

Tier 2 Chapter 3.9 Revision 2 to Revision 3 Change List

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1.	Title Page	Changed “GE Nuclear Energy” to “GE Energy Nuclear”
2.	S3.9.1, 2 nd para., Item 6	Replaced “10 CFR 100, Appendix A” with “10 CFR 50, Appendix S” per RAI 3.9-3.
3.	S3.9.1.3, last para.	Deleted paragraph plus title.
4.	S3.9.1.4, 5 th para. (RPV Assembly), 1 st sent.	Inserted “vessel” after “(2)” and deleted “brackets” per RAI 3.9-102.
5.	S3.9.1.4, new 8 th para.	Additional details are provided in response to RAI 3.8-27 S3.
6.	S3.9.2, 1 st para.	Added following sentence at the end of paragraph per RAI 3.9-27: “Structural requirements for Conduits and Cable Tray supports and HVAC Duct supports are specified in Subsections 3.8.4.1.6 and 3.8.4.1.7 respectively.”
7.	S3.9.2.1.1, 6 th para., 3 rd & 4 th sent.	Replaced sentences with the following sentences per RAI 3.9-19: “For steady state vibration, the Level 1 criteria are based on ASME OM-S/G-1990 Standard, paragraph 3.2.1.2. For stainless steel, the Level 1 criteria are 10,880 psi (75 MPa). For carbon steel and low alloy steel, the level 1 criteria is 7692 psi (53MPa). The corresponding Level 2 criteria are based on one half of the Level 1 limits.”
8.	S3.9.2.2.2, 23 rd para., last sent	Revised last sentence per RAI 3.9-45 to read: “For the case of equipment having multiple supports with different dynamic motions, an upper bound envelope of all the individual response spectra for these locations is used to calculate maximum inertial responses of items with multiple supports.”
9.	S3.9.2.3, 3 rd para., new last sent.	Added additional details in response to RAI 3.9-66.
10.	S3.9.2.3, 4 th para., 1 st sent.	Inserted “with the exception of steam dryer, in order” after “±68.95 MPa (±10,000 psi)” per RAIs 3.9-66.
11.	S3.9.2.3, new 5 th para.	Added additional details in response to RAIs 3.9-58, 3.9-66.

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12.	S3.9.2.3, last para.	Revised paragraph in response to RAIs 3.9-56.
13.	S3.9.2.4, 4 th para	Deleted 3 rd & 4 th bullets per RAI 3.9-132.
14.	S3.9.2.4, 4 th para., new 1 st bullet	Added additional details in response to RAI 3.9-61.
15.	S3.9.2.4, 6 th para., 3 rd sent.	Inserted “steam dryer” after “...inspections cover the” per RAI 3.9-58.
16.	S3.9.2.4, last para.	Replaced “Subsection 3.9.7.1” with “Subsection 3.9.9.1” per RAI 3.9-74.
17.	S3.9.3, new last para.	Added additional details in response to RAI 3.9-107.
18.	S3.9.3.2, 1 st para.	Revised paragraph per RAI 3.9-102 to read: “The reactor vessel assembly includes: (1) the reactor pressure vessel boundary out to and including the nozzles and housings for FMCRD and in-core instrumentations; (2) vessel sliding support, and (3) shroud support.”
19.	S3.9.3.4, 12 th para. (ASME Class 1, 2 and 3 Piping), 6 th sent.	Replaced “S _y ” with “S _m ” per RAI 3.12-16 S2.
20.	S3.9.3.4, new last para.	Added additional details in response to RAI 3.12-38S1.
21.	S3.9.3.5.2, 2 nd para., 2 nd sent.	Replaced “Subsection 3.9.3.5” with “Section 3.10”. RAI 3.9-106S1
22.	S3.9.3.5.2, 4 th para., 2 nd sent.	Replaced “Subsection 3.9.3.5” with “Section 3.10”. RAI 3.9-106S1
23.	S3.9.3.5.2, new 6 th & 7 th para.	Added additional details in response to RAI 3.9-106S1.
24.	S3.9.3.5.2, 6 th para., Items 1 and 4	(1) Removed “ZPA”. (4) Revised per RAI 3.9-106S1 to read: “Powered valve actuators and other accessory components directly attached onto the valve or actuator that are necessary for operation are qualified as operable during a dynamic event by appropriate qualification tests prior to installation on the valve. The powered actuator assemblies then have individual Seismic Category I supports attached to decouple the dynamic loads between the actuators and valves themselves.”

