Revision 1 to Revision 2 Change List – Section 3.1

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1	S3.1.2.6, 4th para.	Editorial change.
2	S3.1.4.6, 9th and 10th para.	Editorial change.
3	S3.1.6.2, 4th para.	Revised 4th paragraph per RAI 9.1-7 to read: "The nonsafety-related Fuel and Auxiliary Pools Cooking System (FAPCS) normally removes decay heat from fuel storage pools. Without the active cooling trains of the FAPCS, the safety-related method of cooling the spent fuel is to allow the spent fuel pools to boil. Sufficient pool water inventory is provided to permit boiling for several days without makeup. If required, makeup water is provided from on site sources for up to at least 7 days from the fire protection system (FPS). Safety-related FAPCS piping is used to transport makeup water to the spent fuel pool from FPS (for at least 7 days0 and from a connecting point (also safety-related) in the yard area to portable water sources (See Subsection 9.1.2.2)."

Revision 1 to Revision 2 Change List – Section 3.2

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1	S3.2 Title	Corrected spelling of "Systems"
2	S3.2.2, 2nd para.	Deleted reference to "component supports" as being outside the scope of the regulatory guide. (Incorporated in response to RAI 3.2-2)
3	S3.2.2, 3rd para.	Revised text to read: "Due to the use of many passive safety-related systems in ESBWR, the definitions of the Quality Groups provided in Regulatory Guide 1.26 can be somewhat misleading when trying to apply them directly to the ESBWR design. The following definitions in this section, which are based on Section 6 of ANS Standard 58.14, are consistent with the definitions in Regulatory Guide 1.26 but have been modified to more accurately describe their application to the ESBWR design."
4	S3.2.3	Section completely rewritten to describe safety class instead of safety designation. Revised writeup includes new Subsections 3.2.3.1 through 3.2.3.4. (Incorporated in response to RAIs 3.2-3, 3.2-4 and 3.2-6)
5	S3.2.4	Text changed to "None." Table 3.2-1 now addresses Switch Yard.
6	T3.2-1	Changed second column header from "Safety Designation" to "Safety Class". (Incorporated in response to RAI 3.2-3)
7	T3.2-1, Safety Class Column	Safety Designation of "Q" replaced with Safety Class of "1", "2" or "3" throughout entire table. (Incorporated in response to RAI 3.2-3)
8	T3.2-1, System B11, Items 4 and 5	Assigned Safety Class "2" to Control Rods and SLC System headers and spargers. (Incorporated in response to RAIs 3.2-8 and 3.2-9)
9	T3.2-1, System B11, Item 7	Changed Quality Group to "B". (Incorporated in response to RAI 3.2-10)
10	T3.2-1, System B21, Item 6	Added note "Seismic interface restraints are located inside the seismic category I building." (Incorporated in response to RAI 3.2-13)
11	T3.2-1, System B21, Item 8	Changed from Safety Designation of "N" to Safety Class of 2. Changed Quality Group from D to B. (Incorporated in response to RAI 3.2-15)

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
12	T3.2-1, System B21, Item 9	Changed Seismic Category to "I or II". Changed note to read: "Pipe Whip Restraints – Pipe whip restraints are required on the Main Steam Line (MSL) and Feedwater (FW) piping except where a "Leak-Before-Break" evaluation has been approved by the NRC. (Incorporated in response to RAI 3.2-18)
13	T3.2-1, System C12, Items 6, 7, 8 and 10	Changed Seismic Category from "NS" to "II". (Incorporated partially in response to RAI 3.2-23)
14	T3.2-1, System D11, Item 3	Deleted text in Notes column. (Incorporated in response to RAI 3.2-24)
15	T3.2-1, System E50, Items 2 and 3	Changed Quality Group from C to B. (Incorporated in response to RAI 3.2-26)
16	T3.2-1, System E50	Added new item 5: "GDCS pool splash guard", Safety Class "3", Location "CV", Quality Group "C", QA Requirement "B", Seismic Category "I". (Incorporated in response to RAI 3.2-27)
17	T3.2-1, System F42, Item 1	Changed Quality Group to "D". (Incorporated in response to RAI 3.2-29)
18	T3.2-1, System G21, Item 2	Changed Description to read: "Piping between inboard manual valve and outboard containment isolation valve on suppression pool suction line, as well as the LPCI piping between the RWCU/SDC interface and the second isolation valve."
19	T3.2-1, System G21, Item 5	Changed Description to read: "Piping and components outside containment needed for fuel pool cooling, suppression pool cooling, LPCI and drywell spray modes of operation including skimmer lines and all components in the cooling and cleanup trains." (Incorporated in response to RAI 3.2-33)
20	T3.2-1, System G21, Item 9	Changed Description to read: "IC/PCC pools active cooling and cleanup subsystem piping and components." (Incorporated in response to RAI 3.2-33)
21	T3.2-1, System G21, Item 10	Changed Description to read: "Auxiliary pools skimmer lines, and auxiliary pool return lines between isolation valves and terminus points." (Incorporated in response to RAI 3.2-33)

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
22	T3.2-1, System G21, Item 11	In Description, changed "post-accident monitoring instruments" to "parameters", and added "Spent fuel pool level" to the list of parameters.
23	T3.2-1, System J11	Added Note: "Nuclear fuel and channels are designed in accordance with NRC-approved methodology as described in chapters 4, 15 and Reference 15.0-2." (Incorporated in response to RAI 3.2-36)
24	T3.2-1, System J12	Added Note: "See note for J11". (Incorporated in response to RAI 3.2-36)
25	T3.2-1, System K10, Item 1	Changed Note to read: "Radwaste Management Systems – A quality assurance program meeting the guidance of Regulatory Guide 1.143, as applied to radioactive waste management systems, is described in Chapter 17. The radioactive Waste Management System components conform to Regulatory Guide 1.143 Table 1. For Radwaste processing systems, Regulatory Guide 1.143 Table 1 modifies Regulatory Guide 1.26 Table 1 Quality Group D. This modification is acceptable per Standard Review Plan 3.2.2 Appendix C Note (9). Applicable portions of Regulatory Guide 1.143 Table 1 are reprinted in Chapter 11 Table 11.2-1." (Incorporated in response to RAIs 3.2-37 and 3.2-38)
26	T3.2-1, System K30	Changed note to read: "See note for K10 item 1." (Incorporated in response to RAIs 3.2-37 and 3.2-38)
27	T3.2-1, System N11, Item 1	Changed QA Requirement to "B". Changed Seismic Category to "II". Changed Note to read: "Main Steam Lines – TMSS lines are designed to ASME Section III Code, Class 2. TMSS piping is not code stamped and does not require ASME authorized inspection. Lines smaller than 63.5 mm (2.5 inches) are NS. Also see Figure 3.2-1." (Incorporated in response to RAIs 3.2-7, 3.2-16 and 10.3-1)
28	T3.2-1, System N21	Added Note: "Feedwater lines from seismic isolation restraint to last feedwater heater are Quality Group B, Seismic Category II. See Figure 3.2-2." (Incorporated in response to RAI 3.2-7)

