-05	2.90E-08
Squaw Creek Reservoir	ESE	0.1	158	1.90E-05	1.70E-05	5.30E-08

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Table 2.3-344 (Sheet 2 of 3)

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Annual Average X/Q (sec/M^3) for an 8.00 Day Decay, Depleted

SECTOR	5	7.5	10	15	20	25	30	35	40	45	50
S	2.65E-08	1.36E-08	8.44E-09	4.27E-09	2.63E-09	1.79E-09	1.31E-09	9.99E-10	7.89E-10	6.40E-10	5.29E-10
SSW	2.10E-08	1.08E-08	6.72E-09	3.42E-09	2.11E-09	1.45E-09	1.06E-09	8.09E-10	6.40E-10	5.20E-10	4.31E-10
SW	1.49E-08	7.63E-09	4.72E-09	2.39E-09	1.48E-09	1.01E-09	7.41E-10	5.68E-10	4.50E-10	3.65E-10	3.03E-10
WSW	1.44E-08	7.33E-09	4.52E-09	2.28E-09	1.40E-09	9.57E-10	6.98E-10	5.34E-10	4.22E-10	3.42E-10	2.83E-10
W	2.19E-08	1.13E-08	7.05E-09	3.60E-09	2.23E-09	1.53E-09	1.12E-09	8.56E-10	6.78E-10	5.50E-10	4.56E-10
WNW	3.64E-08	1.92E-08	1.21E-08	6.25E-09	3.90E-09	2.69E-09	1.98E-09	1.53E-09	1.21E-09	9.88E-10	8.21E-10
NW	7.58E-08	4.04E-08	2.57E-08	1.35E-08	8.49E-09	5.90E-09	4.37E-09	3.38E-09	2.69E-09	2.20E-09	1.84E-09
NNW	9.37E-08	4.98E-08	3.16E-08	1.65E-08	1.04E-08	7.18E-09	5.30E-09	4.09E-09	3.25E-09	2.65E-09	2.21E-09
N	6.30E-08	3.37E-08	2.14E-08	1.13E-08	7.15E-09	4.99E-09	3.70E-09	2.87E-09	2.30E-09	1.89E-09	1.58E-09
NNE	5.81E-08	3.19E-08	2.07E-08	1.11E-08	7.12E-09	5.01E-09	3.75E-09	2.92E-09	2.34E-09	1.92E-09	1.61E-09
NE	5.12E-08	2.83E-08	1.85E-08	1.00E-08	6.46E-09	4.56E-09	3.42E-09	2.67E-09	2.14E-09	1.76E-09	1.48E-09
ENE	3.88E-08	2.20E-08	1.45E-08	8.06E-09	5.27E-09	3.77E-09	2.86E-09	2.25E-09	1.83E-09	1.52E-09	1.28E-09
E	2.10E-08	1.18E-08	7.77E-09	4.27E-09	2.78E-09	1.98E-09	1.49E-09	1.17E-09	9.48E-~~09~~10	7.84E-10	6.60E-10
ESE	2.83E-08	1.58E-08	1.04E-08	5.66E-09	3.67E-09	2.60E-09	1.96E-09	1.54E-09	1.24E-09	1.03E-09	8.62E-10
SE	3.70E-08	2.04E-08	1.33E-08	7.23E-09	4.66E-09	3.30E-09	2.48E-09	1.94E-09	1.57E-09	1.29E-09	1.09E-09
SSE	2.04E-08	1.07E-08	6.69E-09	3.45E-09	2.15E-09	1.49E-09	1.10E-09	8.43E-10	6.71E-10	5.47E-10	4.55E-10

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Table 2.3-346 (Sheet 2 of 3)
χ/Q and D/Q Values for 2.26 and 8 Day Decay Half-Lives

Type of Location	Sector	Distance (mi)	Distance (meters)	X/Q (m^3) 2.26 Day Decay Undepleted	X/Q (m^3) 8.00 Day Decay Depleted	D/Q (m^{-2})
Residence	SW	0.79	1276	3.30E-07	3.00E-07	3.10E-09
Residence	WSW	1.16	1869	1.80E-07	1.60E-07	1.40E-09
Residence	W	1.16	1869	2.60E-07	2.20E-07	1.60E-09
Residence	WNW	2.26	3645	1.50E-07	1.30E-07	8.00E-10
Residence	NW	2.18	3515	3.30E-07	2.70E-07	1.90E-09
Residence	NNW	2.18	3515	4.10E-07	3.40E-07	2.80E-09
Residence	N	1.99	3202	3.20E-07	2.60E-07	2.90E-09
Residence	NNE	1.99	3202	2.70E-07	2.30E-07	1.20E-09
Residence	NE	2.39	3853	1.80E-07	1.50E-07	5.20E-10
Residence	ENE	2.4	3863	1.30E-07	1.10E-07	3.90E-10
Residence	E	2.76	4449	6.00E-08	4.90E-08	1.40E-10
Residence	ESE	2.43	3903	9.70E-08	8.00E-08	3.20E-10
Residence	SE	1.95	3146	1.80E-07	1.50E-07	8.70E-10
Residence	SSE	1.83	2942	1.20E-07	1.00E-07	1.30E-09
Garden	ENE	2.86	4609	1.10E-07	8.50E-08	2.90E-10
Garden	E	2.86	4609	5.70E-08	4.60E-08	1.30E-10
Squaw Creek Reservoir	WNW	0.1	158	2.40E-05	2.30E-05	1.20E-07
Squaw Creek Reservoir	NW	0.1	158	4.80E-05	4.50E-05	2.70E-07

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Table 2.3-346 (Sheet 3 of 3)
χ/Q and D/Q Values for 2.26 and 8 Day Decay Half-Lives

Type of Location	Sector	Distance (mi)	Distance (meters)	X/Q (m^3) 2.26 Day Decay Undepleted	X/Q (m^3) 8.00 Day Decay Depleted	D/Q (m^{-2})
Squaw Creek Reservoir	NNW	0.1	158	6.00E-05	5.60E-05	3.90E-07
Squaw Creek Reservoir	N	0.1	158	4.30E-05	4.00E-05	3.40E-07
Squaw Creek Reservoir	NNE	0.1	158	3.80E-05	3.60E-05	1.40E-07
Squaw Creek Reservoir	NE	0.1	158	3.30E-05	3.10E-05	8.40E-08
Squaw Creek Reservoir	ENE	0.1	158	2.60E-05	2.40E-05	6.40E-08
Squaw Creek Reservoir	E	0.1	158	1.40E-05	1.30E-05	2.90E-08
Squaw Creek Reservoir	ESE	0.1	158	1.80E-05	1.70E-05	5.30E-08

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2.4 HYDROLOGIC ENGINEERING

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

CP SUP 2.4(1) Add the following content after the third paragraph of DCD Section 2.4.

Section 2.4 describes the hydrological characteristics of the CPNPP Unit 3 and 4 Site. The site location and description are provided in Section 2.1 of this report in sufficient detail to support the safety analysis. This section discusses characteristics and natural phenomena that have the potential to affect the design basis for the US-APWR units. The section is divided into the following 14 subsections:

- 2.4.1 Hydrologic Description
- 2.4.2 Floods
- 2.4.3 Probable Maximum Flood (PMF) on Streams and Rivers | MAP-02-402
- 2.4.4 Potential Dam Failures
- 2.4.5 Probable Maximum Surge and Seiche Flooding
- 2.4.6 Probable Maximum Tsunami Hazards
- 2.4.7 Ice Effects
- 2.4.8 Cooling Water Canals and Reservoirs
- 2.4.9 Channel Diversions
- 2.4.10 Flooding Protection Requirements
- 2.4.11 Low Water Considerations
- 2.4.12 Groundwater
- 2.4.13 Accidental Releases of Liquid Effluents in Ground and Surface Waters | MAP-02-402
- 2.4.14 Technical Specifications and Emergency Operation Requirements

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corresponded to the maximum recorded discharge of 59,000 cfs (Reference 2.4-225). The annual peak stage and discharge measurements for the period of record are provided in Table 2.4.2-202. The datum for USGS gage (08091500) is reported in NAD27 and ~~NGDV29~~NGVD29. CTS-01402

The USGS gage (08091750) closest to the site is located on Squaw Creek just below the SCR. The gage drainage area is 70.3 sq mi (Reference 2.4-226) and the gage location is shown in Figure 2.4.2-201. The peak flow measurement period of record for the gage is from 1973 to 2006. (Reference 2.4-220) The maximum recorded water surface elevation of 610.90 ft msl occurred on April 8, 1975 and corresponded to the maximum recorded discharge of 9030 cfs. (Reference 2.4-226) Squaw Creek Dam, impounding SCR, was completed in 1977. (Reference 2.4-222) Since completion of the Squaw Creek Dam, the maximum recorded water surface elevation of 610.85 ft msl occurred on June 13, 1989 and corresponded to the maximum recorded discharge of 8940 cfs. (Reference 2.4-220) The annual peak stage and discharge measurements for the period of record are provided in Table 2.4.2-203. The datum for USGS gage (08091500) is reported in NAD27 and ~~NGDV29~~NGVD29. CTS-01402

Prior to completion of the Squaw Creek Dam, a USGS gage (08091700) was located upstream of the site on the Panter Branch, a tributary of Squaw Creek. The gage drainage area is 7.82 sq mi and the gage location is shown in Figure 2.4.2-201. The peak flow measurement period of record for the gage is from 1966 to 1973. The maximum recorded water surface elevation of 904.88 ft msl occurred on September 16, 1972 and corresponded to the maximum recorded discharge of 3750 cfs. (Reference 2.4-220) The annual peak stage and discharge measurements for the period of record are provided in Table 2.4.2-204. The datum for USGS gage (08091700) is reported in NAD27 and NAVD88.

2.4.2.2 Flood Design Considerations

By examination of the vicinity of CPNPP Units 3 and 4 site and area topography, it was determined that the flooding potential at the site would originate from local intense precipitation, the adjacent SCR, or the Brazos River and the Squaw Creek or the Paluxy River tributaries. Squaw Creek joins the Paluxy River just below SCR. The Paluxy River joins the Brazos River just below the junction with Squaw Creek. In addition, coincident wind wave activity is considered.

The local intense precipitation analysis is approached conservatively. The precipitation selected is the point PMP at the most critical temporal distribution and assumed to apply to the entire site. No losses are assumed. All rainfall is converted to runoff. Conservative estimates for roughness coefficients are utilized in the determination of peak flows. Downstream boundary conditions are based on the maximum water surface elevation for SCR and account for datum conversion.

The SCR flooding analysis is approached conservatively. The PMP is maximized for SCR watershed using the critical storm center, orientation, and temporal

2.4.13 Accidental Releases of Radioactive Liquid Effluents in Ground and Surface ~~w~~Waters

MAP-02-402

CP COL 2.4(1) Add the following at the end of the DCD Subsection 2.4.13.

Historical and projected groundwater flow paths were evaluated in Subsection 2.4.12 to characterize groundwater movement from the nuclear island area to a point of exposure. Figure 2.4.12-203 depicts subsurface conditions that control the movement of groundwater beneath the CPNPP Unit 3 and 4 site. Based on groundwater flow directions (Figure 2.4.12-209, Sheets 1, 4, 7, and 10), different flow paths are applicable from Units 3 and 4 via horizontal groundwater movement to the nearest surfacewater body (SCR). Subsection 2.4.12 provides the locations and users of surface water in the CPNPP site area.

A conceptual model of radionuclide transport through groundwater to the nearest surfacewater body is described below. The conceptual model and alternate conceptual model developed consider both vertical and horizontal radioactive liquid effluent transport based upon the post-construction configuration of CPNPP Units 3 and 4 (see Figures 2.4.12-212 through 2.4.12-214).

2.4.13.1 Identification of Source Term and Soil/Water Distribution of Liquid Effluent

In performing the evaluation of Postulated Radioactive Releases Due to Liguid-Containing Tank Failures, the following tanks were considered in determining which tank would have the highest concentration and the largest volume of radionuclides:

Holdup Tank - located in the Auxiliary Building (A/B), a Seismic Category II building.

Waste Holdup Tank - located in the A/B

Boric Acid Evaporator - located in the A/B

Boric Acid Tank - located in the A/B

Volume Control Tank - located in the Reactor Building (R/B)~~.~~, a Seismic Category I Building~~.~~

CTS-01351

Auxiliary Building Sump Tank - located in the A/B

Reactor Building Sump Tank - located in the R/B

Primary Makeup Water Tank - located outside

Refueling Water Storage Auxiliary Tank - located outside

Chemical Drain Tank - located in the A/B

The Volume Control Tank, the Chemical Drain Tank, and Sump Tanks were eliminated from consideration based on smaller volumes and lower radionuclide contents than the Boric Acid Tank (BAT). ~~The evaporation pond contains treated liquid effluents in trace amounts of radionuclide content that meet discharge requirements specified in 10 CFR 20 Appendix B, Table 2, and has radionuclide contents below that of the boric acid tank contents. Hence, the contamination level due to the failure of the evaporation pond is bounded by the failure of the boric acid tanks.~~ The Primary Makeup Water Tank was eliminated from consideration based upon the fact that the Primary Makeup Water Tank stores demineralized water from the Treatment System and low level radioactive condensate water from the Boric Acid Evaporator. Condensate water contains low levels of radionuclide concentrations. including tritium. Additionally, the Refueling Water Storage Auxiliary Tank (RWSAT) was eliminated from consideration because it stores refueling water. Prior to refueling, tank water is supplied to the refueling cavity where the reactor coolant radionuclide concentration dilutes with refueling cavity water. Radionuclide concentration of cavity water is reduced by the purification system of the Chemical and Volume Control System (CVCS) and the Spent Fuel Pit Cooling and Purification System (SFPCS) during refueling operations. Upon refueling completion, part of the cavity water is returned to this tank where the radionuclide concentration is low. Accordingly. the impact of RWST or Primary Makeup Water Storage Tank failure is small. RCOL2_11.02-18 RCOL2_11.02-18 S01

After eliminating the tanks described above, the remaining tanks left to consider for the failure analysis are those in the A/B, which is a seismic category II Building. As shown in DCD Figure 1.2-29, these tanks are located on the lowest elevation of the A/B at elevation 793 ft msl. In selecting the appropriate tank for the failure analysis, the guidance in Branch Technical Position (BTP) 11-6 was utilized based upon the concentrations generated from the RATAF Code for Pressurized Water Reactors. The concentration of the radioactive liquid in the tanks, such as the Boric Acid Evaporator, the Holdup Tank, and the BAT, are larger than the Waste Holdup Tank since they receive reactor coolant water extracted from the Reactor Coolant System. Since the enrichment factor of 50 is considered for the liquid phase of the Boric Acid Evaporator. the radioactive concentrations in the liquid phase of the Boric Acid Evaporator, and in the BAT (which receives the enriched liquid from the Boric Acid Evaporator) becomes large when compared to the other tanks. The BAT has been selected since its volume is larger than the liquid phase of the Boric Acid Evaporator. Credit is taken for the removal effect by demineralizers or other treatment equipment for the liquid radioactive waste prior to entering the tank. No chelating agents are used in the plant system design in order to provide chemical control of the reactor- coolant. Only a very small amount of chelating agents is used in the sampling system for analysis. The sampling drain, which contains only a small amount of chelating agents is directly sent to the dedicated chemical drain tank and treated separately. Chemical agents used in laboratory analysis are also sent to the chemical drain tank for treatment. CTS-01405 CTS-01412

2.4.15 Combined License Information

CP COL 2.4(1) Add the following at the end of DCD Subsection 2.4.15.

2.4(1) Hydrologic Related Events

This COL item is addressed in Subsections 2.0, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.4.5, 2.4.6, 2.4.7, 2.4.8, 2.4.9, 2.4.10, 2.4.11, 2.4.12, 2.4.13 and 2.4.14 along with the associated tables and figures. CTS-01428

2.4.16 References

CP SUP2.4(1) Add the following references after the last ~~DCD~~ reference in DCD Section 2.4.16. CTS-01404

2.4-201 Environmental Report, Volume 1. Comanche Peak Steam Electric Station.

2.4-202 Bathymetry and Volume Storage of a Portion of Lake Granbury, Hood County, Texas. Boss, Stephen, PhD, P.G. Department of Geosciences University of Arkansas. Fayetteville, AR. July 11, 2007.

2.4-203 Brazos Basin 2002. Texas Commission on Environmental Quality, Assessment. http://www.tceq.state.tx.us/compliance/monitoring/water/quality/data/02twqi/basins/brazos.html. Accessed December 2007.

2.4-204 Groundwater Atlas of the United States, Oklahoma, Texas, HA 730-E, 1996. U.S. Geological Survey. http://capp.water.usgs.gov/gwa/ch_e/index.html, Accessed June 2007.

2.4-205 Hydrologic Unit Codes for Region 12 Brazos River Basin. U.S. Geological Survey Water Resources of the United States. http://water.usgs.gov/GIS/huc_name.html#Region12. Accessed June 15, 2007.

2.4-206 Surface Water. Texas Water Development Board. http://www.twdb.state.tx.us/data/surfacewater/surfacewater_toc.asp. Accessed December 2007.

2.4-207 USACOE, Fort Worth District Daily Reservoir Reports http://www.swf-wc.usace.army.mil/cgi-bin/rcshtml.pl?page=Reports

2.4-208 Brazos G 2006 Regional Water Plan. Brazos G Regional Water Planning Group, January 2006.

2.4-209 Volumetric Survey Report of Lake Granbury, July 2003. Texas Water Development Board. http://www.twdb.state.tx.us/home/index.asp. Accessed November 2007.

2.4-210 Water Data for Texas. U.S. Geologicel Survey, Nation Water Information System, USGS Surface Water Data for the Nation. http://waterdata.usgs.gov/tx/nwis. Accessed June 2007

2.5.1.1.4.3.1 Late Proterozoic Tectonic Features

The oldest outcropping rocks in Texas occur in part in the Llano Uplift in south-central Texas ~~(~~(Figures 2.5.1-202 and 2.5.1-207), 90 mi south-southwest of the site. Ultramafic to amphibolitic metamorphic rocks and plutons record Mesoproterozoic high-grade metamorphism and deformation as part of the Grenville orogeny (References 2.5-247 and 2.5-248). This deformation primarily comprises broad folds and thrusts within the metamorphic units and resulted from a north-directed collision of a continental block with the southern margin of North America during the formation of Rodinia, likely between ~1300 and 1080 Ma (References 2.5-228 and 2.5-248). The Mesoproterozoic rocks are surrounded by Cambrian-Mississippian marine strata that were deposited during the Early Paleozoic rifting and ocean development that preceded the Late Paleozoic Ouachita orogeny (Reference 2.5-249). The current map pattern of the Llano Uplift is dominated by northeast-trending exposures of normal to oblique faults that have Late Paleozoic ages (Reference 2.5-249). These faults originated during the Ouachita orogeny and exhumed the Llano basement rocks to temperatures of less than 120 °C in the Late Permian (Reference 2.5-250). This thermal history indicates that the Llano Uplift experienced little uplift since the Permian. The Mesoproterozoic basement and Paleozoic marine strata are then overlain by nearly flat-lying Lower Cretaceous shallow marine deposits that also limit the deformation in the Llano Uplift to pre-Cretaceous (Reference 2.5-249). CTS-01407

2.5.1.1.4.3.2 Early Paleozoic Tectonic Features

There are few exposures of faults that accommodated the Cambrian rifting of Laurentia. The most abundant evidence for this extension is recorded by the sedimentary sequences deposited during and after extension--the Southern Oklahoma Aulacogen, located 100 mi north of the site (Figure 2.5.1-208). Normal faults and fault-bounded basins associated with Late Proterozoic to Early Paleozoic rifting of Laurentia are inferred from geophysical surveys to lie beneath overthrust rocks of the Late Paleozoic Ouachita orogenic belt and Mesozoic to Tertiary Gulf Coastal Plain strata (References 2.5-204 and 2.5-228), but these structures are not exposed in central Texas, and are not well documented in peer-reviewed geologic literature. Additionally, many of the faults associated with Precambrian to Cambrian rifting of the Southern Oklahoma Aulacogen were reactivated during the Late Paleozoic compression as thrusts bounding the Amarillo, Wichita, and Arbuckle uplifts.

The southern boundary of the Anadarko Basin is an uplifted zone of Precambrian basement and overlying Cambrian to Permian sedimentary units that were deposited during Early Paleozoic rifting and later subsidence (Figure 2.5.1-207). Subsequently, this composite structure was dismembered into three pieces during Late Paleozoic Ouachita deformation: the western Amarillo Uplift in the Texas Panhandle (230 mi from site), the central Wichita Uplift in southwestern Oklahoma (180 mi from the site), and the eastern Arbuckle Uplift (155 mi from the site) in southeastern Oklahoma. The northwest-southeast-trending uplifts are bound by steeply dipping faults. The basement within these uplifts was uplifted relative to

A series of foreland basins, including the Fort Worth, Ardmore/Marietta, and Arkoma basins, are oriented sub-parallel to the trend of the thrust belt and lie northwest of the trace of the Ouachita thrusts. The basins are filled with Late Paleozoic synorogenic sediments like the Atoka Group series, and preserve the record of Ouachita deformation (Reference 2.5-204). These foreland basins are buried by strata of the Gulf Coastal Plain, and are known from subsurface data gathered during oil and gas exploration (References 2.5-204 and 2.5-256). The basins primarily formed by flexural loading of the crust as the Ouachita orogen developed structural and topographic relief. Geophysical data from other parts of the Ouachita foreland indicate that these basins typically subsided along down-to-the-south normal faults, which in some cases were overthrust by the frontal thrust sheets during the final stages of the Ouachita orogeny (References 2.5-204 and 2.5-256). Stratigraphic data indicate that these basins generally formed during the deposition of the Atoka to Desmoinesian (Reference 2.5-204). The Bend Arch, which forms the western margin of the Fort Worth Basin, is the hingeline that accommodated the downward flexure of the Fort Worth Basin during the Ouachita orogeny (Pennsylvanian) (Reference 2.5-203).

2.5.1.1.4.3.4 Mesozoic Tectonic Features

Mesozoic tectonic structures within the site region are generally confined to the Gulf Coastal Plain, a broad homocline comprising gently gulfward-dipping Mesozoic and Cenozoic strata. The disturbances to this plain are either broad, regional arches and embayments or normal fault systems. These two types of Mesozoic deformation features are described separately below.

2.5.1.1.4.3.4.1 Arches and Embayments

The Gulf Coastal Plain, in the southeastern portion of the site region, includes a series of Mesozoic, gulf-perpendicular, regional arches and basins. These features, such as the San Marcos Arch, the East Texas Basin, and the Sabine Uplift are discussed below. Stratigraphic evidence indicates that the relief on these features had diminished during the Eocene (Reference 2.5-257).

The Sabine Uplift is a broad, basement-cored north-trending anticline centered on the Texas-Louisiana border, 184 mi east of the site (References 2.5-258 and 2.5-259). On geologic maps, the Sabine Uplift appears as a circular outcrop of Eocene Wilcox Group surrounded by younger Claiborne Group (Figure 2.5.1-202a~~,~~ and Figure 2.5.1-202b~~,~~) (Reference 2.5-257). The change in thickness of Middle Cretaceous strata over the area indicate that about 550 ft of relief existed during this time and probably began around 100 Ma. This uplift region was later submerged and not present at the time of the deposition of the regional Austin chalk at 90.5 Ma (Reference 2.5-257). The 650 ft of uplift which allows for the current map pattern probably occurred between 58 and 46 Ma (Early Eocene) (Reference 2.5-257). Similarly, the San Marcos Arch, a gently southeast-plunging fold that extends southeast from the Llano Uplift, developed in Late Cretaceous time (References 2.5-228 and 2.5-260). The San Marcos Arch extends for over 250 mi from the Rio Grande Embayment to the East Texas Basin, and cuts across

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the lithosphere and thus the associated faulting and volcanism (Reference 2.5-310, 2.5-311, and 2.5-312). Despite the cessation of large-scale RGR formation, numerous faults within the RGR have been active within the Quaternary (References 2.5-302, 2.5-303, 2.5-304, 2.5-305, 2.5-306, 2.5-307, and 2.5-309).

Presently, the RGR is characterized by north-trending grabens centered on a broad topographic high, elevated heat flow, and a tensile stress regime (References 2.5-296, 2.5-300, 2.5-310, and 2.5-313). The east-west extent of the RGR surficial expression (e.g., faults and elevated topography) occupies a narrower region than the lithospheric structure of the RGR (region of tensile stress, thinned crust, elevated mantle, gravity anomaly) (References 2.5-241, 2.5-245, 2.5-300, 2.5-314, and 2.5-315). This observation suggests that the processes driving the Quaternary seismic activity observed within the RGR also extend beyond the region of the surficial expression of the rift (Reference 2.5-316).

An example of this phenomenon is the April 14, 1995, Alpine earthquake in West Texas discussed in Subsection 2.5.2.1.3.1 that occurred significantly eastward of the nearest RGR fault ~~(Figure 2.5.1-240)~~. The focal mechanism for this event shows that the earthquake was a normal faulting event with the minimum compressive stress (tensile stress) oriented north-northeast and the maximum horizontal stress oriented east-west (Reference 2.5-317). This event and others with similar focal mechanisms have been interpreted as reflecting the interaction of the topographically high RGR with relatively stable and low-lying Great Plains further east (References 2.5-318 and 2.5-319). Essentially, the RGR region is characterized by large gradients in gravitational potential energy caused by a combination of excess topography and variations in lithospheric density. These potential energy gradients create a tensile stresses regime at the eastern edge of the RGR, with the maximum horizontal compressive stress generally oriented east–west. These tensile stresses partially drive deformation within and well eastward of the physiographic RGR (References 2.5-245 and 2.5-220) as evident with the 1995 Alpine earthquake. CTS-01411

Quaternary faulting within the RGR has been reported in numerous studies that are well summarized and documented in the USGS Quaternary Fault and Fold Database of the United States (Reference 2.5-308). Summaries of these faults are not presented here due to the large number of faults. However, some of these faults have been studied in enough detail to generate complete seismic source characterizations, and these faults are included in the 2002 USGS National Seismic Hazard Maps (Reference 2.5-321). The seismic source characterizations of these faults are discussed in detail in Subsection 2.5.2.4.2.3.3.

2.5.1.1.4.3.7.2 Cheraw Fault

The Cheraw fault is located in southeastern Colorado over 500 mi from the site (Figure 2.5.1-213). The potential for Quaternary events on the fault was first noted by Scott (Reference 2.5-322) and three Late Quaternary events were dated by Crone, et al. (Reference 2.5-323). The fault is included in this discussion because,

The correlation coefficient between ln(Vs) in adjacent layers is estimated using the inter-layer correlation model from Toro (Reference 2.5-432) for USGS category A. In the log-normal randomization model used to calculate the synthetic Vs for each layer, it is possible for the synthetic Vs in the deeper formations to be greater than 9,200 fps. When this happens for a certain synthetic profile, the randomization scheme sets that Vs to 9,200 fps and defines the corresponding depth to be the depth to bedrock for that synthetic profile.

Figure 2.5.2-240 illustrates the Vs value for the first 10 synthetic profiles for the GMRS/FIRS1 site column. Figure 2.5.2-241 compares the median of these 60 Vs profiles to the Vs ±1 sigma Variability values given in Table 2.5.2-227, indicating excellent agreement. The difference in the mean +sigma values below 800 m is a consequence of imposing the 9200 fps upper bound dictated by the bedrock Vs(see above). Figures 2.5-242 and 2.5-243 show analogous results for top portion the FIRS4 site column.

The best-estimate values for the damping ratio and for the stiffness degradation (G/Gmax) are given in Table 2.5.2-227. Except for the fill at the top of the FIRS4 soil column, materials are assumed to behave linearly (strain-independent), with constant damping and G/Gmax=1. The uncertainty in damping is specified as 35%, (following the generic values in EPRI, Reference 2.5-387) and the uncertainty in G/Gmax for fill is specified as 15% at $3x10^{-3}$% strain (following the generic values given by Costantino, Reference 2.5-433). The correlation coefficient between ln(G/Gmax) and ln(damping) ~~in~~of the fill is specified as -0.75. CTS-01408
This implies that in synthetic profiles where the fill has higher than average G/Gmax, the fill tends to have lower than average damping. The degradation and damping properties are treated as fully correlated among layers in the same geological unit, but independent between different units. Figure 2.5.2-244 shows the damping ratios for the Strawn formation in the 60 synthetic profiles corresponding to FIRS1. Similarly, Figure 2.5.2-245 shows the G/Gmax and damping ratios for the 60 synthetic profiles corresponding to FIRS4. A sensitivity study that evaluates the effect of using strain-dependent shear-modulus degradation (G/Gmax) and damping ratio, instead of using constant shear-modulus degradation (G/Gmax =1) and constant damping ratio. Results from this study indicate that the spectra at the top of the profile obtained with the constant material properties are slightly higher than those obtained with strain-dependent properties. The profile with constant material properties was used to develop all FIRS (GMRS/FIRS1, FIRS2, FIRS2, FIRS4, and FIRS4_CoV50), as presented in Subsection 2.5.2.6, and to develop the inputs for the SSI analysis in Subsection 3.7.2.

Each set of 60 synthetic profiles, consisting of Vs and unit weight vs. depth, depth to bedrock, stiffness, and damping curves, is used to calculate and quantify site response and its uncertainty, as described below.

2.5.2.5.2.2 Selection of Rock Input Motions

Rock input motions were selected for input to the site response calculations using the seismic hazard results presented in Subsection 2.5.2. Uniform hazard response spectra (UHRS) for rock conditions corresponding to mean annual exceedence frequencies of 10^{-4}, 10^{-5}, and 10^{-6} were used. The base spectrum for each mean annual exceedence frequency was a broad-banded (BB) spectrum, because deaggregation and fitting of high-and low-frequency (HF and LF) spectra indicated the same high-frequency amplitudes. These spectra are plotted in Figures 2.5.2-229 through 2.5.2-231 and are given in tabular form in Table 2.5.2-219. The development of these spectra is documented in Subsection 2.5.2.4.4. The effect of choosing a broad-banded spectrum was investigated by also computing response to the 10^{-4} HF spectrum, and comparing that response to the 10^{-4} BB spectrum, as described in the next subsection.

2.5.2.5.2.3 Site Response Calculations

The site response calculations for Comanche Peak were performed using the Random Vibration Theory (RVT) approach. In many respects, the inputs and assumptions are the same for an RVT analysis and for a time-history based analysis (e.g., an analysis with the program SHAKE, Reference 2.5-434). Both the RVT and time-history (SHAKE, Reference 2.5-434) procedures use a horizontally-layered half-space representation of the site and use an equivalent-linear representation of dynamic response to vertically propagating shear waves. Starting from the same inputs (in the form of response spectra), both procedures will lead to similar estimates of site response (see, for example, Rathje and Ozbey, Reference 2.5-435). The main advantage of the RVT approach is that it does not require the spectral matching of multiple time histories to a given rock response spectrum. Instead, the RVT approach uses a probabilistic representation of the ensemble of all input motions corresponding to that given response spectrum and then calculates the response spectrum of the ensemble of dynamic responses.

