

ESBWR DCD Tier 2 Chapter 4
26A6642AP Revision 5 to Revision 6 Change List

| Item | Location | Description of Change |
|-------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Entire Chapter | Global chapter editorial changes to correct misspelling and grammar, spell out or integrate acronyms where appropriate, add dual dimensioning for consistency, and updated references as needed and where required. |
| 2. | S4.1.1, 1 st para., 1 st sent. | Deleted “brackets”, no longer used in design. |
| 3. | F4.1-1 | Figure revised in response to RAI 4.2-29. |
| 4. | S4.2.1.1.5, 1 st para, 6 th sent. | Revised sentence in response to RAI 4.2-2 S04. |
| 5. | S4.2.1.1.7, last para, 3 rd sent. | Deleted “or equal to” for consistency. |
| 6. | S4.2.3.11 | Delete ”/or” for clarity. |
| 7. | S4.2.3.12, 1 st para., 8 th and 9 th sent. | Replaced 8 th and 9 th sentences with “The Fuel Assembly Mechanical Design Report LTR (Reference 4.2-4) contains the fuel-specific acceptance criteria.” In response to RAI 14.3-398. |
| 8. | S4.2.7, references | Updated references to latest revision and added “Class III Proprietary” and added non-proprietary reference when appropriate for consistency. |
| 9. | S4.2.7, note | Added note for clarification in response to RAI 4.2-28. |
| 10. | S4.3.1.3 | Replaced “abnormal operational occurrences” with “AOOs” for clarity. |
| 11. | S4.3.1.3, Maximum Linear Heat Generation Rate para., 3 rd sent. | Replaced “abnormal” with “AOO” for clarity. |
| 12. | S4.3.2.1, 3 rd para., 2 nd sent. | Deleted “(TGBLA)” for clarity. |
| 13. | S4.3.2.1, 5 th para., 2 nd sent. | Deleted “similar to the THERMOS formulation.” For clarity. |
| 14. | S4.3.2.1, 6 th para., last sent. | Deleted last sentence for clarity. |
| 15. | S4.3.2.1, 7 th para., 1 st sent. | Deleted “PANACEA” for consistency. |
| 16. | S4.3.2.1, 8 th para., 2 nd sent. | Deleted “Zuber-Findlay” for consistency. |

| Item | Location | Description of Change |
|------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| 17. | S4.3.2.1, 9 th para., 1 st sent. | Replaced “These methods (TGBLA06/PANAC11) include a” with “These methods include at least a” for consistency. |
| 18. | S4.3.2.1, 9 th para., 2 nd sent. | Deleted “TGBLA” for consistency. |
| 19. | S4.3.2.1, 10 th para., 1 st sent. | Replaced “PANACEA” with “A simulator code” for consistency. |
| 20. | S4.3.3.1, 1 st para., 2 nd sent. | Replaced “Figure 4.3-1” with “Reference 4.3-8” for consistency. |
| 21. | S4.3.3.1, 2 nd para., 3 rd sent. | Replaced “number and/or types” with “numbers, types or both number and types” for clarity. |
| 22. | S4.3.3.2.2, 2 nd para., 4 th sent. | Deleted sentence for DCD consistency and clarity. |
| 23. | S4.3.3.2.2, 2 nd para., 5 th sent. | Replaced “Figure 4.3-2” with “Reference 4.3-8” for consistency. |
| 24. | S4.3.3.2.3 3 rd para., 2 nd sent. | Replaced “Figure 4.3-3” with “Reference 4.3-8” for consistency. |
| 25. | S4.3.3.2.3 4 th para. | Deleted paragraph for DCD consistency and clarity |
| 26. | S4.3.3.3, 2 nd para., 2 nd sent. | Replaced “Figure 4.3-5 shows” with ”Reference 4.3-8 provides” and added “...used to verify SDM.” For consistency and clarity. |
| 27. | S4.3.3.3.1, 5 th para., 1 st sent. | Replaced “Table 4.3-1” with “Reference 4.3-8” for consistency. |
| 28. | S4.3.3.3.3, 2 nd para. 5 th sent. | Replaced “Figure 4.3-4” with “Reference 4.3-8” for consistency. |
| 29. | S4.3.3.6.2, 1 st para., last sent. | Replaced “core decay ratio vs channel decay ratio” with “channel, core wide, and regional decay ratios” for consistency. |
| 30. | S4.3.6 References | Updated references to latest revision and added “Class III (Proprietary)” and “Class I (Non-proprietary)” for consistency. |
| 31. | S4.3.6, note | Added note for clarification in response to RAI 4.2-28. |
| 32. | T4.3-1 | Deleted for consistency. |
| 33. | F4.3-1 | Deleted for consistency. |
| 34. | F4.3-2 | Deleted for consistency. |