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
29	T3.2-1, System N37, Item 1	Changed QA Requirement to "E". Changed Seismic Category to "II". Changed Note to read: "TS lines are designed to ASME Section III Code, Class 2. TBS piping is not code stamped and does not require ASME authorized inspection. Lines smaller than 63.5 mm (2.5 inches) are NS. Also see Figure 3.2-1." (Incorporated in response to RAIs 3.2-7 and 3.2-40)
30	T3.2-1, System N61	Added Note: "The main condenser is nonsafety-related, nonseismic design, but the condenser anchorage is seismically analyzed for SSE. Also see Figure 3.2-1." (Incorporated in response to RAIs 3.2-7, 3.2-16 and 3.2-41)
31	T3.2-1, System P10	Added three new individual line items. (Incorporated in response to RAI 9.2-2)
32	T3.2-1, System P51	Added two new individual line items. (Incorporated in response to RAI 3.2-46)
33	T3.2-1, System R11	Added two new individual line items.
34	T3.2-1, System S21	Added classification information as follows: Safety Class "N", Location "OO", Quality Group "–", QA Requirement "E", Seismic Category "NS".
35	T3.2-1, System T10	Added four new individual line items. (Incorporated in response to RAI 3.2-48)
36	T3.2-1, System T62, Item 1	Changed from Safety Designation "Q" to Safety Class "2/3". Added Note: "Containment isolation function is safety class 2, rest of safety-related functions are safety class 3." (Incorporated in response to RAI 3.2-49)
37	T3.2-1, System U31, Item 1	Deleted "refueling bridge and fuel handling jib" from Description and Note. These components belong to F-series systems listed elsewhere in the table.
38	T3.2-1, System U31, Items 2 and 3	Changed Seismic Category for item 2 to "I" and for item 3 to "II". (Incorporated in response to RAI 3.2-50 and 3.8-2)
39	T3.2-1, System U31, Item 4	Changed Seismic Category to "II or NS". Added Note: "Components must be seismic category II if they can potentially damage safety-related equipment." (Incorporated in response to RAI 3.2-50)
40	T3.2-1, System U40	Added three new individual line items. (Incorporated in response to RAIs 3.2-51 and 3.8-2)

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
41	T3.2-1, System U43, Items 2, 3 and 5	Changed Quality Group from "D" to "C". (Incorporated in response to RAIs 3.2-53 and 9.1-12)
42	T3.2-1, System U43, Item 4	Changed Seismic Category from "NS" to "II".
43	T3.2-1, System U43	Deleted Item 6. Current system design does not include any booster pumps in the Reactor Building.
44	T3.2-1, System U97	Editorial clarification. Revised Note to read: "Main building is SC I. HVAC penthouse, stair towers and elevator shafts are SC II."
45	T3.2-1, System U98	Added four new individual line items. (Incorporated in response to RAI 3.8-2)
46	T3.2-1, Systems W12, W24, W32, W33 and W41	Added classification information as follows: Safety Class "N", Location "OO", Quality Group "–", QA Requirement "E", Seismic Category "NS". (Incorporated in response to RAIs 3.2-55 and 3.8-2)
47	T3.2-1, Y Systems	Deleted "Not in Scope" statement. These systems are not included in the scope for the ESBWR Standard Plant for Design Certification, but can still be assigned appropriate classifications on a generic basis. (Incorporated in response to RAI 3.2-55)
48	T3.2-1, Systems Y12, Y21, Y41, Y46, Y47, Y51 and Y53	Added classification information as follows: Safety Class "N", Location "OO", Quality Group "–", QA Requirement "E", Seismic Category "NS". (Incorporated in response to RAI 3.2-55)
49	T3.2-1, System Y21	Added Note: "Some tanks in the yard area belong to other systems (e.g., fire water storage tank in U43) and have different classifications."
50	T3.2-1, Systems Y52, Y71, Y72 and Y86	Changed Seismic Category to "NS".
51	T3.2-1, System Y71	Added Note: "Typical classifications for piping ducts in the yard area. Classification of individual piping ducts shall match the classification of the pipe they carry."
52	T3.2-1, System Y72	Added Note: "Typical classifications for cable ducts in the yard area. Classification of individual cable ducts shall match the classification of the cables they carry."

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
53	T3.2-1, Note (2)	Changed "Designation Q" to "Class 1, 2, 3" (Incorporated in response to RAI 3.2-3)
54	T3.2-1, Note (9), Item a.	Replaced reference to ISO 9001 with "GE Publication GEZ-4982A, General Electric Large Steam Turbine Generator Quality Control Program." (Incorporated in response to RAI 3.2-39)
55	T3.2-2	Revised table to replace Safety Designation column with Safety Class. (Incorporated in response to RAI 3.2-3)
56	T3.2-2, Note 1	Deleted "or Non-Seismic (NS)". (Incorporated in response to RAI 3.2-57)
57	Table 3.2-2, Note 3	Changed "3.2.3" to "3.2.3.4".
58	T3.2-2, Note 4	Changed "(Q)" to "(Safety Class 1, 2 and 3)". Added following to end of Note 4: "Elements of 10 CFR 50, Appendix B, are generally applied to nonsafety-related equipment commensurate with the importance of the equipment's function." (Incorporated in response to RAI 3.2-3)
59	T3.2-3	Added new columns for "Non-ASME Section III Component Supports" and "Core Support Structures and Reactor Internals". (Incorporated in response to RAIs 3.2-60 and 3.2-61)
60	T3.2-3	Added new row for ASME Section III Code Class CS. (Incorporated in response to RAI 3.2-61)
61	T3.2-3	Changed heading of column 4 to read: "Pipes, Valves and Pumps". (Incorporated in response to RAI 3.2-59)
62	T3.2-3, Quality Group B	Typographical error correction. Changed "NB" to "NC" in "Pressure Vessels and Heat Exchangers" column. (Incorporated in response to RAI 3.2-62)
63	T3.2-3	Added Note 4 to "Pressure Vessels and Heat Exchangers" column header. Added Note 4 text: "For heat exchangers, both the ASME Code and TEMA C must be taken into account." (Incorporated in response to RAI 3.2-58)
64	F3.2-1	Added new Figure 3.2-1, "Quality Group and Seismic Category Classification Applicable to Power Conversion System". (Incorporated in response to RAI 3.2-7, RAI 3.2-17 and other RAIs in Section 3.2)

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
65	F3.2-2	Added new Figure 3.2-2, "Quality Group and Seismic Category Classification Applicable to Feedwater System". (Incorporated in response to RAI 3.2-7, RAI 3.2-17 and other RAIs in Section 3.2)

Revision 1 to Revision 2 Change List – Section 3.3

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1	S3.3, 2nd sent.	Replaced "wind only" with "and tornado wind (excluding tornado missiles)" per RAI 3.3-3.
2	S3.3.1.1, 2nd sent.	Replaced "Subsection 3.3.3.2" with "Subsection 3.3.2.3" per COLA FSAR.
3	S3.3.1.2, 1st para., 1st sent.	Deleted "in accordance with SRP 3.3.1 (II.3) discussion at a height of 30 ft (9.14 m) and distribution of pressure for other heights is" per RAI 3.3-1.
4	S3.3.2.1, 2nd para.	Deleted "Refer to Subsection 3.3.3 for COL information" per COLA FSAR.
5	S3.3.2.3, Title	Editorial: Replaced "Failure" with "Failures".
6	S3.3.2.3, 1st sent.	Editorial: Replaced "system" with "systems".
7	S3.3.2.3, 1st para.	Added following at the end of paragraph per RAI 3.3-3 and COLA FSAR: "The remainder of plant systems and components not designed for tornado load are arranged or designed such that their failures do not adversely affect the ability of any Seismic Category I ESBWR Standard Plant structures, systems and components to perform its safety-related function(s). Any non-safety related, non-seismic (NS) structure (except the Radwaste Building) postulated to fail under tornado loading is located at least a distance of its height above grade from C-I or C-II structures."
8	S3.3.3	Deleted entire section & subsections per RAI 3.3-3 and COLA FSAR.
9	S3.3.4	Renumbered to S3.3.3