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25.	S3.9.3.5.2, 7 th para.	Replaced “motor operator” with “actuator assembly” per RAI 3.9-106S1.
26.	S3.9.3.7, new 1 st para.	Added additional details in response to RAI 3.9-113.
27.	S3.9.3.7, 4 th para.	Deleted 1 st and 2 nd sentence and reworded 3 rd paragraph.
28.	S3.9.3.7, 5 th para.	Added “components” at the end of sentence.
29.	S3.9.3.7, 6 th and 7 th para.	Deleted.
30.	S3.9.3.7.1, 1 st para.	Inserted following sentence after 1 st sentence per RAI 3.9-112: “The building structure component supports (connecting the NF support boundary component to the existing building structure) are designed in accordance with ANSI/AISC N690, Nuclear Facilities-Steel Safety-Related Structures for Design, Fabrication and Erection (1994 edition), or the AISC specification for the Design, Fabrication and Erection of Structural Steel.” Deleted last 3 sentences.
31.	S3.9.3.7.1, 2 nd para.	Deleted last sentence per RAI 3.12-37 S2.
32.	S3.9.3.7.1, new 3 rd para.	Added additional details in response to RAI 3.9-111.
33.	S3.9.3.7.1, 6 th , 7 th and 8 th para.	6 th paragraph: Added “(1/16 in.)” after “1.6 mm” 7 th paragraph: Deleted “for directions that are loaded” from the first sentence. Added “3.2 mm” in front of “1/8 in.” and placed parenthesis around “1/8 in”. Added following sentence at the end of paragraph per RAI 3.12-35 S2: “The minimum total gap shall be specified to ensure that it is adequate for the thermal radial expansion of the pipe to avoid any thermal binding.” 8 th paragraph: Added “(1.97 in.)” after “50 mm”.
34.	S3.9.3.7.1, 9 th para., Item 3b	Added additional details in response to RAI 5.2-31 & RAI 3.9-25.
35.	S3.9.3.7.1, 9 th para., Item 3c.(i)	Reworded first sentence and added additional details in response to RAI 3.9-114.

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36.	S3.9.3.7.1, 9 th para., new Item 3c.(ii)	Added additional details in response to RAI 3.9-24.
37.	S3.9.3.7.1, 9 th para., Item 3c.(iii)	Added following after the 1 st sentence per RAI 3.9-117: “Production and qualification test programs for both hydraulic and mechanical snubbers are carried out by the snubber vendors in accordance with the snubber installation instruction manual required to be furnished by the snubber supplier. Acceptance criteria to assure compliance with ASME Section III Subsection NF are cited in this manual, and applicable codes and standards are referenced.”
38.	S3.9.3.7.1, 9 th para., new Item 3c.(iv)	Added additional details in response to RAI 3.9-124.
39.	S3.9.3.7.1, 9 th para., Item 3e, title	Changed title with “Snubber Preservice and Inservice Examination and Testing” per RAIs 3.9-120, 3.9-121, 3.9-122 & 3.9-174.
40.	S3.9.3.7.1, 9 th para., Item 3e, 1 st para., 1 st sent.	Inserted “in accordance with the requirements of the ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code), Subsection ISTD, and the additional requirements of this Section” at the end sentence per RAIs 3.9-120, 3.9-121, 3.9-122 & 3.9-174.
41.	S3.9.3.7.1, 9 th para., Item 3e, new last para.	Added additional details in response to 3.9-120, 3.9-121, 3.9-122 & 3.9-174.
42.	S3.9.3.7.1, 9 th para., new Item 3f	Added additional details in response to RAI 3.9-123.
43.	S3.9.3.7.1, 9 th para., Item 5, new 4 th para.	Added additional details in response to RAI 3.9-125.
44.	S3.9.3.7.1, 9 th para., Item 6, all para.	Replaced entire Special Engineered Pipe paragraph with “Shall not be used” per RAI 3.12-13.
45.	S3.9.3.8	2 nd sentence reworded.
46.	S3.9.5, 4 th para., 2 nd bullet, 3 rd dash	Replaced “dryers” with “dryer”.
47.	S3.9.5, 5 th para.	Changed Figure “5.3-2” to “Figure 5.3-3”.
48.	S3.9.6, 2 nd para., last sent.	Added “(Code Cases OMN-1 though OMN-6 and OMN-12)” at the end of sentence per RAI 5.2-31.

