Chapter 6 Changes From Revision 3 to Revision 4

Item	Location	Description of Change
1.	Chapter 6	Made editorial changes in numerous locations to remove excessive spacing, correct punctuation, delete repeated words, correct misspelling, and correct grammar. Spelled out acronyms where appropriate. Changed GE to GEH where appropriate.
2.	S6.0	Removed part (3)a and renumbered part (3)b. Editorial change due to deletion of (3)a text in DCD Rev. 3.
3.	S6.0	Revised nomenclature to be consistent with DCD Tier 2 Section 6.4 as an editorial change.
4.	S6.1.1	Minor editorial changes exist through out Section 6.1 of DCD Tier 2 Rev. 4 that are not explicitly referenced in this Change List.
5.	S6.1.1	Removed reference to Quality Assurance Criteria for Nuclear Power Plants and Fuel Processing Plants in item (7) as an editorial change.
6.	S6.1.1.1	Added “including PCCS" to provide complete definition of Table 6.1-1 contents.
7.	S6.1.1.1.3, 1st sent.	Added "including cleaning in accordance with Regulatory Guide 1.37" after "steel" to be consistent with DCD Tier 2 Subsection 5.2.3.
8.	S6.1.1.4, 2nd para, 4th sent.	Provided additional information on water purity control as an editorial change for clarification.
9.	S6.1.2.1, 2nd para., 1st sent.	Corrected “ANSI" to "ASTM". Change in response to RAI 6.1-16.
10.	S6.1.2.1, 2nd para., last sent.	Added statement on applicable reference standards including ASTM D 5144, and removed reference to Subsection 6.1.3 for COL items. Change in response to RAI 6.1-16.
11.	S6.1.2.2	Removed reference to Subsection 6.1.3 for COL items. Change in response to RAI 6.1-16.
12.	S6.1.3.1, all bullets	Restated COL Holder commitments. Change in response to RAI 6.1-16.
13.	T6.1-1	Technical change in response to RAI 6.1-2S01.

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Item	Location	Description of Change
14.	S 6.2.1.1.3.2	Last paragraph, last sentence, changed "calculated peak drywell pressure" to "calculated maximum drywell pressure during the 72 hours following a LOCA"; change in response to RAI 6.2-177.
15.	S6.2	All paragraphs, tables, and figures: Clarified terminology used to describe valves used in ADS function. Changed "ADS-SRV" to "SRV".
16.	S6.2.1.1, 1st para	Deleted "Draft Rev 6" from reference to SRP 6.2.1.1.C. Applicable revision of SRP is given in Table 1.9-20.
17.	S6.2.1.1.2, 3rd para.	Refueling bellows description added in response to RAI 16.2-77.
18.	S6.2.1.1.2, 18th para.	In last sentence replaced "Figure 6.2-4" with "Figure 5.2-3". Figure 6.2-4 is deleted from Section 6.2.
19.	S6.2.1.1.3, 2nd para.	Added reference to NEDO-33338 that discusses limiting breaks for operation with feedwater temperature maneuvering.
20.	S6.2.1.1.3.1	Second paragraph, last sentence, added "Appendix 6B provides the justification for the use of the DCD nodalization (similar to that in Reference 6.2-1, as outlined in the first row of Table 6A-1), including the results of the tie-back calculations between these nodalizations. The combined nodalization that integrates the responses between the containment and the reactor vessel is used for both the containment analyses (Subsection 6.2.1.1.3) and the ECCS analyses (Subsection 6.3.3). The impact of containment back pressure on the ECCS performance has been evaluated and the results show that the minimum chimney collapsed level is not sensitive for a wide range of change in the containment back pressure. Appendix 6C summarizes the details of this evaluation. " These additions are in response to RAI 6.2-52S01 and RAI 6.2-144S01 which will be submitted at a later date.
21.	S6.2.1.1.3.1	Last paragraph, last sentence, changed "calculated peak drywell pressure" to "calculated maximum drywell pressure during the 72 hours following a LOCA". Change in response to RAI 6.2-177.