Revision 1 to Revision 2 Change List – Section 3.4

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1.	S3.4.1.1, 3rd para., 2nd sent.	Deleted. The flooding analysis does not consider the drain system.
2.	S3.4.1.2, 2nd para, 2nd sent.	Added data from Table 3.4-1
3.	S3.4.1.3, 5th para., 1st sent.	Deleted first sentence. Second sentence provides the required criteria.
4.	S3.4.1.3, 6th para., 3rd sent.	Added markups of RAI 5.4-10 response.
5.	S3.4.1.4, 7th para.	Deleted paragraph. "It is not necessary in the flooding analysis scope (the flooding analysis does not consider the drain system)."
6.	S3.4.1.4, 8th para., 1st and 2nd sent.	Added markups of RAI 5.4-10 response.
7.	S3.4.1.4.2, 6th para., 4th sent.	Added markups of RAI 5.4-10 response.
8.	S3.4.1.4.2, 10th para., 3rd sent.	Deleted sentence. This statement is not applicable to Steam Tunnel discussion.
9.	S3.4.1.4.2, 2nd bullet, 1st sent.	Added clarification for Fuel Building treatment.
10.	S3.4.2, various.	Replaced “plant grade” with finished “ground level”
11.	S3.4.2, 2nd para., item 2 and 3.	Added the figure obtained from Table 3.4-1
12.	S3.4.3	Subsection deleted according to Subsection 3.4.1.3 change, and replaced with a new Subsection entitled “References”
13.	T3.4-1	Replaced “Reference Plant Grade (mm)” with “Design Plant Grade (mm)”.
14.	T3.4-1	Replaced “Actual Plant Grade (mm)” with “Finished Ground Level (mm)”, and showed the values.
15.	T3.4-1	Deleted table footnote. This information is included in Section body.

Revision 1 to Revision 2 Change List – Section 3.5

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1	S3.5.1, 8th para., 5th bullet20	Replaced, "Absorbers" with "Adsorbers (located in the Turbine Building" per COLA FSAR
2	S3.5.1, 9th para., items (4) through (8)	Added "Isolation Condenser" and "Gravity Driven Cooling System" as items (4) and (5) and re-numbered preceding items per COLA FSAR.
3	S3.5.1, 9th para., items (9)	Revised, "…through (6)…" to "…through (8)…"
4	S3.5.1.1.1.2, 1st para.	Added following sentence at the end of paragraph per RAI 3.5-12 and 3.5-16: "Refer to Subsection 3.5.4.1 and 3.5.4.2 for COL licensing information."
5	S3.5.1.1.1.2, 2nd para.	Replaced 2nd para with "At COL the applicant shall meet the minimum requirements for the probability of turbine missile generation given in Table 3.5-1" per RAI 3.5-12 and 3.5-16.
6	S3.5.1.2.4, 3rd para.	Editorial: Deleted "Category I".
7	S3.5.1.4, 2nd para., 2nd sent.	Replaced "it is not necessary to consider missiles generated from other natural phenomena" with "they envelope less intense phenomena such as extreme winds. See Reference 3.5-8" per RAI 3.5-16.
8	S3.5.1.4, last para.	Replaced last paragraph with the following per RAI 3.5-16: "Non-tornado resistant building superstructures are constructed from materials such as reinforced concrete block, and/or structural steel with metal siding and roof deck. Potential missiles or debris from these materials, resulting from failure of superstructure or from items blown off, when subjected to winds of tornado intensity, are not considered to generate missiles more severe than the Spectrum I missiles of SRP 3.5.1.4 in accordance with Reference 3.5-8."

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
9	S3.5.1.5, 1st para., 1st sent.	Revised 1st sentence per RAI 3.5-16 to read "The site is selected such that the probability of occurrence of the Site Proximity Missile (except aircraft) is less than 10^{-7} occurrences per year."
10	S3.5.1.5, 1st para.	Deleted last sentence per RAI 3.5-16.
11	S3.5.2, 3rd para.	Replace, "charcoal delay tanks" with "Off-Gas Charcoal Bed Adsorbers"
12	New section 3.5.3.3	Added details on "Impact of Failure of Nonsafety-Related Structures, Systems and Components" per RAI 3.5-16 and COLA FSAR
13	S3.5.4, title	Inserted "Unit Specific" after "COL".
14	S3.5.4	Deleted subsection 3.5.4.1 through 3.5.4-4 and renumbered preceding subsection(s) per RAI 3.5-16 and COLA FSAR.
15	New Section 3.5.4.2	Added details on "Probability of Turbine Missile Generation" per RAI 3.5-13 and COLA FSAR.

Revision 1 to Revision 2 Change List – Section 3.6

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1	S3.6.1.2, 1st para., 1st sent.	Replaced "high-energy" with "high and moderate-energy" per RAI 3.6-2.
2	S3.6.2.1.3, 1st bullet, 2nd dash, 1st sent.	Replaced "small" with smaller than 6 kJ per meter of 1.25 inch line" per RAI 3.6-5.
3	S3.6.2.3.1, 5th bullet	Replaced "full (100%)" with "102%" per RAI 3.6-7.
4	T3.6-3	Added list of moderate energy piping inside containment per RAI 3.6-2.
5	T3.6-4	Added list of moderate energy piping outside containment per RAI 3.6-2.

Revision 1 to Revision 2 Change List – Section 3.7

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1	S3.7, 1st para.	Added the following at the end of 1st paragraph per RAI 3.8-9: "The method of combination of peak dynamic responses to seismic and RBV loads is the Square Root of the Sum of the Squares (SRSS) in accordance with NUREG-0484 Revision 1. For reinforced concrete structures the section forces or stresses due to each dynamic load are combined in the most conservative manner by systematically varying the sign (+ or -), equivalent to the absolute sum method."
2	S3.7, 2nd para., 3rd sent.	Added "and within applicable stress, strain, and deformation limits" after "…remain functional" per RAI 3.7-1.
3	S3.7, 4th para., 2nd sent.	Replaced "and/or so physically arranged" with "such" per RAI 3.8-42.
4	S3.7, 5th para.,	Deleted 5th paragraph per RAI 3.7-2 S1.
5	S3.7, 6th para.	Replaced fist three sentences with the following per RAI 3.7-3: "The Operating Basis Earthquake (OBE) is a design requirement. For the ESBWR OBE ground motion is chosen to be one-third of the SSE ground motion. Therefore, no explicit response or design analysis is required to show that OBE design requirements are met. This is consistent with Appendix S to 10 CFR 50."