| Item | Location | Description of Change |
|------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 35. | F4.3-3 | Deleted for consistency. |
| 36. | F4.3-4 | Deleted for consistency. |
| 37. | F4.3-5 | Deleted for consistency. |
| 38. | S4.4.2.3.1, 2 nd para., 2 nd sent. | Added additional reference "...and 4.4-22" due to RAI 4.4-66 S01. |
| 39. | S4.4.2.3.2, 2 nd para., 1 st sent. | Revised equation due to RAI 4.4-66 S01. |
| 40. | S4.4.2.3.2, 2 nd para., 3 rd sent. | Added "...elevation..." due to RAI 4.4-66 S01. |
| 41. | S4.4.2.3.2, 2 nd para., new 10 th sent. | Added "However, full-scale pressure drop testing for a simulated GE14E fuel was performed to better characterize the differences in active fuel length, spacer separation, and part-length rod height between the GE14 and GE14E fuel design and the spacer loss coefficients for the GE14E fuel are determined to best fit the full-scale data obtained from the GE14E testing as discussed in Reference 4.4-22." Due to RAI 4.4-66 S01. |
| 42. | S4.4.2.3.5, 1 st para., 5 th sent. | Replaced "Moreover," with "However, full-scale pressure drop testing for a simulated GE14E fuel was performed to better characterize..." and replaced "...are accounted for in determining the local loss coefficients from the experimental data as explained in Subsection 4.4.2.3.2" with "...and to qualify the spacer loss coefficients for the ESBWR application. Test results and associated analysis are provide in Reference 4.4-22." due to RAI 4.4-66 S01. |
| 43. | S4.4.2.3.5, 1 st para., 6 th sent. | Added "...for the upper-tie plate, water rods, and bundle inlet based on the GE14 pressure drop data..." due to RAI 4.4-66 S01. |
| 44. | S4.4.2.3.5, 1 st para., 7 th sent. | Added "The spacer loss coefficients for the GE14E fuel are determined to best fit the full-scale data obtained from the GE14E testing." Due to RAI 4.4-66 S01. |
| 45. | S4.4.2.4, 2 nd para., 3 rd sent. | Added reference 4.4-22 due to RAI 4.4-66 S01. |
| 46. | S4.4.3.2, 1 st para., 1 st sent. | Replaced "radially average channel" with "average power channel" for clarity. |
| 47. | S4.4.3.2, 1 st para., 4 th sent. | Deleted reference to "Figure 4.3-1" for consistency. |

| Item | Location | Description of Change |
|------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 48. | S4.4.3.2, 2 nd para. | Corrected “0.93” with “0.92”, corrected “0.90” with “0.89”, and “4.4-15” with “4.4-11” due to TRACG re-analysis committed in MFN 09-114. |
| 49. | S4.4.4.1.3, 1 st para., 2 nd sent. | Replaced “minimum elevations” with “elevation of bottom of volume” for consistency. |
| 50. | S4.4.4.6, 1 st para., 2 nd , 3 rd , and 4 th sent. | Added “TRACG” before “average and hot channels” for consistency and clarity; added “in Table 4.4-1a and Table 4.4-1b” for consistency and clarity. |
| 51. | S4.4.8, ref. 4.4-1 | Corrected reference to “Critical Power and Pressure Drop Tests of Simulated 10X10 Bundle Designs Applicable to GE14, NEDC-32874P, Class III (Proprietary), March 2000” due to TRACG re-analysis committed in MFN 09-114. |
| 52. | S4.4.8 | Updated references to latest revision and added “Class III (Proprietary)” and “Class I (Non-proprietary)” for consistency. |
| 53. | S4.4.8 | Updated reference 4.4-12 in response to RAI 4.4-86 and added reference 4.4-22 due to RAI 4.4-66 S01. |
| 54. | S4.4.8 | Added Tier 2* note and added “[]*” to reference 4.4-20 and 4.4-21 due to RAI 4.2-28. |
| 55. | T4.4-1a | Updated values for consistency. |
| 56. | T4.4-1b | Updated values for consistency. |
| 57. | T4.4-2a | Corrected values due to TRACG re-analysis committed in MFN 09-114. |
| 58. | T4.4-2b | Corrected values due to TRACG re-analysis committed in MFN 09-114. |
| 59. | T4.4-3a | Corrected values due to TRACG re-analysis committed in MFN 09-114. |
| 60. | T4.4-3b | Corrected values due to TRACG re-analysis committed in MFN 09-114. |
| 61. | T4.4-4a | Corrected values due to TRACG re-analysis committed in MFN 09-114. |
| 62. | T4.4-4b | Corrected values due to TRACG re-analysis committed in MFN 09-114. |

