

ESBWR DCD Tier 2 Chapter 2

26A6642AH Revision 4 to Revision 5 Change List

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change															
1	Acronyms	Deleted Acronyms and Abbreviations list. It is replaced by a global list elsewhere in the DCD.															
2	Generic	Editorial. Changed "Fire Water" to "Firewater" throughout chapter for consistency with Global Acronym List.															
3	S2.0, Paragraph 4	Deleted first sentence. Changed last sentence to read "All site parameters specified in Tier 1 have the same values as those presented in this chapter." (per response to RAI 2.3-12)															
4	S2.0, Paragraph 5	Editorial. Changed "the DCD Tier 2" to "this document".															
5	S2.0, Next to last paragraph	Added new sentence to end of paragraph as follows: "Appendix 2A provides ARCON96 source/receptor inputs for use by COL applicants in the confirmation of site-specific X/Q values." (per response to RAI 2.3-9 S01)															
6	S2.0.1	Editorial. Deleted "Unit-Specific" from section title.															
7	S2.0.2, Reference 1	Changed from "Revision 1, September 2006" to "Revision 3, May 2008".															
8	Table 2.0-1, Ambient Design Temperature	Changed "Exceedance Values" to "Annual Exceedance Values" for 1% and 2% exceedances. Changed "wet bulb (coincident)" to "wet bulb (mean coincident)" for all three exceedance levels. (per response to RAI 2.3-3 S02)															
9	Table 2.0-1 Title	Editorial. Deleted "Design" from title on third through fifth pages of table for consistency with title on first two pages.															
10	Table 2.0-1, Meteorological Dispersion	Under Control Room X/Q heading, deleted "– Diffuse Source" from Reactor Building and Fuel Building sub-headings. (per response to RAI 2.3-9 S01)															
11	Table 2.0-1, Meteorological Dispersion	Under Control Room X/Q heading, added the following new listing (per response to RAI 2.3-9 S01): Blowout Panels / Reactor Building Roof <table data-bbox="771 1648 1404 1816"> <tr> <td>0-2 hours:</td> <td>7.00E-03 s/m³</td> <td>5.90E-03 s/m³</td> </tr> <tr> <td>2-8 hours:</td> <td>5.00E-03 s/m³</td> <td>4.70E-03 s/m³</td> </tr> <tr> <td>8-24 hours:</td> <td>2.10E-03 s/m³</td> <td>1.50E-03 s/m³</td> </tr> <tr> <td>1-4 days:</td> <td>1.70E-03 s/m³</td> <td>1.10E-03 s/m³</td> </tr> <tr> <td>4-30 days:</td> <td>1.50E-03 s/m³</td> <td>1.00E-03 s/m³</td> </tr> </table>	0-2 hours:	7.00E-03 s/m ³	5.90E-03 s/m ³	2-8 hours:	5.00E-03 s/m ³	4.70E-03 s/m ³	8-24 hours:	2.10E-03 s/m ³	1.50E-03 s/m ³	1-4 days:	1.70E-03 s/m ³	1.10E-03 s/m ³	4-30 days:	1.50E-03 s/m ³	1.00E-03 s/m ³
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12	Table 2.0-1, Meteorological Dispersion	Deleted note ** and all references to it. (per response to RAI 2.3-9 S01)																																													
13	Table 2.0-1, Meteorological Dispersion	Under Control Room X/Q heading, changed Fuel Building values to read as follows (per response to RAI 2.3-9 S01): <table> <tr> <td>0-2 hours:</td><td>2.80E-03 s/m³</td><td>2.80E-03 s/m³</td></tr> <tr> <td>2-8 hours:</td><td>2.50E-03 s/m³</td><td>2.50E-03 s/m³</td></tr> <tr> <td>8-24 hours:</td><td>1.25E-03 s/m³</td><td>1.25E-03 s/m³</td></tr> <tr> <td>1-4 days:</td><td>1.10E-03 s/m³</td><td>1.10E-03 s/m³</td></tr> <tr> <td>4-30 days:</td><td>1.00E-03 s/m³</td><td>1.00E-03 s/m³</td></tr> </table>	0-2 hours:	2.80E-03 s/m ³	2.80E-03 s/m ³	2-8 hours:	2.50E-03 s/m ³	2.50E-03 s/m ³	8-24 hours:	1.25E-03 s/m ³	1.25E-03 s/m ³	1-4 days:	1.10E-03 s/m ³	1.10E-03 s/m ³	4-30 days:	1.00E-03 s/m ³	1.00E-03 s/m ³																														
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14	Table 2.0-1, Meteorological Dispersion	Under Control Room X/Q heading, deleted Fuel Building Cask Doors information. (per response to RAI 2.3-9 S01)																																													
15	Table 2.0-1, Meteorological Dispersion	Under Control Room X/Q heading, deleted Radwaste Building information and note for "NA". This information is no longer used in any radiological analysis.																																													