Site-response ~~calculations~~calculations were performed for the three broad-banded (BB) bedrock motions, and for the 10^{-4} HF motion,as described in the previous section. CTS-01403

In addition to the rock response spectra, the RVT site-response calculations require the following inputs: (1) the strong-motion duration associated with each rock spectrum; and (2) the equivalent-strain ratio to use in the ~~eqivalent~~equivalent-linear calculations (this input is required for both the time-history and RVT approaches) and depends on magnitude. The duration is calculated from the de-aggregation results in Subsection 2.5.2.4.4 (Table 2.5.2-220), using standard seismological relations between magnitude, seismic moment, corner frequency, and duration (see, for example, Rathje and Ozboy, Reference 2.5-435) and using stress-drop and crustal Vs values typical of the eastern United States. The effective strain ratio is calculated using the expression CTS-01403

events (see Figures 2.5.2-223 and 2.5.2-224). These distant events will generate a BB rock spectrum. The effect of a difference in amplification factors at 10^{-5} would be somewhat larger (and would result in lower mean site spectra) because roughly 40% of the 10^{-5} hazard comes from local, small-magnitude events (see Figures 2.5.2-225 and 2.5.2-226). As a result, use of the BB amplification factors for all magnitude-distance combinations in the soil-hazard calculations (Subsection 2.5.2.6.1.1) yields slightly ~~conservantive~~conservative hazard results at 10^{-5}, resulting in slightly conservative estimates of the design spectrum. CTS-01403

2.5.2.6 Ground Motion and Site Response Analysis

CP COL 2.5(1) Replace the content of DCD Subsection 2.5.2.6 with the following.

Four FIRS have been identified for the CPNPP Units 3 and 4 and are calculated for both the Safe Shutdown Earthquake (SSE) and Operating Basis Earthquake (OBE) where OBE=(1/3)SSE. The SSE is the envelope of the GMRS and the minimum earthquake requirements of 10 CFR 50 Appendix S, based on the shape of the Certified Site Design Response Spectra (CSDRS) scaled down to a PGA of 0.1 g. The CSDRS is itself a modified RG 1.60 shape formed by shifting the control points at 9 Hz and 33 Hz to 12 Hz and 50 Hz, respectively.

2.5.2.6.1 Ground Motion Response Spectrum (GMRS)

All category 1 structures as well as the Turbine Building will be founded directly on a stiff limestone (Layer C) at elevation 782 ft. Thus the GMRS/FIRS1 (referred to hereafter as GMRS) represents the top of stiff limestone (Layer C) at, or slightly below, foundation basemat elevation for the following safety-related and seismic Category II structures:

- Reactor Building
- Ultimate Heat Sink
- Turbine Building
- Auxiliary Building
- Essential Service Water Pipe Tunnel
- Power Source Fuel Storage Vaults
- East and West Power Source Buildings

In some cases, slight amounts of over-excavation will be required below the planned foundation subgrade elevations to reach the stiff limestone (Layer C). In these cases, a relatively thin layer of fill concrete will be placed on the cleaned limestone sub-excavation and extended to the foundation subgrade elevation.

N_c, N_γ, N_q = Bearing capacity factors

Local shear failure is a case where a failure surface starts to develop but does not propagate to the surface. For this mode of failure, depth of embedment contributes little to the total bearing capacity. The expression for the ultimate bearing capacity applicable to localized shear failure is as follows:

$$q_{ult} = cC_cN_c + 0.5\gamma BC_\gamma N_\gamma$$

The parameters are the same as those defined for the general shear failure condition.

Compressive failure is a case characterized by a foundation that is supported on poorly constrained columns of rock, and the failure mode is similar to unconfined compression failure. The expression for the ultimate bearing capacity applicable to compressive failure is as follows:

$$q_{ult} = 2c\tan(45 + \frac{\phi}{2})$$

The parameters are the same as those defined for the general shear failure condition. Assuming ϕ=0, the ultimate bearing capacity for compressive failure is approximated by the unconfined compressive strength of rock mass (q_{ult}=2c).

COE recommends that the initial strength parameters selected for analysis should be based on lower bound estimates because rock masses generally provide generous margins of safety against bearing capacity failure. For a conservative estimation of the bearing capacity using the above procedures, the angle of internal friction is assumed to be zero and the cohesion is assumed to be one-half of the lower bound of the unconfined compression strength values.

Results of the bearing capacity analysis performed for main seismic category I and II structures (Table 2.5.4-228) indicate that the ultimate bearing capacity for foundations bearing in Glen Rose Formation engineering Layer C limestone is governed by the compressive failure mode and is at least 146 ksf. The estimated bearing capacity is compared to minimum bearing capacity values referenced in the US-APWR Key Site Parameters (DCD Table 2.0-1) that are 15 ksf static and ~~95~~60 ksf dynamic. The estimated ultimate bearing capacity for engineering Layer C limestone provide factors of safety against bearing capacity failure of about 10 for static loading and at least 1.5 for seismic loading. The actual available factors of safety for specific structures (Table 3.8-202) are much higher than these levels and clearly indicate that the Glen Rose Formation engineering Layer C limestone provides adequate bearing capacity for support of the proposed structures. CTS-01409

2.5.5 Stability of Slopes

CP COL 2.5(1) Replace the content of DCD Subsection 2.5.5 with the following.

In conformance with Regulatory Guide (RG) 1.206, this subsection provides an evaluation of the static and dynamic stability of all natural and man-made earth and rock slopes that could adversely affect the safety of seismic category I and II structures for CPNPP Units 3 and 4. The slope evaluation incorporates site characterization information described in Subsection 2.5.4, and applies geologic- and geotechnical-based slope stability methodology in current practice for nuclear power projects. In general, all seismic category I and II structures within the nuclear islands are founded on stable and competent Glen Rose Formation limestone Layer C at about elevation 782 ft. The design of the Ultimate Heat Sinks (UHS) consists of reinforced concrete structures that are also founded on the Glen Rose Formation limestone Layer C, and does not include any earth embankments for side wall support. Geologic conditions, past slope performance, and slope stability analyses presented in this subsection indicate that a postulated failure of soil, fill, or rock materials above Layer C in any slopes in the vicinity of the plant would not adversely affect the safety or performance of seismic category I and II structures.

Temporary cuts below plant yard grade are required for construction of safety-related structures. However, all temporary cuts and excavations are backfilled with engineered fill up to plant yard grade level, and do not pose any post-construction or operational slope stability hazard. Temporary construction cut slopes are discussed in Subsection 2.5.4.5.

A map showing the locations of the proposed CPNPP Units 3 and 4 plant facilities, with respect to site setting, is shown on Figure 2.5.4-201. Safety-related seismic category I and II facilities are shown on Figure 2.5.4-216.

As specified in ~~the DCD and~~ RG 1.206 (pages C.I.2-35 to C.I.2-37), this subsection is organized into the following subsections: CTS-01410

- Slope Characteristics (2.5.5.1)
- Design Criteria and Analyses (2.5.5.2)
- Logs of Borings (2.5.5.3)
- Compacted Fill (2.5.5.4)

Slope stability analyses considered temporary and permanent loading conditions, pre- and post-construction topography (Figure 2.5.5-204), groundwater conditions described in Subsections 2.4.12 and 2.5.4.6, and seismic ground motions described in Subsection 2.5.2.

2.5.6 Combined License Information

CP COL 2.5(1) Replace the content of DCD Subsection 2.5.6 with the following.

2.5(1) Seismic and Geological Characteristics of the Site and Region

This COL item is addressed in Subsections 2.0, 2.5.1, 2.5.2, 2.5.3, 2.5.4 and 2.5.5 along with the associated tables and figures. CTS-01429

2.5.7 References

CP SUP2.5(1) Add the following references after the last ~~DCD~~ reference in DCD Section 2.5.7. CTS-01406

2.5-201 CPSES, *Comanche Peak Steam Electric System (CPSES) Final Safety Analysis Report.* 2007, Amendment 101.

2.5-202 Wermund, E., *Physiographic map of Texas*. 1996, University of Texas, Bureau of Economic Geology: Austin, Texas. p. 1 sheet.

2.5-203 Walper, J.L., *Paleozoic tectonics of the southern margin of North America.* Gulf Coast Association of Geological Societies Transactions, 1977. 27: p. 230-241.

2.5-204 Viele, G.W. and W.A. Thomas, *Tectonic synthesis of the Ouachita orogenic belt,* in *The Appalachian-Ouachitian Orogen in the United States*, R.D.J. Hatcher, W.A. Thomas, and G.W. Viele, Editors. 1989, The Geological Society of America: Boulder, Colorado. p. 695–728.

2.5-205 Flawn, P.T., *Basement Rocks of Texas and Southeast New Mexico*. Vol. 5605. 1956, Austin, TX: Bureau of Economic Geology, University of Texas. 261.

2.5-206 Walker, N., Middle Proterozoic geologic evolution of Llano uplift, Texas: Evidence from U-Pb zircon geochronometry. GSA Bulletin, 1992. 104: p. 494-504.

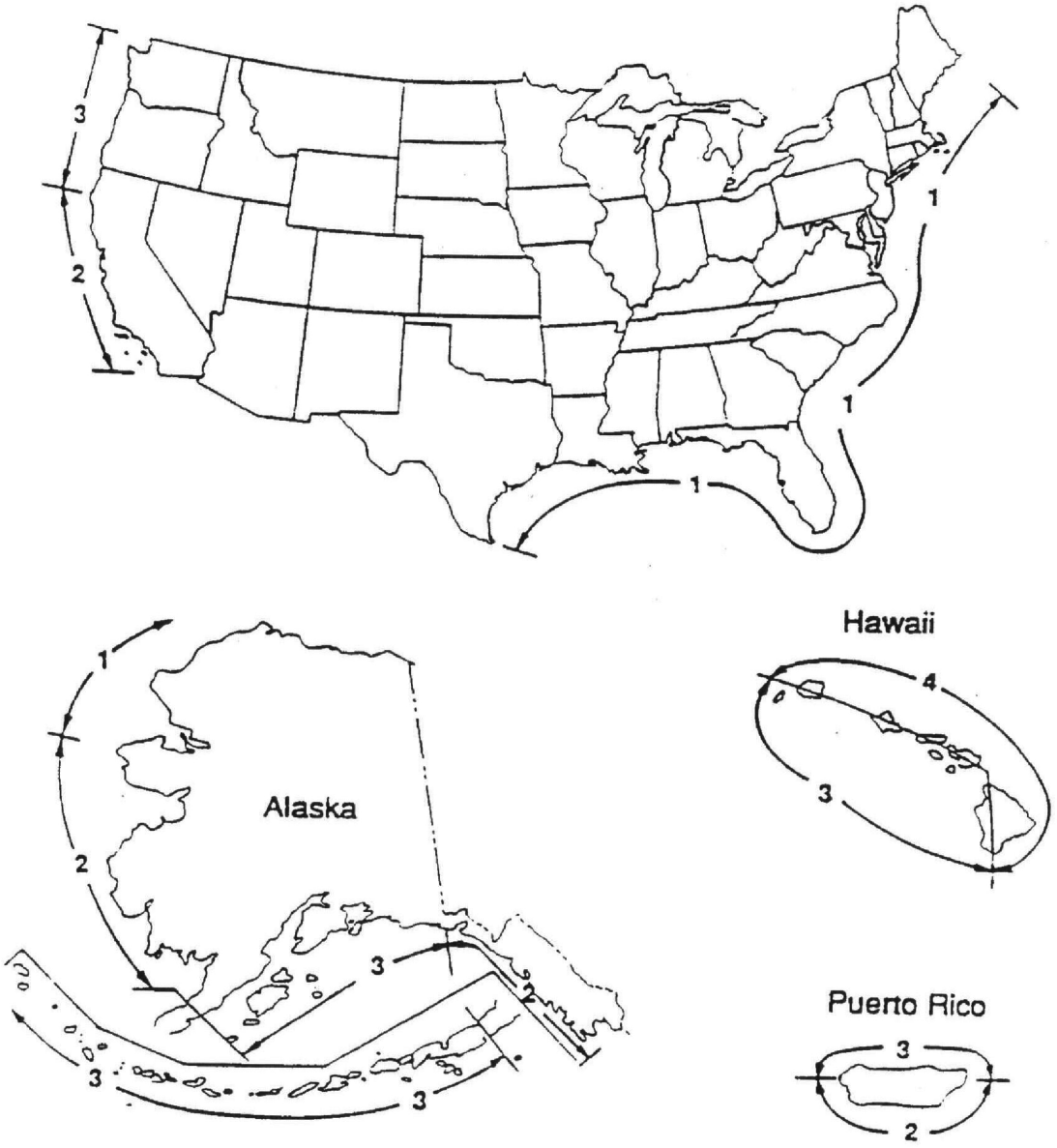
2.5-207 Garrison, J.R., Jr., *Coal Creek serpentinite, Llano Uplift, Texas: A fragment of an incomplete Precambrian ophiolite*. Geology, 1981. 9: p. 225–230.

2.5-208 Roback, R.C., *Characterization and tectonic evolution of a Mesoproterozoic island arc in the southern Grenville Orogen, Llano uplift, central Texas*. Tectonophysics, 1996. 265: p. 29–52.

2.5-209 Wilkerson, A., W.D. Carlson, and D. Smith, *High-pressure metamorphism during the Llano orogeny inferred from Proterozoic eclogite remnants*. Geology, 1988. 16: p. 391–394.

2.5-210 Hogan, J.P. and M.C. Gilbert, *The Southern Oklahoma Aulacogen: A Cambrian analog for Mid-Proterozoic AMCG (Anorthosite–Mangerite–Charnockite–Granite) complexes,* in *Basement Tectonics 12: Central North America and Other Regions,* J.P. Hogan and M.C. Gilbert, Editors. 1988, Kluwer Academic Publishers: Norwell, MA. p. 39–78.

CTS-01416



Zone	Wave Height (feet)
1	5
2	15
3	30
4	50

1 foot = 0.3 meters

Source: Reference 2.4-242

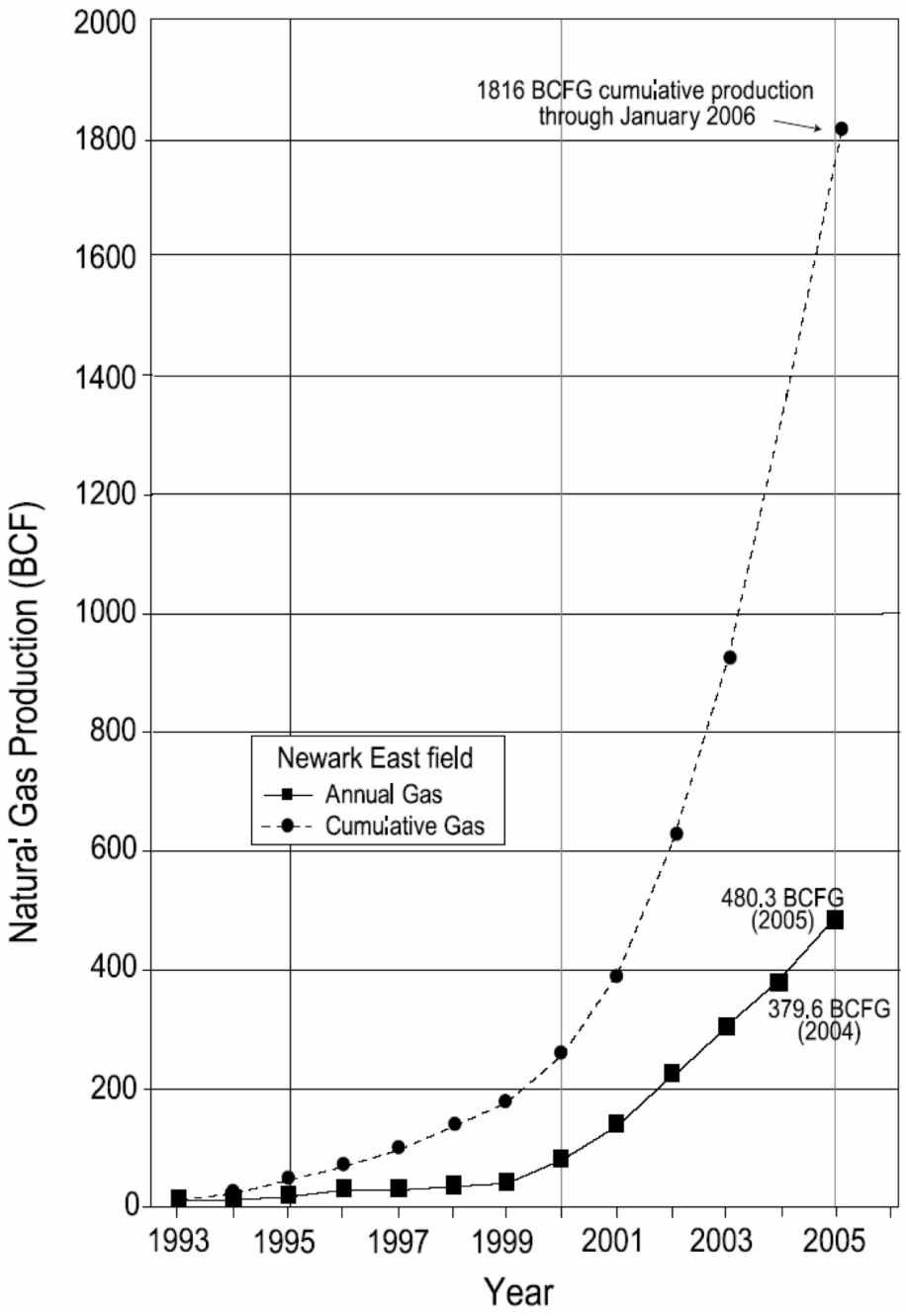
Figure 2.4.6-201 Tsunami Zone Map and Wave Heights

CTS-01417

Source: Reference 2.4-245

Figure 2.4.7-201 Ice Jam Flooding Map

CTS-01414



Note: This figure is not intended to forecast future gas production in the vicinty of the CPNPP site. It is intended to show the history and increase in production for the time period shown on the graph (1993-2006) (from Pollastro 2007)

Figure 2.5.1-229 Gas Production from the Newark East Field in the Barnett Shale

CTS-01415

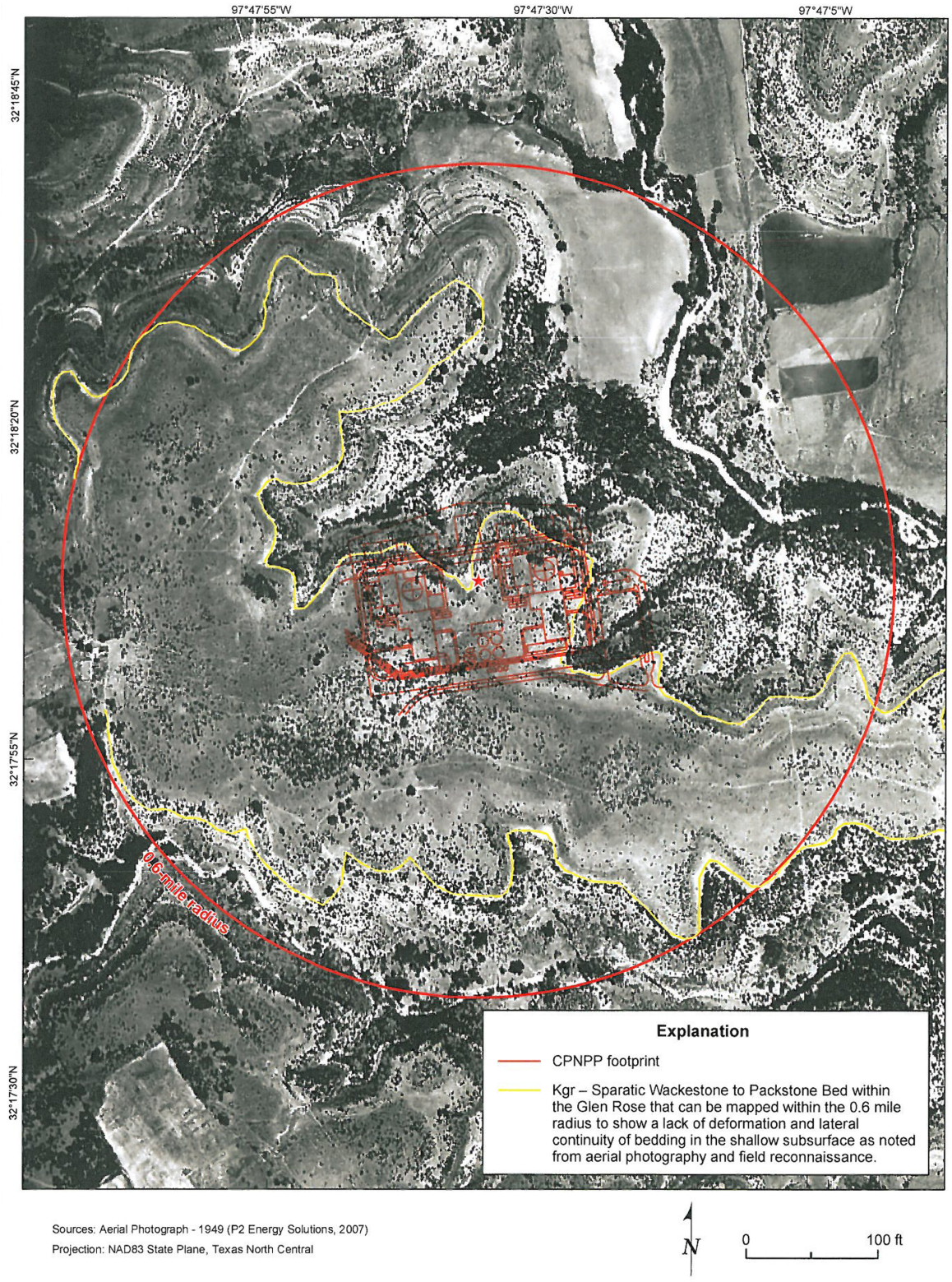
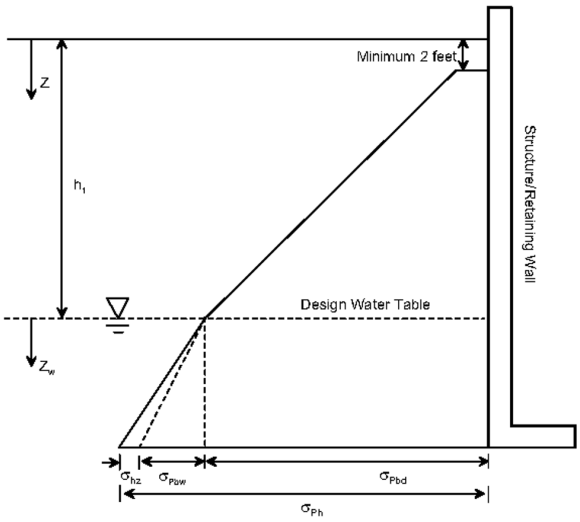


Figure 2.5.1-230 1949 Historical Photograph

CTS-01390



$k_P = \tan^2(45 + \frac{\phi'}{2}) = 3.25\ [1.7]$	Passive earth pressure coefficient
$\sigma_{Pbd} = k_P \gamma_t Z \cong 406Z\ [213Z]$	Passive pressure above water table $(2 < Z \le h_1)$
$\sigma_{Pbd} = 0$	No passive pressure for $(Z \le 2)$
$\sigma_{Pbw} = k_P(\gamma_t - \gamma_w)Z_w \cong 203Z_w\ [103\ Z_w]$	Passive pressure increment below h_1 (water table depth)
$\sigma_{hz} = \gamma_w Z_w \cong 62.4Z_w$	Hydrostatic pressure
$\sigma_{Ph} = \sigma_{Ps} + \sigma_{Pbd} + \sigma_{Pbw}$	Total passive (horizontal) pressure

Notes:

- Units: psf for pressure and ft for dimensions.
- Assumed compacted backfill properties:
  - Total unit weight: γ_t =125 pcf
  - Internal effective friction angle: ϕ' = 32°
  - Effective cohesion intercept: C′ = 0
- Seismic earth pressure not included.
- A horizontal displacement of about 0.02H at the top of the walls is required in order to mobilize the full passive resisting forces (H is total wall height). For the case of rigid and unyielding walls, the numbers are shown in brackets (ϕ' is limited to 15°).

Figure 2.5.4-244 Passive Earth Pressure

Chapter 3

Chapter 3 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
ROCL2_02.05.04-11 S01	3.4.1.2	3.4-1 3.4.-2	Supplemental Response to RAI No 22 Luminant letter TXNB- 11057 Date 8/29/2011	Added discussion on waterproofing and material used and deleted discussion on drain.	-
RCOL2_03.07.02-24	3KK.2	3KK-2	Response to RAI No. 226 Luminant Letter no.TXNB-11068 Date 10/27/2011	Clarification	-
RCOL2_03.07.02-24	Table 3kk-6	3kk-16	Response to RAI No. 226 Luminant Letter no.TXNB-11068 Date 10/27/2011	Clarification	-
RCOL2_03.07.02-24	3LL.2	3LL-2	Response to RAI No. 226 Luminant Letter no.TXNB-11068 Date 10/27/2011	Clarification	-
RCOL2_03.07.02-24	Table 3LL-9	3LL-16	Response to RAI No. 226 Luminant Letter no.TXNB-11068 Date 10/27/2011	Clarification	-
RCOL2_03.07.02-24	Table 3LL-10	3LL-17	Response to RAI No. 226 Luminant Letter no.TXNB-11068 Date 10/27/2011	Clarification	-
RCOL2_03.07.02-24	Table 3LL-11	3LL-18	Response to RAI No. 226 Luminant Letter no.TXNB-11068 Date 10/27/2011	Clarification	-
RCOL2_03.07.02-24	Table 3LL-12	3LL-19	Response to RAI No. 226 Luminant Letter no.TXNB-11068 Date 10/27/2011	Clarification	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_03.07.02-24	3MM.2	3MM-3	Response to RAI No. 226 Luminant Letter no.TXNB-11068 Date 10/27/2011	Clarification	-
RCOL2_03.07.02-24	Table 3MM-3	3MM-10	Response to RAI No. 226 Luminant Letter no.TXNB-11068 Date 10/27/2011	Clarification	-
RCOL2_03.07.02-24	Table 3MM-7	3MM-14	Response to RAI No. 226 Luminant Letter no.TXNB-11068 Date 10/27/2011	Clarification	-
RCOL2_03.07.02-24	3NN.1	3NN-1	Response to RAI No. 226 Luminant Letter no.TXNB-11068 Date 10/27/2011	Clarification	-
RCOL2_03.07.02-24	3NN.6	3NN-9	Response to RAI No. 226 Luminant Letter no.TXNB-11068 Date 10/27/2011	Clarification	-
RCOL2_03.09.06-14	3.9.6.4 3.9.9	3.9-2 3.9-3 3.9-9	Response to RAI No. 228 Luminant Letter no.TXNB-11077 Date 11/7/2011	Deleted COL item 3.9(6).	-
RCOL2_03.09.06-15	3.9.6 3.9.9	3.9-2 3.9-3	Response to RAI No. 228 Luminant Letter no.TXNB-11077 Date 11/7/2011	Updated the COL item 3.9(8).	-
RCOL2_03.09.06-17	Table 3.9-203	3.9-6 through 3.9-11	Response to RAI No. 228 Luminant Letter no.TXNB-11077 Date 11/7/2011	Updated the IST requirement Table for clarification.	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_02.05.04-26	3.4.1.2	3.4-1	Response to RAI No 233 Luminant letter no .TXNB-11081 Date 12/1/2011	Deleted the following sentence: " The lowest point of the structure foundation is above the groundwater elevation identified in Section 2.4, and therefore no permanent dewatering system is required."	-
CTS-01384	3.2.3 Table 3.2-202	3.2-2 3.2-6 3.2-7	Editorial	Added the reference of Table 3.2-202 and LMA.	0
DCD_03.03.02-5	3.3.1.2	3.3-2	Reflect Response to DCD RAI No.817	Added clarification sentences.	0
DCD_03.07.02-102	3.7.2.3.4 (New section) 3.7.5	3.7-7 [3.7-8] 3.7-14 [3.7-15]	Reflect Response to DCD RAI No.810	Reinstated COL 3.7(11).	0
DCD_003.07.02-88	3.7.2.8	3.7-11	Reflect Response to DCD RAI No.800	Clarification	0
RCOL2_03.11-18	3.11.1.2	3.11-2 [3.11-3]	Response to RAI No. 239 Luminant Letter no.TXNB-12006 Date 2/27/2012	The last sentence in DCD Subsection 3.11.1.1 is changed is changed to: "This list forms the basis for the operational Equipment Qualification Master Equipment List (EQMEL), which will be prepared in conjunction with work activities authorized by an engineering / construction / procurement (EPC) contract." The list to which the sentence refers is in Table 3D-201.	-
RCOL2_03.11-19	3.11.1.1	3.11-2	Response to RAI No. 239 Luminant Letter	The fourth sentence of the first paragraph in DCD Section 3.11.1.2	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
			no.TXNB-12006 Date 2/27/2012	is changed in order to explain that procurement specifications developed for US-APWR projects in the future will contain applicable EQ parameters, seismic parameters, operating times for equipment exposed to harsh conditions, acceptable methods of qualification, acceptable types of documentation, other issues related to EQ for mechanical, electrical and I&C equipment.	
RCOL2_03.06-21	3.9.6	3.9-2 [3.9-3]	Response to RAI No. 244 Luminant Letter no.TXNB-12006 Date 2/27/2012	Additional description was added to describe the implementation of the IST program by identifying the anticipated content of those specifications.	-
RCOL2_03.06-22	3.9.6 3.9.6.4 3.9.9 3.9.10(new)	3.9-2 [3.9-3] 3.9-2 3.9-3 [3.9-5] 3.9-3 [3.9-6]	Response to RAI No. 244 Luminant Letter no.TXNB-12007 Date 3/9/2012	Subsection 3.9.6 and 3.9.6.4 was revised to expand the description of the IST program and address the revised COL items. The wordings of COL Item 3.9(6) and 3.9(8) were revised. Subsection 3.9.10 was newly added.	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01501	3.2.3	3.2-2	Consistency within COLA	LMN of CP COL 3.2(4) and CP COL 3.2(5) were added to have consistency within COLA.	1
CTS-01394	3.4.3	3.4-3 [3.4-4]	Consistency with DCD and R-COLA ITAAC	Added 3K.1 as Subsection addressing COL 3.4(7).	1
DCD_03.06.01-9	3.6.1.3	3.6-1	Reflect response to DCD RAI No.795	Added sentence in consistency with COL 3.6(1).	1
MAP-03-401	3.9.6	3.9-2	Consistency with DCD	Revised in the lead sentence referenced paragraph in the lead sentence to have consistency between DCD and COLA.	1
CTS-01435	3.9.6	3.9-2 [3.9-2 3.9-5]	Editorial	Moved LMN of STD COL 3.9(6) at page 3.9-5 to the top of Subsection 3.9.6.	1
CTS-01396	3.9.6	3.9-2 [3.9-2 3.9-3 3.9-4 3.9-5]	Typo	Change IDs “RCOL2_03.06-21” and “RCOL2_03.06-22” were amended to “RCOL2_03.09.06-21” and “RCOL2_03.09.06-22” respectively.	1
CTS-01465	3.9.9	3.9-3 [3.9-6]	Editorial	Added Subsection 3.9.6 to COL Item 3.9(6).	1
CTS-01462	3.11.7	3.11-4 [3.11-4 3.11-5]	Correction	Corrected the referenced sections of COL 3.11(5) and 3.11(8).	1
DCD_03.12-25	3.12.5.6	3.12-1	Reflect response	Added Subsection	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
	(New Subsection 3.12.5.10)	[3.12-2]	to DCD RAI No.742 Amend	3.12.5.10 and changed sentence in consistency with COL 3.12(5).	
DCD_03.12-25	3.12.7	3.12-2	Reflect response to DCD RAI No.742 Amend	Added COL 3.12(5) in consistent with DCD RAI response.	1
CTS-01394	3K 3K.1	3K-1	Consistency with DCD and R-COLA ITAAC	Added a new paragraph explaining the new Figure 3K-201.	1
CTS-01394	Figure 3K-201 (New Figure)	3K-1 [3K-2]	Consistency with DCD and R-COLA ITAAC	Added a new Figure 3K-201.	1
CTS-01394	List of Figures (New)	3K-i [3K-ii]	Consistency with DCD and R-COLA ITAAC	Added LIST OF FIGURES due to addition of Figure 3K-201.	1

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

3.2.3 Combined License Information

Replace the content of DCD Subsection 3.2.3 with the following.

