Revision 1 to Revision 2 Change List – Section 3.9

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1.	S3.9.1.4, Fuel Storage and Refueling Equipment	Replaced "33Hz for seismic load and up to 60 Hz for other dynamic loads" with "ZPA defined in subsection 3.7.2.7".
2.	S3.9.1.4, Inelastic Analysis Methods	Added sentence to end of second paragraph: "Except for pipe whip restraints, inelastic analysis methods are not used in the ESBWR piping design and analysis."
3.	S3.9.2.1.2	Added the following paragraph at the end of the subsection: In addition to thermal expansion testing, the initial ESBWR plant shall also perform thermal stratification testing for the feedwater system piping. This testing shall be performed using external thermocouples on the pipe to confirm that the thermal stratification inputs to the piping analysis were conservative.
4.	S3.9.2.2.1.	Second paragraph replaced "33Hz for seismic load and up to 60 Hz for other dynamic loads" with "ZPA defined in subsection 3.7.2.7" and replaced "33Hz in the case of seismic loads and 60 Hz" with "ZPA defined in subsection 3.7.2.7".
5.	S3.9.2.2.2. Other ASME Code Section III Equipment	Second paragraph replaced "33Hz for seismic load and 60 Hz for other RPV loads" with "ZPA defined in subsection 3.7.2.7".
6.	S3.9.3.1	Moved last sentence in second paragraph between second and third paragraphs (creating a new paragraph) and adding: "Also for Class 1 piping, all the operating temperatures above ambient or below ambient are included in the fatigue analysis. Even the ambient temperature is included as a load set with defined cycles. The stress free state for the piping system is defined as a temperature of 21°C (70°F) for Class 1, 2, 3 or B31.1 piping. For Class 2,3 or B31.1 piping, no thermal expansion analysis will be performed for a piping system operating at 65°C (150°F) or less."
7.	S3.9.3.3	Changed Sy to Sm.

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
8.	S3.9.3.4 ASME Class 1, 2, and 3 Piping	Added sentence between 3rd and 4th sentences: "In the event that a NB-3600 analysis is performed for Class 2 or 3 pipe, all the analysis requirements for Class 1 pipe as specified in this document and the ASME code will be performed." Added sentence at end: "If Code Case N-122-2 is used for analysis of a class 1 pipe, the analysis complying with this Case will be included in the Design Report for the piping system."
9.	S3.9.3.6 Main Stream Safety / Relief Valves	Added paragraph at end: "Many of the SRV design parameters and criteria are specified in Sections 5.2 and 15.2. The procurement specification for the SRV, that will be prepared by GE, define the SRV requirements that are necessary to be consistent with the SRV parameters used in the steam line stress analysis."
10.	S3.9.3.7	Replaced 4th paragraph with: "Concrete expansion anchor bolts, with regard to safety factor and anchor plates flexibility, will follow all aspects of IE Bulletin 79-02, "Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts," Revision 2 dated November 8, 1979. Expansion anchor bolts shall not be used for any safety related system components. The design and installation of all anchor bolts will be performed in accordance with Appendix B to ACI 349-01 "Anchoring to Concete", subject to the conditions and limitations specified in RG 1.199 and all applicable requirements of IE Bulletin 79-02 Rev. 2." Replaced 5th paragraph with: "It is preferable to attach pipe supports to embedded plates; however, surface-mounted base plates with undercut anchor bolts can be used in the design and installation of supports for safety related piping."
11.	S3.9.3.7.1	Replaced 2nd and 3rd sentence with: "The applicable loading combinations and allowables used for design of supports are shown on Tables 3.9-10, -11, and –12" Added new Tables 3.9-10, 3.9-11 and 3.9-12 (see below).
12.	S3.9.3.7.1	Deleted footnote 1.

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
13.	S3.9.3.7.1	2nd paragraph, 1st sentence, replaced word "suspension" with "piping".
14.	S3.9.3.7.1	After 4th paragraph, inserted the following paragraphs: "The friction loads caused by unrestricted motion of the piping due to thermal displacements are considered to act on the support with a friction coefficient of 0.3, in the case of steel-to-steel friction. For stainless steel, Teflon, and other materials, the friction coefficient could be less. The friction loads are not considered during seismic or dynamic loading evaluation of pipe support structures." "For the design of piping supports, a deflection limit of 1.6 mm for erection and operation loadings is used, based on WRC-353 paragraph 2.3.2. For the consideration of loads due to SSE and in the cases involving springs, the deflection limit is increased to 3.2 mm." "For frame type supports for directions that are loaded, the total gap is limited to 1/8 inch. In general, this gap is adequate to avoid thermal binding due to radial thermal expansion of the pipe. For large pipes with higher temperatures, this gap will be evaluated to assure that no thermal bending occurs." "The small bore lines (e.g. small branch and instrumentation lines) are supported taking into account the flexibility, and thermal and dynamic motion requirements of the pipe to which they connect. Subsection 3.7.3.16 provides details for the support design and criteria for instrumentation lines 50 mm and less where it is acceptable practice by the regulatory agency to use piping handbook methodology."
15.	S3.9.3.7.1 (6) Special Engineered Pipe Supports	Deleted second paragraph "Energy Absorbers", and deleted last sentence in last paragraph.
16.	S3.9.3.7.2	Deleted footnote 2.
17.	S3.9.3.8	Deleted footnote 3.