16	Table 2.0-1, Meteorological Dispersion	Added new section for Technical Support Center X/Q as follows (per response to RAI 2.3-9 S01): Technical Support Center X/Q:* Reactor Building <table> <tr> <td>0-2 hours:</td><td>1.00E-03 s/m³</td><td>1.00E-03 s/m³</td></tr> <tr> <td>2-8 hours:</td><td>6.00E-04 s/m³</td><td>6.00E-04 s/m³</td></tr> <tr> <td>8-24 hours:</td><td>3.00E-04 s/m³</td><td>3.00E-04 s/m³</td></tr> <tr> <td>1-4 days:</td><td>2.00E-04 s/m³</td><td>2.00E-04 s/m³</td></tr> <tr> <td>4-30 days:</td><td>1.00E-04 s/m³</td><td>1.00E-04 s/m³</td></tr> </table> Turbine Building <table> <tr> <td>0-2 hours:</td><td>2.00E-03 s/m³</td><td>2.00E-03 s/m³</td></tr> <tr> <td>2-8 hours:</td><td>1.50E-03 s/m³</td><td>1.50E-03 s/m³</td></tr> <tr> <td>8-24 hours:</td><td>8.00E-04 s/m³</td><td>8.00E-04 s/m³</td></tr> <tr> <td>1-4 days:</td><td>6.00E-04 s/m³</td><td>6.00E-04 s/m³</td></tr> <tr> <td>4-30 days:</td><td>5.00E-04 s/m³</td><td>5.00E-04 s/m³</td></tr> </table> Passive Containment Cooling System / Reactor Building Roof <table> <tr> <td>0-2 hours:</td><td>2.00E-03 s/m³</td><td>2.00E-03 s/m³</td></tr> <tr> <td>2-8 hours:</td><td>1.10E-03 s/m³</td><td>1.10E-03 s/m³</td></tr> <tr> <td>8-24 hours:</td><td>5.00E-04 s/m³</td><td>5.00E-04 s/m³</td></tr> <tr> <td>1-4 days:</td><td>4.00E-04 s/m³</td><td>4.00E-04 s/m³</td></tr> <tr> <td>4-30 days:</td><td>3.00E-04 s/m³</td><td>3.00E-04 s/m³</td></tr> </table>	0-2 hours:	1.00E-03 s/m ³	1.00E-03 s/m ³	2-8 hours:	6.00E-04 s/m ³	6.00E-04 s/m ³	8-24 hours:	3.00E-04 s/m ³	3.00E-04 s/m ³	1-4 days:	2.00E-04 s/m ³	2.00E-04 s/m ³	4-30 days:	1.00E-04 s/m ³	1.00E-04 s/m ³	0-2 hours:	2.00E-03 s/m ³	2.00E-03 s/m ³	2-8 hours:	1.50E-03 s/m ³	1.50E-03 s/m ³	8-24 hours:	8.00E-04 s/m ³	8.00E-04 s/m ³	1-4 days:	6.00E-04 s/m ³	6.00E-04 s/m ³	4-30 days:	5.00E-04 s/m ³	5.00E-04 s/m ³	0-2 hours:	2.00E-03 s/m ³	2.00E-03 s/m ³	2-8 hours:	1.10E-03 s/m ³	1.10E-03 s/m ³	8-24 hours:	5.00E-04 s/m ³	5.00E-04 s/m ³	1-4 days:	4.00E-04 s/m ³	4.00E-04 s/m ³	4-30 days:	3.00E-04 s/m ³	3.00E-04 s/m ³
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17	Table 2.0-1, Long-Term Dispersion Estimates	Revised values to read as follows: X/Q: <table><tr><td>Reactor/Fuel Building Ventilation Stack</td><td>3.0E-07 s/m³</td></tr><tr><td>Turbine Building Ventilation Stack</td><td>2.0E-07 s/m³</td></tr><tr><td>Radwaste Building Ventilation Stack</td><td>2.0E-05 s/m³</td></tr></table> D/Q: <table><tr><td>Reactor/Fuel Building Ventilation Stack</td><td>1.0E-08 m⁻²</td></tr><tr><td>Turbine Building Ventilation Stack</td><td>6.0E-09 m⁻²</td></tr><tr><td>Radwaste Building Ventilation Stack</td><td>3.0E-08 m⁻²</td></tr></table> (for consistency with DCD Tier 2 Table 12.2-15 and RAI 12.2-25 Rev 1)	Reactor/Fuel Building Ventilation Stack	3.0E-07 s/m ³	Turbine Building Ventilation Stack	2.0E-07 s/m ³	Radwaste Building Ventilation Stack	2.0E-05 s/m ³	Reactor/Fuel Building Ventilation Stack	1.0E-08 m ⁻²	Turbine Building Ventilation Stack	6.0E-09 m ⁻²	Radwaste Building Ventilation Stack	3.0E-08 m ⁻²
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Turbine Building Ventilation Stack	6.0E-09 m ⁻²													
Radwaste Building Ventilation Stack	3.0E-08 m ⁻²													
18	Table 2.0-1, Note (1)	Added the following to the end of the note: "for all parameters except as follows: (1) Tornado: Winds Speeds, Radius, Pressure Drop, and Rate of Pressure Drop; (2) Seismology: Horizontal and Vertical Ground Spectra: See Figures 2.0-1 and 2.0-2". (per response to RAI 3.3-3 S02)												
19	Table 2.0-1, Note (5)	Added "an average depth of" to second sentence of note. (per response to RAI 2.3-4 S03)												
20	Table 2.0-1, Note (6)	Editorial clarification about basis for 0% exceedance values. Added the following sentence to the middle of the note: "Consistent with Reference 2.0-4, they represent historical limits excluding peaks of less than two hours."												
21	Table 2.0-1, Note (6)	Changed "One and two percent exceedance ..." to "One and two percent annual exceedance ..." (per RAI 2.3-3 S02)												
22	Table 2.0-1, Note (12)	Revised first sentence of note to read as follows due to replacement of plant stack with separate building stacks: "If a selected site has X/Q values that exceed the ESBWR reference site values, the release concentrations in Table 12.2-17 would be adjusted proportionate to the change in X/Q values using the stack release information in Table 12.2-16."												