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Item	Location	Description of Change
22.	S6.2.1.1.3.3	Last paragraph, last sentence, changed "calculated peak drywell pressures" to "calculated maximum drywell pressures during the 72 hours following a LOCA". Change in response to RAI 6.2-177.
23.	S6.2.1.1.3.4	Last paragraph, last sentence, changed "peak drywell pressure" to "calculated maximum drywell pressure during the 72 hours following a LOCA". Change in response to RAI 6.2-177.
24.	S6.2.1.1.3.5	Last paragraph, last sentence, changed "peak drywell pressure" to "calculated maximum drywell pressure during the 72 hours following a LOCA". Change in response to RAI 6.2-177.
25.	S6.2.1.1.4, 2nd para	Additional information added in response to RAI 6.2-150 S01.
26.	S6.2.1.1.5.3.1, 2nd para	Deleted "There is no technical merit in changing ESBWR design to provide wetwell sprays." Statement does not provide additional information to paragraph.
27.	S6.2.1.1.5.3.2, 1st para	Changed "Therefore, this requirement for monthly testing is deemed unnecessary for the ESBWR. However, the vacuum breakers will be tested for free movement and leakage during each outage." to "Therefore, monthly testing is not performed for these vacuum breakers. However, the vacuum breakers are tested for free movement and leakage during each outage." Clarified testing for vacuum breakers.
28.	S6.2.1.1.10.2, Item 7	Change in response to RAI 6.2-152.
29.	S6.2.1.2, 5th Sub-bullet of 2nd Bullet	Reworded paragraph not to make reference to construction stage, since this is not a COL item.
30.	S6.2.1.2.3, 1st para	Changed "Steady Mass and Energy releases from the…" to "Mass and Energy releases from the…" Clarified statement.
31.	S6.2.2, 3rd Sub-bullet of 1st Bullet	Changed "safety-grade" to "safety-related" to be consistent in use of terminology describing safety-related.
32.	S6.2.2, 3rd Sub-bullet of 1st Bullet	Changed "onsite power" to "offsite power" to correspond with GDC 38.

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Item	Location	Description of Change
33.	S6.2.2.1, 1st para.	Changed "with the Isolation Condenser/Passive Containment Cooling (IC/PCC) pool inventory not being replenished." to "without makeup to the Isolation Condenser/Passive Containment Cooling (IC/PCC) pools, dryer/separator pool, and reactor well pool inventory not being replenished." Changed to describe the all sources for PCC and IC cooling and emphasize no makeup within 72 hours post LOCA.
34.	S6.2.2.1, 4th para., 2nd bullet	Changed "101°C (214°F)" to "102°C (216°F)" to correspond with Table 6.2-10, Passive Containment Cooling Design Parameters.
35.	S6.2.2.2.2, 13th para.	Changed "101°C (214°F)" to "102°C (216°F)" to correspond with Table 6.2-10, Passive Containment Cooling Design Parameters.
36.	S6.2.3.3, 2nd para thru 5th para.	Additional information provided in response to RAIs 6.2-46S01 and 6.2-153.
37.	S6.2.4	Additional information provided in response to RAI 6.2-131.
38.	S6.2.4.1	Additional information added in response to RAI 3.9-166.
39.	S6.2.4.2, 7th para.	Added 7th paragraph information in response to RAI 6.2-131.
40.	S6.2.4.3.1.1, 2nd para.	Changed "Additionally, two valves with automatic power-actuated closure, including the outboard containment isolation valve, automatic power-actuated closure, including the outboard containment isolation valve." to "Additionally, two valves with automatic power-actuated closure, including the outboard containment isolation valve, isolate the line in the event of an inboard feedwater pipe rupture (feedwater LOCA)." to clarify statement.
41.	S6.2.4.3.1.2, 6th para	Updated containment isolation valve information for Reactor Water Cleanup System /Shutdown Cooling System". Deleted duplicate statement and completed statement with intended meaning.
42.	S6.2.4.3.2.4	Change in response to RAI 6.2-129.
43.	S6.2.4.4	Additional information provided in response to RAI 6.2-130.