3.2(1) *Deleted from the DCD.*

3.2(2) *Deleted from the DCD.*

3.2(3) *Deleted from the DCD.*

STD COL 3.2(4)
CP COL 3.2(4)

3.2(4) *Site-specific safety-related systems and components designed to withstand earthquakes* CTS-01501

This COL item is addressed in Subsection 3.2.1.2 and Tables 3.2-201 and 3.2-202. CTS-01384

STD COL 3.2(5)
CP COL 3.2(5)

3.2(5) *Equipment class and seismic category* CTS-01501

This COL item is addressed in Subsection 3.2.2 and Table 3.2-201.

STD COL 3.2(6)
CP COL 3.2(6)

3.2(6) *Equipment class and seismic category of risk-significant, non-safety related SSCs*

This COL item is addressed in Subsection 3.2.2.5 and Table 3.2-201.

STD COL 3.4(7)
CP COL 3.4(7)

3.4(7) *Protection from internal flooding*

This COL item is addressed in Subsection 3.4.1.3 and 3K.1. CTS-01394

3.4.4 References

Add the following reference after the last reference in DCD Subsection 3.4.4.

3.4-201 *A Guide to the Use of Waterproofing, Dampproofing, Protective, and Decorative Barrier Systems for Concrete,* ACI 515.1R-79, American Concrete Institute, Revised 1985.

3.6 PROTECTION AGAINST DYNAMIC EFFECTS ASSOCIATED WITH POSTULATED RUPTURE OF PIPING

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

3.6.1.3 Postulated Failures Associated with Site-Specific Piping

STD COL 3.6(1) Replace the paragraph in DCD Subsection 3.6.1.3 with the following.

The site-specific systems or components that are safety-related or required for safe shutdown are limited to the essential service water system (ESWS) and the ultimate heat sink (UHS) system. There is no site-specific high-energy piping within the protective walls of the ESWPT and UHSRSs and therefore, high-energy pipe breaks are not postulated for site-specific piping within these protective walls. The site-specific moderate-energy piping systems are the ESWS and the fire protection water supply system (FSS).

A qualitative evaluation of site-specific moderate-energy piping systems to assess environmental and flooding impacts is provided below.

The ESWS and the UHS consist of four independent trains with each train providing fifty percent (50%) of the cooling capacity required for a design basis accident and subsequent placement of the plant in the safe shutdown condition. Each train of the ESWS in the ESWPT is physically separated from the other trains by concrete walls and floors, and piping penetrations to other buildings are sealed. The failure in the piping of one ESWS train will not affect the other trains of the ESWS from an environmental and flooding perspective. Therefore, the consequences of failures in site-specific ESWS piping does not affect the ability to safely shut down the plant.

The failure in the FSS piping will not affect the safety function of the ESWS and the UHS from an environmental perspective because the FSS water temperature is approximately room temperature. From a flooding perspective, the ESWS is safe from a FSS pipe failure because FSS piping does not exist in the ESWPT, and the ESWPT piping penetrations prevent intrusion from any postulated FSS spillage in other buildings. Therefore, the consequences of the failure in site-specific FSS piping does not affect the ability to safely shut down the plant.
The as-design pipe hazards analysis report to include the impact of all site specific high and moderate piping system is to be updated. DCD_03.06.01-9

The design specification for snubbers installed in harsh service conditions (e.g., high humidity, temperature, radiation levels) is evaluated for the projected life of the snubber to assure snubber functionality including snubber materials (e.g., lubricants, hydraulic fluids, seals).

3.9.6 Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints

STD COL 3.9(6)
STD COL 3.9(8)

~~Replace the second sentence of the third paragraph in DCD Subsection 3.9.6 with the following.~~Replace the seventh paragraph in DCD Subsection 3.9.6 with the following.

RCOL2_03.09.06-15
MAP-03-401
CTS-01435

~~The inservice testing (IST) program for pumps, valves, and dynamic restraints is administratively controlled to ensure that the equipment will be capable of performing its safety function throughout the life of the plant.~~The US-APWR utilizes the ASME OM Code, 2004 Edition through the 2006 Addenda (or the optional ASME Code Cases listed in NRC RG 1.192 that is incorporated by reference in paragraph (b) of 10 CFR 50.55a, subject to the applicable limitations and modifications) (Reference 3.9-13) for developing the IST Program for ASME Code, Section III, Class 1, 2 and 3 safety-related pumps, valves and dynamic restraints in US-APWR Subsection 3.9.6. The inservice testing (IST) program for pumps, valves, and dynamic restraints including the ASME OM Code edition and addenda to be used for the IST program is administratively controlled to ensure that the equipment will be capable of performing its safety function throughout the life of the plant.

Inservice Testing Program Description

RCOL2_03.09.06-22
CTS-01396

The CPNPP Units 3 and 4 IST program incorporates the IST program described in US-APWR DCD Section 3.9.6 and its subsections as expanded in this FSAR subsection. The IST program is developed in accordance with the requirements delineated in ASME Code Section XI Rules for Inservice Inspection of Nuclear Power Plant Components, the ASME OM Code, the plant Technical Specifications, and good engineering practices. The IST relies on baseline information obtained during plant construction and startup testing. The program is implemented in general conformance with NUREG-1482 (Reference 3.9-60), Guidelines for Inservice Testing at Nuclear Power Plants. [also see NUREG-1482, Revision 2 (Reference 3.9-201), APPENDIX A: Guidelines for Inservice Testing Program for Pumps and Valves at Nuclear Power Plants and APPENDIX B: Guidelines for Inservice Examination and Testing Program for Dynamic Restraints (Snubbers) at Nuclear Power Plants]. In addition, the development of the IST relies on the guidance provided in Sections 5 (Guidance for Developing and Implementing IST Programs) and 8 (IST Program Guidance for New Reactors) of

RCOL2_03.09.06-22
CTS-01396

NUREG 1482, as well as other applicable regulatory guidance documents referenced in these NUREG documents.

Aspects of the IST program will:

a. verify the appropriate Code Class for each component of the plant, identify the system boundaries for each class of components subject to test or examination, and identify the components exempt from testing or examination requirements

b. verify the design and arrangement of system components to include allowance for adequate access and clearances for conducting the tests and examinations (done as part of the initial design verification phase and for any subsequent plant modifications)

c. verify that appropriate IST requirements are captured in procurement specifications for ASME components

d. prepare plans and schedules for the implementation of the IST program and the performance of IST activities

e. prepare written test and examination instructions and procedures. In formulating program procedures, the appropriate code edition and addenda are to be identified and administratively controlled.

f. verify the qualification of personnel who perform and evaluate examinations and tests in accordance with the QAP

g. perform the required tests and examinations

h. record the required test and examination results that provide a basis for evaluation and facilitate comparison with the results of subsequent tests or examinations

i. evaluate tests and examination results

j. maintain adequate test and examination records in accordance with the QAP requirements

k. retain test and examination records for the service lifetime of the component or system

l. assure that any plant changes that impact IST requirements are evaluated and the IST program is adjusted accordingly

m. provide for the training of personnel assigned to perform IST functions

RCOL2_03.09.06-21
CTS-01396

Additional details are provided for each component or group of components within the scope of the IST program. For example, some of the information that is incorporated in project documents such as the System Design Packages, System Descriptions, Procurement Specifications, System Requirement Documents, etc. includes:

- Equipment design, qualification, testing, inspection, surveillance, and documentation requirements
- Codes and standards to be applied, and their justification
- Regulatory guides and Code cases to be applied
- Equipment design life requirements
- Equipment design-basis calculation methodology
- Application requirements such as fluid conditions, ambient temperatures, etc. Special design requirements such as valve seat types and materials, valve stem friction limitations and materials, snubber types or pump types and materials, operating requirements methodology and assumptions such as valve thrust and torque requirement or pump flow and head requirement.
- Equipment sizing and testing methodology requirements
- Power supply design requirements, degraded voltage, ambient temperature effects, battery life, and thermal overload devices
- Lubricants and lubrication requirements
- Weak link design, qualification, and surveillance methodology requirements
- Environmental qualification methodology and qualification report requirements
- Design, qualification, surveillance, and replacement requirements for non-metallic parts
- Periodic verification and condition monitoring requirements
- Responsibilities of vendor and licensee for design, qualification, testing, and documentation

The descriptions and items identified in this section are intended to be a general outline only. They are not all inclusive but are intended to be representative of various elements of the IST program.

The IST program, including pumps, valves and dynamic restraints, will be developed and implemented per the milestone schedule provided in Table 13.4-201 for the Inservice Testing Program.

RCOL2_03.09.06-21
CTS-01396
CTS-01435

3.9.6.2 IST Program for Pumps

STD COL 3.9(11) Replace the ~~third~~seventh paragraph in DCD Subsection 3.9.6.2 with the following.

DCD_03.09.06-53

The site-specific safety-related pump IST parameters and frequencies are provided in Table 3.9-202.

3.9.6.3 IST Program for Valves

STD COL 3.9(12) Replace the fifth paragraph in DCD Subsection 3.9.6.3 with the following.

The types of testing and frequencies of site-specific valves subject to IST in accordance with the ASME Code are provided in Table 3.9-203.

3.9.6.4 IST Program for Dynamic Restraints

RCOL2_03.09.06-14
RCOL2_03.09.06-22

STD COL 3.9(6) Replace the second paragraph in DCD Subsection 3.9.6.4 with the following.

The IST program for dynamic restraints is implemented in accordance with the ASME OM Code.~~The IST program plan for dynamic restraints (snubbers) complies with the requirements in the latest edition and addenda of the Nonmandatory Appendix A of ASME OM Code incorporated by reference in 10 CFR 50.55a (Reference 3.9-29). The IST program plan for dynamic restraints will be provided 12 months prior to fuel load.~~

3.9.9 Combined License Information

Replace the content of DCD Subsection 3.9.9 with the following.

STD COL 3.9(1) ***3.9(1)*** *Snubber functionality*

This COL item is addressed in Subsection 3.9.3.4.2.5

CP COL 3.9(2) ***3.9(2)*** *Classification of CPNPP Unit 3 reactor internals as prototype*

This COL item is addressed in Subsection 3.9.2.4.1.

***3.9(3)** Deleted from the DCD.*

***3.9(4)** Deleted from the DCD.*

***3.9(5)** Deleted from the DCD.*

STD COL 3.9(6)

***3.9(6)** ~~Program plan for IST of dynamic restraints~~Program for IST of dynamic restraints in accordance with the ASME OM Code.*

This COL item is addressed in Subsection 3.9.6 and 3.9.6.4.

RCOL2_03.09.06-14
RCOL2_03.09.06-22
CTS-01465

***3.9(7)** Deleted from the DCD.*

STD COL 3.9(8)

***3.9(8)** ~~Administrative control of the edition and addenda used for the IST program~~Administrative control of the edition and addenda to be used for the IST program and to provide a full description of their IST program for pumps, valves, and dynamic restraints.*

This COL item is addressed in Subsection 3.9.6.

RCOL2_03.09.06-15
RCOL2_03.09.06-22

***3.9(9)** Deleted from the DCD.*

STD COL 3.9(10)
CP COL 3.9(10)

***3.9(10)** Site-specific active pumps*

This COL item is addressed in Subsection 3.9.3.3.1, and Table 3.9-201.

STD COL 3.9(11)
CP COL 3.9(11)

***3.9(11)** Site-specific, safety-related pump IST parameters and frequency*

This COL item is addressed in Subsection 3.9.6.2, and Table 3.9-202.

STD COL 3.9(12)
CP COL 3.9(12)

***3.9(12)** Testing and frequency of site-specific valves subject to IST*

This COL item is addressed in Subsection 3.9.6.3, and Table 3.9-203.

3.9.10 References

RCOL2_03.09.06-22

Add the following reference after the last reference in DCD Subsection 3.9.10.

3.9-201 Guidelines for Inservice Testing at Nuclear Power Plants, NUREG-1482; Revision 2.

Chemical and radiation environmental requirements for site-specific electrical and mechanical equipment (including instrumentation and control and certain accident monitoring equipment) are included in MUAP-08015 (Reference 3.11-3). This equipment is qualified using the process described in MUAP-08015 (Reference 3.11-3).

3.11.6 Qualification of Mechanical Equipment

STD COL 3.11(8) Replace the second paragraph in DCD, Subsection 3.11.6 with the following.

Site-specific mechanical equipment requirements are to be included in Table 3D-201 by completion of detailed design. This equipment is qualified using the process described in MUAP-08015 (Reference 3.11-3).

3.11.7 Combined License Information

Replace the content of DCD Subsection 3.11.7 with the following.

CP COL 3.11(1) ***3.11(1)*** *Environmental qualification document assembly and maintenance*

This COL item is addressed in Section 3.11.

STD COL 3.11(2) ***3.11(2)*** *Qualification tests results recorded*

This COL item is addressed in Subsection 3.11.3.

CP COL 3.11(3) ***3.11(3)*** *Schedule for EQ program implementation milestones*

This COL item is addressed in Section 3.11.

CP COL 3.11(4) ***3.11(4)*** *Periodic tests, calibrations, and inspections*

This COL item is addressed in Section 3.11.

STD COL 3.11(5)
CP COL 3.11(5) ***3.11(5)*** *Site-specific equipment addressed in EQ program*

This COL item is addressed in Subsection 3.11.1.1, Subsection 3D.1.6 and Table 3D-201. CTS-01462

STD COL 3.11(6) ***3.11(6)*** *Site-specific equipment qualification process*

This COL item is addressed in Subsection 3.11.4.

STD COL 3.11(7) ***3.11(7)*** *Site-specific chemical and radiation environmental requirements*

This COL item is addressed in Subsection 3.11.5.

STD COL 3.11(8)
CP COL 3.11(8)

***3.11(8)** Site-specific mechanical equipment requirements*

This COL item is addressed in Subsection 3.11.6, Subsection 3D.1.6 and Table 3D-201. CTS-01462

STD COL 3.11(9)

***3.11(9)** Parameters based on site-specific considerations*

This COL item is addressed in Subsection 3.11.1.2.

3.12 PIPING DESIGN REVIEW

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

3.12.5.1 Seismic Input Envelope vs. Site-Specific Spectra

STD COL 3.12(2) Replace the second paragraph in DCD Subsection 3.12.5.1 with the following.

For piping located in the yard that is not part of the US-APWR standard design, site specific response spectra described in Subsection 3.7.1 are used for piping analysis.

3.12.5.3.6 Wind/Tornado Loads

CP COL 3.12(3) Replace the paragraph in DCD Subsection 3.12.5.3.6 with the following.

There is no ASME Code, Section III (Reference 3.12-2) Class 2 or 3 piping exposed to wind or tornado loading. Non-ASME piping, such as B31.1 (Reference 3.12-1) exposed to wind or tornado loading, is evaluated to the wind and tornado loading identified in Section 3.3, in conjunction with the applicable piping code load combinations.

3.12.5.6 High-Frequency Modes

CP COL 3.12(4) Replace the second sentence of the second paragraph in DCD Subsection 3.12.5.6 with the following.

For the site-specific ground motion response spectra, there are no high frequency exceedances of the CSDRS. Therefore, high frequency screening of the piping system for high frequency sensitivity is not required.

3.12.5.10 Thermal Stratification

DCD_03.12-25

CP COL 3.12(5) Replace the last sentence of the last paragraph in DCD Subsection 3.12.5.10 with the following.

The monitoring of the first cycle operation is performed when the CPNPP Unit 3 or 4 will be the first US-APWR Plant. DCD_03.12-25

3.12.7 Combined License Information

Replace the content of DCD Subsection 3.12.7 with the following.

3.12(1) *Deleted from the DCD.*

STD COL 3.12(2) ***3.12(2)*** *Site-specific seismic response spectra for design of piping*

This COL item is addressed in Subsection 3.12.5.1.

CP COL 3.12(3) ***3.12(3)*** *Site-specific ASME Code, Section III, Class 2 or 3 piping, exposed to wind or tornado loads*

This COL item is addressed in Subsection 3.12.5.3.6.

CP COL 3.12(4) ***3.12(4)*** *Piping systems evaluation for sensitivity to high frequency modes*

This COL item is addressed in Subsection 3.12.5.6.

CP COL 3.12(5) ***3.12(5)*** *The monitoring of thermal stratification at pressurizer surge line* DCD_03.12-25

This COL item is addressed in Subsection 3.12.5.10.

3K COMPONENTS PROTECTED FROM INTERNAL FLOODING

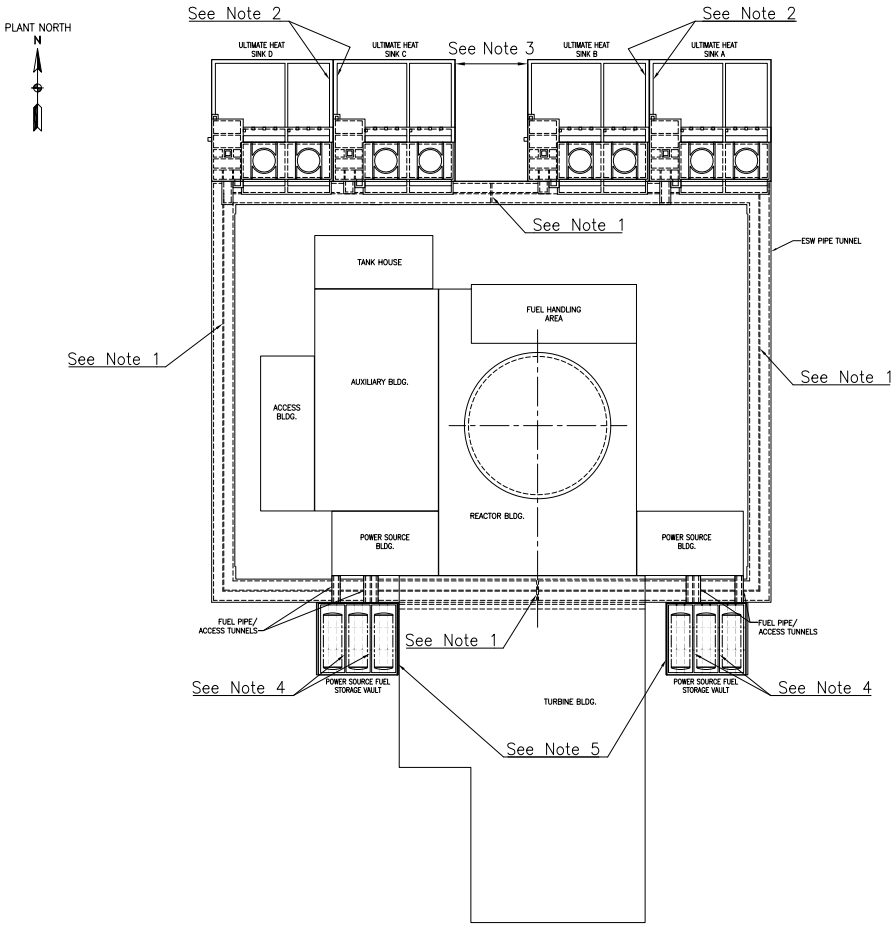
This section of the referenced DCD is incorporated by reference with ~~no~~the following departures and/or supplements. CTS-01394

3K.1 Introduction

STD COL 3.4(7) Add the following paragraph after the last paragraph in DCD Subsection 3K.1.

Figure 3K-201 provides the location of flood barrier walls that are located in the UHSRS, the ESWPT, and the PSFSV.

CTS-01394



NOTES:

1. CONCRETE WALL BARRIER PROVIDES DIVISIONAL SEPARATION AND PREVENTS FLOODING BETWEEN ESWPT DIVISIONS.
2. SEPARATE CONCRETE WALLS FOR EACH ULTIMATE HEAT SINK BASIN PREVENTS FLOODING BETWEEN UHS BASINS 'A' TO 'B' OR 'C' TO D'.
3. ULTIMATE HEAT SINK BASINS 'B' AND 'C' ARE PHYSICALLY SEPARATED WITH EXTERIOR CONCRETE WALL TO PREVENT FLOODING COMMUNICATION BETWEEN THEM.
4. CONCRETE WALLS BETWEEN EACH FUEL STORAGE TANK ENCLOSURE PREVENT FLOODING COMMUNICATION BETWEEN THEM.
5. POWER SOURCE FUEL STORAGE VAULTS ARE PHYSICALLY SEPARATED WITH EXTERIOR CONCRETE WALLS TO PREVENT FLOODING COMMUNICATION BETWEEN THEM.

CP COL 3.4(7)

Figure 3K-201 Location of Flood Barrier Walls UHSRS, ESWPT, and PSFSV

LIST OF FIGURES

Chapter 4

Chapter 4 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

Chapter 5

Chapter 5 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_12.03-12.04-12	5.2.3.2.1	5.2-1 5.2-2	Response to RAI No. 225 Luminant Letter no.TXNB-11058 Date 9/16/2011	Added a description about target concentration of soluble zinc at the end of the eighth paragraph in Subsection 5.2.3.2.1.	-
CTS-01382	5.2.1.1	5.2-1	Editorial	Replaced “The licensee uses ASME Code editions and addenda that is” with “The licensee uses ASME Code editions and addenda that are”	0
CTS-01383	5.3.4	5.3-4	Editorial	Deleted “COL” from in front of the COL numbers to be consistent with Section 5.2.6.	0

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

Chapter 6

Chapter 6 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_06.02.02-4	6.2.2.3	6.2-1	Response to RAI No. 229 Luminant Letter no.TXNB-11063 Date 10/10/2011	Added the words as described in 6.2-1 markup to third bullet for the containment cleanliness program.	-
RCOL2_06.04-14	6.4.3 6.4.7	6.4-1 6.4-4	Response to RAI No. 240 Luminant Letter no.TXNB-12008 Date 03/29/2012	Changed from “STD COL 6.4 (2)” to “CP COL 6.4(2)”.	-
RCOL2_06.04-15	6.4.4.2	6.4-2 6.4-3	Response to RAI No. 240 Luminant Letter no.TXNB-12008 Date 03/29/2012	Added additional sensitivity analysis for chlorine as a heavy gas using “virtual source” approach to utilize the combined features of ALOHA and HABIT models. Added MCR elevation to FSAR.	-
CTS-01395	6.4.4.1	6.4-1	Response to RAI No. 240 Luminant Letter no.TXNB-12008 Date 03/29/2012	Corrected typo by deleting extra space between “W” and “R” in “US-APWR”.	-
MAP-06-401	6.2.2.3	6.2-1	Consistency with DCD	Subsection and title were changed from "6.2.2.3 Design Evaluation" to "6.2.2.3.2 Debris Source Term".	1
MAP-06-402	6.2.2.3	6.2-1	Consistency with DCD	Deleted extra article “the” in the lead sentence.	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
				Revised from “tenth” to “seventh” and “Subsection 6.2.2.3” to “Subsection 6.2.2.3.2” in lead sentence.	
MAP-06-403	6.2.8	6.2-2	Consistency with DCD	Added “STD COL 6.2(6)” to 6.2(6) and following description: “Preparation of administrative procedure(s) for control of RMI and fiber insulation debris within ZOIs and aluminum in containment."	1
MAP-06-404	6.6.8	6.6-1	Consistency within COLA	Deleted “the first sentence of” from the lead sentence of section 6.6.8.	1

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

6.2 CONTAINMENT SYSTEMS

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

6.2.2.3.2 ~~Design Evaluation~~Debris Source Term

MAP-06-401

STD COL 6.2(5)

Replace the last sentence of ~~the~~ the first bullet of ~~tenth~~seventh paragraph in DCD Subsection 6.2.2.3.2 with the following.

MAP-06-402

Administrative procedures in Subsection 13.5.1 implement the containment cleanliness program.

The program includes the following:

- Organizational responsibilities for implementing the program
- Controls and limits on type and quantity of materials for all modes of operation (not limited to outages)
- Guidance documents used to develop the cleanliness program survey/sampling methods including NEI 04-07(Ref. 6.2-24) and associated NRC safety evaluation dated December 6, 2004.

RCOL2_06.02.02-4

- Inspection frequency
- Evaluation frequency
- Reporting requirements for degraded conditions or non-conforming results

Procedures to remove foreign materials and minimize the amount of debris that might be left in containment following refueling and maintenance outages address the following:

- Frequency of cleanliness control and inspection activities for operation and maintenance
- Restriction of materials introduced into the containment
- Accounting for materials introduced into and out of the containment (e.g., scaffold, tape, labels, plastic film, paper, cloth, keys, and pens)
- Cleaning of maintenance outage area, including areas associated with removal or replacement of insulation

- Cleanliness inspections and removal of debris/foreign material, including operation and maintenance areas, RWSP, debris interceptors, RWSP vent and drain lines (available for inspection), and strainer debris
- Preparation and review of entry/exit logs and inspection records

The containment cleanliness program including administrative procedures will be developed and implemented prior to initial fuel load.

6.2.6.1 Containment Integrated Leakage Rate Testing

STD COL 6.2(8) Replace the first and second sentences of the first paragraph in DCD Subsection 6.2.6.1 with the following.

The containment leakage rate test program requirements are defined by Technical Specifications Subsection 5.5.16. Implementation milestone of the containment leak rate tests program is provided in Table 13.4-201.

6.2.8 Combined License Information

Replace the content of DCD Subsection 6.2.8 with the following.

6.2(1) *Deleted from the DCD.*

6.2(2) *Deleted from the DCD*

6.2(3) *Deleted from the DCD.*

6.2(4) *Deleted from the DCD.*

STD COL 6.2(5) ***6.2(5)*** *Preparation of a cleanliness, housekeeping and foreign materials exclusion program*

This COL item is addressed in Subsection 6.2.2.3 and Table 6.2.2-2R.

STD COL 6.2(6) ***6.2(6)*** ~~***Deleted from the DCD.***~~*Preparation of administrative procedure(s) for control of RMI and fiber insulation debris within ZOIs and aluminum in containment.* MAP-06-403

6.2(7) *Deleted from the DCD.*

STD COL 6.2(8) ***6.2(8)*** *Containment leakage rate testing program*

This COL item is addressed in Subsections 6.2.6.1.

6.6 INSERVICE INSPECTION OF CLASS 2 AND 3 COMPONENTS

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

STD COL 6.6(1) Replace the second sentence of the second paragraph in DCD Section 6.6 with the following.

A preservice inspection program (non-destructive base line examination) and an Inservice inspection program for American Society of Mechanical Engineers (ASME) Code Section III Class 2 and 3 systems, components (pumps and valves), piping, and supports will be developed and implemented in accordance with Table 13.4-201.

6.6.8 Augmented ISI to Protect Against Postulated Piping Failures

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STD COL 6.6(2) Replace ~~the first sentence of~~ the second paragraph in DCD Subsection 6.6.8 with the following. MAP-06-404

Implementation milestones of the augmented ISI program are the same as that specified for inservice inspection of Class 2 and 3 components provided in Table 13.4-201.

6.6.9 Combined License Information

Replace the content of DCD Subsection 6.6.9 with the following.

STD COL 6.6 (1) ***6.6(1)*** *Preparation of a preservice inspection program and an inservice inspection program*

This COL item is addressed in Section 6.6.

STD COL 6.6(2) ***6.6(2)*** *Preparation of an augmented inservice inspection program for high-energy fluid system piping*

This COL Item is addressed in Subsection 6.6.8.

Chapter 7

Chapter 7 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01365	Table 7.4-201	7.4-2	Editorial Correction	Changed “ESWP” to “ESW Pump.”	0
DCD_07.09-23	7.9	7.9-1	Reflect Response to DCD RAI No. 710	Changed “the following departures and/or supplements” to “no departures or supplements” in Section 7.9, and deleted Subsections 7.9.2.6 and 7.9.4	0

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

Chapter 8

Chapter 8 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_08.01-2 S01	8.1.2.1	8.1-1	Supplemental Response to RAI No 9 01 Luminant letter TXNB- 11055 Date 8/9/2011	Added The Following at the end of the second paragraph of the subsection: "The switching station equipment shared between Unit 3 and 4 has the capacity and is configured such that sharing will not significantly impair the ability to provide offsite power in response to an accident in one unit and an orderly shutdown and cooldown of the remaining unit."	-
RCOL2_08.02-30 S01	8.2.2.2	8.2-12	Supplemental Response to RAI No 182 Luminant letter TXNB- 11060 Date 9/16/2011	Added the following to the end of the 7th paragraph of subsection 8.2.2.2: The grid stability analysis justifies the assumption used in Chapter 15 to power RCPs through the UATs for at least three seconds after a turbine generator trip.	-
RCOL2_08.01-2 S02	8.1.2.1	8.1-1	Supplemental Response to RAI No 9 02 Luminant letter TXNB- 11065 Date 10/17/2011	Revised the text added in S01 to RAI 9 (above). Added the following to the end of the text. "and that adequate offsite power capacity exists to support both units during this scenario."	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01367	8.1.5.3.5	8.1-2	Deleted Subsection	Subsection no longer needed	0
CTS-01369	Figure 8.1-1R	8.1-3	Corrected figure	Replaced Figure 8.1-16 to 1) Deleted the second GLBS shown in the upper Left of Figure 8.1-1R. 2) Corrected the legend for the Battery symbol from “P21 MCC” to “Battery”	0
CTS-01368	8.2.3 8.3.4	8.2-13 8.3-4	Editorial	Deleted, the Following text:“of the FSAR and 8.3.3 of the DCD.” Changed STD to CP in LMN	0
MAP-08-401	8.2.3	8.2-12 8.2-13	Consistency with DCD	Changed from “third” to “fifth”. Changed from "fourth' to 'Eighth".	1
CTS-01492	8.2.3	8.2-12	Correction	Added “summary of a” at the first sentence.	1
CTS-01494	8.2.4	8.2-13	Correction	Added Subsection 8.2.1.2.1 on the COL Item 8.2(3).	1
CTS-01495	8.2.4	8.2-14	Correction	Deleted Subsection 8.2.2.2 and added Subsection 8.2.1.2.3 on the COL Item 8.2(11).	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01499	8.3.1.1 8.3.1.1.9 8.3.1.1.11 8.3.1.3.2 8.3.1.3.4 8.3.1.3.5 8.3.2.1.1 8.3.2.1.2 8.3.2.3.2	8.3-1 8.3-2 8.3-3	Editorial	Added period after “following” at the first sentence. Deleted “s” after “following” at the first sentence.	1

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

- Loss of the largest load in the grid.