| Item | Location | Description of Change |
|------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 63. | T4.4-5 | Corrected values due to TRACG re-analysis committed in MFN 09-114 and corrected column headings for consistency. |
| 64. | T4.4-6 | Updated to add dual units and footnotes for the detailed definition of the variables for clarity. |
| 65. | F4.4-1 | Updated figure due to RAI 4.3-16. Added footnotes for the detailed definition of “FWTR”, “FWTI” and all “SPX” points for clarity. |
| 66. | S4.5.1.2.1, 1 st para, 2 nd sent. | Corrected “0.020%” with “0.02% for 300 series austenitic stainless steel”. |
| 67. | S4.5.2.1, 1 st para., 4 th sent. | Added “300 series stainless steel” for clarity. |
| 68. | S4.5.2.1, 3 rd para., 2 nd sent. | Added “300 series” for clarity. |
| 69. | S4.5.2.2, 1 st para, 2 nd sent. | Replaced “Welded austenitic...assemblies...” with “Austenitic... weldments...” for clarity. |
| 70. | S4.5.2.2, 1 st para., 3 rd sent. | Added “300 series” for clarity. |
| 71. | S4.5.2.2, 1 st para, 3 rd sent. | Increased large forgings to .03% C content due to product capability. |
| 72. | S4.5.2.2, 1 st para., new 4 th sent. | Added “Type XM-19 materials are exempt from this requirement” for consistency. |
| 73. | S4.5.2.2, 2 nd para, 2 nd bullet | Deleted 2 nd sentence due to RAI 5.2-71 S01 and replaced 4.8” with “5”. |
| 74. | T4.5-1 | For support legs, shroud and support ring, peripheral fuel supports, control rod drive housings, stub tubes, chimney, chimney head, steam separator, chimney head bolts, steam dryer seismic blocks, feedwater spargers, SLC, in-core guide tube restraints and guide rod, added product form and corresponding or missing ASME material specifications for manufacturing. |
| 75. | T4.5-1 | For core plate, top guide, and control rod guide tube, added missing ASME material specifications for manufacturing. |
| 76. | T4.5-1 | Added in-core housings, data was missing from table. |

| Item | Location | Description of Change |
|------|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 77. | T4.5-1 | For steam dryer, added product form and corresponding ASME material specifications for manufacturing, also deleted nickel alloy which is not used. |
| 78. | T4.5-1 | Deleted bottom head drain line, no longer used in design. |
| 79. | T4.5-1, note 1 | Clarified Nb terminology outside US. |
| 80. | T4.5-1, note 2 | Revised to clarify 300 series austenitic stainless steel use. |
| 81. | S4.6.1.1.1 | Added bullet “The design provides for isolation capability terminating high pressure makeup water injection, HP CRD, to ensure containment pressure remains within design limits.” In response to RAI 21.6-103. |
| 82. | S4.6.1.1.2 4 th bullet | Added “The design provides for isolation bypass capability allowing high pressure makeup water injection, HP CRD, into the RPV if GDCS is unsuccessful in injecting water into the RPV.” In response to RAI 21.6-103. |
| 83. | S4.6.1.2 3 rd para., 2 nd sent. | Added “...scram...” in response to RAI 16.2-186. |
| 84. | S4.6.1.2 4 th para., 1 st sent. | Deleted “...HCU...” in response to RAI 16.2-186. |
| 85. | S4.6.1.2 4 th paragraph | Deleted “bypass” and added “During certain LOCA events the makeup water is isolated from the RPV and directed to the CST through the CRD pump minimum flow lines. The high pressure makeup isolation is bypassed, in response to signals indicating unsuccessful GDCS injection, to allow normal high pressure makeup injection to the RPV.” In response to RAI 21.6-103. |
| 86. | S4.6.1.2 new bullets | Added “Isolates high pressure makeup from the reactor in response to certain LOCA events to ensure containment pressure remains within design limits” and “Bypasses the high pressure makeup isolation in response to signals indicating unsuccessful GDCS injection to allow normal high pressure makeup mode”. In response to RAI 21.6-103. |