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Item	Location	Description of Change
44.	S6.2.5.1, 4th and 5th para.	Paragraphs added to describe passive autocatalytic recombiners (PARs).
45.	S6.2.5.2	Paragraphs 1, 3, 4, 5, and 6, 1st Sentence, deleted in response to RAI 9.4-7.
46.	S6.2.5.2.1	Additional information added in response to RAI 9.4-7.
47.	S6.2.5.2.2	Additional information added in response to RAI 9.4-7.
48.	S6.2.5.2.3	Additional information added in response to RAI 9.4-7.
49.	S6.2.5.2.4	Additional information added in response to RAI 9.4-7.
50.	S6.2.5.2.5	Additional information added in response to RAI 9.4-7.
51.	S6.2.5.2.6	Additional information added in response to RAI 9.4-7.
52.	S6.2.5.3.1, 1st para.	Deleted "inoperative" from "inoperative alarm" for clarification.
53.	S6.2.5.3.2, 1st para.	Deleted "inoperative" from "inoperative alarm" for clarification.
54.	S6.2.5.3.3, 1st para.	Deleted "inoperative" from "inoperative alarm" for clarification.
55.	S6.2.5.4.2	Section moved to Chapter 19 Appendix B in response to RAIs 19.2-39S01, 19.2-40S01, 19.2-48S02, 6.2-96S02, 19.2-41S01, 19.2-44S01, 19.2-45S01, 19.2-46S01, and 6.2-95S01.
56.	S6.2.6.1.2, 3rd para.	Information deleted and added per RAIs 6.2-84 and 6.2-85.
57.	S6.2.6.1.2, 5th para.	Additional information provided in response to RAIs 6.2-85S01 and 6.2-76 S01.
58.	S6.2.6.5	Deleted paragraphs. Test is now covered under Technical Specifications SR 3.6.1.1.3.
59.	S6.2.9, Reference 6.2-6	Deleted reference 6.2-6. It is not specifically referenced in Section 6.2, but Chapter 19 is referenced within the text of 6.2.
60.	S6.2.9, Reference 6.2-7	Last paragraph, added new reference 6.2-7 "GE-Hitachi Nuclear Energy, "ESBWR Feedwater Temperature Operating Domain Transient and Accident Analysis", NEDO-33338, scheduled September 2007."; Feedwater temperature maneuvering

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61.	T6.2-3	Technical change in response to RAI 6.2-153 and RAI 16.2-94S01.
62.	T6.2-5	First Row, changed "Peak DW Pressure" to "Maximum DW Pressure*", per RAI 6.2-177.
63.	T6.2-5	First Row, changed "Margin" to "Margin**", per RAI 6.2-177.
64.	T6.2-5	Footnote, added "* Maximum DW pressure calculated during the 72 hours following a LOCA", per RAI 6.2-177.
65.	T6.2-5	Footnote, added "** Minimum pressure margin calculated during the 72 hours following a LOCA", per RAI 6.2-177.
66.	T6.2-5	Rows 2 to 6, values updated per the revised calculations.
67.	T6.2-5	Row 3, Column 3, changed "1 SRV" to "1 DPV"; updated per the revised calculations.
68.	T6.2-5	Row 6, Column 3, changed "1 SRV" to "1 DPV"; updated per the revised calculations.
69.	T6.2-7	Title, changed "One SRV" to "One DPV"; updated per the revised calculations.
70.	T6.2-7 through 6.2-7e	Values updated per the revised calculations.
71.	T6.2-7d	Title, changed "One SRV" to "One DPV"; updated per the revised calculations.
72.	T6.2-12	Table added in response to RAI 6.2-46 S01.
73.	T6.2-12a	Technical change in response to RAI 6.2-46 S01.
74.	T6.2-12c	Table added in response to RAI 6.2-46 S01.
75.	T6.2-13	Technical change is response to RAI 6.2-135 S01.
76.	T6.2-16 thru T6.2-42	Added "Inboard" to "Pipe Length from Cont. to Inboard/Outboard Isolation Valve" to clarify pipe lengths required.
77.	T6.2-23 thru T6.2-30	Added additional valve type information.
78.	T6.2-31	Additional information added based on RWCU/SDC break analysis.