The addition of the proposed CPNPP Units 3 and 4 at the Comanche Peak facility does not adversely impact the stability of the existing units and the new units in the area. The Comanche Peak generation remains stable for reasonably expected contingencies. These study cases include loss of the most heavily loaded transmission circuit connected to the plant switching station, loss of the largest capacity transmission circuit connected to the plant switching station and removal of the largest load from the system. In addition, in case of loss of the largest supply, i.e. CPNPP Units 3 and 4, the transmission system remains stable with slight voltage and frequency variation. The voltage low point is about 0.976 pu and frequency deviation from 60 Hz is only 0.24 Hz at the lowest point. In addition, the maximum frequency decay rate does not exceed 5 Hz/second that is assumed in the reactor coolant system flow analysis in Chapter 15. The grid stability analysis justifies the assumption used in Chapter 15 to power RCPs through the UATs for at least three seconds after a turbine generator trip. RCOL2_08.02-30 S01

Grid stability is evaluated on an ongoing basis based on load growth, addition of new transmission lines, addition of new generation capacities and for planned system changes.

The plant switching station and associated outgoing transmission lines and tie lines are newly constructed in CPNPP site and the transmission lines are connected to the four independent and separate local switching station. The transmission system reliability is evaluated in a similar manner as the CPNPP Units 1 and 2. CPNPP Units 1 and 2 have not experienced any LOOP event caused by both the transmission system accepting the unit's output and the transmission system providing the preferred power for the unit's loads, from 1986 to 2007. According to this experience data, the transmission system is expected to be highly reliable.

8.2.3 Design Bases Requirements

CP COL 8.2(11) Replace the first sentence of the second paragraph in DCD Subsection 8.2.3 with the following.

A failure modes and effects analysis is provided in Subsection 8.2.1.2.1.1 and the offsite power system conforms to the following requirements.

STD COL 8.2(11) Replace the last sentence of the ~~third~~fifth paragraph in DCD Subsection 8.2.3 with the following. MAP-08-401

A summary of a grid stability analysis is provided in Subsection 8.2.2.2 and the grid stability conforms to this requirement. CTS-01492

STD COL 8.2(11) Replace the last sentence of the ~~fourth~~eighth paragraph in DCD Subsection 8.2.3 with the following. MAP-08-401

A transmission system reliability analysis is provided in Subsection 8.2.2.2.

~~STD~~ CP COL 8.3(12) Condition monitoring of underground or inaccessible cables within the scope of the maintenance rule (10 CFR50.65) is incorporated into the maintenance rule program. The cable condition monitoring program incorporates lessons learned from industry operating experience, address regulatory guidance, and utilizes information from detailed design and procurement documents to determine the appropriate inspections, tests, and cable monitoring criteria within the scope of the maintenance rule described in Subsection 17.6.2. The program takes into consideration Generic Letter 2007-01. CTS-01368

8.2.4 Combined License Information

Replace the content of DCD Subsection 8.2.4 with the following.

CP COL 8.2(1) ***8.2(1)*** *Utility power grid and transmission line*

This Combined License (COL) Item is addressed in Subsections 8.1.2.1, 8.2.1.1, 8.2.1.2.3, Table 8.2-201, Table 8.2-202, and Figure 8.2-201.

8.2(2) *Deleted from the DCD.*

CP COL 8.2(3) ***8.2(3)*** *Switchyard description*

This COL Item is addressed in Subsections 8.1.1, 8.1.5.3.5, 8.2.1.2.1, 8.2.1.2.1.1, 8.2.1.2.1.2, 8.2.1.2.2, Figure 8.1-1R, Figure 8.2-202, Figure 8.2-203, Figure 8.2-204, Figure 8.2-205, Figure 8.2-206, Figure 8.2-207, Figure 8.2-208, Figure 8.3.1-1R and Figure 8.3.1-2R. CTS-01494

CP COL 8.2(4) ***8.2(4)*** *Normal preferred power*

This COL Item is addressed in Subsection 8.2.1.2, Figure 8.2-202, Figure 8.2-203, Figure 8.2-207 and Figure 8.2-208.

CP COL 8.2(5) ***8.2(5)*** *Alternate preferred power*

This COL Item is addressed in Subsection 8.2.1.2, Figure 8.2-202, Figure 8.2-204, Figure 8.2-207 and Figure 8.2-208.

8.2(6) *Deleted from the DCD.*

CP COL 8.2(7) ***8.2(7)*** *Protective relaying*

This COL Item is addressed in Subsections 8.2.1.2.1.1, 8.2.1.2.1.2, Figure 8.2-203, Figure 8.2-204, Figure 8.2-209 and Figure 8.2-210.

CP COL 8.2(8) ***8.2(8)*** *Switchyard dc power*

This COL Item is addressed in Subsections 8.2.1.2.1.1 and 8.2.1.2.1.2.

CP COL 8.2(9) ***8.2(9)*** *Switchyard ac power*

This COL Item is addressed in Subsections 8.2.1.2.1.1 and 8.2.1.2.1.2.

STD COL 8.2(10) ***8.2(10)*** *Transformer protection*

This COL Item is addressed in Subsection 8.2.1.2.

CP COL 8.2(11)
STD COL 8.2(11) ***8.2(11)*** *Stability and Reliability of the Offsite Transmission Power Systems*

This COL Item is addressed in Subsections 8.2.1.2.1.1, 8.2.1.2.3~~8.2.2.2~~, 8.2.3 and Table 8.2-203. CTS-01495

8.2(12) *Deleted from the DCD.*

8.3 ONSITE POWER SYSTEMS

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

8.3.1.1 Description

CP COL 8.3(1) Replace the first sentence of the second paragraph in DCD Subsection 8.3.1.1 with the following.

The onsite ac power system is supplied offsite power from the 345 kV transmission system by two independent connections to the transmission system.

CP COL 8.3(1) Replace the seventh sentence of the second paragraph in DCD Subsection 8.3.1.1 with the following. CTS-01499

The rated voltage of the high-voltage winding of the RAT is 345 kV.

8.3.1.1.9 Design Criteria for Class 1E Equipment

STD COL 8.3(3) Replace the last sentence of the ninth paragraph in DCD Subsection 8.3.1.1.9 with the following~~s~~. CTS-01499

Short circuit analysis for ac power system is addressed in Subsection 8.3.1.3.2.

8.3.1.1.11 Grounding and Lightning Protection System

CP COL 8.3(2) Replace the last paragraph in DCD Subsection 8.3.1.1.11 with the following~~s~~. CTS-01499

The ground grid is designed in the shape of uniform square or rectangular meshes as shown in Figure 8.3.1-201. The layout of the air terminals is shown in Figure 8.3.1-201.

8.3.1.3.2 Short Circuit Studies

STD COL 8.3(3) Replace the last two sentences of the first paragraph in DCD Subsection 8.3.1.3.2 with the following~~s~~. CTS-01499

As a result of the studies, maximum short circuit current has been confirmed to satisfy short circuit interrupt rating of circuit breakers indicated in Table 8.3.1-1R.

8.3.1.3.4 Equipment Protection and Coordination Studies

STD COL 8.3(10) Replace the last sentence of the first paragraph in DCD Subsection 8.3.1.3.4 with the following~~s~~. CTS-01499

Coordination of protective devices is confirmed as part of equipment procurement.

8.3.1.3.5 Insulation Coordination (Surge and Lighting Protection)

CP COL 8.3(11) Replace the last sentence of the first paragraph in DCD Subsection 8.3.1.3.5 with the following~~s~~. CTS-01499

Surge arresters are selected to be compatible with lightning impulse insulation level of the 345 kV offsite power circuit so that the insulation of onsite power system is assured from lightning surge.

8.3.2.1.1 Class 1E DC Power System

STD COL 8.3(8) Replace the last sentence of the third paragraph in DCD Subsection 8.3.2.1.1 with the following~~s~~. CTS-01499

Short circuit analysis for dc power system is addressed in Subsection 8.3.2.3.2.

8.3.2.1.2 Non-Class 1E DC Power System

STD COL 8.3(8) Replace the last sentence of the fourth paragraph in DCD Subsection 8.3.2.1.2 with the following~~s~~. CTS-01499

Short circuit analysis for dc power system is addressed in Subsection 8.3.2.3.2.

8.3.2.3.2 Short Circuit Studies

STD COL 8.3(8) Replace the last two sentences of the first paragraph in DCD Subsection 8.3.2.3.2 with the following~~s~~. CTS-01499

As a result of the studies, maximum short circuit current has been confirmed to satisfy short circuit interrupt rating of circuit breakers indicated in Table 8.3.2-3.

8.3.4 Combined License Information

Replace the content of DCD Subsection 8.3.4 with the following.

CP COL 8.3(1) ***8.3(1)*** *Transmission voltages*

This COL Item is addressed in Subsection 8.3.1.1 and in Table 8.3.1-1R.

CP COL 8.3(2) ***8.3(2)*** *Ground grid and lightning Protection*

This COL Item is addressed in Subsection 8.3.1.1.11 and in Figure 8.3.1-201.

STD COL 8.3(3) ***8.3(3)*** *Short Circuit analysis for ac power system*

This COL Item is addressed in Subsections 8.3.1.1.9 and 8.3.1.3.2.

8.3(4) *Deleted from the DCD.*

8.3(5) *Deleted from the DCD.*

8.3(6) *Deleted from the DCD.*

8.3(7) *Deleted from the DCD.*

STD COL 8.3(8) ***8.3(8)*** *Short circuit analysis for dc power system*

Chapter 9

Chapter 9 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_12.03-12.04-11 S02	9.2.6.2.4 (New section)	9.2-17 9.2-18	Response to RAI No. 135 S02 Luminant Letter no.TXNB-11020 Date 4/13/2011	Added new Subsection 9.2.6.2.4.	-
RCOL2_14.03.07-34	Figure 9.4-203	9.4-21	Response to RAI No. 220 Luminant Letter no.TXNB-11043 Date 6/23/2011	Figure 9.4-203 has been revised to add a note that the non-safety related instrumentation attached to the room heaters and exhaust fans is classified as seismic category II.	-
RCOL2_12.03-12.04-11 S03	9A.3.114	9A-17	Response to RAI No. 135 S03 Luminant Letter no.TXNB-11050 Date 7/28/2011	Added ", other than the auxiliary boiler building," after ninth word in the first sentence in the paragraph of "Radioactive Release to Environment Evaluation" in Subsection 9A.3.114.	-
RCOL2_09.05.02-4 S01	9.5.2.2.5.2 9.5.2.3 9.5.9	9.5-20 9.5-21 9.5-22 9.5-23	Supplemental Response to RAI No. 196 Luminant Letter no. TXNB-11053 Date 8/4/2011	Deleted 2nd through 5th paragraph on Subsection 9.5.2.2.5.2. Deleted entire Subsection 9.5.2.3. Deleted COL Items COL 9.5(7) and COL 9.5(9) on Section 9.5.9. Added "Deleted from the DCD" in their places.	-
RCOL2_12.03-12.04-12	9.3.4.2.3.3	9.3-2	Response to RAI No. 225 Luminant Letter no.TXNB-11058 Date 9/16/2011	Added a new Subsection 9.3.4.2.3.3 about zinc injection system.	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
DCD_09.02.01-40	9.2.1.2.1	9.2-1	Reflect Response to DCD RAI No. 585	Deleted replacement of Figure 9.2.1-1R which is now IBR.	0
CTS-01370	9.2.1.2.1	9.2-1	Correction	Revised to clarify discussion of water hammer minimization and ESWP NPSH in 9.2.1.2.1	0
DCD_09.02.01-49	9.2.1.2.1	9.2-2	Reflect Response to DCD RAI No. 585	Added description regarding the isolation valve in the backwash line to the CWS blowdown main header precluding water hammer at pump restart.	0
DCD_09.02.01-36	9.2.1.2.1	9.2-2	Reflect Response to DCD RAI No. 585	Revised paragraph and COL number to discuss piping layout to assure water pressure above saturation.	0
CTS-01371	9.2.1.2.2.1	9.2-3	Correction	Revised for clarity regarding ESW pump shut off head and to make STD.	0
DCD_09.02.01-38	9.2.1.2.2.1	9.2-3	Reflect Response to DCD RAI No. 585	Revised to indicate testing procedures in DCD Subsection 14.2.12.1.113	0
DCD_09.02.01-32	9.2.1.2.2.1	9.2-3	Reflect Response to DCD RAI No. 585	Delete discussion of ESWP motor cooling as DCD now indicates air cooling.	0
CTS-01372	9.2.1.2.2.2	9.2-3	Clarification	Revised for clarity regarding isolation valves located downstream of the strainer backwash	0
CTS-01373	9.2.1.2.2.2	9.2-3 9.2-4	Clarification	Revised for editorial clarity regarding strainer backwash lines	0
DCD_09.02.01-43	9.2.1.2.3.1	9.2-4	Reflect Response to DCD RAI No. 585	Revise title of Subsection 9.2.1.2.3.1 from Normal Operation to Power Operation.	0

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
DCD_09.02.01-40	9.2.1.2.3.1	9.2-4	Reflect Response to DCD RAI No. 585	Revised action statement to reflect correct replaced sentence.	0
CTS-01374	9.2.1.2.3.1	9.2-4 [9.2-5]	Editorial	Revised for editorial clarity regarding IST implementation milestones.	0
DCD_09.02.01-40	9.2.1.3	9.2-4 [9.2-5]	Reflect Response to DCD RAI No. 585	Revised action statement to reflect correct replaced paragraph.	0
DCD_09.02.01-32	9.2.1.3	9.2-5 [9.2-6]	Reflect Response to DCD RAI No. 585	Revised paragraphs to address countermeasures to prevent freezing of ESW, including discussion of R/B temperature maintained through ventilation.	0
DCD_09.02.01-33	9.2.1.3	9.2-5 [9.2-6]	Reflect Response to DCD RAI No. 585	Revised paragraphs to indicate isolation of ESW to the CWS blowdown main header and isolation of water supply line to the FSS.	0
DCD_09.02.01-36	9.2.10	9.2-22 [9.2-23]	Reflect Response to DCD RAI No. 585	Deleted reference of Subsection 9.2.1.2.1 from 9.2(7).	0
DCD_09.02.01-40	9.2.10	9.2-22 [9.2-23]	Reflect Response to DCD RAI No. 585	Delete reference Figure 9.2.1-1R from 9.2(7).	0
DCD_09.02.01-52	Table 9.2.1-1R	9.2-26 [9.2-27]	Reflect Response to DCD RAI No. 585	Added note to table to indicate electrical power for ESWP outlet strainer to include discharge valve, rotating brush motor and other associated components.	0
CTS-01376	Table 9.2.1-2R	9.2-27 9.2-28 9.2-29 9.2-30 [9.2-31 9.2-32	Correction	Revised table to correctly refer to ESWS blowdown main header, include correct tag	0

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
		9.2-33]		numbers, correct modes, and include ESWS Blowdown Control valve.	
CTS-01377	Table 9.2.5-4R	9.2-33 9.2-34 9.2-35 [9.2-36 9.2-37 9.2-38]	Correction	Revise table to correct tag numbers and delete UHS Basin Blowdown Control valve.	0
DCD_09.02.01-40	Figure 9.2.1-1R	9.2-36 9.2-37 [9.2-39 9.2-40]	Reflect Response to DCD RAI No. 585	Deleted Figure 9.2.1-1R, updated DCD Figure 9.2.1-1 is now IBR.	0
CTS-01378	9.4.3.2.2	9.4-1	Correction	Removed text reference to Figure 9.4-201 and Table 9.4.3-1.	0
CTS-01379	9.4.5.2.2	9.4-3	Correction	Removed text reference to Figure 9.4-202 and Table 9.4.5-1.	0
CTS-01380	9.4.5.2.6	9.4-4	Correction	Renumbered Figure 9.4-203 to Figure 9.4-201	0
DCD_09.02.02-72	9.4.7	9.4-8	DCD 09.02.02-72	Clarified COL Applicant requirement for 9.4(4) for heating and cooling coils in air handling units	0
CTS-01378	9.4.7	9.4-8	Correction	Removed Figure 9.4-201 from 9.4(4).	0
CTS-01379	9.4.7	9.4-8	Correction	Removed Figure 9.4-202 from 9.4(4).	o
CTS-01380	9.4.7	9.4-8	Correction	Renumbered Figure 9.4-203 to Figure 9.4-201	0
CTS-01378	Table 9.4-201	9.4-9	Clarification	Added Non-Class 1E Electrical Room AHU heating coil capacity as non-heating.	0

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01378	Figure 9.4-201	9.4-18	Correction	Removed Figure 9.4-201. DCD figure is now IBR.	0
CTS-01379	Figure 9.4-202	9.4-19	Correction	Removed Figure 9.4-202. DCD figure is now IBR.	0
CTS-01380	Figure 9.4-203	9.4-20	Correction	Renumbered Figure 9.4-203 to Figure 9.4-201	0
RCOL2_09.04.05-20	9.4.5	9.4-2	Response to RAI No. 243 Luminant Letter no.TXNB-12006 Date 2/27/2012	Corrected DCD paragraph reference.	-
RCOL2_09.04.05-21	Figure 9.4-203 (9.4-201)	9.4-20	Response to RAI No. 243 Luminant Letter no.TXNB-12006 Date 2/27/2012	Corrected COL item as 9.4(6)	-
RCOL2_09.04.05-22	Figure 9.4-203 (9.4-201)	9.4-20	Response to RAI No. 243 Luminant Letter no.TXNB-12006 Date 2/27/2012	Revised Figure to clarify seismic classification of instrumentation.	-
RCOL2_09.04.05-24	9.4.5.2.2	9.4-3	Response to RAI No. 243 Luminant Letter no.TXNB-12006 Date 2/27/2012	Clarified the UHS ESW pump house ventilation system provides the proper environmental conditions during normal operations.	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01438	9.1.6	9.1-2	Correction	Changed Subsection 9.1.5 to Subsection 9.1.5.3 on COL Item 9.1(6). Changed Subsection 9.1.2 to Subsection 9.1.2.1 on COL Item 9.1(9).	1
MAP-09-401	9.2.1.2.3.1	9.2-4 [9.2-5]	Consistency with DCD	Changed lead sentence of STD COL 9.2(7) to "eighth" in consistency with DCD.	1
MAP-09-402	9.2.1.3	9.2-4 [9.2-5]	Consistency with DCD	Changed lead sentence of STD COL 9.2(1) to "sixteenth" in consistency with DCD.	1
MAP-09-402	9.2.1.3	9.2-5	Consistency with DCD	Changed lead sentence of CP COL 9.2(2) to "seventeenth" in consistency with DCD.	1
MAP-09-402	9.2.1.3	9.2-5 [9.2-6]	Consistency with DCD	Changed lead sentence of CP COL 9.2(7) and 9.2(29) to "eighteenth" in consistency with DCD.	1
MAP-09-403	9.2.2.2.2.6	9.2-7 [9.2-8]	Consistency with DCD	Revised the subsection and title "9.2.2.2.2 System Operation" to "9.2.2.2.2.6 Water Hammer Prevention".	1
MAP-09-404	9.2.2.2.2.6	9.2-7 [9.2-8]	Consistency with DCD	Changed lead sentence to read "DCD Subsection 9.2.2.2.2.6" in consistency with DCD.	1
MAP-09-405	9.2.4.2	9.2-8 [9.2-9]	Consistency with DCD	Revised lead sentence in consistency with DCD.	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
MAP-09-406	9.2.7.2.1	9.2-21 [9.2-23]	Consistency with DCD	Changed lead sentence to read "thirteenth" in consistency with DCD.	1
CTS-01439	9.2.10	9.2-22 through 9.2-24 [9.2-24 9.2-26]	Correction	Deleted Subsection 9.4.5.1.1. 6 on COL Item 9.2(6). Added Subsection 9.2.4.2 and Figure 9.4-201 on COL Item 9.2(11). Added Subsection 9.2.5.2.3 on COL Item 9.2(28).	1
CTS-01440	9.2.10	9.2-25 [9.2-26]	Correction	Added “CP COL 9.2(31)” notation to COL Item 9.2(31). Added Subsection 9.2.5.2.3 on the COL Item 9.2(31).	1
CTS-01441	Table 9.2.1-2R (Sheet 2 of 4[6])	9.2-28 [9.2-29]	Correction	Changed system code and component ID from “CWS” to “ESWS” and "EWS-AOV-559A, B, C, D" to " EWS-AOV-576A, B, C, D".	1
CTS-01441	Table 9.2.1-2R (Sheet 2[3] of 4[6])	9.2-28 [9.2-30]	Correction	Changed component ID from "EWS-AOV-559A, B, C, D" to "EWS-AOV-576A, B, C, D".	1
CTS-01441	Table 9.2.1-2R (Sheet 4[5] of 4[6])	9.2-30 [9.2-32]	Correction	Clarified blowdown main header as ESWS blowdown main header.	1
DCD_09.04.03-19	9.4.3.4.1 (New Section)	9.4-2	Reflect response to DCD RAI No.831	Subsection 9.4.3.4.1 was newly added to resolves STD COL 9.4(7).	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
DCD_09.04.03-19	9.4.7	9.4-8	Reflect response to DCD RAI No.831	Added “STD COL 9.4(7)” in Combined License Information as described in the markup.	1
CTS-01443	Table 9.4-203 (Sheet 1 of 6)	9.4-12	Correction	Changed component ID from “VRS-OFN-601A, B, C, D” to “VRS-MFN-601A, B, C, D” on Description of Component. Changed component ID from “VRS-BDD-601A, B, C, D” to “VRS-OTD-601A, B, C, D” on Description of Component.	1
CTS-01443	Table 9.4-203 (Sheet 2 of 6)	9.4-13	Correction	Changed component ID from “VRS-BDD-602A, B, C, D” to “VRS-OTD-602A, B, C, D” on Description of Component. Changed component ID from “VRS-QEQ-601A, B, C, D” to “VRS-MEH-601A, B, C, D” on Description of Component.	1
CTS-01443	Table 9.4-203 (Sheet 3 of 6)	9.4-14	Correction	Changed component ID from “VRS-QEQ-602A, B, C, D” to “VRS-MEH-602A, B, C, D” on Description of Component.	1
CTS-01443	Table 9.4-203 (Sheet 4	9.4-15	Correction	Changed component ID from “VRS-OFN-602A, B, C, D” to “VRS-MFN-	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
	of 6)			602A, B, C, D" on Description of Component. Changed component ID from "VRS-BDD-603A, B, C, D" to "VRS-OTD-603A, B, C, D" on Description of Component.	
CTS-01443	Table 9.4-203 (Sheet 5 of 6)	9.4-16	Correction	Changed component ID from "VRS-BDD-604A, B, C, D" to "VRS-OTD-604A, B, C, D" on Description of Component. Changed component ID from "VRS-QEQ-603A, B, C, D" to "VRS-MEH-603A, B, C, D" on Description of Component.	1

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

9.1(2) *Deleted from the DCD.*

9.1(3) *Deleted from the DCD.*

9.1(4) *Deleted from the DCD.*

9.1(5) *Deleted from the DCD.*

STD COL 9.1(6) ***9.1(6)*** *The establishment of a Heavy Load Handling Program*

This COL item is addressed in Subsection 9.1.5.3. CTS-01438

9.1(7) *Deleted from the DCD.*

9.1(8) *Deleted from the DCD.*

STD COL 9.1(9) ***9.1(9)*** *The establishment of an inspection procedure of spent fuel rack integrity*

This COL item is addressed in Subsection 9.1.2.1. CTS-01438

STD COL 9.2(32) Replace the ~~last~~thirteenth sentence of the ~~fifth~~seventh paragraph in DCD Subsection 9.2.1.2.3.1 with the following: DCD_09.02.01-40

Level switches are installed in the vertical piping before the cooling tower spray header to annunciate if system inventory reduction occurs. The detail of the detector is described in Subsection 9.2.5.5.

STD COL 9.2(7) Replace the ~~fifth~~sixth sentence of the ~~sixth~~eighth paragraph in DCD Subsection 9.2.1.2.3.1 with the following: CTS-01374 MAP-09-401

The IST program with detailed criteria, including valve leak rates committed to in the implementation ~~M~~milestones, is identified in Table 13.4-201 ~~of FSAR Section 13.4~~. CTS-01374

9.2.1.3 Safety Evaluation

STD COL 9.2(1) Replace the ~~eleventh~~sixteenth paragraph in DCD Subsection 9.2.1.3 with the following. DCD_09.02.01-40 MAP-09-402

Design of the basin provides adequate submergence of the pumps to assure the NPSH for the pumps. The basin is divided into two levels. One is approximately 12 feet lower than the other, and directly above it is installed the ESWP. The ESWP is designed to operate with the lowest expected water level (after 30 days of accident mitigation). The basins have sufficient water inventory to assure adequate cooling and NPSH for 30 days without makeup. This is discussed further in Subsection 9.2.5.2.

Recovery procedures contained in the Operating and Maintenance Procedures (see Subsection 13.5.2.1) are implemented if the UHS approaches low water level.

CP COL 9.2(2) Replace the ~~twelfth~~seventeenth paragraph in DCD Subsection 9.2.1.3 with the following. DCD_09.02.01-32 MAP-09-402

Based on ~~T~~the lowest anticipated ambient temperature, the following countermeasures are provided to prevent ~~anticipated at the site does not result in the freezing of~~ the ESW from freezing in the basins or ~~the~~ piping ~~for the following reasons~~: DCD_09.02.01-32

- The basins are located below grade and thus ground temperature prevents water from freezing.

- In the operating trains, water is continuously circulated which helps to prevent freezing. Ultimate heat sink (UHS) transfer pumps can be used to circulate water from the idle basins. Plant procedures are developed to operate the pumps in this mode based on the basin water and ambient temperatures.

- UHS ESW pump house ventilation system maintains pre determined minimum temperature in the pump house areas. This is further described in Subsection 9.4.

- Temperature in the reactor building is maintained through ventilation and therefore heat tracing is not required. DCD_09.02.01-32

- ~~Any e~~Exposed ~~essential~~safety-related ESW piping that may be filled with water while the pump is not operating is heat traced. The safety-related heat tracing is activated when the thermostat senses a pre-set low ambient temperature.

For the thermal overpressure protection of the component cooling water heat exchanger ESW side, the valves located at the component cooling water heat exchanger ESW side inlet and outlet lines are administratively locked open valves. These locked open valves assure protection from the thermal overpressurization due to the erroneous valve operation coincident with the heat input from the component cooling water (CCW) side to ESW side. During backflush operation of the heat exchanger, essential service water flows from the discharge side of the heat exchanger and then exits from the inlet side to the discharge header. The backflush procedure requires opening the bypass valves before closing the isolation valves. The train to be backflushed is identified as a maintenance outage train before backflush commences. RCOL2_09.02.01-7 Cooling operation is continued and there is no overpressurization.

CP COL 9.2(7)
CP COL 9.2(29)

Replace the ~~thirteenth~~eighteenth paragraph in DCD Subsection 9.2.1.3 with the following: DCD_09.02.01-33 MAP-09-402

The non-safety-related ~~portion of the ESWS~~portions connected to the CWS blowdown header are automatically isolated by the ~~begins at the discharge side of the strainer and CCW heat exchangers vent and drain valves~~ESWS Blowdown Main Header Isolation Valve to the CWS blowdown main header, which closes with ECCS actuation signal, undervoltage signal, ESW pump stop signal, or low UHS basin level signal. The supply line to the fire protection water supply system (FSS) is isolated by normally closed manual valves. The positions of these valves are controlled by the Operating and Maintenance Procedures mentioned in Subsection 13.5.2.1 in order to maintain water-tight conditions and prevent inadvertent draining of the ESW. DCD_09.02.01-33

The blowdown header to the CWS blowdown header, to which the strainer blowdown line for normal power operation use and the UHS basin blowdown line for maintaining acceptable water chemistry are connected, has an isolation valve

testing above are subject to programmatic requirements and procedural controls as described in FSAR Section 13.5.

The operating procedures to periodically alternate the operating trains for monitoring performance of all ESWS trains are included in the system operating procedures in FSAR Section 13.5.2.1.

9.2.2.2.2.6 ~~System Operations~~Water Hammer Prevention MAP-09-403

STD COL 9.2(27) Replace the last paragraph in DCD Subsection 9.2.2.2.2.6 with the following. MAP-09-404

The operating and maintenance procedures regarding water hammer are included in system operating procedures in Section 13.5.2.1. A milestone schedule for implementation of the procedures is also included in Subsection 13.5.2.1.

9.2.4.1 Design Bases

CP COL 9.2(10)
CP COL 9.2(11) Replace the second bullet in DCD Subsection 9.2.4.1 with the following.

- The receipt of potable water from Somervell County Water District conforms to the requirements of the Environmental Protection Agency "National Primary Drinking Water Standards," 40 CFR 141 (Reference 9.2.11-4). All state and local environmental protection standards are applied and followed, as these may be more stringent than federal requirements.

CP COL 9.2(9)
CP COL 9.2(15) Replace the fourth bullet in DCD Subsection 9.2.4.1 with the following.

- The supply capacity of potable water is 50 gpm (approximately 70,000 gpd), sufficient to provide a quantity of potable water based on 20 gpd for approximately 3500 persons expected to be at the station during a 24-hour period of power generation or outages. No onsite potable water storage tank is required.

CP COL 9.2(12)
CP COL 9.2(17) Replace the eighth bullet in DCD Subsection 9.2.4.1 with the following.

- Sanitary drainage from all CPNPP Units 3 and 4 buildings is routed to a single on-site sanitary sump lift station via an underground sanitary sewer

line. The sanitary wastewater is pumped by grinder pump to a new sanitary wastewater treatment plant for purification.

CP COL 9.2(12) Add the following bullet after the last bullet in DCD Subsection 9.2.4.1.

- The sanitary waste discharge system is designed to produce a wastewater effluent quality in compliance with federal, state, and local regulations and permits.