| Item | Location | Description of Change |
|------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 87. | S4.6.1.2, 8 th para., 2 nd sent. | Replaced “HCU” with “scram accumulator” due to RAI 16.2-186. |
| 88. | S4.6.1.2.1, 1 st para., 2 nd sent. | Corrected “a minimum...increments...” with “nominal increments” and corrected speed tolerance with “nominal” and added dual unit. |
| 89. | S4.6.1.2.1, 2 nd para., 3 rd sent. | Replaced “drives this piston and” with “lifts the piston and drives” for clarity. |
| 90. | S4.6.1.2.1, 12 th para., 2 nd and 3 rd sent.s | Replaced “gives the least possible” with “provides low” and replaced “and/or” with “or” for clarity. |
| 91. | S4.6.1.2.2, FMCRD Brake and Ball Check Valve, 1 st para., 4 th sent. | Added dual unit for consistency. |
| 92. | S4.6.1.2.4 CRD Supply Pump, 2 nd paragraph, 4 th sent. | Deleted “bypass” in response to RAI 21.6-103. |
| 93. | S4.6.1.2.4 CRD Supply Pump 3 rd paragraph 4 th sent. | Added “-low scram accumulator” due to RAI 16.2-186 |
| 94. | S4.6.1.2.4 Accumulator Charging Water Header | Replaced “accumulator charging water header” with “scram accumulator charging water header” numerous times and “(gas bottle)” for consistency due to RAI 16.2-186. |
| 95. | S4.6.1.2.4 Accumulator Charging Water Header | Added “scram” to accumulator numerous times for clarification in response to RAI 16.2-186. |
| 96. | S4.6.1.2.4 “High Pressure Makeup Line” 2 nd paragraph, 3 rd sent. and last two sent.s | Added new valve description “...two in-series air-operated HP CRD isolation valves, and in parallel with the two air-operated HP CRD isolation valves are two motor-operated isolation bypass valves.” and “The two air-operated HP CRD isolation valves isolate the high pressure makeup water from the RPV to ensure containment pressure remains within design limits during certain LOCA events. The two motor-operated HP CRD isolation bypass valves provide a flow path around the two air-operated HP CRD isolation valves in the event of a GDCS injection failure or loss of air.” In response to RAI 21.6-103. |
| 97. | S4.6.1.2.5 Normal Operation 2 nd paragraph 4 th sent. | Replace “bypass” with “minimum line” in response to RAI 21.6-103. |