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Item	Location	Description of Change
79.	T6.2-32a	Technical change in response to RAI 6.2-135 S01.
80.	T6.2-32b	Table added for additional technical information.
81.	T6.2-33a	Technical change in response to RAI 6.2-111 S01.
82.	T6.2-33b	Power Fail Position updated to reflect design.
83.	T6.2-34	Normal Position and Power Fail Positioin updated to reflect design.
84.	T6.2-35	Power Fail Position updated to reflect design.
85.	T6.2-39	Additional information provided in response to RAI 6.2-111 S01.
86.	T6.2-39a	Additional information provided in response to RAI 6.2-111 S01.
87.	T6.2-40	Additional information provided in response to RAI 6.2-111 S01.
88.	T6.2-46	Deleted in response to RAI 19.2-39 S01.
89.	F6.2-4	Figure moved to Figure 5.2-3.
90.	F6.2-9a1 to 6.2-14d3	Figures updated per the revised calculations.
91.	F6.2-9d1, -9d2, -9d3	Figure Caption, changed "Air Pressures" to "NC Gas Pressures", per RAI 6.2-176.
92.	F6.2-10d1, -10d2, -10d3	Figure Caption, changed "Air Pressures" to "NC Gas Pressures", per RAI 6.2-176.
93.	F6.2-11d1, -11d2, -11d3	Figure Caption, changed "Air Pressures" to "NC Gas Pressures", per RAI 6.2-176.
94.	F6.2-12d1, -12d2, -12d3	Figure Caption, changed "Air Pressures" to "NC Gas Pressures", per RAI 6.2-176.
95.	F6.2-13d1, -13d2, -13d3	Figure Caption, changed "Air Pressures" to "NC Gas Pressures", per RAI 6.2-176.
96.	F6.2-14d1, -14d2, -14d3	Figure Caption, changed "Air Pressures" to "NC Gas Pressures", per RAI 6.2-176.
97.	F6.2-15	Revised containment boundary per RAI 6.2-102 S01.

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Item	Location	Description of Change
98.	F6.2-18	Name change in response to RAI 6.2-46. Also figure changed per RWCU/SDC break analysis.
99.	F6.2-29	Figures added for additional clarification.
100.	S6.3	All paragraphs: Clarified terminology used to describe valves used in ADS function. Changed " ADS-SRV" to "SRV".
101.	S6.3, 1st para	Deleted "Draft Rev 3" from reference of SRP 6.3. Applicable revision of SRP is given in Table 1.9-20. Also Deleted GDC's 13, 20, 21, 22, 23, 24, 25, and 29 as they are not listed in the acceptance criteria for SRP 6.3.
102.	S6.3, 10th para.	Added GDCS and SLC to clarify which ECCS are initiated by squibs that provide coolant to reactor vessel during LOCA.
103.	S6.3.1.1.2, 1st para. 3rd bullet	Changed reference from Table 6.3-1 to Table 6.3-6 which is the correct table for combination of ECCS equipment.
104.	S6.3.2.7.1, 2nd para.	Clarified by deleting "penetrating the protective layer".
105.	S6.3.2.7.1, 8th para.	Clarified last sentence by changing "The equipment in each division is separated from that of the other two divisions." to "The equipment in each division is separated from that of the other three divisions."
106.	S6.3.2.7.2, 2nd para.	Additional information added in response to RAI 6.3-12S01.
107.	S6.3.2.7.2, 2nd para.	Added reference to Figure 6.3-1a which shows typical flows for GDCS.
108.	S6.3.2.7.2, 6th para. & 14th para.	Additional information added in response to RAI 6.3-41 S01, RAI 6.3-41 S02, and RAI 6.3-41 S03.
109.	S6.3.2.7.2, 9th para.	Clarified squib valves operability in LOCA environment.
110.	S6.3.2.7.2, 11th para.	Changed "thermocouples penetrating in the basemat" to "thermocouples located on the basemat".
111.	S6.3.2.7.4, 6th para.	Added more detail to the initial removal of ignitors and booster subassemblies to be consistent with DPV's in Section 5.4.13.4.

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Item	Location	Description of Change
112.	S6.3.2.8.1, 1st para., 6th bullet	Changed "Employ valves designed so a safe SSE cannot open a closed valve or cause an open valve to close" to "Employ valves designed to maintain function during a SSE (cannot open a closed valve or cause an open valve to close)". Expanded meaning of "safe" with respect to valve functioning during an SSE.
113.	S6.3.2.8.1, 1st para., 7th bullet	Changed "Be capable of opening over the full range…" to "Be capable of initiating vessel depressurization over the full range…". Made statement more specific as to the function of ADS for its depressurization function.
114.	S6.3.2.8.1, 3rd para.	Deleted last sentence of paragraph. DPVs and SRVs are discussed in Sub-sections 5.4.13 and 5.2.2. This reference is given in Sub-section 6.3.2.8.2.
115.	S6.3.2.8.2	Majority of sub-section information moved to be aligned with SRP's in Chapter 5.
116.	S6.3.2.8.2, 3rd para.	Changed "The 10-second time delay to confirm persistence requirement for the Level initiation signal ensures" to "The 10-second persistence requirement for the Level initiation signal ensures…" to "The 10-second time delay to confirm Level initiation signal ensures…". Clarified phrase "persistence requirement".
117.	S6.3.2.8.3	Majority of sub-section information moved to be aligned with SRP's in Chapter 5.
118.	S6.3.2.8.4	Information moved to be aligned with SRP's in Chapter 5, and added appropriate reference to Chapter 7 for ADS testing requirements.
119.	S6.3.2.8.5	Majority of sub-section information moved to be aligned with SRP's in Chapter 5.
120.	S6.3.3, 2nd para.	Change: "These results will be provided by the utility referencing the ESBWR design to the USNRC for information. See Subsection 6.3.5." to "For plant operation with nominal feedwater temperature, the analysis results are discussed in Subsection 6.3.3.7. For plant operation with feedwater temperature maneuvering (increase and reduction), the limiting breaks were evaluated and results are discussed in Reference 6.3-3."Analysis results are now contained within Subsection 6.3.3.7.