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23	Table 2.0-1, Note (16)	Added new note (16) as follows to provide additional clarification for sites not meeting the soil properties requirement: "(16) For sites not meeting the soil property requirements, a site specific analysis is required."
24	Table 2.0-2, Subsection 2.3.1	Added "COL applicant to supply site-specific information in accordance with SRP 2.3.1." to COL Information column. (per response to RAI 2.3-13)
25	Table 2.0-2, Subsection 2.4.4	Deleted "seismically induced" in second and third columns for consistency with SRP title. (per response to RAI 2.4-33)
26	Table 2.0-2, Subsection 2.5.4	Inserted ": (1)" in front of "localized" and added "and (2) settlement and differential settlements" to end of COL information statement. (per response to RAI 3.8-116)
27	Appendix 2A	New appendix added per response to RAI 2.3-9 S01.
28	Appendix 2A	Some information in Appendix 2A was revised based on design changes made to location of Turbine Building truck doors and changes to the vent stacks. See separate table that follows for details of changes.

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NOTE:

Appendix 2A was originally provided in response to RAI 2.3-9 Supplement 1. After that RAI response was submitted to NRC, design changes were made to the location of the Turbine Building truck doors and changes were made to the vent stacks. These changes impact the information that was provided in response to RAI 2.3-9 S01. Changes relative to the submitted RAI response are summarized in the table below.