| Item | Location | Description of Change |
|------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 98. | S4.6.1.2.5 Normal Operation 5 th and 6 th paragraph | Replaced “accumulator charging water header” with “scram accumulator charging water header” numerous times and for consistency due to RAI 16.2-186. Added “scram” to accumulator numerous times for clarification in response to RAI 16.2-186 |
| 99. | S4.6.1.2.5 Scram 1 st paragraph 1 st sent. | Added “ In response to an automatic or a manual scram from the RPS, power is interrupted to both scram solenoid pilot valve coils (for each HCU) and safety-related power is supplied to each backup scram valve solenoid, either action resulting in insertion of all control rods.” Replaced “...HCU opens to apply the...” with “HCU opens inserting the control rods. Also, after the backup scram valve solenoids are energized, the backup scram valves exhaust air from the scram air header, allowing the HCU scram valves to open ensuring / causing a hydraulic scram. The hydraulic scram occurs by applying ...”. In response to RAI 16.2-135 S01. |
| 100. | S4.6.1.2.5 Scram | Added “scram” to accumulator numerous times for clarification in response to RAI 16.2-186 |
| 101. | S4.6.1.2.5, Alternate Rod Insertion, 2 nd para., 1 st sent. | Replaced “10.34” with “10.342” for consistency. |
| 102. | S4.6.1.2.5 “High Pressure Makeup | Replaced “charging water header” with “scram accumulator charging water header” numerous times and for consistency due to RAI 16.2-186. |
| 103. | S4.6.1.2.5 “High Pressure Makeup” 1 st paragraph, 3 rd bullet | Deleted “bypass” in response to RAI 21.6-103. |
| 104. | S4.6.1.2.5 “High Pressure Makeup” 2 nd paragraph, 2 nd sent. | Replaced “The pump minimum flow bypass valve...” with “Each pump minimum flow valve...” in response to RAI 21.6-103. |
| 105. | S4.6.1.2.5 “High Pressure Makeup” 4 th paragraph, 1 st & 2 nd sent. | Changed from “...the CRD pumps tripped by...GDCS pools.” To “...the high pressure makeup flow to the RPV isolated... GDCS pools or drywell pressure high and drywell level high. The flow is directed to the CST through the pump minimum flow lines.” In response to RAI 21.6-103. |

| Item | Location | Description of Change |
|------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 106. | S4.6.1.2.5 “High Pressure Makeup” 4 th paragraph, 5 th sent. | Deleted “...that could be...”. Editorial |
| 107. | S4.6.1.2.5 “High Pressure Makeup” 4 th paragraph, last two sent.s | Added new description “In the event of a GDCS failure (GDCS initiation logic and a time delay to allow for system actuation and a not low signal from two out of three GDCS pools) to successfully inject water into the reactor the HP CRD isolation bypass valves provide a flow path around the HP CRD isolation valves for high pressure makeup water injection to the RPV. Manual inhibit capability exists for the high pressure makeup isolation function and manual initiation capability exists for the isolation bypass function for either GDCS injection failure or loss of air.” In response to RAI 21.6-103. |
| 108. | S4.6.1.2.6 “Instrumentation” 4 th bullet | Replaced “HCU” with “scram” for consistency due to RAI 16.2-186. |
| 109. | S4.6.1.2.6 “Instrumentation” 5 th bullet | Replaced “the charging” with “the scram accumulator charging” for consistency due to RAI 16.2-186. |
| 110. | S4.6.1.2.6 “Controls and Interlocks” | Replaced “charging water header” with “scram accumulator charging water header” for consistency due to RAI 16.2-186. |
| 111. | S4.6.1.2.6 “Controls and Interlocks” 4 th dash of 1 st bullet | Deleted “bypass” in response to RAI 21.6-103. |
| 112. | S4.6.1.2.6 “Controls and Interlocks” last dash of 1 st bullet | Changed “The...” to “Each...” and deleted “ bypass” twice in response to RAI 21.6-103. |
| 113. | S4.6.1.2.6 “Controls and Interlocks” 5 th bullet | Replaced “CRD” with “scram accumulator” and added “water” in response to RAI 16.2-186. |
| 114. | S4.6.1.2.6 “Controls and Interlocks” 5 th bullet 1 st dash | Replaced “...low charging header pressure” with “scram accumulator charging water header pressure-low” in response to RAI 16.2-186. |
| 115. | S4.6.1.2.6 “Controls and Interlocks” 5 th bullet 2 nd dash | Replaced “...low- low charging header pressure” with “scram accumulator charging water header pressure-low-low” in response to RAI 16.2-186. |