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Item	Location	Description of Change
121.	S6.3.3.2	Under Criterion 1, deleted "For each plant-specific application, conformance will be re-confirmed for the limiting break. "This is not applicable since core re-loading/loading goes through a separate licensing process.
122.	S6.3.3.2	Under Criterion 2, deleted "For each plant-specific application, conformance will be re-confirmed for the limiting break." This is not applicable since core re-loading/loading goes through a separate licensing process.
123.	S6.3.3.2	Under Criterion 5, changed "The water level in the vessel remains above the core for 72 hours (refer to section 6.2.1.1.3)" to "The ESBWR ECCS maintains the water level in the vessel above the core for a period of greater than 30 days following a LOCA."; in response to RAI 6.3-79.
124.	S6.3.3.2	Delete subsection references that have been previously removed.
125.	S6.3.3.5	Added SLCS and ICS to ECCS components, since they have dual functions.
126.	S6.3.3.7.3	Delete subsection references that have been previously removed.
127.	S6.3.3.7.6	First paragraph, changed "For these cases the GDCS injection line break and the bottom head drain line break were analyzed. Important variables from these analyses are shown in Table 6.3-5 and Figures 6.3-23 through 6.3-38." to "For these cases, the equalization line break, SLC injection line break, the GDCS injection line break and the bottom head drain line break were analyzed. Results show that the GDCS injection line break and the bottom drain line break bound the other small line breaks. Important variables from these two analyses are shown in Table 6.3-5 and Figures 6.3-23 through 6.3-38."; in response to RAI 6.3-46 and RAI 6.3-65.
128.	S6.3.3.7.8	Delete subsection references that have been previously removed.
129.	S6.3.3.7.8	2nd paragraph, changed "For each bundle design in a plant, conformance will be reconfirmed by the limiting break" to "For each bundle design in a plant, conformance is reconfirmed by the limiting break ".
130.	S6.3.4.1, 3rd para.	Deleted paragraph. ADS testing is discussed in sub-section 6.3.2.8.4.

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Item	Location	Description of Change
131.	S6.3.6.1	Deleted subsection heading. Content had been previously deleted in Revision 3.
132.	S6.3.6.2	Renumbered to 6.3-1-H and deleted paragraph; the requirements for surveillance are captured in the Technical Specifications.
133.	6.3.6.3	Renumbered to 6.3-2-H and deleted paragraph; initial core results are given in Section 6.3.3.
134.	S6.3.7, Reference 6.3-3	Added reference for "ESBWR Feedwater Temperature Operating Domain Transient and Accident Analysis", NEDO-33338.
135.	T6.3-1	Revised table with different analysis information provided. B.5, 9th row, 3rd column, changed "4.356 x 106" to "5.18 x 105" and "[9.61 x 106]" to "[1.14 x 104]", as a result SRV capacity changed to 144 kg/s.
136.	T6.3-1	C, 3rd row, 3rd column, changed initial minimum critical power ratio from "1.12" to 1.10", this corresponds to what is given in Table 6.3-11.
137.	T6.3-2	Revised table in response to RAI 16.2-94 and 16.2-94S01, and converted mass flow rate to volumetric flow rate.
138.	T6.3-3	Title change in response to RAI 16.2-96, and changed third column heading from "Component to be aligned" to "Description of Test".
139.	T6.3-4	Table moved to be aligned with SRP's in Chapter 5, Table 5.4-4.
140.	T6.3-5	First Row, changed "Minimum Chimney Static Head* Level Above Vessel Zero Per Active Single Failure" to "Minimum Chimney Static Head Level* with reference to Vessel Zero Per Active Single Failure", per RAI 6.3-77.
141.	T6.3-5	Footnote, changed "Chimney static head is calculated by adding the static head in the chimney to the elevation of bottom of chimney." to "Chimney static head level with reference to vessel zero is calculated by adding the equivalent height of water corresponding to the static head of the two-phase mixture inside the chimney to the elevation (7.896 m) of bottom of chimney.", per RAI 6.3-77.
142.	T6.3-5	Rows 2 to 6, values updated per the revised calculations due to SRV capacity change.