9.2.4.2 System Description

CP COL 9.2(11) Add the ~~content of DCD Subsection 9.2.4.2 with the following~~following new paragraph after the end of DCD Subsection 9.2.4.2. MAP-09-405

The potable water system for CPNPP is designed to receive supply from Somervell County Water District.

9.2.4.2.1 General Description

CP COL 9.2(11)
CP COL 9.2(12)
CP COL 9.2(14)

Replace the content of DCD Subsection 9.2.4.2.1 with the following.

The potable and sanitary water system (PSWS) flow diagram is shown in Figure 9.2.4-1R. Major component data for the PSWS are provided in Table 9.2.4-1R.

The source of potable water is from Somervell County Water District and provides an uninterruptible supply of 50 gpm directly to the end users. The potable water system consists of a distribution loop around the power block, local hot water heaters, and necessary interconnecting piping and valves within the potable and sanitary water system with no sharing between any radiologically controlled systems. The water supply meets and/or exceeds the pressure, capacity, and quality requirements. No additional onsite water treatment is required.

The sanitary drainage system collects sanitary wastes from potable and non-potable water usage, from various plant areas such as restrooms and locker rooms. The waste is then drained to the 100,000-gpd sanitary wastewater treatment plant and 15 cu. ft. sludge dewatering filter press unit. The effluent is processed for disinfection and odor reduction and discharged to the Squaw Creek Reservoir. The sewage sludge is transferred to a truck for off-site landfill disposal. The sanitary drainage system does not serve any facilities in the radiologically controlled areas.

9.2.6.2.4 Condensate Storage Tank

RCOL2_12.03-12.04-11 S02

Replace the last sentence of the first paragraph in DCD Subsection 9.2.6.2.4 with the following.

After analysis for level of contamination, the content inside the dike area can be trucked to Waste Management Pond C for disposal; or to the LWMS for treatment and release.

9.2.7.2.1 Essential Chilled Water System

STD COL 9.2(27) Replace the ~~last~~thirteenth paragraph in DCD Subsection 9.2.7.2.1 with the following. MAP-09-406

The operating and maintenance procedures regarding water hammer are included in system operating procedures in Subsection 13.5.2.1. A milestone schedule for implementation of the procedures is also included in Subsection 13.5.2.1.

9.2.10 Combined License Information

Replace the content of DCD Subsection 9.2.10 with the following.

CP COL9.2(1)
STD COL 9.2(1) ***9.2(1)*** *The evaluation of ESWP at the lowest probable water level of the UHS and the recovery procedures when UHS approaches low water level*

This COL item is addressed in Subsection 9.2.1.3, 9.2.5.2.1, 13.5.2.1.

CP COL 9.2(2) ***9.2(2)*** *The protection against adverse environmental, operating and accident condition that can occur such as freezing, low temperature operation, and thermal over pressurization*

This COL item is addressed in Subsection 9.2.1.3.

CP COL 9.2(3) ***9.2(3)*** *Source and location of the UHS*

This COL item is addressed in Subsection 9.2.5.2, 9.2.5.2.1, 9.2.5.2.2, 9.2.5.2.3.

CP COL 9.2(4) ***9.2(4)*** *The location and design of the ESW intake structure*

This COL item is addressed in Subsection 9.2.5.2, 9.2.5.2.1, 9.2.5.2.2, 9.2.5.2.3.

CP COL 9.2(5) ***9.2(5)*** *The location and the design of the discharge structure*

This COL item is addressed in Subsection 9.2.5.2, 9.2.5.2.1, 9.2.5.2.2, 9.2.5.2.3.

CP COL 9.2(6)
STD COL 9.2(6) ***9.2(6)*** *The ESWP design details – required total dynamic head with adequate margin, NPSH available, and the mode of cooling the pump motor.*
The ESWS design pressure exceeds the sum of the shut-off head of the selected

ESW pumps and static head at any location within the system Vortex formation prevention.

This COL item is addressed in Subsection 9.2.1.2.1, 9.2.1.2.2, 9.2.1.2.2.1, Table 9.2.1-1R, Table 9.2.1-2R ~~and 9.4.5.1.1.6~~. CTS-01439

CP COL 9.2(7)
STD COL 9.2(7)

9.2(7) *The design of ESWS related with the site specific UHS*

This COL item is addressed in Subsections ~~9.2.1.2.1,~~ 9.2.1.2.2.5, 9.2.1.2.3.1, 9.2.1.3 and ~~Figure 9.2.1-1R,~~ 13.4, Table 13.4-201. DCD_09.02.01-36 DCD_09.02.01-40

STD COL 9.2(8)

9.2(8) *The ESW specific chemistry requirements*

This COL item is addressed in Subsection 9.2.1.2.1.

CP COL 9.2(9)
STD COL 9.2(9)

9.2(9) *The storage capacity and usage of the potable water*

This COL item is addressed in Subsections 9.2.4.1, 9.2.4.2.2.1, 9.2.4.2.2.2 and 9.2.4.2.2.3.

CP COL 9.2(10)

9.2(10) *State and Local Department of Health and Environmental Protection Standards*

This COL item is addressed in Subsection 9.2.4.1.

CP COL 9.2(11)

9.2(11) *Source of potable water to the site, the necessary required treatment and the system operation*

This COL item is addressed in Subsections 9.2.4.1, 9.2.4.2, 9.2.4.2.1, 9.2.4.2.2.4, 9.2.4.2.3, 9.2.4.4, 9.2.4.5, ~~and~~ Figure 9.4-201 and Figure 9.2.4-1R. CTS-01439

CP COL 9.2(12)

9.2(12) *Sanitary waste treatment*

This COL item is addressed in Subsections 9.2.4.1 and 9.2.4.2.1.

9.2(13) *Deleted*

CP COL 9.2(14)

9.2(14) *Potable and sanitary water system components data*

This action is addressed in Subsections 9.2.4.2.1 and Table 9.2.4-1R.

CP COL 9.2(15)
STD COL 9.2(15)

9.2(15) *Total number of people at the site, the usage capacity and sizing of the potable water tank and associated pumps.*

This COL item is addressed in Subsections 9.2.4.1, 9.2.4.2.2.1, 9.2.4.2.2.2 and 9.2.4.2.2.3.

9.2(16)*Deleted*

CP COL 9.2(28) ***9.2(28)*** *Design related to the site specific UHS*

This COL Item is addressed in Subsection 9.2.5.2.2, 9.2.5.2.3. CTS-01439

CP COL 9.2(29) ***9.2(29)*** *Safety evaluation of the capability of the ESWS to: (1) isolation ofnonsafety-related portions; and (2) provision of measures per Generic Letter (GL)89-13*

This COL Item is addressed in Subsection 9.2.1.3, 13.5.2.1.

CP COL 9.2(30) ***9.2(30)*** *Conduction of periodic inspection, monitoring, maintenance, performance and functional testing of the ESWS and UHS. Development of operating procedures for periodically alternate operation of the trains for regular monitoring.*

This COL Item is addressed in Subsection 9.2.1.4, 13.4, 13.5, 13.5.2.1.

STD COL 9.2(31)
CP COL 9.2(31) ***9.2(31)*** *Verification of the system layout of the ESWS and UHS and development of operating procedures to assure the ESWS and UHS are above saturation condition.* CTS-01440

This COL Item is addressed in Subsection 9.2.1.2.1, 9.2.5.2.2, 9.2.5.2.3. CTS-01440

CP COL 9.2(32)
STD COL 9.2(32) ***9.2(32)*** *Void detection system*

This COL Item is addressed in Subsection 9.2.1.2.3.1, 9.2.5.5.

STD COL 9.2(33) ***9.2(33)*** *Design detail of the strainer backwash line, vent line, and their discharge locations*

This COL Item is addressed in Subsection 9.2.1.2.2.2.

Table 9.2.1-2R (Sheet 2 of 6)

Essential Service Water System Failure Modes and Effects Analysis

Description of Component	Safety Function	Plant Operating Mode	Failure Mode(s)	Method of ~~f~~Failure Detection	Failure Effect on System Safety Function Capability	General Remarks	
ESWP Discharge Strainer (SST-001A, B, C, D and SST-002A, B, C, D)	Starts and opens to provide flow path to backwash flow before strainer clogging to maintain ESW supply to CCW HX	A, ~~Accident, Safe shutdown, cooldown – loss of offsite power~~Startup, normal shutdown, normal operation, refueling, cooldown	A, Fails to start and fails to open on remote manual demand	A, Position indication in MCR	A, None Remaining three 50% capacity trains are available. Minimum of two trains are required for safety function.	One train unavailable due to maintenance does not affect the safety functions because only a minimum of two pumps are required.	CTS-01376
		B, Accident, Safe shutdown, cooldown – loss of offsite power	B, Fails to start and fails to open on remote manual demand	B, Position indication in MCR	B, None Same as A		CTS-01376
	Stops and isolates backwash flow to prevent drain down which leads water hammer at pump start	A, Startup, normal shutdown, normal operation refueling, cooldown	A, Fails to closed position at pump stop signal	A, Position indication in MCR	A, None Backwash flow can be isolated by closing ESWP Discharge Strainer Backwash Isolation Valve to ~~CWS~~ESWS blowdown main header (EWS-AOV-~~559~~576A, B, C, D) at pump stop signal.		CTS-01441
		B, Accident, safe shutdown, cooldown – loss of offsite power	B, Fails to closed position at pump stop signal	B, Position indication in MCR	A, None Backwash flow can be isolated by closing ESWP Discharge Strainer Backwash Isolation Valve to UHS basin (EWS-MOV-573A, B, C, D), (EWS-MOV-574A, B, C, D) at pump stop signal.		

Table 9.2.1-2R (Sheet 3 of 6)

Essential Service Water System Failure Modes and Effects Analysis

Description of Component	Safety Function	Plant Operating Mode	Failure Mode(s)	Method of ~~f~~Failure Detection	Failure Effect on System Safety Function Capability	General Remarks	
ESWP Discharge Strainer Backwash Isolation Valve to ~~C~~CESWS blowdown main header (EWS-AOV-~~559~~576 A, B, C, D)	Isolates the backwash line to the ~~C~~CESWS blowdown main header to keep UHS basin inventory required for cooling the unit for a minimum of 30 days without makeup water	A, Accident, safe shutdown – loss of offsite power	A, Fails to close on demand	A, Position indication in MCR	A, None Backwash line to ~~the C~~CESWS blowdown main header can be isolated by closing ESWS Blowdown Main Header Isolation Valve to ~~the~~ CWS blowdown main header (EWS AOV-~~560~~577).		CTS-01376 CTS-01376 CTS-01441 CTS-01376 CTS-01376
	Isolates the backwash line to ~~the C~~CESWS blowdown main header to preclude the system inventory drain down which leads to water hammer at pump restart	A, Startup, normal shutdown, normal operation, refueling, cooldown	A, Fails to close on demand	A, Position indication in MCR	A, None Backwash line to ~~the C~~CESWS blowdown main header can be isolated by closing isolation valve coming with the ESWP Discharge Strainer (SST-001A, B, C, D and SST-002A, B, C, D).		CTS-01376
		B, Accident, safe shutdown – loss of offsite power	B, Fails to close on demand	B, Position indication in MCR	B, None Same as A.		

Table 9.2.1-2R (Sheet 5 of 6)

Essential Service Water System Failure Modes and Effects Analysis

Description of Component	Safety Function	Plant Operating Mode	Failure Mode(s)	Method of ~~f~~Failure Detection	Failure Effect on System Safety Function Capability	General Remarks	
ESWS Blowdown Control Valve (EWS-HCV-010, 011, 012, 013), fail close air operated valve	Closes to isolate blowdown	All	Fails to close upon command	Position indication in MCR	None. Blowdown can be isolated by closing the manual valves (VLV-541A,B,C,D, VLV-543A,B,C,D) Effect of uncontrolled blowdown for 30 minutes on basin inventory is insignificant.		CTS-01376
ESWS Blowdown Main Header Isolation Valve to ~~the~~ CWS blowdown main header (EWS AOV-~~560~~577)	Isolates the backwash line to ~~the~~ CWS blowdown main header to keep UHS basin inventory required for cooling the unit for a minimum of 30 days without makeup water	A, Accident, safe shutdown – loss of offsite power	A, Fails to close on demand	A, Position indication in MCR	A, None Backwash line to ~~the~~ CWS blowdown main header can be isolated by closing ESWP Discharge Strainer Backwash Isolation Valve to ~~CWS~~ ESWS blowdown main header (EWS-AOV-~~559~~576A, B, C, D).		CTS-01376 CTS-01376 CTS-01376 CTS-01441
	Isolates the UHS basin blowdown line to ~~the~~ CWS blowdown main header to keep UHS basin inventory required for cooling the unit for a minimum of 30 days without makeup water	A, Accident, safe shutdown – loss of offsite power	A, Fails to close on demand	A, Position indication in MCR	A, None The UHS basin blowdown line to ~~the~~ CWS blowdown main header can be isolated by closing UHS Basin Blowdown Control Valve (EWS-HCV-010, 011, 012, 013).		CTS-01376

Replace the second sentence of the second paragraph in DCD Subsection 9.4.3.2.2 with the following.

Each air handling unit consists of, in the direction of airflow, a low efficiency prefilter, a high efficiency filter, a chilled water cooling coil, a supply fan, and associated controls.

9.4.3.2.3 Main Steam/Feedwater Piping Area HVAC System

STD COL 9.4(4) Replace the second sentence of the first paragraph in DCD Subsection 9.4.3.2.3 with the following.

The capacity of cooling and heating coils that are affected by site specific conditions is shown in Table 9.4-201.

9.4.3.2.4 Technical Support Center HVAC System

STD COL 9.4(4) Replace the second sentence of the first paragraph in DCD Subsection 9.4.3.2.4 with the following.

The capacity of cooling and heating coils that are affected by site specific conditions is shown in Table 9.4-201.

9.4.3.4.1 Auxiliary Building HVAC System

DCD_09.04.03-19

STD COL 9.4(7) Replace the last sentence in DCD Subsection 9.4.3.4.1 with the following.

The operating and maintenance procedures regarding the frequency of performance of periodic auxiliary building HVAC system ventilation flow balancing are included in system operating procedures in Subsection 13.5.2.1. A milestone schedule for implementation of procedures is also included in Subsection 13.5.2.1.

STD COL 9.4(4) Replace the second sentence of the first paragraph in DCD Subsection 9.4.6.2.4.1 with the following.

The capacity of cooling and heating coils that are affected by site specific conditions is shown in Table 9.4-201.

9.4.6.2.4.2 Containment High Volume Purge System

STD COL 9.4(4) Replace the second sentence of the first paragraph in DCD Subsection 9.4.6.2.4.2 with the following.

The capacity of cooling and heating coils that are affected by site specific conditions is shown in Table 9.4-201.

9.4.7 Combined License Information

Replace the content of DCD Subsection 9.4.7 with the following.

9.4(1) *Deleted from the DCD.*

9.4(2) *Deleted from the DCD.*

9.4(3) *Deleted from the DCD.*

CP COL 9.4(4)
STD COL 9.4(4)

9.4(4) *Capacity of heating coils in safety-related HVAC system and capacity of cooling and heating coils in non-safety related HVAC system air handling units that are affected by site specific conditions*
This COL item is addressed in Subsections 9.4.1.2, 9.4.3.2.1, 9.4.3.2.2, 9.4.3.2.3, 9.4.3.2.4, 9.4.5.2.2, 9.4.5.2.3, 9.4.5.2.4, 9.4.5.2.5, 9.4.6.2.4.1, 9.4.6.2.4.2 and Table 9.4-201~~, Figure 9.4-201, Figure 9.4-202~~.

DCD_09.02.02-72

CTS-01378
CTS-01379

9.4(5) *Deleted from the DCD.*

CP COL 9.4(6)
STD COL 9.4(6)

9.4(6) *Information of UHS ESW pump house ventilation system*
This COL item is addressed in Subsections 9.4.5, 9.4.5.1.1.6, 9.4.5.2.6, 9.4.5.3.6, 9.4.5.4.6, 9.4.5.5.6, Table 9.4-202, Table 9.4-203 and Figure 9.4-203~~1~~.

CTS-01380

STD COL 9.4(7)

9.4(7) *Frequency of performance of periodic auxiliary building HVAC system ventilation flow balancing.*

This COL item is addressed in Subsection 9.4.3.4.1.

DCD_09.04.03-19

STD COL 9.4(6)

Table 9.4-203 (Sheet 1 of 6)
UHS ESW Pump House Ventilation System Failure Modes and Effects Analysis

Description of Component	Safety Function	Plant Operating Mode	Failure Mode(s)	Method of Failure Detection	Failure Effect on System Safety Function Capability	General Remarks	
ESW Pump Room Exhaust Fans (VRS-~~OFN~~MFN-601A, B, C, D)	Draws outside air through ESW Pump Room to provide cooling	All	Fails to start on t'sat commant	Low air flow alarm in MCR	None, Remaining three ESW pump houses are available	One Train out due to maintenance does not affect safety function, because a minimum of two ESW pumps and two transfer pumps are required.	CTS-01443
			Fails to stop on t'sat command	Room low temperature alarm in MCR	None, Remaining three ESW pump houses are available		
			Trips for any reason	Low air flow alarm in MCR	None, Remaining three ESW pump houses are available		
ESW Pump Room Air Intake Gravity Type Backdraft Dampers (VRS-~~BDD~~OTD-601A, B, C, D)	Opens to provide air flow path	All	Fails to open	Low air flow alarm in MCR	None, Remaining three ESW pump houses are available		CTS-01443
			Fails to close	Room low temperature alarm in MCR	None, Remaining three ESW pump houses are available		

Table 9.4-203 (Sheet 2 of 6)
UHS ESW Pump House Ventilation System Failure Modes and Effects Analysis

Description of Component	Safety Function	Plant Operating Mode	Failure Mode(s)	Method of Failure Detection	Failure Effect on System Safety Function Capability	General Remarks
ESW Pump Room Air Discharge Gravity Type Backdraft Dampers (VRS-~~BDD~~OTD-602A, B, C, D)	Opens to provide air flow path	All	Fails to open	Low air flow alarm in MCR	None, Remaining three ESW pump houses are available	
			Fails to close	Room low temperature alarm in MCR	None, Remaining three ESW pump houses are available	CTS-01443
ESW Pump Room Unit Heaters (VRS-~~QEQ~~MEH-601A, B, C, D)	Provides heating to ESW Pump Room	All	Fails to energize on t'sat command	Room low temperature alarm in MCR	None, Remaining three ESW pump houses are available	CTS-01443
			Fails to deenergize on t'sat command	Room high temperature alarm in MCR	None, Remaining three ESW pump houses are available	
			Trips for any reason	Room low temperature alarm in MCR	None, Remaining three ESW pump houses are available	
			Unit heater fan fails	High heating element temperature alarm in MCR	None, Remaining three ESW pump houses are available	

Table 9.4-203 (Sheet 3 of 6)
UHS ESW Pump House Ventilation System Failure Modes and Effects Analysis

Description of Component	Safety Function	Plant Operating Mode	Failure Mode(s)	Method of Failure Detection	Failure Effect on System Safety Function Capability	General Remarks
ESW Pump Room Unit Heaters (VRS-~~QEQ~~MEH-602A, B, C, D)	Provides heating to ESW Pump Room	All	Fails to energize on t'sat command	Room low temperature alarm in MCR	None, Remaining three ESW pump houses are available	CTS-01443
			Fails to deenergize on t'sat command	Room high temperature alarm in MCR	None, Remaining three ESW pump houses are available	
			Trips for any reason	Room low temperature alarm in MCR	None, Remaining three ESW pump houses are available	
			Unit heater fan fails	High heating element temperature alarm in MCR		

Table 9.4-203 (Sheet 4 of 6)
UHS ESW Pump House Ventilation System Failure Modes and Effects Analysis

Description of Component	Safety Function	Plant Operating Mode	Failure Mode(s)	Method of Failure Detection	Failure Effect on System Safety Function Capability	General Remarks
UHS Transfer Pump Room Exhaust Fans (VRS-~~OFN~~MFN-602A, B, C, D)	Draws outside air through Transfer Pump Room to provide cooling	All	Fails to start on t'sat commant	Low air flow alarm in MCR	None, Remaining three ESW pump houses are available	CTS-01443
			Fails to stop on t'sat command	Room low temperature alarm in MCR	None, Remaining three ESW pump houses are available	
			Trips for any reason	Low air flow alarm in MCR	None, Remaining three ESW pump houses are available	
UHS Transfer Pump Room Air Intake Gravity Type Backdraft Dampers (VRS-~~BDD~~OTD-603A, B, C, D)	Opens to provide air flow path	All	Fails to open	Low air flow alarm in MCR	None, Remaining three ESW pump houses are available	CTS-01443
			Fails to close	Room low temperature alarm in MCR	None, Remaining three ESW pump houses are available	

Table 9.4-203 (Sheet 5 of 6)
UHS ESW Pump House Ventilation System Failure Modes and Effects Analysis

Description of Component	Safety Function	Plant Operating Mode	Failure Mode(s)	Method of Failure Detection	Failure Effect on System Safety Function Capability	General Remarks
UHS Transfer Pump Air Discharge Gravity Type Backdraft Dampers (VRS-~~BDD~~OTD-604A, B, C, D)	Opens to provide air flow path	All	Fails to open	Low air flow alarm in MCR	None, Remaining three ESW pump houses are available	CTS-01443
			Fails to close	Room low temperature alarm in MCR	None, Remaining three ESW pump houses are available	
			Trips for any reason	Low air flow alarm in MCR	None, Remaining three ESW pump houses are available	
UHS Transfer Pump Unit Heaters (VRS-~~QEQ~~MEH-603A, B, C, D)	Provides heating to Transfer Pump Room	All	Fails to energize on t'sat command	Room low temperature alarm in MCR	None, Remaining three ESW pump houses are available	CTS-01443
			Fails to deenergize on t'sat command	Room high temperature alarm in MCR	None, Remaining three ESW pump houses are available	
			Trips for any reason	Room low temperature alarm in MCR	None, Remaining three ESW pump houses are available	
			Unit heater fan fails	High heating element temperature alarm in MCR	None, Remaining three ESW pump houses are available	

Chapter 10

Chapter 10 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_12.03-12.04-11 S02	10.4.8.2.1	10.4-8 10.4-9	Response to RAI No. 135 S02 Luminant Letter no.TXNB-11020 Date 4/13/2011	Added a new paragraph regarding the design consideration for the prevention of environmental contamination before the last paragraph in Subsection 10.4.8.2.1.	-
RCOL2_10.04.08-3	10.4.8.2.1	10.4-7	Response to RAI No. 237 Luminant Letter no. TXNB-11084 Date 12/8/2011	Piping design was changed from single-walled stainless steel pipe with insulation to double-walled pipe consisting of a stainless steel inner pipe and a carbon steel outer pipe with coating.	-
DCD_10.04.06-17	ACRONYMS AND ABBREVIATIONS	10-v	Reflect Response to DCD RAI No. 807	“EPRI, Electric Power Research Institute” was added as an acronym.	0
DCD_10.04.06-17	10.3.5.5 (new Subsection)	10.3-1	Reflect Response to DCD RAI No. 807	Subsection 10.3.5.5 was newly added to resolve CP COL 10.3(4).	0
CTS-01362	10.3.6.3.1 10.3.6.3.1.1	10.3-1 10.3-2	Response to ACRS Questions	Wording of “high energy” was deleted.	0
DCD_10.04.06-17	10.3.7	10.3-4	Reflect Response to DCD RAI No. 807	New Combined License Information was added as CP COL 10.3(4)	0
CTS-01360	Table 10.4.5-1R (Sheet 1 of 3)	10.4-12	Editorial	Table number was recovered.	0

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
MAP-10-401	10.2.3.5	10.2-1	Consistency with DCD	Changed “A turbine maintenance and Inspection procedure will” to “ A turbine maintenance, inspection and test procedure”.	1
MAP-10-402	10.3.6.3.1	10.3-1 [10.3-2]	Consistency with DCD	Changed “R2” to “R3”.	1
MAP-10-403	Figure 10.4.8-1R (Sheet 1 of 2)	10.4-20	Consistency with DCD	Replaced figure for consistency between DCD and R-COLA.	1
CTS-01436	Figure 10.4.8-201	10.4-22	Correction	Replaced Figure to correct cooling water for startup SG blowdown heat exchanger from TCS to CWS.	1

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

10.2 TURBINE-GENERATOR (T/G)

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

10.2.3.5 Inservice Inspection

STD COL 10.2(1) Replace the last paragraph of DCD Subsection 10.2.3.5 with the following.

A turbine maintenance, ~~and~~ inspection and test procedure will be established prior to fuel load. The procedure will be consistent with the maintenance and inspection program plan activities and inspection intervals identified in DCD Subsection 10.2.3.5. MAP-10-401

10.2.5 Combined License Information

Replace the content of DCD Subsection 10.2.5 with the following.

STD COL 10.2(1) ***COL 10.2(1)*** *Inservice Inspection*

This Combined License (COL) item is addressed in Subsection 10.2.3.5.

89-08 and consistent with the guidelines of NSAC-202L-~~R2~~R3. The FAC monitoring program will be established prior to fuel load. | MAP-10-402

The thrust of the FAC monitoring program is to:

- Conduct appropriate analysis and perform preservice inspection.
- Determine the extent of pipe wall thinning, if any, and repair/replace components as necessary.
- Perform follow-up inspections to confirm or quantify pipe wall thinning and take long-term corrective actions (such as adjust water chemistry, operating parameters or others).

10.3.6.3.1.1 Analysis

An industry-sponsored program is used to predict the wear rate for piping and components in ~~high energy~~ carbon steel piping systems which are susceptible to FAC. Each susceptible component is tracked in a database and is inspected in the order of susceptibility. For each piping component, the analytical method predicts the FAC wear rate, trends the estimated inspection interval, repairs, and/or replacement. Carbon steel piping American Society of Mechanical Engineers (ASME) III and B31.1 and pipe components that are used in single-phase and two-phase ~~high energy~~ flow systems are the most susceptible to FAC damage and receive the most critical analysis. | CTS-01362 | CTS-01362

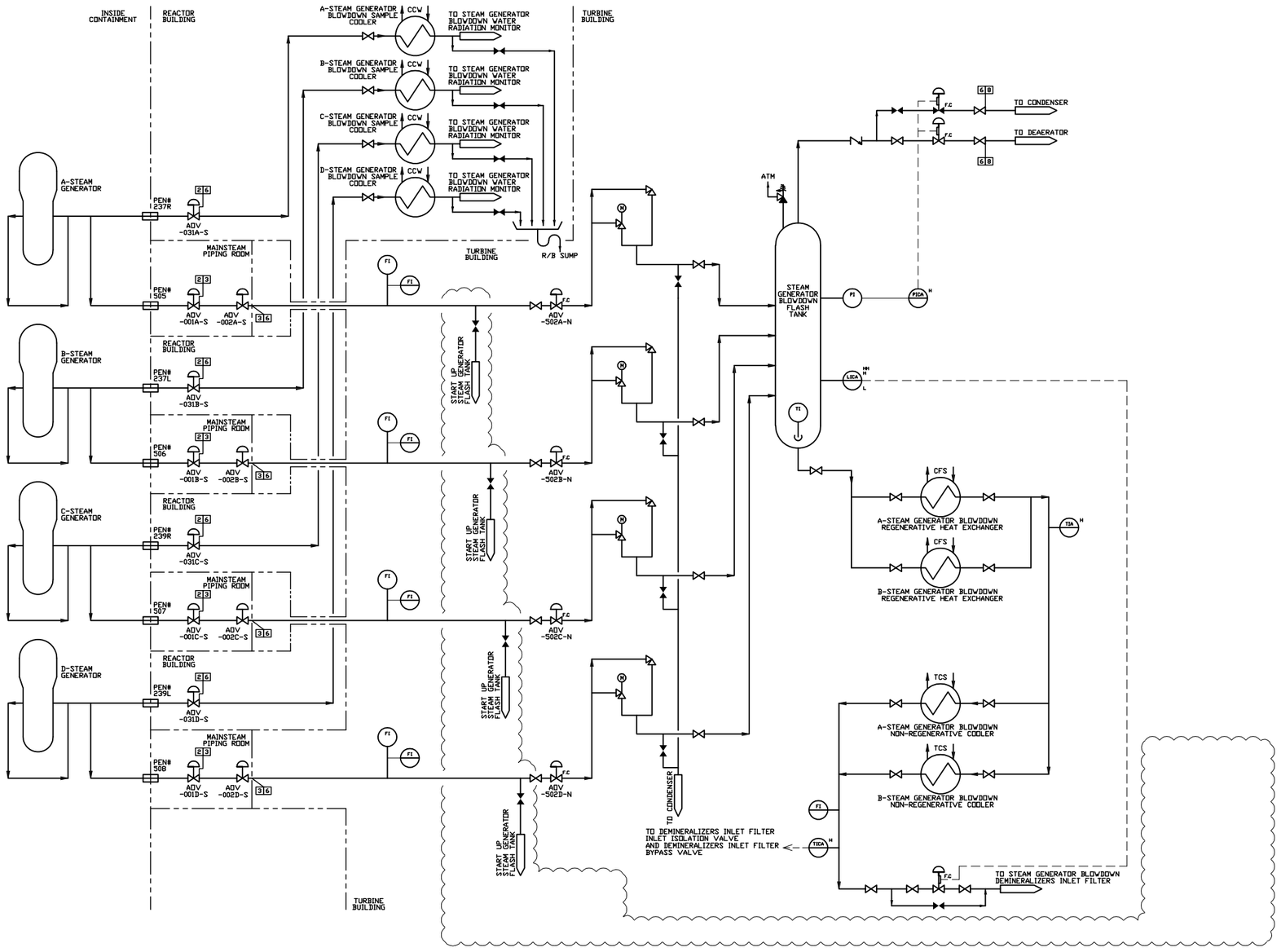
10.3.6.3.1.2 Inspections

Inspections that involve wall thickness measurements are used to identify wall thickness margins for thinning and to evaluate the FAC trending data, and provide the refinement of the predictions. Components are inspected for wear using ultrasonic examination method with grid location, radiographic examination method, or visual observation. Preservice wall thickness measurement or baseline data are collected prior to individual system turnover to operation. The first inspection after preservice inspection is used as a baseline trend for future inspections. Each subsequent inspection determines the FAC wear rate for the piping and piping components and the need for inspection frequency adjustment for those components.

10.3.6.3.1.3 Training

The FAC monitoring program is administered by trained and experienced personnel. Task-specific training is provided for plant personnel that implement the monitoring program. The specific nondestructive examination (NDE) is carried out by qualified personnel. Inspection data are analyzed by engineers and/or other experienced personnel to determine the overall effect on the piping and piping components.