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
6	S3.7.1.1, 1st para.	Revised paragraph per RAI 3.7-30 to read: "The ESBWR standard plant SSE design ground motion is rich in both low and high frequencies. The low-frequency ground motion follows RG 1.60 ground spectra anchored to 0.3g. The high-frequency ground motion matches the North Anna ESP site-specific spectra as representative of most severe rock sites in the Eastern US. These two ground motions are considered separately in the basic design. To verify the basic design the two separate inputs are further enveloped to form a single ground motion as the design basis ground motion for ESBWR. The single envelope design ground response spectra are shown in Figures 2.5-1 and 2.5-2 for horizontal and vertical direction, respectively. They are defined as free-field outcrop spectra at the foundation level (bottom of the base slab). Application of design ground motion at the foundation level is a conservative approach for deeply embedded foundations as compared to the compatible free-field motion deconvoluted from the free ground surface motion at the finished grade. The ESBWR Reactor Building (RB) and Control Building (CB) foundations are embedded at depth of 20 m (66 ft) and 14.9 m (49 ft), respectively. The Fuel Building (FB) shares a common foundation mat with the RB. The development of design ground motion is delineated in the following subsections."
7	S3.7.1.1.1, Title	Replaced "Design Response Spectra" with "Low-Frequency Ground Motion" per RAI 3.7-30.
8	S3.7.1.1.1, 1st para., 1st sent.	Revised 1st sent per RAI 3.7-30 to read: "The ground response spectra for low-frequency ground motion are developed in accordance with Regulatory Guide 1.60 anchored to 0.3g and specified at the foundation level in the free field for generic sites."
9	S3.7.1.1.1, 1st para.	Deleted 2nd sentence per RAI 3.7-30.
10	S3.7.1.1.2	Moved entire Section 3.7.1.1.2 text the end of Section 3.7.1.1.1.

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
11	S3.7.1.1.2, 4th para.,2nd sent.	Added following after "…spectrum is derived" per RAI 3.7-10: "using the following approach (Reference 3.7-15):" (1) Establish initial candidate PSD. (2) Calculate several time histories using the PSD, each with a different phase function. (3) Calculate 2% critically damped pseudovelocity response spectrum (PSV) of each time history. (4) Compare the suite of PSVs from (3) to a target PSV. (5) If the average of the suite of PSVs does not fit (this is a visual fit) the target PSV, adjust form of PSD and go to Step (2). (6) Obtain the final PSD. This vertical target PSD with the following input…."
12	S3.7.1.1.2	Added following paragraph at the end of section per RAI 3.7-30: "The 0.3g RG 1.60 input motion is considered in the basic design seismic analysis for generic uniform sites using the DAC3N computer code."
13	S3.7.1.1.3	Editorial change. Moved entire Section 3.7.1.1.3 to Section 3.7.1.1.2.
14	S3.7.1.1.3, Title	Replaced "North Anna ESP Design" with "High-Frequency" per RAI 3.7-30.
15	S3.7.1.1.3, 1st para., 1st and 2nd sent.	Replaced 1st and 2nd sentences with "The high-frequency ground motion is North Anna site-specific developed in the ESP application" per RAI 3.7-30
16	S3.7.1.1.3, 1st para., 3rd sent.	Replaced "corresponding" with "ESBWR" per RAI 3.7-30.
17	S3.7.1.1.3, 1st para., 4th sent.	Editorial change. Replaced "needs to be" with "is".
18	S3.7.1.1.3, 2nd para., 3rd sent.	Replaced "NUREG-CR-6728" with "NUREG/CR-6728 and "0.3" with 0.16" per RAI 3.7-12.

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
19	S3.7.1.1.3, 2nd para.	Added new sentence at the end of paragraph per RAI 3.7-12: "Since a more stringent matching criteria of NUREG/CR-6728 is used, a separate Power Spectral Density (PSD) check per SRP 3.7.1.II.1 is not required."
20	S3.7.1.1.3	Added following paragraph at the end of section per RAI 3.7-30: "The high-frequency input ground motion thus defined is considered in the basic design seismic analysis for North Anna ESP site condition using the DAC3N computer code."
21	S3.7.1.1	Added new section "3.7.1.1.3 Single Envelope Ground Motion" details per RAI 3.7-30.
22	S3.7.1.2, 2nd para., 1st sent.	Deleted "and Figure 3.7-36" per RAI 3.7-13.
23	S3.7.1.2, 2nd para.	Deleted 2nd, 3rd and 4th sentences per RAI 3.7-13.
24	S3.7.1.2, 3rd para., 1st sent.	Replaced "damping values of ASME Code Case N-411-1 may be used as permitted by Regulatory Guide 1.84, in place of Regulatory guide 1.61 damping" with "alternative damping values specified in Figure 3.7-37 may be used" per RAI 3.12-19.
25	S3.7.1.2, 3rd para.	Deleted 2nd sentence per RAI 3.12-19.
26	S3.7.2, 1st para., 1st sent.	Added "(RB, FB, CB, and EBAS buildings)" at the end of sentence per RAI 3.7-15.
27	S3.7.2, 1st para.	Added following sentence at the end of paragraph per RAI 3.7-17 S1: "Table 3.7-3 provides a summary of methods of seismic analysis for primary building structures."
28	S3.7.2.1.1, 2nd para.	Added following sentence after 2nd sentence per RAI 3.12-4 S1: "An alternative approach for selecting the time step, Δt, is that the Δt used shall be small enough such that the use of ½ of Δt does not change the response by more than 10%."
29	S3.7.2.1.1, 5th para.	Deleted last sentence per RAI 3.7-51(a).

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
30	S3.7.2.1.1	Added following at the end of section per RAI 3.12-5 S1: "The frequency domain solution is not used in the piping system response analysis."
31	S3.7.2.1.2	Deleted 1st paragraph per RAI 3.7-18 S1.
32	S3.7.2.1.2	Added following paragraph at the end of section per RAI 3.7-18 S1: "The response spectrum method is not used for seismic response analysis of primary building structures."
33	S3.7.2.1.3, 1st para., 4th sent.	Add following at the end of sentence per RAI 3.12-7 S1: "similar to those shown to produce conservative results (References 3.7-13 and 3.7-14). A factor of less than 1.5 may be used if justified. If the fundamental frequency of the structure is known, the highest spectral acceleration value at or beyond the fundamental frequency can be multiplied by a factor of 1.5 to determine the response."
34	S3.7.2.1.3, 1st para.	Added following sentences at the end of paragraph per RAIs 3.12-7 S1 & 3.7-19 S1: "Relative displacements between points of support are also considered and the resulting response is combined with the response calculated using the equivalent static method. The static coefficient method is not used for primary building structures."
35	S3.7.2.3, 1st para., 1st sent.	Revised 1st sentence per RAI 3.7-20 to read: "The mathematical model of the structural system is constructed as a stick model for seismic response analysis of primary building structures."
36	S3.7.2.3, 4th para., 2nd sent.	Inserted "(25% of floor live load or minimum 75% of roof snow load, as applicable). For design, 100% of roof snow load is used." after "…and appropriate part" per RAI 3.7-22 and RAI 3.7-22 S1.
37	S3.7.2.3, 4th para.	Added following sentence at the end of paragraph per RAI 3.7-24: "For the stick models of the primary building structures, the number of dynamic degrees of freedom is no less than twice the number of modes below 50 Hz."
38	S3.7.2.4, 1st para.	Deleted last sentence per COLA FSAR.