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Item	Location	Description of Change
143.	T6.3-7	Values updated per the revised calculations due to SRV capacity change.
144.	T6.3-8	Values updated per the revised calculations due to SRV capacity change.
145.	T6.3-9	Values updated per the revised calculations due to SRV capacity change.
146.	T6.3-10	Values updated per the revised calculations due to SRV capacity change.
147.	F6.3-1a	Figure added in response to RAI 6.3-4 S01.
148.	F6.3-4	Deleted figure. Refer to Figures 5.2-1 and 5.2-2 for schematics of SRVs and DPVs.
149.	F6.3-5	Figure moved to Chapter 5, Figure 5.4-5.
150.	F6.3-6 - F6.3-38b	Figures updated per the revised calculations due to SRV capacity change.
151.	F6.3-7a to 6.3-38b	Figure Caption, changed "Line Break" to "Line Break (Nominal Case)", per RAI 6.3-70.
152.	F6.3-7a to 6.3-38a	Figure "a" Caption, changed "Failure" to "Failure (2000 s)", per RAI 6.3-70.
153.	S6.4, throughout	Unless otherwise stated, all changes are due to update, clarification or correction to current design.
154.	S6.4, throughout	Revised "AHU" to "recirculation AHU" for clarity throughout section.
155.	S6.4, throughout	Deleted unnecessary reference to See Table 1.9-22 and See Table 1.9-23 throughout section.
156.	Figures 6.3-7b to 6.3-38b	Figure "b" Caption, changed "Failure" to "Failure (100 s)", per RAI 6.3-70.

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Item	Location	Description of Change
157.	S6.4, 6th para 2nd sent.	For proper clarification, changed sentence "…if high radioactivity is detected in the CRHA outside air supply duct, the RMS automatically isolates the CRHA normal air supply and the habitability requirements are then met by the operation of an Emergency Filter Unit (EFU)." into "if high radioactivity is detected by the RMS in the CRHA outside air supply duct, the CRHA normal air supply is automatically isolated and the habitability requirements are then met by the operation of an Emergency Filter Unit (EFU)."
158.	S6.4, 4th para.	Added a reference for completeness to other DCD section, and inserted "Control Room Habitability System" Subsection 7.3.4.
159.	S6.4, 6th para. 3rd sent.	Provide additional description of EFU units (2 trains) and describe N-2 design for electrical power supply maintenance:"Two trains of EFUs, consisting of two (2) 100% fans each, including HEPA and carbon filters, serve the CRHA envelope. Redundant fans are provided for each EFU to allow continued system operability during maintenance of electrical power supplies."
160.	S6.4.1.1 3rd bullet	Changed sentence around for proper grammar to:The emergency habitability system maintains the American Society of Heating, Refrigeration, and Air Conditioning Engineers fresh air requirements for up to 21 main control room occupants. (Ref. ASHRAE Standard 62).
161.	S6.4.1.1 New bullet	Added new bullet for detail / clarification of power supplies per N-2 Logic Design Change: Electrical power for safety-related equipment including EFUs, dampers, valves and associated instrumentation and controls is supplied from the safety-related uninterruptible power supply. Active safety-related components are redundant and their power supply is divisionally separated such that the loss of any two electrical divisions does not render the component function inoperable.
162.	S6.4.2, 2nd para.	Logic required change in configuration resulting in two 100% fans per EFU. Added: "two (2) 100% capacity fans" to write-up.
163.	S6.4.2, 2nd para	Added clarification phrase (in italics) to last sentence to:The EFUs have been sized to provide sufficient breathing quality air and to maintain a positive pressure in the CRHA with respect to the adjacent areas.