Post-RAI 2.3-9 S01 Changes to Appendix 2A

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1	S2A.2.3	Added following to end of first paragraph: "The values provided in Table 2A-4 are the ARCON96 inputs for directions from the receptors to the sources in degrees from ESBWR Plant North. During the confirmation of X/Q values, these directions must be adjusted by the difference in angle between ESBWR Plant North and the "Site North" associated with any given site-specific meteorological data set."
2	S2A.2.3, Release Height	Added "center of the" to last sentence.
3	S2A.2.3, Building Area	Deleted second sentence.
4	S2A.2.3, Total Height	Deleted second sentence (no longer applies to table). Replaced " σ_Y and σ_Z " with "the initial vertical plume spread parameter (σ_{Y0})".
5	S2A.2.3, Direction (degrees from plant North)	Deleted in its entirety.
6	S2A.2.4	Changed "provided in Table 2A-3" to "listed in Tables 2A-3 and 2A-4". Changed "Table 2A-1" to "Table 2A-3".

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Post-RAI 2.3-9 S01 Changes to Appendix 2A

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
7	S2A.2.5	Revised section to read as follows: "The COL applicant shall confirm that during refueling none of the doors or personnel air locks on the East sides of the Reactor Building or Fuel Building could act as a point source that could result in control room X/Q values that are higher than the ESBWR X/Q values for a release in the Reactor Building. If the X/Q values for a release from any door on the East sides of the Reactor Building or Fuel Building are not bounded by the ESBWR X/Q values for a release in the Reactor Building, the doors must be administratively controlled prior to movement of irradiated fuel bundles, and during movement of irradiated fuel bundles. The administrative controls must be such that the doors and personnel air locks on the East sides of the Reactor Building or Fuel Building are promptly closed under conditions indicative of a fuel handling accident. (Section 2A.3, Item 2A.2-2-A)"
8	S2A.3, Item 2A.2-1-A	Changed "provided in Table 2A-3" to "listed in Tables 2A-3 and 2A-4".
9	S2A.3, Item 2A.2-2-A	Revised item to read as follows: "If the X/Q values for a release from any door on the East sides of the Reactor Building or Fuel Building are not bounded by the ESBWR X/Q values for a release in the Reactor Building, the doors must be administratively controlled prior to movement of irradiated fuel bundles, and during movement of irradiated fuel bundles. The administrative controls must be such that the doors and personnel air locks on the East sides of the Reactor Building or Fuel Building are promptly closed under conditions indicative of a fuel handling accident. (Subsection 2A.2.5)"
10	Table 2A-1	Changed "Bounding" to "On-Site" in table title. For "Wind Speed Units Flag", deleted "if meteorological data is in m/s" and changed "Value" from "1" to "Varies with input".

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Post-RAI 2.3-9 S01 Changes to Appendix 2A

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11	Table 2A-2	Added "on the West face of the Control Building" to the description of "Control Building Louvers" and changed their Designation from "CB Louvers" to "CBL". Deleted "Normal and" from descriptions for Designations "EN" and "ES".
12	Table 2A-3	Changed "Bounding" to "On-Site" in table title. Changed " σ_Y " to " σ_{Y0} " and " σ_z " to " σ_{z0} " in column headings. Relocated information from last column to new Table 2A-4. Changed "CB Louvers" to "CBL" throughout table.
13	Table 2A-3, TB-TD to CBL	Changed Distance from 152 to 156. Changed Release Height from 1.0 to 3.6.
14	Table 2A-3, TB-TD to EN	Changed Distance from 155 to 159. Changed Release Height from 1.0 to 3.6.
15	Table 2A-3, TB-TD to TSCW	Changed Distance from 72 to 66. Changed Release Height from 1.0 to 3.6.
16	Table 2A-3, RB-VS items	Changed Release Height from 54.3 to 52.6 for "RB-VS to CBL", "RB-VS to ES" and "RB-VS to N".
17	Table 2A-3, TB-VS items	Changed Release Height from 55.4 to 71.3 for "TB-VS to CBL", "TB-VS to EN" and "TB-VS to N".
18	Table 2A-3, Notes	Deleted "and σ_{z0} " from note [1]
19	Table 2A-4	Added new Table 2A-4 with direction information that was previously in the last column of Table 2A-3.
20	Figure 2A-1	Revised figure and its legend to move location of TB-TD from West side near the North end to North side near the West end. Changed direction arrow to read "ESBWR Plant North"
21	Figure 2A-1, Legend	Revised figure legend for CBL to read: "Control Building Louvers on the West face of the Control Building"
22	Figure 2A-1, Legend	Revised figure legend for TB-TD to change "West side ... near the North end" to "North side ... near the West end".