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
39	S3.7.2.6, 3rd para.	Added following sentence at the end of the paragraph per RAIs 3.7-41 and 3.7-42: "The use of 100-40-40 method of combination shall be consistent with the requirements of Regulatory Guide 1.92."
40	S3.7.2.6, 5th para.	Added the following sentence at the end of paragraph per RAIs 3.7-41 and 3.7-42: "This method is used for seismic response analysis of primary building structures."
41	S3.7.2.7, 4th para., Step 1	Inserted following sentences after 1st sentence per RAI 3.12-20 S1: "The ZPA cutoff frequency is 100 Hz or the rigid frequency as defined in Figure 2 and Figure 3 of Regulatory Guide 1.92. It is applicable to seismic and other building dynamic loads."
42	S3.7.2.7, 6th para.	Deleted 6th paragraph per RAI 3.7-17.
43	S3.7.2.7, last para.	Delete text after, "…requirements in Regulatory Guide 1.92" per RAI 3.12-20 S1.
44	S3.7.2.9, 1st para., 1st sent.	Inserted "by ±15%" after "…are peak broadened" per RAI 3.7-44.
45	S3.7.2.9, 1st para.	Deleted last 3 sentences per RAI 3.7-44 and 3.12-10 S1.
46	S3.7.2.9, 1st para.	Added following paragraphs at the end of paragraph per RAI 3.12-6 S1: "When the calculated floor acceleration time history is used in the time history analysis for piping and equipment, the uncertainties in the time history are accounted for by expanding and shrinking the time history within 1/(1±0.15) so as to change the frequency content of the time history within ±15%. Alternatively, a synthetic time history that is compatible with the broadened floor response spectra may be used. The methods of peak broadening described above are applicable to seismic and other building dynamic loads."

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
47	S3.7.2.11	Added following at the end of section as a new paragraph per RAI 3.7-45: "The seismic analysis for primary building structure is performed using a three-dimensional model including the torsional degrees of freedom."
48	S3.7.2.13, 2nd para.	Added following sentences at the end of paragraph per RAI 3.7-46: "For models that take SSI into account by the lumped soil spring approach, the method defined by Equation 3.7-14 is acceptable. For fixed base model, either Equation 3.7-14 or 3.7-15 may be used."
49	S3.7.2.13, 3rd para., 1st sent.	Revised per RAI 3.7-47 S1 to read: "In the seismic response analysis of primary building structures described in Appendix 3A using the complex response method in the frequency domain, material damping is included in the formulation of the complex stiffness matrix:"
50	S3.7.2.13, 4th para., 1st sent.	Revised per RAI 3.7-47 S1 to read: "In the seismic response analysis of primary building structures described in Appendix 3A using the time history method solved by direct integration, the damping matrix is formed by the following procedure:"
51	S3.7.2.13, last para., 1st sent.	Replaced "Alternatively," with "In the dynamic response analysis of containment loads described in Appendix 3F" and "can be" with "is" per 3.7-47 S1.
52	S3.7.3, 1st para.	Deleted last sentence per RAI 3.12-10 S1.
53	S3.7.3.1, 1st para.	Added following sentence at the end of paragraph per RAI 3.12-20 S1: "For piping analysis, the ZPA cutoff frequency for modal response analysis of subsystems for seismic and other building dynamic loads is 100 Hz. For equipment analysis, refer to the requirements of Step 1 of Section 3.7.2.7 for ZPA cutoff frequency determination."
54	S3.7.3.3.1, 1st para.	Added following sentence after 5th sentence per RAI 3.12-12 S1: "Additional criteria regarding lump masses for components are specified in subsection 3.7.3.3.2."

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
55	S3.7.3.3.1	Deleted last sentence of 1st paragraph and added following paragraphs at the end of section per RAIs 3.12-32 S1 and 3.12-33 S1: "Pipe supports will be designed and qualified to satisfy stiffness values used in the piping analysis. For struts, snubbers, the stiffness to consider is the combined stiffness of strut, snubber, pipe clamp and piping support steel. In general, pipe support component weights, which are directly attached to a pipe such as a Clamp, Strut, Snubber, and Trapeze are considered in the piping analysis. Frame type supports will be designed to carry its own mass and will be subjected to deflection requirements. A maximum deflection of 1/16 inch is used for normal operating conditions, and 1/8 inch is used for abnormal conditions. For other types of supports, either demonstrate that the support is dynamically rigid, or demonstrate that one half of the support mass is less than 10% of the mass of the straight pipe segment of the span at the support location, to preclude amplification. Otherwise, the contribution of the support weight amplification is added into the piping analysis. Piping supports will be evaluated to include the impact of self-weight excitation on support structure and anchorage in detail along with piping analyzed loads where this effect may be significant. The stiffness of the building steel/structure (i.e., beyond the NF jurisdictional boundary) is not considered in pipe support overall stiffness. Response spectra input to the piping system includes flexibility of the building structure. When attachment to a major building structure is not possible, any intermediate structures are included in the analysis of the pipe support."

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
56	S3.7.3.3.2	Replaced 4th bullet with following per RAIs 3.7-51(b) and 3.7-51(b) S1: "When equipment is concentrated between two existing nodes located between two supports in a finite element model, a new node is created at that location. Alternatively, the equipment mass can be concentrated at the nearest node to either side which tends to shift the natural frequency to the higher amplification region of the input motion response spectrum. When the approximate location of the equipment mass is shifted toward the mid-span between the supports the natural frequency is lowered and when the approximate location is shifted toward either support the natural frequency is increased. Moving the natural frequencies of the equipment into the higher amplification region of the excitation thereby conservatively increases the equipment response level. Similarly, in the case of live loads (mobile) and variable support stiffness, the location of the load and the magnitude of the support stiffness are chosen to lower the system natural frequencies. Similar to the above discussion, this ensures conservative dynamic responses because the lowered equipment frequencies tend to be shifted to the higher amplification range of the input motion spectra. If not, the model is adjusted to give more conservative responses."
57	S3.7.3.3.3, 1st para., 3rd sent.	Revised per RAI 3.12-13 S1 to read: "The use of special engineered pipe supports is not expected, and the need to use it during the detailed design phase is not foreseen. If its use should be essential at any point during the development of detailed engineering, the modeling and analytical methodology will be based on applicable design codes and allowables approved by the NRC."
58	S3.7.3.5, 1st para., 2nd sent.	Replaced "damping values of ASME Code Case N-411-1 may be used as permitted by Regulatory Guide 1.84" with "alternative damping values specified in Figure 3.7-37 may be used" per RAI 3.12-19 S1.
59	S3.7.3.13, 1st sent.	Replaced "Category C-I" with "Category I (C-I) and deleted "or C-II" per RAI 3.7-52 and "piping" per RAI 3.12-9 S1.