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Item	Location	Description of Change
164.	S6.4.3, 9th bullet	Corrected room number designation to 3202 for Restroom B.
165.	S6.4.3, Component Descriptions; 1st bullet, 3rd sentence	Added italic design clarification to the following sentence: Each EFU design incorporates 2 (two) 100% capacity upstream fans powered by the respective divisional power supply to maintain the entire filtration sequence and air delivery duct to the CRHA under positive pressure.
166.	S6.4.4, new 2nd para	Added COL Item 6.4.9-1-A for verification of procedures and training for control room habitability: The COL Applicant will verify procedures and training for control room habitability address the applicable aspects of NRC Generic Letter 2003-01 and are consistent with the intent of Generic Issue 83 (COL Item 6.4.9-1-A).
167.	S6.4.4, Emergency Mode, 2nd para	Changed, for clarification: 2nd and 3rd sentences to:Upon receipt of a high radiation level in the main control room supply air duct exceeding the setpoint, the normal outside air intake and restroom exhaust are isolated from the CRHA pressure boundary by automatic closure of the isolation dampers in the system ductwork. At the same time, one of the EFU automatically starts and begins to deliver filtered air from one of the two unique safety-related outside air intake locations. 4th sentence - Changed "the surroundings" to "the adjacent areas".5th sentence - Moved ASHRAE Standard 62 to after the paragraph as a reference.
168.	S6.4.4, Emergency Mode, 3rd para	1st sentence added, "the operating" prior to EFU for clarification.Added a new 2nd sentence per Engineering Change:For longer-term operation, from after 72 hrs to 7 days, a small portable AC power generator that is kept on the plant site can power the EFU fan system.

Chapter 6 Changes From Revision 3 to Revision 4

Item	Location	Description of Change
169.	S6.4.4, 4th para., 2nd sent.	Changed write-up from "Backup power to the safety-related CR Emergency Filtration Unit (EFU) fans (post 72 hrs) will be provided by a portable dedicated RTNSS generator." to:"Backup power to the safety-related Control Room (CR) EFU fans (post 72 hours) is provided by a small portable dedicated electrical generator. This generator is required to support operation of the Control Room EFU beyond 72 hours through 7 days after an accident. This function is a nonsafety-related function that satisfies the significance criteria for Regulatory Treatment of NonSafety Systems. This AC power generator is kept on the plant site to power the EFU fan system. For a period between 7 days out to 30 days, the EFU can be powered from either off-site power, onsite diesel generator powered PIP bus, or by continued use of the small AC power generator. The requirements for the CRHAVS portable generator are described in Appendix 19A." Per RAI 14.3-34 S01 and Engineering Change.
170.	S6.4.4, 5th para	Deleted "1E" in a couple places, as terminology is not used in ESBWR.
171.	S6.4.5, System Safety Evaluation, 1st para.	Remove accidents with bounding CRHA dose consequences because only the loss of coolant accident analysis credits operation of an EFU in the dose analysis.
172.	S6.4.5, System Safety Evaluation, 2nd para.	Changed write-up from "No radioactive materials are stored or transported near the main control room pressure boundary." To "No radioactive material storage areas are located adjacent to the main control room pressure boundary." for clarification.
173.	S6.4.5, System Safety Evaluation, 2nd para.	For clarification, changed "The sources…" to "Typical sources….
174.	S6.4.5, 3rd para, 5th sent.	Changed wording for clarity to: This flowrate also supplies the fresh air supply of 9.5 l/s (20 cfm) per person for a maximum occupancy of 21 persons. (Reference ASHRAE Standard-62).
175.	S6.4.5, 5th para., last sent.	Changed "capacity" to "volume".
176.	S6.4.5, Last para.	Changed "defined" to "identified" and added reference: COL Item 6.4.9-2-A.