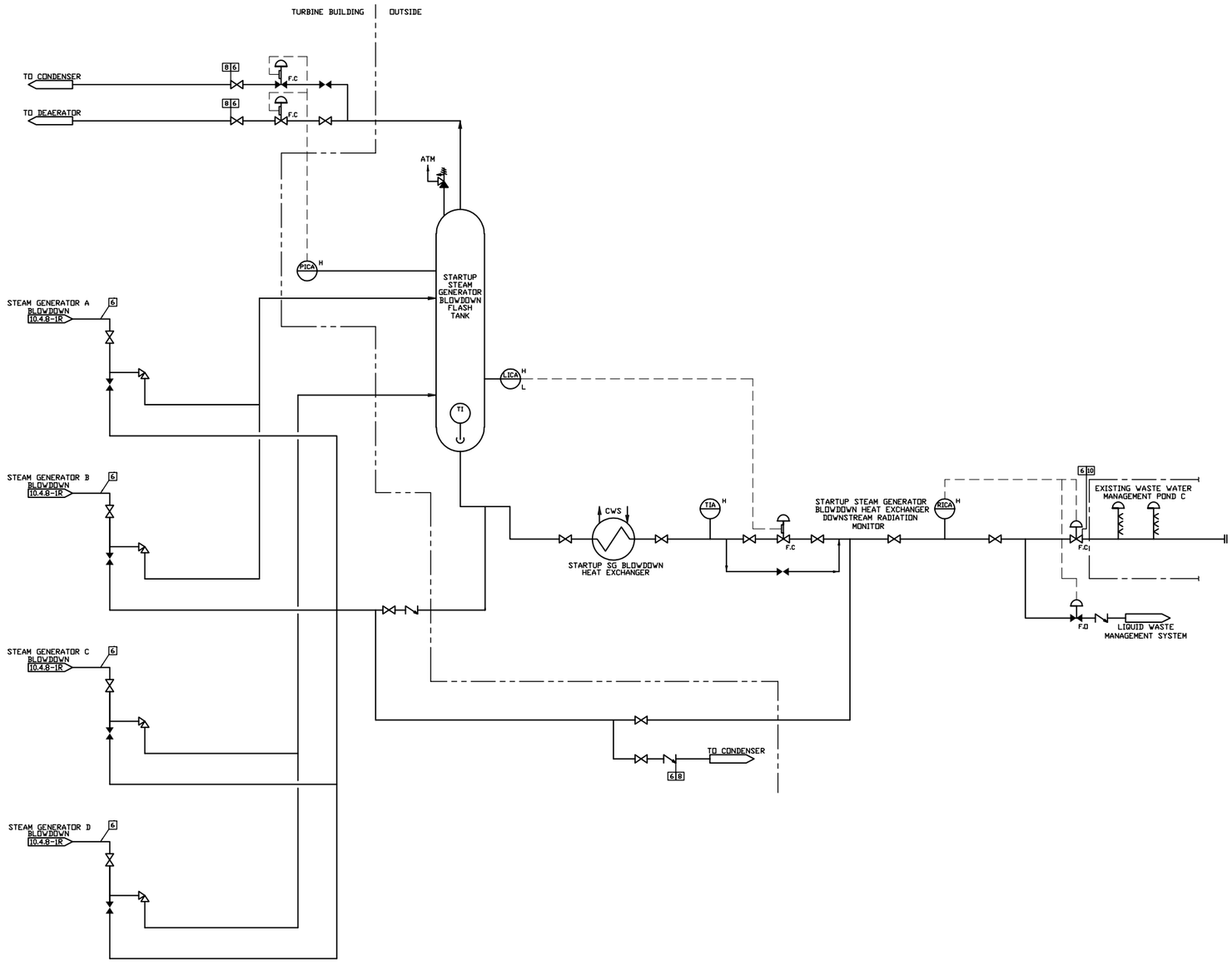
MAP-10-403



CP COL 10.4(2)

Figure 10.4.8-1R Steam Generator Blowdown System Piping and Instrumentation Diagram (Sheet 1 of 2)

CTS-01436



CP COL 10.4(2)

Figure 10.4.8-201 Steam Generator Blowdown System Piping and Instrumentation Diagram (Site-specific portion)

Chapter 11

Chapter 11 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_11.02-18	11.2.3.1 11.2.3.2 11.2.3.4 Figure 11.2-201	11.2-5 through 11.2-17 11.2-34	Response to RAI No. 224 Luminant Letter no. TXNB-11061 Date 9/29/2011	Editorial changes throughout to re-organize existing content for clarity. Technical changes are limited to: Deleted discussion that multiple effluent samples around perimeter will be taken prior to discharge (Subsection 11.2.3.1) Added discussion that pump suction and discharge includes a recirculation option to ensure mixing and will be sampled at discharge of pump before release (Subsection 11.2.3.4 and Figure 11.2-201)	-
RCOL2_11.02-18 S01	11.2.2	11.2-3	Supplemental Response to RAI No. 224 Luminant Letter no.TXNB-11076 Date 11/7/2011	Editorial correction.	-
RCOL2_11.02-18 S01	11.2.2	11.2-4	Supplemental Response to RAI No. 224 Luminant Letter no.TXNB-11076 Date 11/7/2011	Editorial correction.	-
RCOL2_11.02-18 S01	11.2.3.2	11.2-8	Supplemental Response to RAI No. 224 Luminant Letter no.TXNB-11076 Date 11/7/2011	Editorial correction.	-
RCOL2_11.02-18 S01	11.2.3.4	11.2-8	Supplemental Response to RAI No. 224	Clarified holdup tank is in fact the boric acid tank.	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
			Luminant Letter no.TXNB-11076 Date 11/7/2011		
RCOL2_11.02-18 S01	11.2.3.4	11.2-12	Supplemental Response to RAI No. 224 Luminant Letter no.TXNB-11076 Date 11/7/2011	Added system description of evaporation pond discharge recirculation line.	-
RCOL2_11.02-18 S01	11.2.3.4	11.2-13	Supplemental Response to RAI No. 224 Luminant Letter no.TXNB-11076 Date 11/7/2011	Clarified system description of evaporation pond discharge.	-
RCOL2_11.02-18 S01	Figure 11.2-201 (sheet 9 of 10)	11.2-34	Supplemental Response to RAI No. 224 Luminant Letter no.TXNB-11076 Date 11/7/2011	Added sampling point to Evaporation pond discharge recirculation line.	-
RCOL2_11.04-4 S01	11.4.2.3	11.4-3 [11.4-3 11.4-4]	Supplemental Response to RAI No. 39 S01 Luminant Letter no.TXNB-11074 Date 11/14/2011	Updated description of regulatory guidance and design requirements for the Interim Radwaste Storage Facility to address Open Item 11.04-1.	-
CTS-01385	11.2.1.6	11.2-2	Correction	Corrected to lead sentence for consistency.	0
CTS-01444	11.2.3.1	11.2-7	Consistency with Table 11.3-204	Corrected dose contribution from evaporator pond to 2.37E+00 mrem/yr (Adult GI-Track) to be consistent with Table 11.3-204.	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01445	11.2.3.1	11.2-7 [11.2-8]	Consistency with Table 11.3-204	Corrected dose contribution from vent stack and evaporator pond to 2.55E+00 mrem/yr (Adult GI-Track) to be consistent with Table 11.3-204	1
MAP-11-401	11.3.3.1	11.3-2	Consistency with DCD	Corrected reference to DCD Table 11.3-6 and 11.3-7, which provide the bounding values for radioactive concentrations at the EAB.	1
CTS-01446	Table 11.3-8R (Sheet 2 of 2)	11.3-6	Editorial Correction	Corrected reference to RG 1.109 for annual dose calculation.	1
CTS-01447	11.4.8	11.4-6 [11.4-7]	R-COLA site-specific packing, storage, and shipping is plant specific	COL item 11.4(7) is addressed as both standard and site specific.	1
CTS-01448	Figure 11.4-201	11.4-7 [11.4-8]	Editorial Correction	Corrected spelling in figure title.	1

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

~~minimization of cross contamination (leakage to the groundwater), and thus satisfy 10 CFR 20.1406 and RG 4.21.~~

RCOL2_11.02-18

~~The evaporation pond discharge pump and discharge isolation valve are under supervisory control. Prior to discharge, multiple effluent samples around the pond perimeter are required to ensure the pond effluent meets the discharge specifications. The evaporation pond is a relatively small pond. The effluent to the pond has been filtered and ion exchanged and it is expected that effluent concentration in the pond is uniform. Stagnation and stratification of concentrations is not expected. This is confirmed by obtaining representative samples from the pond. The bottom of the pond is designed to be sloped towards the discharge pit to facilitate complete drainage. The pond is washed each time the contents are emptied to significantly reduce the potential for accumulation of residual contamination. Further, a radiation monitor is located close to the pump discharge to monitor the radiation level of the contents. The radiation monitor alarms in the Main Control Room and the Radwaste Operator Control Room and also isolates the pump and its discharge valve in the unlikely event of the content exceeding the setpoint. The radiation monitor setpoint for the evaporation pond discharge is the same as that used at the Waste Monitor Tank discharge.~~

Isotopic concentrations are calculated~~,~~ assuming 247,500 gpm per unit of circulating water from CPNPP Units 1 and 2 (Reference 11.2-201~~, ODCM for CPNPP Units 1 and 2~~). The isotopic ratios between the expected releases and the concentration limits of 10 CFR 20 Appendix B are listed in Tables 11.2-12R. The isotopic ratios between the maximum releases and the concentration limits of 10 CFR 20 Appendix B are listed in Table 11.2-13R. These ratio values are less than the allowable value of 1.0.

The individual doses and population doses are evaluated with the LADTAP II Code (Reference 11.2-14). The site-specific parameters used in the LADTAP II Code are listed in Table 11.2-14R, and the calculated individual doses are listed in Table 11.2-15R. Population dose due to public use of SCR is estimated to be 250 times the maximum SCR individual dose based on an estimated maximum usage of 250 people. The exposure pathways considered due to the public use of SCR are fishing and shoreline recreation. There are no drinking water pathways or irrigated food pathways associated with SCR. Swimming is not a significant contributor to population dose and the 50-mile population dose due to fish ingestion is unchanged due to the public use of SCR. Therefore, drinking water, irrigated foods, swimming and fish ingestion are not considered for the 50-mile population dose.The calculated population dose from liquid effluents is 2.36 person-rem for whole-body and 2.07 person-rem for thyroid. Based on these parameters, the maximum individual dose to total body is 0.90 mrem/yr (adult) and the maximum individual dose to organ is 1.29 mrem/yr (teenager's liver). These values are less than the 10 CFR 50 Appendix I criteria of 3 mrem/yr and 10 mrem/yr, respectively. Evaluating the dose contribution from the evaporation pond (conservatively assuming 50% evaporation of the diverted flow) amounts to ~~1.15E-01~~2.37E+00 mrem/yr (Adult's GI-Tract) described in FSAR Table 11.3-204 and the combined dose from the vent stack gaseous emission and the

CTS-01444

evaporation pond emission amounts to ~~2.73E+00~~2.55E+00 mrem/yr (Adult's GI-Tract) described in FSAR Table 11.3-205, which is well within the 10 CFR Appendix I limit. Based on the above, the evaporation pond meets the acceptance criteria of SRP 11.2. ~~With regards to RG 1.143,~~ RG 1.143 does not provide any guidance on specific design requirements for an evaporation pond. Hence RG 1.143 is not applicable to the ~~desing~~design of the evaporation pond. According to NUREG-0543 (Reference 11.2-202), there is reasonable assurance that sites with up to four operating reactors that have releases within Appendix I design objective values are also in conformance with the EPA Uranium Fuel Cycle Standard, 40 CFR 190. Once the proposed ~~CPNPP~~ Units 3 and 4 are constructed, the Comanche Peak site will consist of four operating reactors.

CTS-01445

RCOL2_11.02-18

RCOL2_11.02-18

RCOL2_11.02-18 S01

RCOL2_11.02-18

11.2.3.2 Radioactive Effluent Releases Due to Liquid Containing Tank Failures

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CP COL 11.2(3) Replace the last sentence in the second paragraph in DCD Subsection 11.2.3.2 with the following.

Source term for each tank is provided in the DCD and the assessment of this model using the site-specific parameters to evaluate the conservatism of this analysis is described below.

CP COL 11.2(3) Replace the first two sentences in the last paragraph in DCD Subsection 11.2.3.2 with the following.

The evaluation of potential radioactive effluent releases to surface water or groundwater due to failure of the ~~holdup tank~~boric acid tank is provided in Subsection 2.4.13. Releases from this tank result in concentrations at the nearest unrestricted potable water supply that are within the limits of 10 CFR 20, Appendix B (Ref 11.2-8).

RCOL2_11.02-18

RCOL2_11.02-18 S01

CP SUP 11.2(1) Add the following Subsection after DCD Subsection 11.2.3.3.

11.2.3.4 Evaporation Pond

The primary purpose of the evaporation pond is to ~~provide a means to~~ receive, store, and process treated radioactive effluent from the ~~CPNPP Units 3 and 4 liquid radioactive waste management systems~~LWMS when ~~the tritium concentration in Squaw Creek Reservoir is approaching the ODCM limit.~~it is

RCOL2_11.02-18

11.3.3.1 Radioactive Effluent Releases and Dose Calculation in Normal Operation

CP COL 11.3(6) Replace the fifth and sixth paragraph in DCD Subsection 11.3.3.1 with the following.

The site-specific long-term annual average atmospheric dispersion factors (χ/Q) given in Tables 2.3-340 through 2.3-346 are bounded by the value given in DCD Table 2.0-1 (1.6E-05 s/m^3). These values are calculated by methods presented in RG1.111. Therefore, the radioactive concentrations at the exclusion area boundary (EAB) are bounded by the values given in DCD Tables ~~11.3-5~~11.3-6 through 11.3-7. The maximum individual doses are calculated using the GASPAR II Code (Reference 11.3-17) which implements the methodology described in RG 1.109. The site-specific parameters for the GASPAR II Code calculation are tabulated in Table 11.3-8R. Calculated doses are tabulated in Table 11.3-9R. The gamma dose in air is 8.42E-02 mrad/yr and the beta dose in air is 6.50E-01 mrad/yr, which are less than the criteria of 10 mrad/yr and 20 mrad/yr, respectively,in 10 CFR 50, Appendix I. The doses to the total body, the skin, and the maximum organ are less than the criteria in 10 CFR 50, Appendix I: 5.38E-02 mrem/yr (5 mrem/yr Appendix I limit), 5.03E-01 mrem/yr (15 mrem/yr Appendix I limit), and 1.46E+00 mrem/yr [child's bone] (15 mrem/yr Appendix I limit), respectively. The compliance with 10 CFR 20.1302 is also demonstrated. The doses to the maximally exposed individual at Squaw Creek Reservoir due to normal effluent releases from the plant vent and the evaporation pond are also calculated. These doses are calculated at the point of maximum exposure at Squaw Creek Reservoir, which occurs at a distance of 0.10 miles NNW of Units 3 & 4 for plant vent releases and at a distance of 0.41 miles NNW of the evaporation pond for evaporation pond releases. The doses to the maximally exposed individual at SCR were calculated based on a person occupying the worst-case location for 134 hours per year. The number of hours was conservatively assumed to be twice the number of hours of shoreline exposure for the maximum age group from Table E-5 of RG 1.109. The doses to an individual at SCR were conservatively included in the maximum individual doses even though SCR is a restricted area per the definition provided in 10 CFR 20.1003 because CPNPP has control of access to the reservoir and has restricted public access in the past. Doses to the maximum individual using SCR are given in Table 11.3-206. MAP-11-401

The population doses within 50 miles are calculated using the GASPAR II Code (Reference 11.3-17). The GASPAR II Code input parameters for the population dose are tabulated in Table 11.3-8R and Table 11.3-201. The calculated doses due to plant vent releases are 2.71 person-rem (Total body) and 3.25 person-rem (Thyroid).

Additionally, the dose from the evaporation pond is also calculated using the GASPAR II Code (Reference 11.3-17). Half of the liquid effluent is assumed to be diverted into the evaporation pond. Conservatively, all of the radioactive nuclides

CP COL 11.3(6)

Table 11.3-8R

Input Parameters for the GASPAR II Code (Sheet 2 of 2)

Parameter	Value
Source term	DCD Table 11.3-5(2) (Sheet 1 to 3)
Other parameters	~~RG 1.10~~RG 1.109(1) CTS-01446
SCR χ/Q and D/Q values for plant vent release	
No decay, undepleted	6.0×10^{-5} s/m^3
2.26 day decay, undepleted	6.0×10^{-5} s/m^3
8.00 day decay, depleted	5.6×10^{-5} s/m^3
D/Q for maximum individual dose calculation	3.9×10^{-7} m^{-2}

Note:

1. The dose conversion factors from GASPAR II are used instead of those found in RG 1.109 because they have been updated to reflect more current information. NUREG/CR-4653 provides further information on the dose factors used by GASPAR II.
2. Ba-137m is not included in the GASPAR library. Because of its short half-life, 2.552 minutes, Ba-137m has a negligible impact on the offsite doses.

This COL item is addressed in Subsection 11.4.4.5.

STD COL 11.4(5) ***11.4(5)*** *Offsite laundry facility processing and/or a mobile compaction*

This COL item is addressed in Subsections 11.4.1.3 and 11.4.1.6.

STD COL 11.4(6) ***11.4(6)*** *Site-specific cost benefit analysis*

This COL item is addressed in Subsection 11.4.1.5.

STD COL 11.4(7)
CP COL 11.4(7) ***11.4(7)*** *Site-specific solid waste processing facility*

This COL item is addressed in Subsections 11.4.1.6, 11.4.2.3 and 11.4.4.5. CTS-01447

STD COL 11.4(8)
CP COL 11.4(8) ***11.4(8)*** *Piping and instrumentation diagrams*

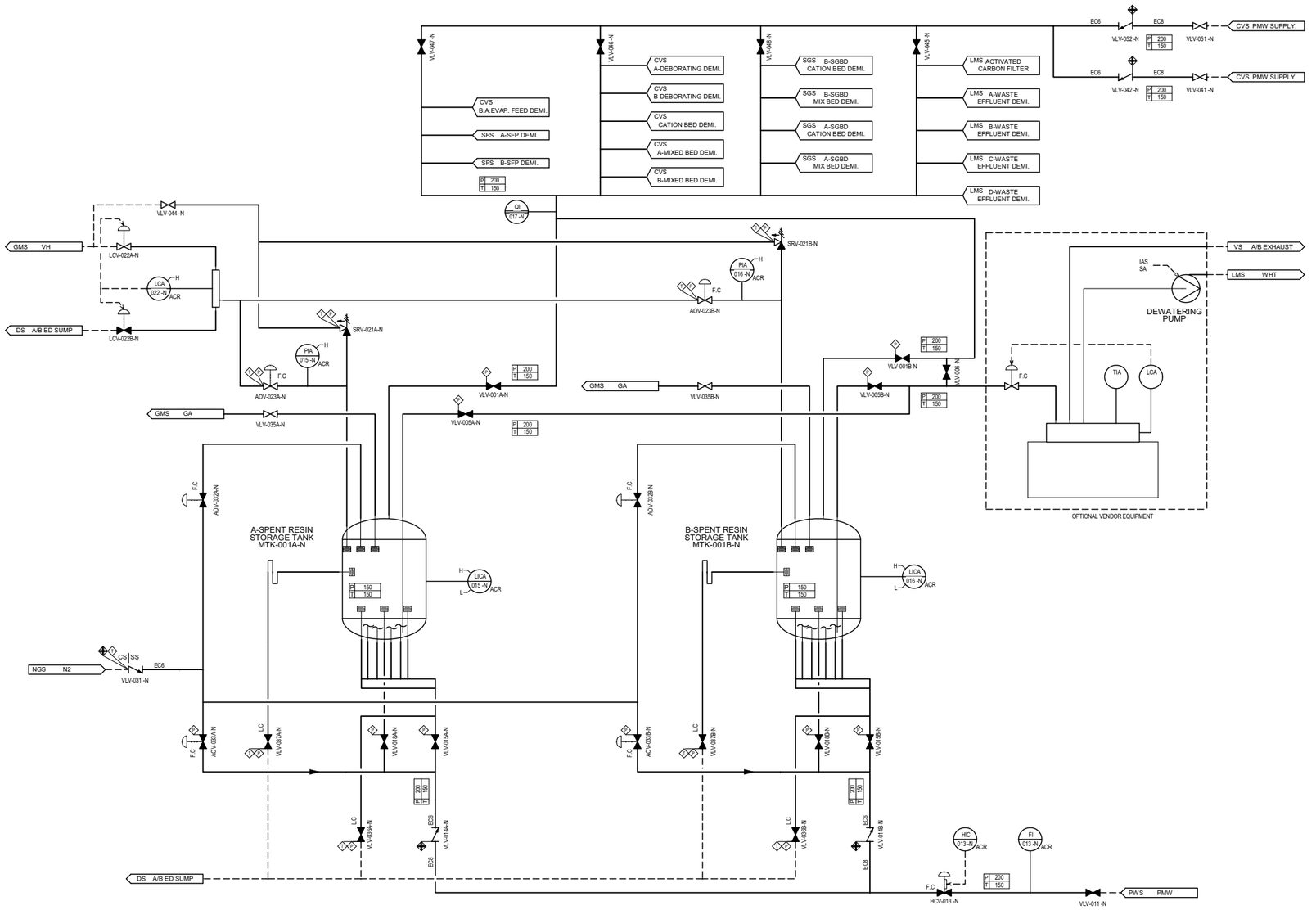
This COL item is addressed in Subsection 11.4.2.2.1 and Figure 11.4-201.

CP COL 11.4(9) ***11.4(9)*** *The implementation milestones for the coatings program used in the SWMS*

This COL item is addressed in Subsection 11.4.6.

STD COL 11.4(10) ***11.4(10)*** *The mobile/portable SWMS connections*

This COL item is addressed in Subsection 11.4.1.6.



CP COL 11.4(8)

Figure 11.4-201 Solid Waste Management System Piping and Instrumentation~~m~~n Diagram

CTS-01448

Chapter 12

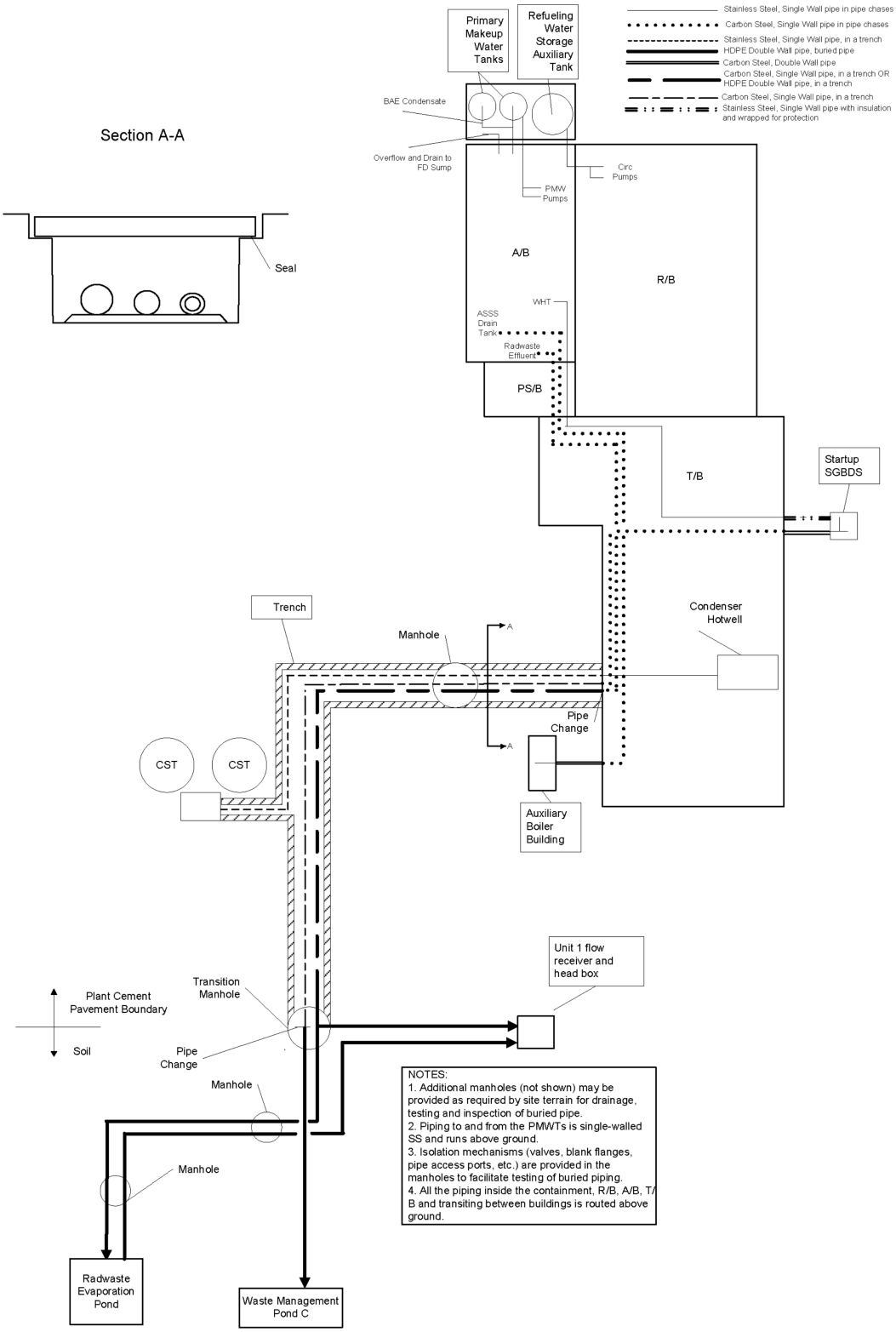
Chapter 12 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_12.03-12.04-11 S02	Table 12.3-201 (Sheet 2 of 5)	12.3-6	Response to RAI No. 135 S02 Luminant Letter no.TXNB-11020 Date 4/13/2011	Added a new paragraph regarding the design considering the prevention of environmental contamination after the last paragraph in the column of “System Features” related to objectives 1 and 2 of “Steam Generator Blowdown System”.	-
RCOL2_12.03-12.04-12	12.3.1.1.1.2	12.3-1	Response to RAI No. 225 Luminant Letter no.TXNB-11058 Date 9/16/2011	Added a description about soluble zinc depleted of Zn-64 as a general design criterion.	-
RCOL2_10.04.08-3	Table 12.3-201 (Sheet 1 of 5) Figure 12.3-201	12.3-5 [12.3-7] 12.3-11 [12.3-13]	Response to RAI No. 237 Luminant Letter no.TXNB-11084 Date 12/8/2011	Piping design was changed from single-walled stainless steel pipe with insulation to double-walled pipe consisting of a stainless steel inner pipe and a carbon steel outer pipe with coating.	-
RCOL2_246_01-09	12.2.1.1.10	12.2-3	Response to RAI No. 246 Luminant Letter no.TXNB-12007 Date 3/9/2012	Changed Item b on source material to be received to indicate that no UF6 would be received on site.	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_12.03-12.04-11 S02	Table 12.3-201 (Sheet 2 of 5)	12.3-6	Response to RAI No. 135 S02 Luminant Letter no.TXNB-11020 Date 4/13/2011	Added a new paragraph regarding the design considering the prevention of environmental contamination after the last paragraph in the column of “System Features” related to objectives 1 and 2 of “Steam Generator Blowdown System”.	-
CTS-01466	Figure 12.3-201	12.3-11 [12.3-12]	Consistency within COLA	Revised the format of the notes to be consistent with others.	1

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

RCOL2_10.0
4.08-3



RCOL2_12.0
3-12.04-11
S02
CTS-01466

CP COL 12.3(10) **Figure 12.3-201 Yard Piping Routing and Building Penetration Schematic (Not to scale)**

Chapter 13

Chapter 13 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_03.09.06-20	Table 13.4-201(Sheet 2, 11 of 11)	13.4-3 13.4-12	Response to RAI No. 228 Luminant Letter no.TXNB-11077 Date 11/7/2011	Updated IST implementation milestone	-
RCOL2_198_2S01	Table 13.4-201 (Sheet 6 of 11)	13.4-7	Supplemental Response to RAI No. 198 Luminant Letter no. TXNB-11080 Date 11/14/2011	Revised Table 13.4-201 to identify a Radioactive Source Control RP Supervisor is assigned prior to initial receipt of by-product, source, or SNM (excluding Exempt Quantities as described in 10 CFR 30.18).	-
RCOL2_03.09.06-23	Table 13.4-201 (sheet 2, 11 of 11)	13.4-3 13.4-12	Response to RAI No. 244 Luminant Letter no.TXNB-12006 Date 2/27/2012	Revised Item 2 of FSAR Table 13.4-201 to clarify the IST implementation milestone by specifying “appropriate” portions rather than “acceptance” portions of the program..	-
RCOL2_246_01-10	13.1.1.2.2	13.1-5	Response to RAI No. 246 Luminant Letter no.TXNB-12007 Date 3/9/2012	Added to the responsibility of the systems engineering supervisors that the core performance engineers will provide the SNM MC&A records to the records	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
				management group in accordance with 10 CFR 74.19.	
CTS-01393	13.1.1.2	13.1-2	Correction	Revised sub-section to 1) indicate that position titles provide functional descriptions only and actual titles may vary and 2) reflect organization title changes	1
CTS-01393	13.1.1.2	13.1-2 13.1-3	Correction	1) Clarified the assistance of Chief Nuclear Officer. 2) Relocated fourth and fifth bullets of Subsection 13.1.1.2.2 as second and third bullets of Subsection 13.1.1.2 and reflect organization title changes.	1
CTS-01393	13.1.1.2.1 13.1.1.2.2	13.1-3 [13.1-3 13.1-4] 13.1-4 13.1-5 [13.1-5 13.1-6]	Correction	Revised Subsection to reflect organization title changes and responsibilities.	1
CTS-01393	13.1.1.2.3 13.1.1.2.4	13.1-5 13.1-6 [13.1-6 13.1-7] 13.1-7	Correction	Revised Subsection to reflect organization title changes.	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01393	Table 13.1-201 (Sheet 1 of 7)	13.1-15 [13.1-16]	Correction	Revised table to reflect organization title changes.	1
CTS-01393	Figure 13.1-202 13.1-203 13.1-204	13.1-24 13.1-25 13.1-26 [13.1-25-13.1-27]	Correction	Revised figures to reflect organization title changes and indicate that position titles provide functional descriptions only and actual titles may vary.	1

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

- The Nuclear Engineering and Support organization, under the Vice President, Nuclear Engineering and Support.
- The CPNPP Units 3 and 4 Site organization, under the Site Vice President.
- The Oversight and Regulatory Affairs organization, under the Director, Oversight and Regulatory Affairs.
- The Fuel Management organization, under the President, STARS FUELCO.

The major design and operational support responsibilities are design and construction activities, pre-operational activities, and technical support for operation. Design, construction and pre-operational activities are addressed in Appendix 13AA.