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
60	S3.7.3.13	Added following sentence after 3rd bullet per RAI 3.12-9 S1: "For ESBWR, there is no buried Seismic Category I piping."
61	S3.7.3.13, 2nd bullet	Deleted entire bullet per RAI 3.12-9 S1.
62	S3.7.3.14	Replaced sentences 1 and 2 with the following sentence: "There are no Seismic Category I concrete dams in the ESBWR design."
63	S3.7.3.15, 1st sent.	Deleted "or C-II" per RAI 3.7-52.
64	S3.7.3.15, 2nd bullet, 3rd sent.	Revised sentence per RAI 3.7-53(b) to read: "The horizontal impulsive-mode spectral acceleration, S_{al}, is then determined using this frequency and damping value for the impulsive mode. This is the same as that for the tank shell material in accordance with NUREG/CR-1161."
65	S3.7.3.15, 3rd bullet	Added following sentence at the end of 3rd bullet per RAI 3.7-53 S1: "The SSI system damping takes into account soil damping in the form of stiffness-weighted damping in accordance with Equation 3.7-14 or complex stiffness matrix in accordance with Equation 3.7-16."
66	S3.7.3.15, 6th bullet, 3rd sent.	Revised sentence per RAI 3.7-53(a) to read: "If the effects of soil-structure interaction results in higher response then an appropriate SSI method of analysis comparable to Reference 3.7-16 is used."
67	S3.7.5.1, item 1	Revised per RAI 3.7-5 to read: "The site-specific free-field SSE ground response spectra of 5% damping defined as outcrop spectra at the foundation level (bottom of the base slab) is enveloped by the ESBWR design response spectra as shown in Figures 2.5-1 and 2.5-2 for horizontal and vertical direction, respectively."

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
68	S3.7.5.1, item 3	Replaced item 3 with following per RAI 3.7-31(b): "The equivalent uniform shear wave velocity (V_{eq}) over the entire soil column is no less than 300 m/sec (1000 ft/sec) at seismic strain, which is a lower bound value after taking into account uncertainties. V_{eq} is calculated to achieve the same wave traveling time over the depth equal to the embedment depth plus 2 time the largest foundation plan dimension below the foundation, as follows: $V_{eq} = \frac{\sum d_i}{\sum \frac{d_i}{V_i}}$ where d_i and V_i are the depth and shear wave velocity, respectively, of the ith layer."
69	S3.7.5.1, item 4	Replaced item 4 with the following per RAI 2.5-6: "ESBWR design assumes no liquefaction potential under the foot-print of safety-related structures. COL applicant shall address localized liquefaction potential under other structures."
70	S3.7.5.2	Deleted entire section per COLA FSAR.

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
71	S3.7.6	Added following references per RAIs 3.12-7, 3.7-10 and 3.7-53: "Stevenson, J.D., and LaPay, W.S., "Amplification Factors to be Used in Simplified Seismic Dynamic Analysis of Piping Systems," Presented at the ASME Pressure Vessels and Piping Conference, Miami Beach, Fla., June 1974. Lin, C.W. and Esselman, T.C., "Equivalent Static Coefficients for Simplified Seismic Analysis of Piping Systems," Proc., 7th International Conference on Structural Mechanics in Reactor Technology, August 1983. Kennedy, R.P. and Shinozuka, M., "Recommended Minimum Power Spectral Density Functions Compatible with NRC Regulatory Guide 1.60 Response Spectrum," January 1989, Appendix B, NUREG/CR-5347. Brookhaven National Laboratory, BNL 52361, "Seismic Design and Evaluation guidelines for the Department of Energy High-Level Waste Storage Tanks and Appurtenances," October 1995."
72	T3.7-1, 1st Column	Row 2: Replaced component description with "Welded and friction bolted steel assemblies/structures" per RAI 3.7-13. Row 3: Replaced component description with "Bearing bolted steel assemblies/structures" per RAI 3.7-13
73	T3.7-1, 2nd Column	Replaced value with "10 max[2]" per RAI 3.7-13 S1.
74	T3.7-1, Note 1	Replaced with the following per RAI 3.12-19 S1: "See Figure 3.7-37 for alternative damping values for response spectra analysis of ASME Section III, Division 1 Class 1, 2, and 3, and ASME/ANSI B31.1 piping systems."
75	T3.7-1	Added Note 2 per RAI 3.7.13 and 3.7-13 S1.
76	T3.7-2 & T3.7-3	Added new Tables 3.7-2 per RAI 3.7-30 and 3.7-3 per RAI 3.7-17 S1.
77	F3.7-36	Deleted Figure per RAI 3.7-13.
78	F3.7-37	Added new Figure 3.7-37 per RAI 3.12-19 S1.
79	F3.7-38 to F3.7-43	Added new Figures 3.7-38 to 3.7-43 per RAI 3.7-30.

Revision 1 to Revision 2 Change List – Section 3.8

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1	S3.8.1.1.2, 2nd para.	Added the following sentence at the end of paragraph per RAI 3.8-25 S1: "The design forces of liner plates are obtained from the analysis directly, and the anchorage design is performed in accordance with ACI 349-01 Appendix B."
2	S3.8.1.2.2	Replaced "Table 3.8-9 item 3" with "Table 3.8-9 Items 1 and 3" per RAI 3.8-14 S1.
3	S3.8.1.2.3, item (2)	Replaced "Table 3.8-9 Item 30" with "Table 3.8-9 Items 29, 30, 31 and 33" per RAI 3.8-5 and 3.8-14 S1.
4	S3.8.1.3.1, item (2)	Added the following sentences at the end of item (2) per RAI 3.8-6: "Live load for structures inside the containment is 9.6 kPa during outages and laydown operations. The loads are applied to the containment interior floors, except the suppression pool floor slab."
5	S3.8.1.3.1, item (7)	Editorial change: Replaced "Safety/relief" with "Safety relief".
6	S3.8.1.3.5, item (7)	Deleted item (7) and renumbered following item(s) per RAI 3.8-46.
7	S3.8.1.4.1.1.1, 3rd para.	Added the following sentence at the end of the paragraph per RAI 3.8-48: "The LOCA and SRV dynamic analyses are described in Appendix 3F."
8	S3.8.1.4.1.1.2, 2nd para.	Added the following sentence at the end of paragraph per RAI 3.8-48: "The LOCA and SRV dynamic analyses are described in Appendix 3F."
9	S3.8.1.7.1, 1st para., 1st sent.	Replaced "shall be performed by the COL Holder" with "is performed" per COLA FSAR.
10	S3.8.1.7.1, 3rd para.	Deleted last sentence per COLA FSAR.
11	S3.8.1.7.3.1, 2nd para., 2nd sent.	Revised per COLA FSAR to read: "The preservice and inservice inspection program plans is based on the ASME Section XI, Edition and Addenda specified in accordance with 10 CFR 50, Section 50.55a."
12	S3.8.1.7.3.1, 2nd para.	Deleted 4th sentence per COLA FSAR.
13	S3.8.1.7.3.1, 2nd para., 5th sent.	Revised sentence per COLA FSAR to read: "The actual Edition of ASME Section XI to be used is specified based on the procurement date of the component per 10 CFR 50, Section 50.55a."