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49.	S3.9.6.1, 2 nd para., title	Replaced “Motor Operated” with “Power-Operated”. RAI 3.9-162S1.
50.	S3.9.6.1, 2 nd para.	Revised paragraph per RAI 3.9-162S1 to read: “The power-operated valve (POV) equipment specifications, including those for the pneumatic-operated (air or nitrogen), pneumatic-motor operated, hydraulic-operated, solenoid-operated, motor-operated and pyrotechnic-operated valves, require the incorporation of the results of either in-situ or prototype testing with full flow and pressure or full differential pressure to verify the proper actuator sizing and correct controls settings of the valves.”
51.	S3.9.6.1, 3 rd para.	Revised first 3 sentences per RAI 3.9-162S1 to read: “Guidelines to justify prototype testing of MOVs are contained in Generic Letter 89-10, Supplement 1, Questions 22 and 24 through 28. These guidelines are appropriately applied to prototype testing of other power-operated valves. The COL holder referencing the ESBWR design shall perform a study to determine the optimal frequency for power-operated valve stroking during in-service testing such that unnecessary testingcycling and damage is not done to the valve does not occur as a result of the testing” In last sentence changed “3.9.9.3(1)” to “3.9.9.3(2)”.
52.	S3.9.6.1, 4 th para.	Inserted following sentences after the 2 nd sentence per RAI 3.9-162S1: “The methods for assessing loads, sizing valve actuators and determining controls settings for AOVs shall consider the guidance developed by the Joint Owners Group on Air-Operated Valves. The guidance from these two sources should also be used to address these same issues for other power-operated valves.” In last sentence changed “3.9.9.3(1)” to “3.9.9.3(3)”.
53.	S3.9.6.1, new 5 th para	Added new paragraph in response to RAI 3.9-162S1.
54.	S3.9.6.1, 5 th para., 1 st , 2 nd and 5 th sent.	Replaced “MOVs” with “POVs” per RAI 3.9-162S1.
55.	S3.9.6.1, 5 th para., 2 nd sent.	Deleted “including recovery from inadvertent valve positioning”.

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56.	(blank)	(blank)
57.	S3.9.9.3, title	Replaced title with “Inservice Testing Programs” per RAI 3.9-122.
58.	S3.9.9.3, 1 st para., 1 st sent.	Editorial change, removed “s” in “holders”
59.	S3.9.9.3, Item 1	Replaced “MOVs” with “POVs” per RAI 3.9-162S1.
60.	S3.9.9.3, new last para.	Added additional details in response to RAI 3.9-122.
61.	T3.9-1, last column title	Replaced “Events ¹ ” with “Cycles”. RAIs 3.9-4 & 3.9-11
62.	T3.9-1, Item A title	Added “1,9” at the end of the title. RAIs 3.9-4 & 3.9-11
63.	T3.9-1, Item B title	Added “1,9” at the end of the title. RAIs 3.9-4 & 3.9-11
64.	T3.9-1, Item B, 13, last column.	Replaced “2 Events ⁵ 10 Cycles/Event” with “20 ⁵ ”. RAIs 3.9-4 & 3.9-11
65.	T3.9-1, Item B, 14, last column	Deleted “Cycle”. RAIs 3.9-4 & 3.9-11
66.	T3.9-1, Notes	Added “55.6°C (100°F)” to note 2. Added Note 9. RAIs 3.9-4 & 3.9-11
67.	T3.9-2	Deleted Note 9 and Reference to Note 9 per RAI 3.6-22.
68.	T3.9-2, Note 12	Revised in response to RAI 3.12-18 S2.
69.	T3.9-8, B21	Added items F028, F029, F030 and F031 per RAI 3.9-173.
69a.	T3.9-3	Added “(psi)” to column heading and appropriate vales for each row.
70.	T3.9-8, E50, Item F003	Deleted “biased open” in the description column.
71.	T3.9-8, E50, Item F007	Deleted “based open” in the description column.
72.	T3.9-8, E50	Added another item F010.
73.	T3.9-8, G21, Item F306	Replaced “F306” with “F306A/B” and changed the quantity to “2”.
74.	T3.9-8, G21, Item F307	Replaced “F307” with “F307A/B” and changed the quantity to “2”.
75.	T3.9-8, G21, Item F321	Replaced “F321” with “F321A/B” and changed the quantity to “2”.