| Item | Location | Description of Change |
|------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 116. | S4.6.1.2.6 “Controls and Interlocks” 7 th bullet 2 nd dash | Added “accumulator” and “water” in response to RAI 16.2-186. |
| 117. | S4.6.1.2.6 “Controls and Interlocks” 9 th bullet | Changed from “... the CRD pumps are tripped to terminate CRD system flow...GDCS pools.” To “... the high pressure makeup flow to the RPV is isolated...GDCS pools or drywell pressure high and drywell level high.” Added “The flow is directed to the CST through the pump minimum flow lines.” In response to RAI 21.6-103. |
| 118. | S4.6.1.2.6 “Controls and Interlocks” last bullet | Added description “When in the high pressure makeup mode of operation and the CRD pumps are isolated due to certain LOCA events and a GDCS failure (GDCS initiation logic and a time delay to allow for system actuation and a not low signal from two out of three GDCS pools) to successfully inject water into the reactor occurs the HP CRD isolation bypass valves open to provide a flow path around the HP CRD isolation valves for high pressure makeup water injection to the RPV. Manual inhibit capability exists for the high pressure makeup isolation function and manual initiation capability exists for the isolation bypass function for either GDCS injection failure or loss of air.” In response to RAI 21.6-103. |
| 119. | S4.6.1.2.8, 1 st para., | Replaced “The following CRD system safety-related electrical equipment are located in either the RB or primary containment and are qualified for harsh environment: the HCU charging header pressure instrumentation, the scram solenoid pilot valves, and the FMCRD separations switches” with “The CRD system safety-related electrical and mechanical equipment listed in Table 3.11-1 are qualified for harsh environment.” Rewritten for clarity and consistency. |
| 120. | S4.6.3.5 7 th bullet last two sent.s | Added “The HP CRD isolation valves will be tested as part of the IST program as shown in Table 3.9-8. The HP CRD isolation bypass valves will be tested at a frequency of every 24 months to verify the automatic response to a simulated or actual initiation signal.” In response to RAI 21.6-103. |

| Item | Location | Description of Change |
|------|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 121. | F4.6-8 | Added new valves and minimum flow line in response to RAI 21.6-103. Removed line sizes for DCD figure consistency. |
| 122. | F4.6-8 | Replaced “SCRAM AIR HEADER DUMP VALVES” with “BACKUP SCRAM VALVES”. In response to RAI 16.2-135 S01. Removed line sizes for DCD figure consistency. |
| 123. | F4.6-9 | Removed line sizes and deleted note 2 for DCD figure consistency |
| 124. | F4.6-9 Sheet 1 of 2 | Added new valves and minimum flow line in response to RAI 21.6-103 and added “G” or “g” to pressure unit. |
| 125. | S4A.1, 1 st para., 1 st sent. | Replaced “...presents...an” with “...identifies reference 4A-2 for...a representative...” for DCD consistency and clarification. |
| 126. | S4A.1, 1 st para., 2 nd sent. | Added “...in reference 4A-2...” and replaced “...to provide the...” with “...and result in...” and replaced “...shaping needed to meet the...” with “distributions that meet...” for DCD consistency and clarification. |
| 127. | S4A.2 | Replaced entire paragraph for DCD consistency and clarification. |
| 128. | S4A.4 | Updated existing reference and added new reference. Added Tier 2* brackets to references and note in response to RAI 4.2-28. |
| 129. | T4A-1 | Deleted |
| 130. | F4A-1 thru 4A-19 | Deleted |
| 131. | S4B.1 all bullets | Added Tier 2* brackets in response to RAI 4.2-29. |
| 132. | S4B.1, S4B.3, S4B.6 | Added Tier 2* note in response to RAI 4.2-34. Updated references. |
| 133. | S4B.3 | Replaced “hot standby” to “hot shutdown” for consistency. |
| 134. | SB.12 | Updated reference. |
| 135. | T4B-1 | Added Tier 2* brackets to Governing Equation criterion 1-7 and added Tier 2* note in response to RAI 4.2-34. |