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
14	S3.8.1.7.3.4, 1st para.	Added the following sentence at the end of paragraph per RAI 3.8-55: "The diaphragm floor and vent wall will receive a visual, VT-3, examination once during each inspection interval."
15	S3.8.1.7.3.12,1st para., 1st sent.	Revised per COLA FSAR to read: "During operation, areas inaccessible for examination for acceptability shall be evaluated as presented in Subsection 3.8.6.5, if conditions…"
16	S3.8.2.1.3, 3rd para.	Added the following sentences at the end of paragraph per RAI 3.8-23: "With regard to the local areas of concrete around high energy penetrations, thermal analyses have been carried out to demonstrate that concrete temperature limits in ASME Section III, CC-3440 are satisfied. In all cases the concrete temperature is lower than 93˚C (200˚F) for normal operation, and lower than 177˚C (350˚F) for accident condition. The sleeve length for hot penetrations is designed to meet these temperature requirements."
17	S3.8.2.1.4	Added the following paragraphs at the end of section per RAIs 3.8-30 and 3.8-31: "There is water in the reactor well above the drywell head during normal operation. The height of water is 6.7 m. Cladding thickness is so determined that it results in negligible stress in the base metal in accordance with ASME NE-3122.3 requirements. There are six (6) support brackets attached to the inner surface of the drywell head circumferentially to support the head on the operating floor during refueling. These support brackets have no stiffening effect and do not resist loads when the head is in the installed configuration."
18	S3.8.3.1.6, 1st para., 2nd sent.	Replaced "air movement and liquids" with movement of air and liquids" per RAI 3.8-42.
19	S3.8.3.1.6, 1st para., 3rd sent.	Replaced "perform" with "support" per RAI 3.8-42.
20	S3.8.3.1.6, 1st para.	Added the following sentence at the end of paragraph per RAI 3.8-42: "Similarly, other miscellaneous structural components inside containment that do not support safety-related functions are classified as C-II."
21	S3.8.3.4	Added the following sentence after 1st sentence per 3.8-54: "See Table 3.8-7 for more details."

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
22	S3.8.3.4.1, 1st para.	Added the following sentence at the end of paragraph per RAI 3.8-56: "The radial support beams are welded to the diaphragm floor, so they form an integral structure."
23	S3.8.3.4.2, 2nd para.	Deleted 2nd sentence and added the following at the end of paragraph per RAI 3.8-50: "In order to provide a low friction coefficient (≈ 0.15) that minimizes the resistance to sliding in the RPV foot/RPV support bracket interface, bearing plates of Lubron alloy GA50 are placed between the sliding components. Therefore, there are no significant thermal expansion loads from the RPV supports acting on the RPV support brackets. Two steel guide blocks at both sides of each RPV foot resist and transmit the horizontal (tangential) forces to the RPV support bracket."
24	S3.8.3.5.1, 1st para.	Added the following at the end of paragraph per RAI 3.8-54: "See Table 3.8-7 for more details."
25	S3.8.3.5.2, 1st para.	Added the following at the end of paragraph per RAI 3.8-54: "See Table 3.8-7 for more details."
26	S3.8.3.5.3, 1st para.	Added the following at the end of paragraph per RAI 3.8-54: "See Table 3.8-7 for more details."
27	S3.8.3.5.4, 1st para.	Added the following at the end of paragraph per RAI 3.8-54: "See Table 3.8-7 for more details."
28	S3.8.3.5.6, 1st para.	Added the following after 1st sentence per RAI 3.8-54: "See Table 3.8-7 for more details."
29	S3.8.3.6.1	Added the following at the end of section per RAI 3.8-57: "Different material choices are available from the specifications listed above."
30	S3.8.3.6.2, 1st para.	Added the following at the end of paragraph per RAI 3.8-57: "Materials are chosen depending on the thickness of each part."
31	S3.8.3.6.3	Added the following after 1st sentence per RAI 3.8-57: "Materials are chosen depending on the thickness of each part." Added the following at the end of section per RAI 3.8-57: "Different material choices are available from the specification listed above."

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
32	S3.8.3.6.4	Added the following at the end of section per RAI 3.8-57: "Different material choices are available from the specifications listed above."
33	S3.8.3.6.5	Added the following at the end of section per RAI 3.8-57: "Different material choices are available from the specifications listed above."
34	S3.8.3.7	Added the following paragraph after 1st paragraph per RAI 3.8-58: "However, during the operating life of the plant the condition of these structures should be monitored by the COL holder to provide reasonable confidence that the structures are capable of fulfilling their intended functions."
35	S3.8.4, 1st para., 3rd sent.	Replaced "the foundation and walls up to the spill height of the building housing the Radwaste systems are" with "it is" per RAI 2.4-29.
36	S3.8.4, 1st para.	Added the following at the end of the paragraph per RAI 3.8-63 S1: "Seismic gaps capable of a minimum 100 mm free movement are provided between independent Nuclear Island buildings to eliminate seismic interaction."
37	S3.8.4, 2nd para., 3rd sent.	Replaced "guard pipe support forces" with "pipe support forces and the environmental conditions during and after the postulated high-energy pipe break" per RAI 3.8-60.
38	S3.8.4, 3rd para.	Deleted 1st sentence and added the following at the end of 2nd sentence per RAI 3.8-61: "or masonry wall construction"
39	S3.8.4, last para.	Deleted paragraph per COLA FSAR.
40	S3.8.4.1.2, 1st para., 1st sent.	Revised sentence per RAI 3.8-63 to read: "The Control Building (CB) is adjacent to but structurally independent of the Reactor Building (see Figures 1.2-2 through 1.2-5 and Figure 1.2-11)."
41	S3.8.4.1.5, 4th para., 2nd sent.	Added "Category RW-IIa" at the end of sentence and deleted last sentence per RAI 2.4-29.
42	S3.8.4.1, new sections 3.8.4.1.6 and 3.8.4.1.7	Information on "Seismic Category I Cable trays, Cable Tray Supports, Conduits, and Conduit Supports" and "Seismic Category I HVAC Ducts and HVAC Duct Supports" has been added per RAI 3.8-52.
43	S3.8.4.2.2, 1st para., 1st sent.	Inserted "the" after "…CB design are" per RAI 3.8-68.
44	S3.8.4.2.2, 1st para.	Deleted 2nd sentence per RAI 3.8-68.
45	S3.8.4.2, new section 3.8.4.2.6	Added "EBAS Building" (Applicable Codes, Standards, and Specifications) information per RAI 3.8-64 S1.

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
46	S3.8.4.3.1.1	Added the following paragraph at the beginning of section per RAI 3.8-71: "This section presents only the loads which are applied to the RB directly. Other loads which are applied to the RCCV only but have effects on RB structures because of common foundation mat, like P_a and T_a, are also considered in the RB design."
47	New section 3.8.4.3.5	Added "EBAS Building" (Loads and Load Combinations) information per RAI 3.8-64 S1.
48	S3.8.4.4.1, Title	Revised per RAI 3.8-64 S1 to read "Reactor Building, Control Building, Fuel Building, and EBAS Building".
49	S3.8.4.4.1, 1st para., 1st sent.	Deleted "and" after "CB" and added "and EBAS Building" after "(FB)" per RAI 3.8-64 S1.
50	S3.8.4.4.1, 3rd para., 1st sent.	Revised per RAI 3.8-64 S1 to read: "The FE analysis models of the CB and EBAS Building include the entire structure."
51	S3.8.4.5.1, 1st para., 2nd sent.	Replaced "SRP 3.8.1 Section II.3" with "SRP 3.8.4 Section II.3" per RAI 3.8-75.
52	New section 3.8.4.5.5	Added "EBAS Building" (Structural Acceptance Criteria) information per RAI 3.8-64 S1.
53	S3.8.5.4, 1st para.	Replaced "well established" with "the" per RAI 3.8-91 S1.
54	S3.8.5.4	Added the following paragraph after 3rd paragraph per RAI 3.8-87, 3.8-91 and 3.8-100: "The foundation mat is analyzed using the linear elastic finite element (FE) computer program NASTRAN as described in Sections 3.8.1.4.1.1 and 3.8.4.4.1. The type of finite elements used to model the foundation mat is the thick shell type of elements which account for out-of-plane shear deformation also. The foundation mat resists out-of-plane forces applied from superstructures and foundation soil. Bending moments in the foundation mat are evaluated for the resultant out-of-plane forces. The foundation soil is modeled with elastic springs and connected to the foundation mat elements in the FE model. By means of using this method, the soil-structure interaction (SSI) is considered in the foundation design, and the requirement of SRP 3.8.5 II 4.a is satisfied."