Chapter 6 Changes From Revision 3 to Revision 4

Item	Location	Description of Change
177.	S6.4.7, 2nd sent.	Change wording for clarity to: The CRHAVS is tested and inspected at appropriate intervals consistent with plant technical specifications.
178.	S6.4.7, Preoperational Inspection and Testing; 1st para., 6th and 7th sent.	Changed wording on sentences for clarity to:The capacity of the safety-related battery is verified to ensure it can power an EFU fan for a minimum of 72 hours. Heat loads within the CRHA are verified to be less than the specified values.
179.	S6.4.7, Inservice Testing	Changed next to last sentence for clarity and added the last sentence. The last sentence was moved from deleted section "Air Inleakage Testing": "Testing to demonstrate the integrity of the CRHA envelope is performed in accordance with Regulatory Guide 1.197 and ASTM E741." For clarity, added the following write-up: "...Operational testing of the EFU fans and filter unit combinations, EFU filter performance testing, automatic actuation testing of the CRHA isolation dampers and EFU fans, and unfiltered air inleakage testing of the CRHA envelope boundary."
180.	S6.4.9	For consistency in COL items, Added COL Title and changed COL Information item into two items:6.4-1-A The COL Applicant will verify procedures and training for control room habitability address the applicable aspects of NRC Generic Letter 2003-01 and are consistent with the intent of Generic Issue 83.6.4-2-A The COL Applicant will identify potential site specific toxic or hazardous materials that may affect control room habitability in order to meet the requirements of TMI Action Plan III.D.3.4 and GDC 19.
181.	S6.4.10	Changed numbering to conform with writers guide
182.	T6.4-1	Incorporated RAI 2.3-3 S01 changes to 0% exceedance design temperature, and added English units in parentheses after SI units for air flows.
183.	T6.4-2	For clarification and completeness in listing of expected onsite chemicals for the standard ESBWR, revised title to "Typical Onsite Chemicals and Typical Locations", and added urea & ammonia for control of standby diesel exhaust emissions.
184.	F6.4-1	Revised EFU fan configuration in accordance with N-2 Logic Design Change and labeled recirculation AHUs.

Chapter 6 Changes From Revision 3 to Revision 4

Item	Location	Description of Change
185.	S6.5.2.3, 1st and 2nd para	Revised to reflect current information in Subsections 9.4.6 and 15.4.4.5.2.
186.	S6.5.2.3, 3rd para	Deleted for consistency with Subsection 15.4.4.5.
187.	S6.5.2.3, 4th para	Revised for consistency with Subsection 15.4.4.5.
188.	S6.5.2.4	Revised to reflect current information in Chapter 9.
189.	S6.5.4, last sent.	Deleted to reflect consistency with Subsection 15.4.4.5.
190.	S6.6, 3rd para	Rewritten to clarify PSI/ISI commitments.
191.	S6.6.1	After review, added systems Containment Inerting System, High Pressure Nitrogen Supply System, and Process Radiation Monitoring System.
192.	S6.6.2, 2nd sent.	Deleted sentence since the information is already contained in ASME Section XI.
193.	S6.6.2, 2nd para	Added Class 3 to scope of accessibility.Changed "ultrasonic" to "volumetric" in two places since RT is another inspection option. Added VT-1 and reference to subsection IWF of ASME Section XI. Added "100%" in second change to clarify the extent of examination.
194.	S6.6.3.1, 1st sent.	Changed to clarify compliance with ASME code.
195.	S6.6.3.2.1, 1st para.	Added VT1 to comply with ASME Section XI, IWA-2210.
196.	S6.6.3.2.1, 4th para.	Changed "a working man's arm length 508 mm (20 inches)" to "an arm's length (508 mm (20 inches))".
197.	S6.6.3.2.2, 1st para.	Changed heading to more generic term by deleting "Manual Ultrasonic".
198.	S6.6.3.2.2, 1st para.	Changed "Volumetric ultrasonic direct examination" to "Ultrasonic examination" This is in line with ASME Section XI, IWA-2232.
199.	S6.6.3.2.3, 1st para.	Deleted "Radiographic Examination" at start of 1st sentence, since it is discussed after code listing.

Chapter 6 Changes From Revision 3 to Revision 4

Item	Location	Description of Change
200.	S6.6.3.2.4, 1st para., last sent.	Added "10 CFR 50.55a(b)(2)(xix)" to clarify code compliance.
201.	S6.6.5, 1st para.	First sentence added to identify compliance with IWA-2000 of ASME Section XI.
202.	S6.6.5, 2nd para.	Added second paragraph to provide description of successive and expanded examination requirements for Class 2 and 3 components containing flaws or relevant conditions.
203.	S6.6.9	Added clarification to code case usage and reference to Regulatory Guide 1.147 for approved code cases.
204.	S6.6.10	Deleted 1st and 2nd bullets and replaced with new Subsection 6.6.10.1, and 6.6.10.2 to appropriately address COL applicant commitments to PSI/ISI program information.
205.	S6.6.11	Revised COL applicant requirement for PSI/ISI to include commitment to provide milestone for full program implementation.
206.	6B	New appendix added, per RAI 6.2-52S01.
207.	6C	New appendix added, per RAI 6.2-144S01.