| Item | Location | Description of Change |
|------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 136. | T4B-1 Criterion 4 Governing Equation | Replaced “≤” with “<” to agree with the text. |
| 137. | S4C.1 | Added Tier 2* note in response to RAI 4.2-34. |
| 138. | S4D.1.1, 3 rd para. 1 st sent. | Replaced “or approximately equal” with “or equal” for clarity. |
| 139. | S4D.1.2, 6 th para., 1 st sent. | Rewritten for clarity. |
| 140. | S4D.1.3.1, Regional Stability, 2 nd para., 2 nd sent. | Replaced “bottom” with “axial/radial” for consistency and clarity. |
| 141. | S4D.1.3.1, Regional Stability, 2 nd para., 4 th sent. | Replaced “...ratio and oscillation frequency...” with “...ratios...” for consistency. |
| 142. | S4D.1.3.1, Results, 4 th para., 1 st sent. | Replaced “...ratio and oscillation frequency...” with “...ratios...” for consistency. |
| 143. | S4D.1.3.1, Results 3 rd and 4 th para., 3 rd sent. | Replaced “design criteria” to “design criteria of 0.8” for consistency. |
| 144. | S4D.1.3.1, Results 4 th para., last sent. | Deleted for consistency. |
| 145. | S4D.1.4.3, 1 st para., 1 st sent. | Deleted “...and BOC conditions as an example.” For consistency. |
| 146. | S4D.1.4.3, 1 st para., 7 th sent. | Added “...where any underlying noise in the core power (typically less than 2%) is removed, consistent with past practice.” For consistency. |
| 147. | S4D.1.4.4 1 st sent. | Deleted first sentence for consistency. |
| 148. | S4D.1.5, 3 rd para., last sent. | Replaced “scram” with “scram setpoint” for clarity. |
| 149. | S4D.1.6 title | Deleted “...Initial Core and...” to be consistent with changes identified in RAI 15.2-16 S01. |
| 150. | S4D.1.6, 1 st para., 2 nd sent. | Deleted “...an initial core and...” and added “...for initial and equilibrium cores” to be consistent with changes identified in RAI 15.2-16 S01. |
| 151. | S4D.2.1, Equation 4D.1 | Added definitions for subscripts. |
| 152. | S4D.2.2.1, 4 th para., last sent. | Replaced “RPV” with “reactor” for consistency. |
| 153. | S4D.2.2.2, 4 th para., 2 nd sent. | Replaced “40K” with “40°C (72°F)” and replaced “10K” with “10°C (18°F)” for consistency. |
| 154. | S4D.2.2.2, 4 th para., 7 th and 9 th sent.s and 5 th para., 6 th sent.. | Adjusted the times for consistency. |

| Item | Location | Description of Change |
|------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 155. | S4D.2.2.3, 1 st para., 1 st sent. | Deleted reference for consistency. |
| 156. | S4D.2.2.3, 5 th para., 2 nd and 4 th sent.s | Added time in seconds for consistency. |
| 157. | S4D.3.2.2, 2 nd para., 1 st sent. | Deleted “initial” in response to RAI 16.2-171. |
| 158. | S4D.3.2.2.2, last sent. | Replaced “Initial values” with “Values” in response to RAI 16.2-171. |
| 159. | S4D.3.2.2.3, 2 nd para., 2 nd sent. | Replaced “Initial values” with “Values” and added “GR ₃ ” in response to RAI 16.2-171. |
| 160. | S4D.3.2.2.3, 2 nd para., 3 rd sent. | Deleted sentence in response to RAI 16.2-171. |
| 161. | S4D.5, References | Updated reference with Class and proprietary identification and updated references with latest revision. Added Tier 2* brackets and note in response to RAI 4.2-28. Deleted Reference 4D-18 because it is based on MFN and the content of the MFN already incorporated in the DCD. Deleted Reference 4D-25 because it’s not referenced in the text. |
| 162. | T4D-1 | Corrected values due to TRACG re-analysis committed in MFN 09-114. |
| 163. | T4D-2 | Corrected values due to TRACG re-analysis committed in MFN 09-114. |
| 164. | T4D-3 | Corrected values due to TRACG re-analysis committed in MFN 09-114. |
| 165. | T4D-4 | Corrected values due to TRACG re-analysis committed in MFN 09-114. |
| 166. | T4D-5 | Deleted note in response to RAI 16.2-171. |
| 167. | F4D-3 | Corrected figure due to TRACG re-analysis committed in MFN 09-114. |
| 168. | F4D-4 | Deleted since it shows redundant information that has been covers in other tables and figures. |
| 169. | F4D-8 | Added footnotes for definitions of colors, startup path and parameters. |
| 170. | F4D-31 | Replaced legend of the figure to show the relative elevation of channel cells. |

| Item | Location | Description of Change |
|------|----------|-----------------------------------------------------|
| 171. | F4D-32 | Added footnotes for definitions of DR, FWT and SPX. |