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
55	S3.8.5.4	Added the following paragraph after 4th paragraph per RAI 3.8-90: "The worst case scenario for foundation base mat design is the soft soil since it is subject to largest deformation. From the NASTRAN analysis the results are scanned for the worst loads in the mat sections and are selected for checking the section. This enveloping of most severe loading is done for all loading considered in the analysis."
56	S3.8.5.4, 5th para.	Revised per COLA FSAR to read: "The capability of the foundation to transfer shear is based on waterproofing material."
57	S3.8.5.4, 6th para., last sent.	Revised per COLA FSAR to read: "See Subsection 3.7.5.1 and 3.8.6.1 for unit-specific information."
58	S3.8.5.4, 7th para., 2nd sent.	Revised per COLA FSAR to read: "The physical properties of the site-specific subgrade materials are furnished within Subection 2.5."
59	S3.8.5.4, 7th para., last sent.	Deleted sentence per COLA FSAR."
60	S3.8.6.3	Deleted Sections 3.8.6.1, 3.8.6.2 and 3.8.6.4 per COLA FSAR. Renumbered Section 3.8.6.3 to 3.8.6.1 and: Revised 1st sentence of new 3.8.6.1 per COLA FSAR to read: "The structural integrity test (SIT) of the ESBWR containment shall be performed in accordance with Subsection 3.8.1.7.1." Revised last sentence of new 3.8.6.1 per COLA FSAR to read: "The details of the test and the instrumentation, required for a prototype SIT, is provided by the first ESBWR utility for NRC review and approval."
61	T3.8-2, Title	Added "*7" per RAI 3.8-46 S1.
62	T3.8-2, Note *5	Deleted ", VLC" from the 1st sentence per RAI 3.8-46 and added the following sentence at the end per RAI 3.8-8: "LOCA loads shall include hydrostatic pressure (with a load factor of 1.0) due to containment flooding."
63	T3.8-2, new Note *7	Added Note *7 per RAI 3.8-46 S1: "The peak responses of dynamic loads do not occur at the same instant. SRSS method to combine peak dynamic responses is NOT acceptable for concrete structures. Absolute Value Sum (ABS) shall be used."
64	T3.8-4, Column 17 (SRV) & 18 (LOCA) Title	Added "(12)" in the column titles per RAI 3.8-46 S1.

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
65	T3.8-4, Note (5)	Deleted ",VLC" from the 1st sentence per RAI 3.8-46 and added the following sentence at the end per RAIs 3.8-8: "LOCA loads shall include hydrostatic pressure (with a load factor of 1.0) due to containment flooding."
66	T3.8-4, new Note (12)	Added Note (12) per RAI 3.8-46 S1 "The peak responses of dynamic loads do not occur at the same instant. SRSS method to combine peak dynamic responses is acceptable for steel structures."
67	T3.8-6, Item 14	Column 2: Replaced "ASME 2004" with "Not Used" per RAI 3.8-45. Column 3: Removed title per RAI 3.8-45.
68	T3.8-6, Item 15, 3rd column	Added "(1)" per RAI 3.8-43.
69	T3.8-6, new Note (1)	Added Note (1) per RAI 3.8-43: "To comply with NUREG-1503, Appendix G, NRC Position on the use of ANSI/AISC N690 (1984), for impact and impulsive loads, the ductility factors μ in Table Q1.5.8.1 are replaced with the ductility factors in Appendix A to SRP Section 3.5.3."
70	T3.8-6, Item 19	Column 2: Replaced "Not Used" with "Regulatory Guide 1.54" per RAI 3.8-43. Column 3: Added title per RAI 3.8-43: "Service Level I, II and III Protective Coatings Applied to Nuclear Power Plants, Rev. 1, July 2000.
71	T3.8-7	Deleted Columns "P_1" and "P_s" per RAI 3.8-46.
72	T3.8-7, Columns 15 (CRV) & 16 (LOCA) Titles	Added "(*6, *7)" in the titles per RAI 3.8-46 S1.
73	T3.8-7, Note 3	Deleted ", VLC" from 1st sentence and added "LOCA includes AP loads and effects." per RAI 3.8-46 and "LOCA loads shall include hydrostatic pressure (with a load factor of 1.0) due to containment flooding." per RAI 3.8-8 at the end of Footnote 3.
74	T3.8-7, new Notes *6 & *7	Added the following Notes *6 & *7 per RAI 3.8-46 S1: "*6 Other loads such as jet loads and drag loads associated with SRV and LOCA hydrodynamic loads are applicable to submerged structures and those above suppression pool water surface. Methodology for calculation of these loads is given in CLD (NEDE-33261P). *7 The peak responses of dynamic loads do not occur at the same instant. SRSS method to combine peak dynamic responses is acceptable for steel structures."

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75	T3.8-9, Title	Replaced "Regulations" with "Regulatory Guides" per RAI 3.8-66.
76	T3.8-9, Item 2, 3rd Column	Added "(1)" per RAI 3.8-66 and 3.8-78.
77	T3.8-9, Item 4	Editorial change. Deleted "(for design of main steam tunnel embedment piping anchorage in the RB only)".
78	T3.8-9, new Note (1)	Added the following Note (1) per RAI 3.8-66 and 3.8-78: "To comply with NUREG-1503, Appendix G, NRC Position on the use of ANSI/AISC N690 (1984), for impact and impulsive loads, the ductility factors μ in Table Q1.5.8.1 are replaced with the ductility factors in Appendix A to SRP Section 3.5.3."
79	T3.8-9, Item 24	Column 2: Replaced "Not Used" with "Regulatory Guide 1.54" per RAI 3.8-66. Column 3: Added title per RAI 3.8-66: "Service Level I, II and III Protective Coatings Applied to Nuclear Power Plants, Rev. 1, July 2000.
80	T3.8-13, 4th row, 2nd column	Replaced "16.15" with "16" per RAI 3.7-8.
81	T3.8-13, 7th row, 2nd column	Replaced "12.05" with "11.9" per RAI 3.7-8.
82	T3.8-16, 3rd column title (D)	Added "*6" per RAI 3.8-78.
83	T3.8-16, new Note *6	Added Note *6 per RAI 3.8-78: "Dead Load includes settlements."