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
18.	(removed)	(none)
19.	T3.9-8 B32 Isolation Condenser System Valves	Changed F013 code class from “2” to “1”, code cat from “B” to “A” and added the F015 and F104: F015, qty 4, Manual valve – isolation condenser purge line (g3), code class 1, code cat A, valve func P, test para P, test freq R0. F0104, qty 4, Dryer / Separator Storage Pool valve, code class 3, code cat B, valve func A, test para S, test freq R0.
20.	T3.9-8 E50 Gravity Driven Cooling System Valves	Changed F003 test para from “S” to “S, L, P” and test freq from “R0” to “R0 3 mo”. Changed F007 test para from “S, P” to “S, L, P” and test freq from “R0” to R0 “3 mo”.
21.	T3.9-8 G21 Fuel and Auxiliary Pools Cooling System Valves	F212 changed “wall” to “well” F213 changed “wall” to “well” F323 changed “outboard” to “inboard” F324 changed “inboard” to “outboard” F321 changed “inboard” to “outboard” F420 changed “IC” to “IC/PCC” F421 changed “IC” to “IC/PCC” Added the following: F426A/B, qty 2, FPS water makeup valve to IC/PCC pool (g3), code class 3, code cat C, valve func A, test para S, test freq R0. F427A/B, qty 2, FPS water makeup check valve to IC/PCC pool (g3), code class 3, code cat C, valve func A, test para S, test freq R0. F428A/B, qty 2, FPS water makeup valve to Spent Fuel pool (g3), code class 3, code cat C, valve func A, test para S, test freq R0. F429A/B, qty 2, FPS water makeup check valve to Spent Fuel pool (g3), code class 3, code cat C, valve func A, test para S, test freq R0.
22.	T3.9-9	For condition “Service Level A&B” change acceptance

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
		criteria from “3.0 Sm” to “2.4 Sm”.
23.	T3.9-10	New table added titled “Snubber Loads”
24.	T3.9-11	New table added titled “Strut Loads”
25.	T3.9-12	New table added titled “Linear Type (Anchor and Guide) Main Steam Piping Support”

Revision 1 to Revision 2 Change List – Appendix 3.10

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1.	S3.10 (1)	a. Moved "Appendix A" to after "10 CFR 50" b. Moved "Appendix B" to after "10 CFR 50"
2.	S3.10 (2)	c. Changed "2004" to "1987"
3.	S3.10 (3)	a. and c. Removed "&" b. Added "ASME" in front of "NQA-1"
4.	S3.10 (4)	a. Replaced "of" with "for" b. Changed title to "Development of Floor Design Response Spectra for Seismic Design of Floor- Supported Equipment or Components" c. Deleted "Requirements for" d. Replaced "1976" with "rev. 2". f. Changed "Electric" to "Electrical and Mechanical".
5.	S3.10.2	Changed second sentence From: "Described here are the general methods and procedures to qualify by test or analysis, Seismic …" To: "Described here are the general methods and procedures for qualifying by testing, analysis, combined testing and analysis or experience data the Seismic ….",
6.	S3.10.2.1 Vibration Conditioning	Replaced "Paragraph 4.4.2.4.5 of NUREG 0588 (Reference 3.10-3), vibration aging program" with "the applicable qualification standard for the equipment".
7.	S3.10.5	Deleted reference 3.10-3.

Revision 1 to Revision 2 Change List – Appendix 3.11

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1.	S3.11 (2)	c. Changed title to "Qualifying Class 1E Electric Cable and Field Splices for Nuclear Power Generating Stations" d. Changed title to "Standard for the Design and Qualification of Class 1E Control Boards, Panels and Racks Used in Nuclear Power Generating Stations". f. Changed "1988" to "1998" and ".. Nuclear.. " to "… Nuclear Power… ". g. Changed "u" to "U". h. Changed "Qualification .. " to "Standard for Qualification ..". k. Changed "…Safety Related …" to " … Safety-Related…" m. Added "IEEE-572-1985 (R2004) "Standard Qualification of Class 1E Connection Assemblies for Nuclear Power Generating Stations". n. Added "IEEE-634-2004 "Standard Cable-Penetration Fire Stop Qualification Test".
2.	S3.11 (3)	b. Added "ASME" in front of "NQA-1".
3.	S3.11 (4)	a. Changed "of" to "for" c. Changed title to "Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants". d. Changed "1979" to "1977" and replaced "Qualification Tests of Electrical Cable, … for Light-Water Cooled Power Plants" with "Qualification Tests of Electric Cables, …for Light-Water-Cooled Nuclear Power Plants". e. Deleted "Power Instrumentation and Control Portions of".
4.	S3.11.2.1	Last sentence, changed reference 3.11-4 to 3.11-3.
5.	S3.11.2.2	4th paragraph deleted "NUREG 0588 (Reference 3.11-3), and". 5th paragraph replaced "C" with "(c)". Last paragraph changed "3.11-4" to "3.11-3".
6.	S3.11.6	Delete reference 3.11-3 and make reference 3.11-4 new reference 3.11-3.