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76.	T3.9-8, G21	Added items F322A/B, F332A/B and F333A/B. Reference RAI 6.2-125
77.	T3.9-8, T10, Item F001	Replaced “solenoid” with “Vacuum breaker isolation” in the description column.
78.	T3.9-9	Added Note (3) in response to RAI 3.12-38S2.
79.	T3.9-9, row 2 (Service Level A&B), column 3	Revised per RAI 3.12-16 S2 to read: “Eq 12 & 13 $\leq 2.4 S_m$ Fatigue - NB-3653: $U < 0.10$ ”.
80.	T3.9-10, 3.9-11 & 3.9-12	Replaced “Basemat” with “Building” in the description of RV ₂ I & RV ₂ D per RAI 3.12-30 S2.
81.	T3.9-12, 3 rd column	For service levels A, B and C: Replaced “Table NF-3623(b)-1” with “Table NF-3131(a)-1 for Linear Support” per RAI 3.12-30 S2.
82.	T3.9-12, new Notes (4) & (5)	Added additional details in response to RAI 3.12-30 S2.
83.	F3.9-5	Replaced figure per RAI 4.4-20.

Tier 2 Chapter 3.10 Revision 2 to Revision 3 Change List

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1.	S3.10, 1 st para., 1 st sent.	Deleted “and Appendix A to 10 CFR 100” and inserted “and Appendix S to 10 CFR 50” at the end of sentence per RAI 3.9-3.
2.	S3.10, 1 st para., last sent.	Deleted “snubbers”.
3.	S3.10, 2 nd para., Item 1c	Revised item per RAI 3.9-3 to read: “10 CFR 50 Appendix S “Earthquake Engineering Criteria for Nuclear Power Plants.”
4.	S3.10.2.2, 4 th para.	Deleted.
5.	S3.10.2.2	For “Analyses for Seismic and RBV Dynamic Loads” paragraph, reworded to the following: “The structural and functional integrity of the equipment is maintained under low level earthquake loads including appropriate RBV dynamic loads in combination with normal operating loads. Where applicable, normal operating and SSE loads including appropriate RBV dynamic loads do not result in failure of the equipment to perform its safety-related function(s)”.
6.	S3.10.2.4	Deleted per RAI 3.10-3S1
7.	S3.10.3 last sentence	Replaced “of the AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings” with “delineated in section 3.8”.
8.	S3.10.3.2	Added following sentence after the 4 th paragraph per RAI 3.9-27: “Structural requirements for Conduits and Cable Tray supports are also specified in Subsection 3.8.4.1.6.”

Tier 2 Chapter 3.11 Revision 2 to Revision 3 Change List

Item	Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	Description of Change
1.	S3.11.1; 1 st para., 2 nd sent.	Inserted “solenoid-operated valves” after “...operated valves” per RAI 3.9-162S1.
2.	S3.11.2.2, 4 th para.	Changed reference 3.11-4 to 3.11-3.