13.1.1.1.1 Technical Support for Operations

Technical services and backup support for nuclear operations are furnished by the Nuclear Engineering and Support organization, including personnel who are competent in technical matters related to plant safety and other engineering and scientific support areas. In the event that nuclear operations require assistance with specific problems, the services of qualified individuals, including outside contractual assistance, are engaged as appropriate. The special capabilities that are available include nuclear, mechanical, structural, electrical, thermal-hydraulic, materials and instrumentation and control (I&C) engineering, as well as plant chemistry, health physics, operations support, maintenance support, quality assurance (QA), training, safety review, fire protection, metallurgy, fueling and refueling support, and emergency coordination support. Technical services and backup support for the operating organization will be available before the preoperational test and startup program begins and continue throughout the life of the plant. Technical supervisors are responsible for management of the technical support group functions performed by the System Engineering group.

13.1.1.2 Organizational Arrangement

CP COL 13.1(1)
CP COL 13.1(3)
CP COL 13.1(4)

Replace the content of DCD Subsection 13.1.1.2 with the following.

Responsible positions in the Nuclear Generation organization are described below. The position titles provide a functional description only and the actual titles may vary from those used herein. CTS-01393 Certain executive and management positions may have deputies assigned. Deputies may act with the full authority of the position to which they are assigned. The CPNPP Units 3 and 4 Nuclear Generation Organization is shown in Figure 13.1-202.

- ~~Executive Vice President and~~ Chief Nuclear Officer - The ~~Executive Vice President and~~ Chief Nuclear Officer, who is generally an Executive Vice President or a Senior Vice President, reports directly to the Chief CTS-01393

~~Operating~~Executive Officer, Luminant Power, and is responsible for directing the reliable operation and maintenance of CPNPP; providing the QA Program and associated evaluation services applicable to nuclear activities, providing engineering services, technical and administrative services, nuclear fuel services, and licensing services. The ~~Executive Vice President and~~ Chief Nuclear Officer is assisted by others including the Site Vice President, the Vice President, Nuclear Engineering and Support, and the Director, Oversight and Regulatory Affairs. CTS-01393 CTS-01393

- Director, NuBuild Project – The Director, NuBuild Project, reports directly to the Chief Nuclear Officer, and is responsible for establishing and managing the NSSS and A/E contracts, and also for the new nuclear plant licensing, engineering, procurement, construction, operational development, and QAPD implementation activities. CTS-01393
- Manager, NuBuild Quality Assurance – The Manager, NuBuild Quality Assurance, reports directly to the Chief Nuclear Officer, and is responsible for developing and maintaining the NuBuild QA Program, evaluating compliance with the QA program, and managing the QA organization resources responsible for independently planning and performing activities to verify effective implementation of the QA Program, including but not limited to new nuclear plant activities in engineering, licensing, document control, corrective action program, and procurement. The Manager NuBuild Quality Assurance is responsible for NuBuild QA activities until QA responsibilities are transitioned to the operating organization under the direction of the Director, Oversight and Regulatory Affairs. This transition will occur after receipt of the COL and prior to 30 days before initial fuel load.

13.1.1.2.1 CPNPP Units 3 and 4 Site Organization

The CPNPP Units 3 and 4 Site Organization is shown in Figure 13.1-203. The CPNPP Units 3 and 4 operating organization, which reports directly to the Site Vice President, is discussed in Subsection 13.1.2. ~~Operational support organizations such as Plant Support Nuclear and Nuclear Training, as well as Maintenance, Radiation Protection, Work Control/Outages, and Industrial Safety, are also described in Subsection 13.1.2.~~ CTS-01393

- Site Vice President - The Site Vice President reports directly to the ~~Executive Vice President and~~ Chief Nuclear Officer, and is responsible for directing the operation and maintenance of CPNPP Units 3 and 4 in a reliable, safe and economic manner, in compliance with federal, state, and local laws, regulations, licenses and codes, and within established corporate and Nuclear Generation policies, plans, and procedures for implementing the appropriate portions of the Nuclear Policy Statements. The Site Vice President is assisted by the Plant Manager, the Nuclear Training Manager, the Director, Performance Improvement, and the Manager, Plant Support Nuclear (which includes Emergency Preparedness, Security, and Environmental). CTS-01393

- Director, Performance Improvement - The Director, Performance Improvement reports directly to the Site Vice President, and is responsible for trending and analysis of conditions adverse to quality, review and assessment of nuclear industry operating experience impact on CPNPP Units 3 and 4, ~~administering and facilitating the Corrective Action Program,~~ identifying and evaluating significant trends in human performance, and administering and facilitating the Human Performance, Self Assessment and Benchmarking Programs. ~~The Director, Performance Improvement is assisted by the Manager, Corrective Action Program.~~ CTS-01393 CTS-01393
- Review Committees - Independent reviews of activities affecting plant safety and safety/security interface during the operations phase are performed by the Operations Review Committee (ORC) and the Station Operations Review Committee (SORC). The ORC is the designated corporate level review committee that provides independent review of CPNPP activities. The SORC is a CPNPP Units 3 and 4 site management standing committee that functions as an onsite operating organization review committee. The ORC reports directly to the ~~Executive Vice President and~~ Chief Nuclear Officer. The ORC immediately advises the ~~Executive Vice President and~~ Chief Nuclear Officer on all matters adversely affecting nuclear safety. The SORC provides a similar, site-level function and reports directly to the Plant Manager. CTS-01393
- Programmatic Controls - Work planning and controls, corrective action and reporting programs, etc. are established to assess and manage potential safety and security issues to ensure that emergent and planned operations or activities are identified, reviewed, approved, monitored and documented as appropriate. These programmatic controls include reviews of proposed changes to the facility as described in the FSAR; reviews of violations, deviations and reportable events; results of investigations; review of corrective actions; and review of audits to ensure that safety issues and issues involving physical protection, including safety/security interface, will be appropriately addressed.

Multiple layers of protection are provided to preserve unit integrity, including Organizational attributes and controls. Organizationally, operators and other shift members are assigned to a specific unit. Physical separation of units helps to minimize wrong-unit activities. In addition, station procedures and programs provide operating staff with methods to minimize human error including tagging programs, procedure adherence requirements, and training. As well as the ongoing protection it affords to existing CPNPP Units 1 and 2, the implementation of this protection strategy also applies to preserving the integrity between the existing CPNPP Units 1 and 2 and the new CPNPP Units 3 and 4.

Licensed Operators will license on both CPNPP Units 3 & 4 and other shift personnel will receive training on both units. This will allow the flexibility to rotate personnel between units on an as-needed basis.

13.1.1.2.2 Nuclear Engineering and Support Organization

The CPNPP Units 3 and 4 Support Organization is shown in Figure 13.1-204. The Support organization reports directly to the Vice President, Nuclear Engineering and Support. Support organizations include Site Engineering and Engineering Support.

- Vice President, Nuclear Engineering and Support - The Vice President, Nuclear Engineering and Support reports directly to the ~~Executive Vice President and~~ Chief Nuclear Officer, and is responsible for performing design and engineering activities; providing technical support to other Nuclear Generation functions; developing and maintaining an integrated administrative services program which includes Document Control and Records Management; providing and coordinating regulatory rate case support; and implementing the appropriate portions of the Nuclear Policy Statements. ~~In addition, the Vice President, Nuclear Engineering and Support, is responsible for development of new nuclear generation, (which is referred to as the "NuBuild Project").~~ The Vice President, Nuclear Engineering and Support is assisted by the Director, Site Engineering~~,~~ and the Director, Engineering Support~~, the Director, NuBuild Project, and the Manager, NuBuild Quality Assurance.~~ CTS-01393 CTS-01393

- Director, Engineering Support - The Director, Engineering Support reports directly to the Vice President, Nuclear Engineering and Support and is responsible for providing for the development and implementation of specific major scope plant modifications and/or engineering projects including interface with involved off-site vendor organizations, evaluations related to plant reliability, and providing for the development and implementation of an integrated administrative services program.

- Director, Site Engineering - The Director, Site Engineering reports directly to the Vice President, Nuclear Engineering and Support and is responsible for systems engineering and plant reliability, assuring the consistency of design documentation, providing Operations with timely design engineering services for analyses and technical evaluations, assuring that design activities conducted for Comanche Peak meet the requirements of the design control program, assuring that design outputs are consistent with the design basis of the plant, and providing engineering specialists.

- ~~Director, NuBuild Project – The Director, NuBuild Project, reports directly to the Vice President, Nuclear Engineering and Support, and is responsible for establishing and managing the NSSS and A/E contracts, and also for the new nuclear plant licensing, engineering, procurement, construction, operational development, and QAPD implementation activities.~~ CTS-01393

- ~~Manager, NuBuild Quality Assurance – The Manager, NuBuild Quality Assurance, reports directly to the Vice President, Nuclear Engineering and Support, and is responsible for developing and maintaining the NuBuild QA Program, evaluating compliance with the QA program, and managing~~

~~the QA organization resources responsible for independently planning and performing activities to verify effective implementation of the QA Program, including but not limited to new nuclear plant activities in engineering, licensing, document control, corrective action program, and procurement. The Manager NuBuild Quality Assurance is responsible for NuBuild QA activities until QA responsibilities are transitioned to the operating organization under the direction of the Director, Oversight and Regulatory Affairs. This transition will occur after receipt of the COL and prior to 30 days before initial fuel load.~~ CTS-01393

- Systems Engineering Supervisors - The Systems Engineering Supervisors report directly to the Director, Site Engineering. The Systems Engineering Supervisors provide oversight to the systems engineers, including providing technical direction to the operating organization and operating support organizations, maintain training and qualification requirements of system engineers, providing technical support for plant surveillance testing and maintaining design configuration control of plant SSCs. The reactor engineering group (core performance engineering) is responsible for providing records related to the special nuclear material (SNM) control and accounting program to records management to ensure that the records are maintained as required under 10 CFR 74.19. A reactor engineer (systems engineer) is assigned as the SNM custodian. The SNM custodian is responsible for the implementation of the SNM control and accounting program. RCOL2_246_01-10

13.1.1.2.3 Oversight and Regulatory Affairs Organization

- Director, Oversight and Regulatory Affairs - The Director, Oversight and Regulatory Affairs, reports directly to the ~~Executive Vice President and~~ Chief Nuclear Officer and is responsible for providing assistance, as required, (including technical interface between Nuclear Generation departments) to assure consistency and compliance with CPNPP licensing commitments, providing liaison with government regulatory agencies, controlling correspondence with regulatory agencies, providing for employee interviews and resolution of concerns through the SAFETEAM process, obtaining, controlling, amending, and renewing licenses and licensing documents needed to safely operate and maintain CPNPP, and implementing the appropriate portions of Nuclear Policy Statements. The Director, Oversight and Regulatory Affairs is also responsible for the definition, direction, maintenance, and measurement of the effectiveness of the QA Program for Nuclear Generation and assures that QA Program requirements are met by conducting evaluations that measure compliance to established requirements, the results of which are reported to the responsible organization and to higher Luminant Power management. The Director, Oversight and Regulatory Affairs is also responsible for the independent verification of critical attributes associated with safety-related equipment or work activities and providing, when necessary, independent review and concurrence for quality-related activities such as procurement, nonconformance reporting, corrective action and other activities as designated in the QA Program. These responsibilities include the CTS-01393

identification of deficient conditions, the evaluation of subsequent corrective actions for acceptability, and the verification of corrective action implementation. The Director, Oversight and Regulatory Affairs has the authority to stop work to assure compliance with the QA Program. The Director, Oversight and Regulatory Affairs is assisted by the Manager, Quality Assurance, the Manager, Nuclear Licensing, the Manager, Corrective Action, and the Manager, SAFETEAM. CTS-01393

- Manager, Quality Assurance - The Manager, Quality Assurance reports directly to the Director, Oversight and Regulatory Affairs, and is responsible for developing and maintaining QA programs, manuals and procedures; supervising QA/quality control (QC) personnel; conducting QA/QC inspections, evaluations, reviews and audits; and maintaining channels of communications with management in matters of quality. The Manager, Quality Assurance has the duty and authority to identify quality-related problems; to initiate, recommend, or provide solutions; and to verify the implementation and effectiveness of solutions. When required, the Manager, Quality Assurance is responsible for the issuance and removal of stop work orders.
- Manager, Nuclear Licensing – The Manager, Nuclear Licensing, reports directly to the Director, Oversight and Regulatory Affairs, and is responsible for day-to-day licensing and regulatory engineering activities at CPNPP Units 3 and 4. These activities include, but are not limited to, licensing submittals to the U.S. Nuclear Regulatory Commission (NRC), maintenance of licensing documents such as the Final Safety Analysis Report (FSAR) and Technical Specifications, supporting the operations organization with interpretation of regulatory requirements, ensuring plant conformance with regulatory commitments, and interfacing with the NRC on inspections and enforcement actions.
- Manager, SAFETEAM - The Manager, SAFETEAM is responsible for managing the SAFETEAM Program for the review and investigation of employee safety concerns, and ensuring both departing employees and employees with concerns are interviewed.
- Manager, Corrective Action – The Manager, Corrective Action is responsible for administering and facilitating the Corrective Action Program. CTS-01393

13.1.1.2.4 Fuel Management Organization

- President, STARS FUELCO – STARS FUELCO will provide nuclear fuel services to CPNPP Units 3 and 4. The President, STARS FUELCO reports directly to the Luminant ~~Executive Vice President and~~ Chief Nuclear Officer, and is responsible for providing those services safely and efficiently. CTS-01393

CP COL 13.1(1)
CP COL 13.1(4)
CP COL 13.1(6)

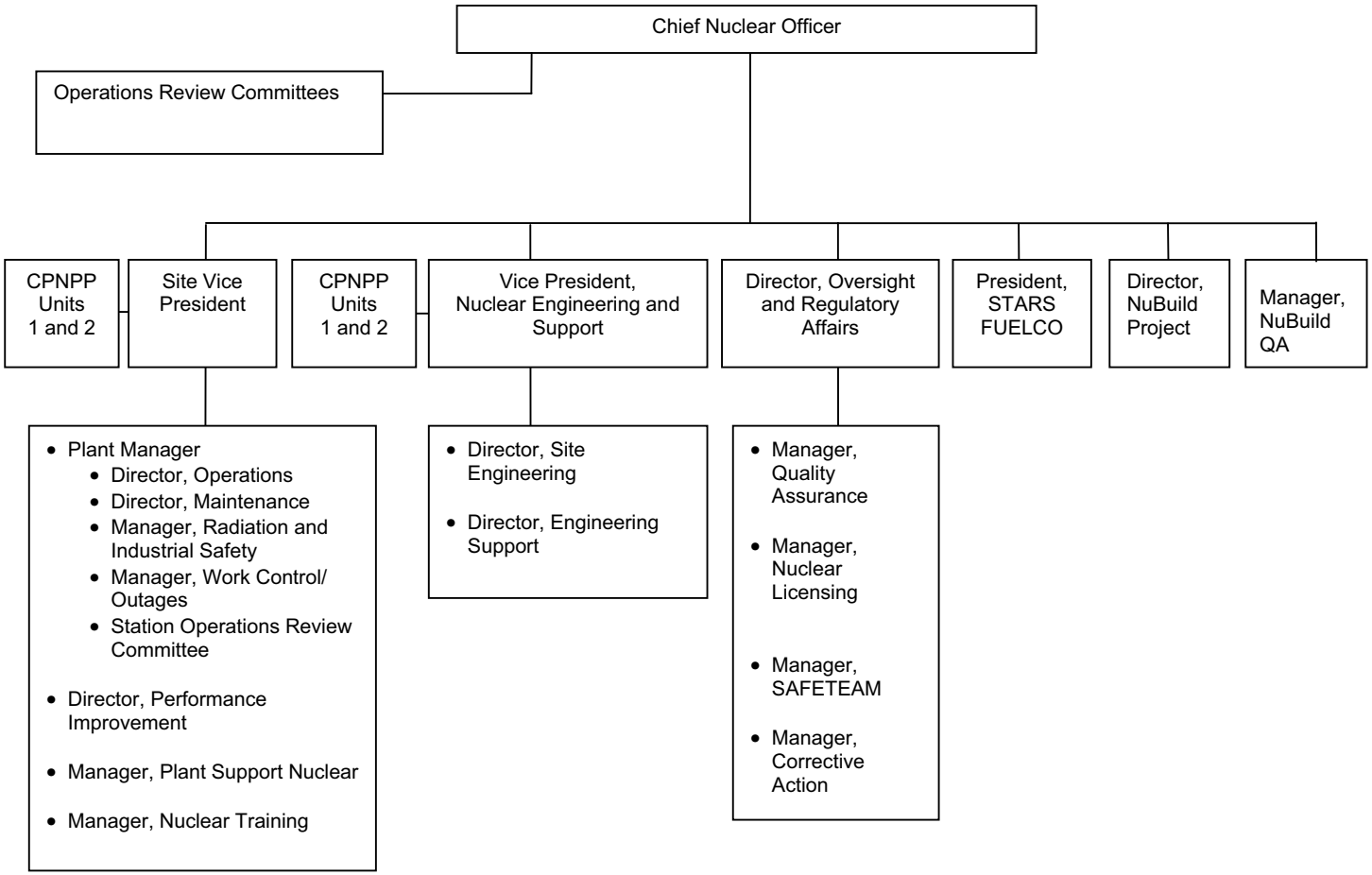
Table 13.1-201 (Sheet 1 of 7)

Staffing Plan for CPNPP Units 3 and 4 (1)

			Estimated Numbers of Full Time Equivalents			
Nuclear Function	**Function Position (ANS-3.1-1993 section)**	**CPNPP Units 3 and 4 Position**	**Design Review Phase**	**Construction Phase**	**Preoperational Phase**	**Operational Phase**
Executive Management	Chief Nuclear Officer (NA)	~~Executive VP and~~ Chief Nuclear Officer	0.1	0.1	0.1	0.1
	Site Executive (NA)	Site Vice President	0.25	0.25	0.5	0.5

CTS-01393

CTS-01393

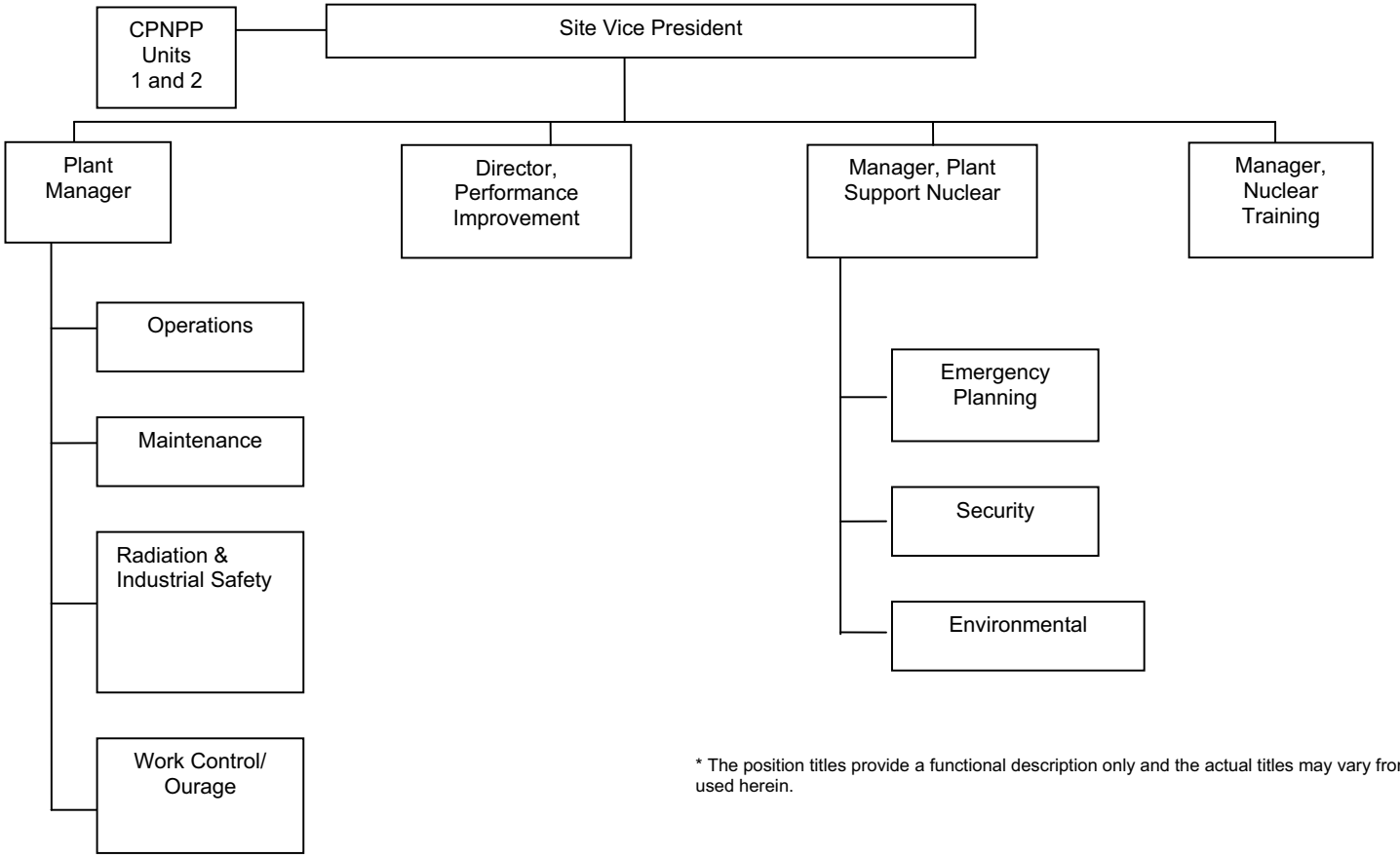


* The position titles provide a functional description only and the actual titles may vary from those used herein.

CP COL 13.1(1)
CP COL 13.1(4)
CP COL 13.1(6)

Figure 13.1-202 Nuclear Generation Organization*

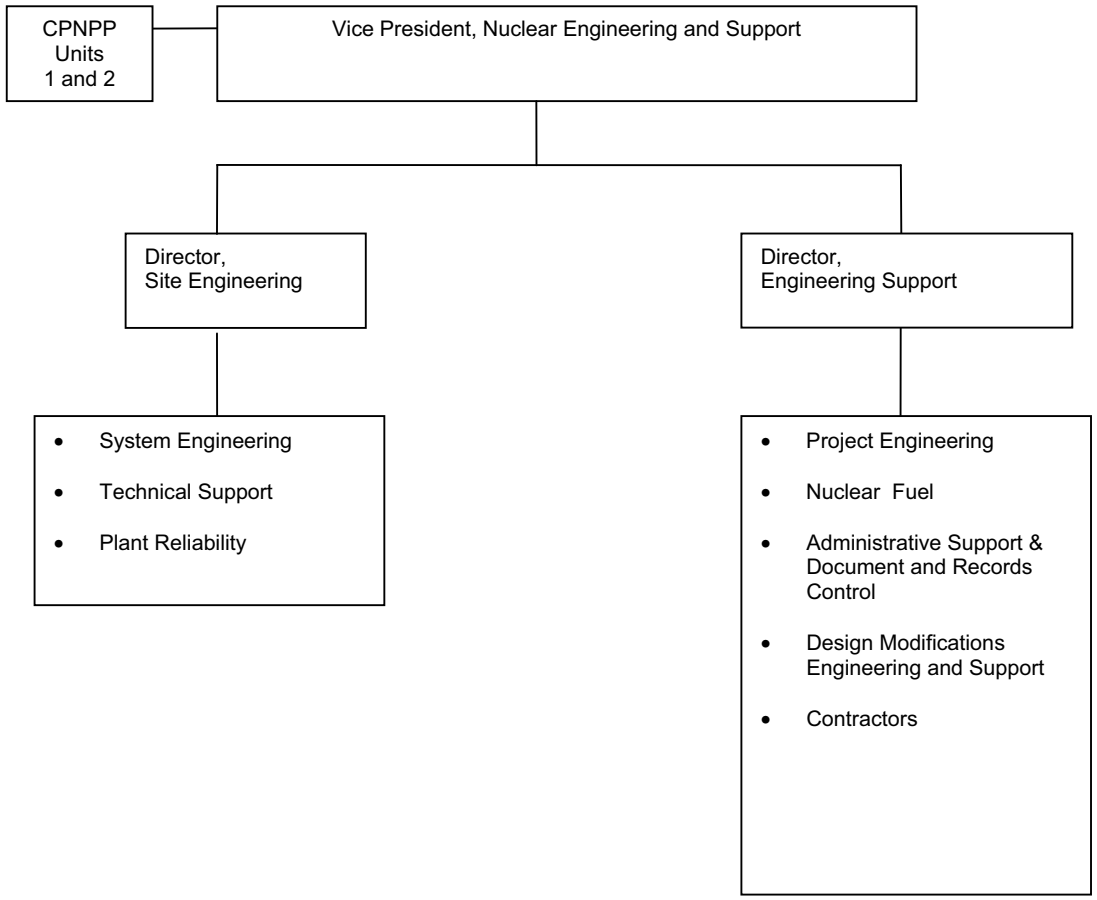
CTS-01393



CP COL 13.1(1)
CP COL 13.1(4)
CP COL 13.1(6)

Figure 13.1-203 CPNPP Units 3 and 4 Site Organization*

CTS-01393



CP COL 13.1(1)
CP COL 13.1(3)
CP COL 13.1(4)

* The position titles provide a functional description only and the actual titles may vary from those used herein.

Figure 13.1-204 CPNPP Units 3 and 4 Support Organization*

Chapter 14

Chapter 14 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01381	14.3.4.7	14.3-1	Consistency with changes to R-COLA Part 10.	Deleted sentence, "There are only two site specific systems…" because additional systems have been added to Part 10.	0
RCOL2_09.04.05-19	14.2.12.1.114	14.2-7	Response to RAI No. 243 Luminant Letter no.TXNB-12006 Date 2/27/2012	Added test method and acceptance criteria for verifying position of backdraft dampers in UHS ESW Pump House Ventilation System.	-
DCD_03.12-25	Table 14.2-202 (Sheet 6 of 6)	14.2-15	Reflect response to DCD RAI Response No.742 Amend	Added "Pressurizer Surge Line HFT Performance Test" in consistent with DCD RAI response	1
DCD_14.03.03-27	14.3 (New Subsection 14.3.4.3) 14.3.6	14.3-1 14.3-2 [14.3-3]	Reflect response to DCD RAI Response No. 892	Added COL Item 14.3(4) to address DAC closure.	1

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

Table 14.2-202 (Sheet 6 of 6)

Comparison of Tier 2 Preoperational Tests with Tier 1 Test Requirements

Test Description	Tier 2 Section	Tier 1 Section	
Technical Support Center HVAC System	14.2.12.1.103	2.7.5.4	
Non-Essential Chilled Water System	14.2.12.1.104	2.7.3.6	
Vessel Servicing	14.2.12.1.105	2.7.6.5	
Safety-Related Component Area HVAC System	14.2.12.1.106	2.7.5.2	
Pressurizer Heater and Spray Capability and Continuous Spray Flow Verification	14.2.12.1.107	-	
Non-Essential Service Water (non-ESW) System	14.2.12.1.108	-	
Condensate Storage Facilities System	14.2.12.1.108	-	
Turbine Building Area Ventilation System (General Mechanical Area)	14.2.12.1.110	-	
Turbine Building Area Ventilation System (Electric Equipment Area)	14.2.12.1.111	-	
RCPB Leak Detection Systems Preoperational Test	14.2.12.1.115	2.4.7	
Equipment and Floor Drainage System Preoperational Test	14.2.12.1.116	2.7.6.8	
Compressed Gas System Preoperational Test	14.2.12.1.117	-	
Equipment Hatch Hoist Preoperational Test	14.2.12.1.118	-	
Pressurizer Surge Line HFT Performance Test	14.2.12.1.119	-	DCD_03.12-25

Note: Tier 1 sections in parentheses indicate inspection activities.

14.3 INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

14.3.4.3 ITAAC for Piping Systems and Components

DCD_14.03.03-27

STD COL 14.3(4) Replace the last sentence of the last paragraph of DCD Subsection 14.3.4.3 with the following:

The COL licensee shall submit ITAAC schedule information to the NRC in accordance with 10 CFR 52.99, which includes a schedule for closing Design Acceptance Criteria. The Design Acceptance Criteria closure process described in DCD Appendix 14B will be utilized to close the Design Acceptance Criteria ITAAC for piping systems and components. The stress analysis, environmental fatigue analysis, LBB analysis and pipe break hazard analysis for the piping systems and components will be completed on a system-by-system basis or a component basis, as applicable, in order to support closure of the Design Acceptance Criteria ITAAC. Information will be made available for NRC review, inspection, and audit on a system-by-system basis or a component basis.

14.3.4.6 ITAAC for Electrical Systems

STD COL 14.3(1) Add the following paragraph after the last paragraph in DCD Subsection 14.3.4.6.

The ITAAC for the site-specific interfaces in the electrical systems are developed to correspond to Section 3.2 of Tier 1 of the referenced DCD. The site-specific interfaces are with the offsite power system. The ITAAC for the interface requirement with the offsite power system are provided in Part 10 of the Combined License Application (COLA).

14.3.4.7 ITAAC for Plant Systems

STD COL 14.3(1) Replace the last paragraph in DCD Subsection 14.3.4.7 with the following.

14.3.6 Combined License Information

Replace the content of DCD Subsection 14.3.6 with the following.

STD COL 14.3(1)
CP COL 14.3(1)

***14.3(1)** ITAAC for site-specific systems*

This COL item is addressed in Subsections 14.3.4.6 and 14.3.4.7.

STD COL 14.3(2)

***14.3(2)** ITAAC for emergency planning*

This COL item is addressed in Subsection 14.3.4.10.

CP COL 14.3(3)

***14.3(3)** ITAAC For Physical Security Hardware*

This COL item is addressed in Subsection 14.3.4.12.

STD COL 14.3(4)

***14.3(4)** Design Acceptance Criteria ITAAC for Piping Systems and Components*

DCD_14.03.03-27

This COL item is addressed in Subsection 14.3.4.3.

14.3.7 References

14.3-201 “Comanche Peak Units 3 and 4 Physical Security Hardware ITAAC Abstracts,” Revision 1, April 2011.

Chapter 15

Chapter 15 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

Chapter 16

Chapter 16 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

Chapter 17

Chapter 17 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
CTS-01460	Table 17.4-201	17.4-5	Editorial	Editorial correction on the description regarding PRA insights on ultimate heat sink cooling towers.	1

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

CP COL 17.4(1)

Table 17.4-201

Risk-significant SSCs (Phase II D-RAP)

#	Systems, Structures and Components (SSCs)	Rationale(1)	Insights and Assumptions
1	Essential service water system (ESWS)		
1	Ultimate Heat Sink Cooling Tower Fan 1 [UHS-OEQ-001A, (B, C, D)] Ultimate Heat Sink Cooling Tower Fan 2 [UHS-OEQ-002A, (B, C, D)]	RAW /CCF/LPSD	The essential service water system (ESWS) transfers heat from the component cooling water (CCW) system as ultimate heat sink (UHS), which is the cooling tower. This system supports the CCW system (CCWS), which supports various safety and non-safety mitigation systems. Accordingly, reliability of CCWS ~~emergency feedwater (EFW) system~~and ESWS has significant impact on risk. Since ESWS consists of four independent trains, failure of one train does not have significant impact on risk. However, failures of SSCs that impact multiple trains have ~~risk~~ significant impact on risk. Accordingly, SSCs that have potential to cause common cause failures among multiple trains are risk significant.

CTS-01460

CTS-01460

Notes:

1.Definition of Rationale Terms:

RAW = risk achievement worth

CCF = common cause failure

LPSD =low power and shut down operation

Chapter 18

Chapter 18 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

Chapter 19

Chapter 19 Tracking Report Revision List

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
RCOL2_19-17	19.1.5 Table 19.1-205 (Sheet 1 through 13[14],15 [16] through 26 [27, 28], 28 through 30 [30 through 33] 32 through 35 [36, 37] Table 19.1-206 (Sheet 2 of 2) (new sheet)	19.1-9 [19.1-10] 19.1-48 through 19.1-60 [19.1-61] 19.1-62 through 19.1-73 [19.1-74, 19.1-75] 19.1-75 through 19.1-77[19.1-78, 79, 80] 19.1-79 19.1-80 [19.1-82 through 19.1-84] 19.1-81 [19.1-86]	Supplemental Response to RAI No. 232 Luminant Letter no.TXNB-11084 Date 12/8/2011	Clarified the bases and the screening criterion applied for screening external events. Minor errata and editorial corrections. Added assumptions identified in External Events Screening Table 19.1-205 to the list of Site Specific Assumptions.	-
RCOL2_19-18	19.1.4.1.2 19.1.5 19.1.7.1 Table 19.1-205 (sheet 1 of 33)	19.1-3 19.1-4 19.1-11 [19.1-12] 19.1-48	Supplemental Response to RAI No. 232 Luminant Letter no.TXNB-11084 Date 12/8/2011	Chapter 19.1 clarifications for event screening, assumptions, and term TNT equivalency.	-

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
DCD_08.03.01-38	Table 19.1-119R (Sheet 15 of 46)	19.1-19	Response to DCD RAI No.394 amended MHI Letter No. UAP-HF-11404 Date 11/22/2011	5th item of "14. Onsite Electric Power System" was revised.	0
DCD_11.02.06-45	19.2.3.3.7 (New Subsection)	19.2-1	Reflect Response to DCD RAI No. 803	Added COLA section 19.2.3.3.7 to address new COL item 19.3(7)	0
DCD_11.02.06-45	19.3.3.	19.3-1	Reflect Response to DCD RAI No. 803	Added new COL item 19.3(7)	0
DCD_19-564	19.1.1.4 (New Subsection) 19.1.1.4.1 19.1.1.4.2 19.1.2.4 (New Subsection) 19.3	19.1-1 [19.1-2] 19.1-2 19.1-2 [19.1-3] 19.3-1	Reflect Response to DCD RAI No. 898	Incorporated description regarding the use of PRA and PRA maintenance during the operational phase.	1
DCD_19-512	Table 19.1-119R (Sheet 1 of 46)	19.1-13 [19.1-14]	Reflect Response to DCD RAI No. 750	Added key PRA insights regarding the operability of SI pumps under no HVAC systems.	1
DCD_16-117	Table 19.1-119R (Sheet 19 of 46)	19.1-21 [19.1-22]	Reflect Response to DCD RAI No. 161	Incorporated new key insights regarding administrative controls for AAC and demineralized water storage tank.	1
DCD_09.02.02-48	Table 19.1-119R (Sheet 22 of 46)	12.1-24 [19.1-25]	Reflect Response to DCD RAI No. 571	Deleted the description regarding CCW header tie line automatic isolation valves.	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
DCD_19-514	Table 19.1-119R (Sheet 25 of 46)	19.1-27 [19.1-28]	Reflect Response to DCD RAI No. 750	Added operator actions to depressurize the secondary side under SGTR events.	1
DCD_19-496	Table 19.1-119R (Sheet 27 of 46)	19.1-29 [19.1-30]	Reflect Response to DCD RAI No. 681	Clarified the operation for decay heat removal through the SGs during shutdown	1
DCD_19.01-10 S01	Table 19.1-119R (Sheet 31 of 46)	19.1-33 [19.1-34]	Reflect Response to DCD RAI No. 668	Deleted description regarding hydrogen peroxide.	1
DCD_19.01-5	Table 19.1-119R (Sheet 32 of 46)	19.1-34 [19.1-35]	Reflect Response to DCD RAI No. 621	Added description of the operator actions after vacuum venting.	1
DCD_19-496	Table 19.1-119R (Sheet 33 of 46)	19.1-35 [19.1-36]	Reflect Response to DCD RAI No. 681	Added description of the removal of pressurizer safety valves during shutdown	1
DCD_19-494	FSAR Table 19.1-119R (Sheet 34 of 46)	19.1-36 [19.1-37]	Reflect Response to DCD RAI No. 669	Incorporated a new key insight regarding administrative controls for SIS during LPSD operation.	1
DCD_19-506	Table 19.1-119R (Sheet 36 of 46)	19.1-38 [19.1-39]	Reflect Response to DCD RAI No. 749	Clarified the number of pressurizer safety valve that have to be removed.	1

Change ID No.	Section	FSAR Rev. 2 Page	Reason for change	Change Summary	Rev. of FSAR T/R
DCD_19-493	Table 19.1-119R (Sheet 36 of 46)	19.1-38 [19.1-39]	Reflect Response to DCD RAI No. 669	Clarified the SG nozzle dams that need to be removed or installed.	1
DCD_19-557	Table 19.1-119R (Sheet 40 [40,41] of 46)	19.1-39 [19.1-40 19.1-41]	Reflect Response to DCD RAI No. 834	Clarified assumptions and insights regarding fire PRA	1
CTS-01456	19.3.3	19.3-1	Correction	Deleted left hand notation “STD COL 19.3(5)” for 19.3(5)	1

*Page numbers for the attached marked-up pages may differ from the revision 2 page numbers due to text additions and deletions. When the page numbers for the attached pages do differ, the page number for the attached page is shown in brackets.

CP COL 19.3(8)

19.1.1.4 Operational Phase

DCD_19-564

Replace the content of DCD Subsection 19.1.1.4 with the following.

The uses of PRA in support of licensee programs and description of risk-informed applications being implemented during the operational phase are described in the following subsections.

19.1.1.4.1 Uses of Probabilistic Risk Assessment in Support of Licensee Programs

STD SUP 19.1(1)

~~Add the following text after the first paragraph in~~Replace the content of DCD Subsection 19.1.1.4.1 with the following.

DCD_19-564

CP COL 19.3(8)

The PRA will be used in the operational phase to support licensee programs such as the human factors engineering program, the severe accident management program, the maintenance rule, and the reactor oversight program.

The PRA models and results provide input to such as the preventive maintenance basis program and other related maintenance and reliability programs including the motor-operated valve and air-operated valve reliability and testing programs.

19.1.1.4.2 Risk-Informed Applications

~~CP SUP 19.1(2)~~
CP COL 19.3(8)

Replace the content of DCD Subsection 19.1.1.4.2 with the following.

DCD_19-564

The PRA will be updated to reflect the risk-informed technical specifications in accordance with RG 1.174 and RG 1.177, including Initiative 4b, RMTS, in accordance with NEI 06-09 (Reference 19.1-11) and Initiative 5b, risk-informed method for control of surveillance frequencies in accordance with NEI-04-10 (Reference 19.1-201), as described in Subsection 16.1.1.2.

19.1.2.4 PRA Maintenance and Update

DCD_19-564

CP COL 19.3(9) Add the following text after the fifth paragraph in DCD Subsection 19.1.2.4.

Changes to PRA inputs and discovery of new information will be evaluated to determine whether a PRA maintenance or upgrade is warranted. Changes to the PRA impacting risk insights or key assumptions will be prioritized to ensure that the most significant changes are incorporated as soon as practical and associated documentation is updated accordingly. Other changes will be incorporated during the next PRA update.

19.1.4.1.2 Results from the Level 1 PRA for Operations at Power

CP COL 19.3(4) Add the following text after the first sentence in DCD Subsection 19.1.4.1.2.

The only site-specific design that has potential effect on level 1 PRA for operation at power is the site-specific UHS.

Comanche Peak Nuclear Power Plant (CPNPP) Units 3 and 4 use cooling towers (CTWs) as the UHS for the ESWS. Discharged cooling water from the heat exchangers of the ESWS is sprayed into the CTW basin, while the standard US-APWR design simply indicates that the UHS is an assured source of water, without reference to type of source, cooling or discharge.

The UHS consists of four 50 percent capacity mechanical draft CTWs, one for each ESWS train, and four 33-1/3 percent capacity basins to supply cooling water more than 30 days. Each CTW consists of two cells with fans and motors, drift eliminators, film fills, risers, and water distribution system all enclosed and supported by a seismic category I reinforced concrete structure. Each basin includes an ESWP intake structure that contains one 50 percent capacity ESWP and one 100 percent capacity UHS transfer pump, and associated piping and components. The fan motors are powered from the Class 1E normal ac power system. The UHS transfer pump located in each basin is powered from the Class 1E bus, which is independent from the one to power associated ESWP.

Adoption of CTWs to the UHS for the ESWS raises an additional failure mode for the ESWS, which is the failure of CTW fans. Failure of the CTW fans would cause degradation of heat release from the ESWS to the atmosphere, which would result increase of the ESWS temperature in the faulted train. Failure of both fans in a single CTW train is considered a potential failure mode of the ESWS.

CP COL 19.3(6)

Table 19.1-119R Key Insights and Assumptions (Sheet 1 of 46)

Key Insights and Assumptions	Dispositions
Design features and insights	
1. High Head Safety Injection System	
- The high head safety injection system consists of four independent and dedicated SI pump trains.	6.3.2.1.1
- The SI pump trains are automatically initiated by ECCS actuation signal, and supply borated water from the RWSP to the reactor vessel via direct vessel injection line.	6.3.2.1.1
- Each SI pump is connected to a dedicated direct vessel injection nozzle for injection into the reactor downcomer region.	6.3.2.1.1
- SI pump suction isolation valves (SIS-MOV-001A/B/C/D) remain open during normal and emergency operations. These valves are remotely closed by operator action from MCR or RSC to isolate RWSP to terminate leak or if pump/valve maintenance requires it.	6.3.2.2.6.1
- This system provides the safety injection function during LOCA events and feed and bleed operation.	6.3.3 19.2.5 13.5.2 5.2.2.1.2 5.2.2.2.2.2
- During plant shutdown, safety injection provides RCS makeup function in loss of RHRS. In the case of failure of operable SI pump, the pumps that are locked out for LTOP compliance can be used if available.	19.2.5 13.5.2 7.8.1.1.1 Table 7.8-5
- SI pump can be manually actuated by DAS from MCR.	
- SI pumps are operable regardless of HVAC system of the safeguard component area within mission time.	Table 19.1-180

DCD_19-512

CP COL 19.3(6)

Table 19.1-119R Key Insights and Assumptions (Sheet 19 of 46)

Key Insights and Assumptions	Dispositions
18. Main equipments and instrumentations used for severe accident mitigation are designed to perform their function in the environmental conditions such as containment overpressure and temperature rise following hydrogen combustion.	19.2.3.3.7
19. Instrumentations for detecting core damage with high reliability are provided.	5.3.3.1
20. Risk significant SSCs are identified for the RAP.	17.4
21. Instrumentation piping are installed at upside of the RV. No penetrations through the RV are located below the top of the reactor core. This minimizes the potential for a loss of coolant accident by leakage from the reactor vessel, allowing the reactor core to be uncovered.	5.3.3.1
22. Check valves in accumulator, high head injection system, and other systems are in diverse configuration because: - The accumulator does not have any pumps to drive upon a failed closed check valve but other systems have pumps so the forces acting on the valves to open them (even if the valves are similar) are different - The duty cycles in the systems are different. They are cycled at different times when the systems are tested. - Maintenance practices including testing may also be different. Common cause failure between the check valves in accumulator and HHIS is therefore not model in the PRA.	19.1.4.1 Table 19.1-38
23. Surveillance test interval and refueling outages are consistent with Technical Specifications.	Chapter 16
24. The availability and reliability of all trains of safety related systems will be controlled by the maintenance and configuration risk management programs. Availability goals will be set for each train of all safety related systems and their availability will be tracked and compared to these goals.	17.6
25. Administrative controls to ensure the availability of AAC as a back up function to the Class 1E GTGs will be implemented.	13.5.2
26. Administrative controls to ensure the availability of demineralized water storage tank as a back up function to the EFW pits will be implemented.	13.5.2

DCD_16-117

DCD_16-117

CP COL 19.3(6)

Table 19.1-119R Key Insights and Assumptions (Sheet 22 of 46)

Key Insights and Assumptions	Dispositions
12. In the case of loss of secondary side cooling function by emergency feedwater system in transient events including turbine trip, load loss event etc., with emergency feedwater pump flow rate, operators start to recover main feedwater system in order to maintain secondary side cooling.	19.2.5 13.5.2
13. In the case of loss of SI injection function entirely in LOCA event, with SI flow rate and RCS temperature indication, operators provide secondary side cooling to reduce RCS pressure and temperature by opening the main steam depressurization valves manually and supplying water from the emergency feedwater system in order to enable low pressure injection with containment spray system / residual heat removal system.	19.2.5 13.5.2
14. In the case of loss of containment spray system function, alternate containment cooling operation is implemented utilizing CV natural recirculation in order to remove heat from CV. This preparation contains CCW pressurization with N2 gas, disconnection heat load of non-safety chiller and CRDM etc. and connection to containment fan cooler units. This operation is implemented when the containment pressure reaches the design pressure.	19.2.5 13.5.2
15. In the case of leakage of the RWSP water from HHIS piping, CSS/RHRS piping or refueling water storage system piping, with drain sump water level – abnormally high, operators close the RWSP suction isolation valves respectively in order to prevent leakage of RWSP water from failed piping.	19.2.5 13.5.2
16. When the containment isolation signal fail to automatically actuate, with CV pressure abnormally high signal, operators manually actuate the containment isolation signal in order to remove heat from the containment vessel.	19.2.5 13.5.2
17. ~~When the CCW header tie line isolation valves fail to automatically close with specific signals which contain ECCS actuation signal plus under voltage signal, containment spray signal, and surge tank level low signal, operators manually close these valves in order to separate CCW header.~~	~~19.2.5~~ ~~13.5.2~~
18. RCS is depressurized through operating the depressurization valve after onset of core damage and before reactor vessel breach. This operation prevents events due to high pressure melt ejection.	19.2.5 13.5.2
19. Operation of firewater injection to reactor cavity is implemented to flood reactor cavity in case of containment spray system failure, after onset of core damage and before reactor vessel breach.	19.2.5 13.5.2

DCD_09.02.02-48

CP COL 19.3(6)

Table 19.1-119R Key Insights and Assumptions (Sheet 25 of 46)

Key Insights and Assumptions	Dispositions
36. Misalignment of remote-operated valves (e.g. motor-operated valves, air-operated valves), pumps and gas turbine generators after test and maintenance will be fixed before initiating events occur. Remote-operated valve open/close positions and control switch positions are monitored in the main control room, so they will be detected in a short time.	19.1.4 19.1.5 13.5.2
37. The controls and displays available in the US-APWR control room are superior to conventional control room HSIs and, therefore, human error probabilities in the US-APWR operation would be less than those in conventional plants.	Chapter 18 19.1
38. In the SGTR event, operators perform at least one action to equalize primary and secondary pressure after the ruptured SG isolation. - Open safety depressurization valves - Start pressurizer auxiliary spray - Open depressurization valves for severe accident - Actuate pressurizer spray by restarting RCPs	19.2.5 13.5.2

DCD_19-514

CP COL 19.3(6)

Table 19.1-119R Key Insights and Assumptions (Sheet 27 of 46)

Key Insights and Assumptions	Dispositions
8. In case LOCA occurs in RHR line, operator will perform isolation of the RHR hot legs suction isolation valves and stop leakage of RCS coolant from RHRS where LOCA occurs.	19.2.5 13.5.2
9. In case the RCS water level decreases during mid-loop operation and the failure of automatic isolation valve occurs, operator will perform the manual isolation of low-pressure letdown line.	19.2.5 13.5.2
10. When over-draining occurs and the automatic isolation valve fails, with RCS water level – low, operators close the valve on the letdown line in order to stop draining.	19.2.5 13.5.2
11. In the case of loss of decay heat removal functions by RHRS and SGs, operators start the safety injection pump in order to maintain RCS water level. This operator action is risk important. Activities to minimizes the likelihood of human error in the human factors engineering is important in developing procedures, training and other human reliability related programs.	18.6 19.2.5 13.5.2
12. In the case of failure of running RHRS, with RHR flow rate – low, operators open the valves on the standby RHR suction line and discharge line and start the standby RHR pump in order to maintain RHR operating.	19.2.5 13.5.2
13. In the case of leakage of the RWSP water from HHIS piping, CSS/RHR piping or refueling water storage system piping, with drain sump water level – abnormally high, operators close the RWSP suction isolation valves respectively in order to prevent leakage of RWSP water from failed piping.	19.2.5 13.5.2
14. In the case of failure of running CCWS, with CCW flow rate – low, operators start the standby CCW pump in order to maintain CCWS operating.	19.2.5 13.5.2
15. In the case of failure of running ESWS, with CCW flow rate – low, operators start the standby ESW pump in order to maintain ESWS operating.	19.2.5 13.5.2
16. When ESW strainer plugs up, with ESW pump pressure – normal, ESW flow rate – low and differential pressure – significant, operators switch from plugged strainer to standby strainer in order to maintain ESWS operating.	19.2.5 13.5.2
17. In the case of loss of decay heat removal functions from RHR, with RCS temperature – high or RCS water level – low, operators feed water to SGs by motor-driven EFW pump, open ~~MSDVs~~main steam depressurization valves and close the pressurizer spray vent valve (if the valve is opened) in order to remove decay heat from RCS.	19.2.5 13.5.2

DCD_19-496

CP COL 19.3(6)

Table 19.1-119R Key Insights and Assumptions (Sheet 31 of 46)

Key Insights and Assumptions	Dispositions
LPSD assumptions	
1. Freeze plug may not be used for US-APWR because the isolation valves are installed considering maintenance and CCWS has been separated individual trains. Therefore, the freeze plug failure is excluded from the potential initiator.	13.5.2
2. ~~Hydrogen peroxide addition is adopted instead of aeration because it decreases the duration of the mid-loop operation: hydrogen peroxide addition operation does not require mid-loop duration. As a result of adopting hydrogen peroxide addition which is done at a higher SG nozzle level, the mid-loop operation is needed only to drain the SG primary side water while, thus reducing overall duration mid-loop operation.~~	~~5.4.7.2.3.6~~
3. Redundant narrow range water level instrument and a mid-range water level instrument are provided to measure mid-loop water level. Installation of a redundant water narrow level instrument enhances reliability of the mid-loop operation. A temporary mid-loop water level sensor that measures the RCS water level with reference to pressure at the reactor vessel head vent line and cross over leg is installed in addition to these permanent water level sensors to cope with surge line flooding events.	5.4.7.2.3.6 Figure 5.1-2
4. When the RCS is mid-loop operation with the closed state, the reflux cooling with the SGs is effective.	19.1.6 19.2.5 13.5.2
5. Various equipments will be possible temporary in the containment during LPSD operation for maintenance. However, there are few possibilities that these materials fall into the sump because the debris interceptor is installed on the sump of US-APWR. Therefore, potential plugging of the suction strainers due to debris is excluded from the PRA modeling.	6.2.2

DCD_19.01-10 S01

Table 19.1-119R Key Insights and Assumptions (Sheet 32 of 46)

Key Insights and Assumptions	Dispositions
6. Low-pressure letdown line isolation valves are installed. One normally closed air-operated valve is installed in each of two low-pressure letdown lines that are connected to two of four RHR trains. During normal plant cooldown operation, these valves are opened to divert part of the normal RCS flow to the CVCS for purification and the RCS inventory control. These valves are automatically closed and the CVCS is isolated from the RHRS by the RCS loop low-level signal to prevent loss of RCS inventory at mid-loop operation during plant shutdown. There are no features that automate the response to loss of RHR.	5.4.7.2.2.3 5.4.7.2.3.6 7.6.1.7 19.2.5 13.5.2 TS 3.4.8 TS 3.9.6
7. The time when loss of RHR occur were set to be 12 hours after plant trip, which is the time POS 4 (mid-loop operation) is entered after plant trip, since this condition gives the most severe condition for mid-loop operation from a decay heat perspective. The pressurizer spray-line vent line with 3/4 inch diameter is assumed to be open at the initial condition. One hour after loss of RHR function, the operator is assumed to perform the following actions: - Close pressurizer spray line vent, - Start emergency feed water (EFW) pump, and - Open main steam depressurization valve. POS 8 (mid-loop operation) assumes vacuum venting equipment vents air from the RCS through the SDVs. After loss of RHR, the operator is assumed to perform the following actions. - Close valves installed in line to vacuum venting equipment such as SDVs - Start EFW pump, and - Open main steam depressurization valve.	19.2.5 13.5.2
8. Nitrogen will not be injected in the SG tubes to speed draining in the US-APWR design. The SG tubes will be filled with air during midloop operation.	19.2.5 13.5.2
9. Operator actions assumed in the PRA will be considered in the shutdown response guideline, which will be developed satisfying NUMRAC 91-06 and following other recent guidelines such as INPO 06-008.	19.2.5 13.5.2
10. Cleanliness, housekeeping and foreign material exclusion areas are administrative controls and programs to be developed by any applicant referencing the certified US-APWR design for construction and operation	6.2 Table 6.2.2-2 19.2.5 13.5.2

COL 19.3(6)

DCD_19.01-5

CP COL 19.3(6)

Table 19.1-119R Key Insights and Assumptions (Sheet 33 of 46)

Key Insights and Assumptions	Dispositions
11. The reactivity insertion event due to boron dilution has been judged to be insignificant to risk because of the following factors: - Strict administrative controls are in place to prevent boron dilution - Boron dilution events are highly recoverable - The CVCS design inherently limits te maximum boron duration rate. - The consequences of re-criticality are minor unless they continue for very long.	15.4.6.2 19.2.5 13.5.2
12. Administrative controls ensure the RCS water level, temperature and pressure indication are available during shutdown.	19.2.5 13.5.2
13. Pressurizer safety valves are removed to prevent the damage of SG nozzle dams caused by loss of RHR while SG nozzle dams and the reactor vessel head are placed.	5.4.7.2.3.6
14. Maintenance rule process is implemented to evaluate the risk of configurations being entered during shutdown. These practices assure that removing a number of related systems from service at the same time is carefully considered and virtually never done when the conditional risk impacts are high.	17.6
15. The SG nozzle dam installation level for the US-APWR is higher than in most conventional operating plants. The installation and removal of SG nozzle dams are done when the RCS water level is above the top of the main coolant piping (MCP).	5.4.7.2.3.6
16. The de-tensioning and tensioning of RV head stud bolts are performed at an RCS water level between the flange and the top of the MCP.	5.4.7.2.3.6
17. The installation and removal of the in-core instrumentation system (ICIS) is not done at mid-loop operation but is done when the RCS water level is above the top of the MCP.	5.4.7.2.3.6
18. Loss of SFP cooling is also progress the phenomena and has sufficient time to recovery because of large coolant inventory in the pool.	

DCD_19-496

CP COL 19.3(6)

Table 19.1-119R Key Insights and Assumptions (Sheet 34 of 46)

Key Insights and Assumptions	Dispositions
19. Surge line flooding may occur if decay heat removal function is lost during plant operating states where the pressurizer manway is the only vapor release pass from the RCS. Water held up in the pressurizer can erroneous readings of water level indicators measured with reference to the pressurizer. This phenomenon can also prevent gravity injection from the SFP. Measures to prevent accident evolution caused by surge line flooding are important. Adoption of both measures listed below can reduce risk from surge line flooding event. - Installation of an temporary RCP water level sensor that measure the MCP water level with reference to pressure at the reactor vessel head vent line and cross over leg when the RCS is vented at a high elevation. - Operational procedures to perform continuous RCS injections when loss of RHR occurs under conditions where the pressurizer manway is the only vapor release pass from the RCS. The temporary water level will satisfy the following specifications. - Water level can be read outside the containment vessel (CV) in order to be effective during events which involve harsh environment in the CV - Tygon tubing monometer will not be used - Instrumentation piping diameter will be sufficient enough to prevent delay in response	5.4.7.2.3.6 19.2.5 13.5.2
20. Two types of instruments are provided in US-APWR design to measure the temperature representative of the core exit whenever the reactor vessel head is located on top of the reactor vessel. The first one is core exit thermocouples located inside the RV. The second is resistance temperature detectors in the reactor coolant hot leg. These two independent instruments will be available whenever the RCS is in a mid-loop condition and the reactor vessel head is located on top of the reactor vessel.	5.4.7.2.3.6
21. Administrative controls to ensure the availability of a train of the SIS and associated water source (i.e., the RWSP) as an RCS make up function during cold shutdown and during refueling with water level <23 ft above the top of reactor vessel flange.	13.5.2

DCD_19-494

CP COL 19.3(6)

Table 19.1-119R Key Insights and Assumptions (Sheet 36 of 46)

Key Insights and Assumptions	Dispositions
7. Implement procedures and administrative controls that reasonably assure that all hot legs are not blocked simultaneously by nozzle dams unless a vent path is provided that is large enough to prevent pressurization of the upper plenum of the RV. ~~Pressurizer~~At least three pressurizer safety valves are removed to prevent the damage of SG nozzle dams caused by loss of RHR function while SG nozzle dams and reactor vessel head are placed. ~~Removal~~In order to reduce the possibility of rapid loss of RCS inventory or core uncovery, removal of the pressurizer safety valves is done during the period between removal of the SG manyays on cold leg side and installation of the SG nozzle dams on hot leg side. Installation of the pressurizer safety valves is performed during a period between removal of the SG nozzle dams on hot leg side and installation of SG manways on cold leg side.	5.4.7.2.3.6 13.5.2

DCD_19-506

DCD_19-493

DCD_19-493

CP COL 19.3(6)

Table 19.1-119R Key Insights and Assumptions (Sheet 40 of 46)

Key Insights and Assumptions	Dispositions
Internal fire assumption	
1. All fire doors serving as fire barriers between redundant safety train fire compartments are normally closed.	9.5.1
2. For transient combustibles, “three Airline trash bags” has been assumed in each fire compartment.	9.5.1
3. Transient combustibles with total heat release capacity of 93,000 Btu (obtained from NUREG/CR-6850, “AppendixG-table-7LBL-Von Volkinburg, Rubbish Bag” Test results) is assumed for Fire ignition source within Containment Vessel.	9.5.1
4. The Heat Release Rate of various items as specified in Chapter-11 of NUREG/CR-6850 is used.	9.5.1
5. Damage temperature of thermoplastic cables as shown in Appendix-H of NUREG/CR-6850 is used as the target damage temperature.	9.5.1
6. ~~Operators are well trained in responding to fire event.~~Human error probabilities of post-fire operator actions are assumed as follows. - No credit has been taken for the operator actions of any equipment in the fire compartment affected by fire. - The Fire Brigade is provided to meet the requirements of Regulatory Guide 1.189. Higher stress levels of human actions post-fire are not assumed. - The HEP for operations at the remote shutdown console is assumed as 0.1.	9.5.1
7. One of RCS letdown isolation valves and one of RCS vent line isolation valves are locked close by administrative controls	13.5.2
8. Each yard transformer is separated by a fire barrier.	~~19.1.5.2.1~~8.3.1.18

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CP COL 19.3(6)

Table 19.1-119R Key Insights and Assumptions (Sheet 41 of 46)

Key Insights and Assumptions	Dispositions
9. Stress levels following post-fire safe shutdown do not become higher following a fire for the following reasons: - The communication system will remain active during a fire due to the redundant nature of the plant communication systems which are installed with a minimum of two verbal communication paths between all plant locations. - The lighting system will remain operable during a fire because the emergency lighting system has a redundant power source for each fire area. - Heat and smoke propagation to adjacent fire compartments are assumed to be extremely low due to the installation of the fire dampers installed in series within each HVAC duct passing through the fire compartment, therefore it is reasonable to ignore the stress increase due to their heat and smoke.	9.5.2 9.5.3
10. It has been assumed that a “Challenging fire” for MCR shown in Table C-4 of appendix C of NUREG/CR-6850 causes an adverse operational environment in the MCR. Therefore, it has been assumed that a MCR “Challenging fire” may force the operators to abandon MCR and evacuate to the RSC room.	9A.2.7.2

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19.3 OPEN, CONFIRMATORY, AND COL ACTION ITEMS IDENTIFIED AS UNRESOLVED

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

19.3.3 Resolution of COL Action Items

Replace the content of DCD Subsection 19.3.3 with the following.

CP COL 19.3(1) ***19.3(1)*** *Update of PRA and SA evaluation for input to RMTS and peer review*

This COL item is addressed in Subsection 19.1.7.6.

19.3(2) *Deleted from the DCD.*

19.3(3) *Deleted from the DCD.*

CP COL 19.3(4)
STD COL 19.3(4) ***19.3(4)*** *Update of PRA and SA evaluation based on site-specific information*

This COL item is addressed in Subsections 19.1.1.2.1, 19.1.4.1.2, 19.1.4.2.2, 19.1.5, 19.1.5.2.2, 19.1.5.3.2, 19.1.6.2, 19.1.7.1, 19.2.6.1, 19.2.6.1.1, 19.2.6.2, 19.2.6.4, 19.2.6.5 and 19.2.6.6, Tables 19.1-201, 19.1-202, 19.1-203, 19.1-204, 19.1-205, 19.1-206 and 19.2-9R, and Figures 19.1-201 and 19.1-2R.

CP COL 19.3(5) ***19.3(5)*** ~~*Deleted from the DCD.*~~*SSC fragilities* RCOL2_19-8 S01 CTS-01456

This COL item is addressed in Subsections 19.1.5.1.1, 19.1.5.1.2 and Table 19.1-206.

STD COL 19.3(6)
CP COL 19.3(6) ***19.3(6)*** *Accident management program*

This COL item is addressed in Subsections 19.2.5 and Table 19.1-119R.

STD COL 19.3(7) ***19.3(7)*** *Equipment survivability assessment* DCD_11.02.06-45

This COL item is addressed in Subsection 19.2.3.3.7.

CP COL 19.3(8) ***19.3(8)*** *Licensee programs and risk-informed applications* DCD_19-564

This COL item is addressed in Subsections 19.1.1.4.1, and 19.1.1.4.2.

CP COL 19.3(9) ***19.3(9)*** *PRA Maintenance and upgrade programs*

This COL item is addressed in Subsection 19.1.2.4.