July 15, 2013

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
NextEra Energy Seabrook, LLC	)	Docket No. 50-443-LR
	)	
	)	
(Seabrook Station, Unit 1)	)	
	)	

THE STAFF'S RESPONSE TO NEXTERA'S STATEMENT OF MATERIAL FACTS[1]

A. General

1. Severe accident source terms can be generated using computer codes such as (1) the Methods for Estimation of Leakages and Consequences of Releases ("MELCOR") code, or (2) the Modular Accident Analysis Program ("MAAP") code. O'Kula Decl. at ¶¶ 19, 71.

Response: Admitted.

2. NextEra used Version 4 of the MAAP code ("MAAP 4") to generate source terms in connection with the SAMA analyses performed in support of the license renewal application for Seabrook ("Seabrook"). NextEra used MAAP Version 4.0.5 in its initial Severe Accident Mitigation Alternatives ("SAMA") analysis. NextEra used MAAP Version 4.0.7 in an updated SAMA analysis for Seabrook that was used with Seabrook probabilistic risk assessment ("PRA") information to evaluate risk metrics associated with 13 postulated severe accident release categories. O'Kula Decl. at ¶¶ 20, 34.

Response: Admitted.

B. Development of the MAAP Code

3. The MAAP code is used for accident analysis by a wide array of entities, including utilities, vendors, research organizations, and universities. O'Kula Decl. at ¶¶ 19, 25.

Response: Admitted.

4. The MAAP code has a strong technical basis for use in PRA and severe accident analysis and has been accepted for use in numerous NRC-approved analyses. O'Kula Decl. at ¶¶ 11, 19, 21, 24, 27-29, 49, 75.

Response: Admitted to the extent that the NRC has accepted licensee's or applicant's use of

[1] For clarity and ease of reference, the staff of the NRC ("Staff") has reproduced NextEra's corresponding Statement of Material Fact without footnotes above each Staff response.

the MAAP code in specific analysis. **Denied** to the extent that the statement suggests that the NRC has approved the MAAP code for use in certain NRC required analyses generically.

5. The MAAP code simulates thermal-hydraulic and fission product phenomena in both the primary and containment systems of pressurized water reactors ("PWRs") in connection with severe accidents. O'Kula Decl. at ¶ 19.

Response: Admitted.

6. MAAP 4 incorporates updated physical models for core melt, reactor vessel lower head response, and containment response in connection with severe accidents. O'Kula Decl. At ¶ 24.

Response: Admitted.

7. MAAP has been the subject of extensive benchmarking and validation studies in the areas instrumental to severe accident source term estimation. O'Kula Decl. at ¶¶ 11, 21, 26, 75.

Response: Admitted.

8. The original version of MAAP and its successor versions, including MAAP 4, were developed in accordance with 10 C.F.R. Part 50, Appendix B and International Organization for Standardization ("ISO") 9001 quality assurance requirements. O'Kula Decl. at ¶ 23.

Response: Admitted to the extent that the MAAP4 Applications Guidance states that the code was developed and is maintained under Fauske & Associates, L.L.C. quality assurance ("QA") program, and the Applications Guidance states that the QA program is in compliance with 10 C.F.R. Part 50, Appendix B, and ISO 9001 quality assurance requirements. *See* Declaration of Randy Gauntt Concerning the Motion for Summary Disposition of Contention 4B at ¶¶ 6.

9. The Electric Power Research Institute ("EPRI") has identified the MAAP code (Version 4.0.5 and later) as a "consensus computer code" suitable for use in evaluation of PRA success criteria. O'Kula Decl. at ¶ 24.

Response: Admitted.

10. Development of MAAP 4 (1) was sponsored by several organizations, including EPRI and the Department of Energy, (2) included a peer review by a committee of independent experts, and (3) involved an additional review by a Design Review Committee comprised of senior members of the nuclear safety community. O'Kula Decl. at ¶ 24.

Response: Admitted.

11. The MAAP 4 code has been benchmarked and validated against the results of (1) numerous severe accident studies, as well as (2) the Three Mile Island Unit 2 ("TMI-2") core melt accident. Both EPRI and the Nuclear Energy Agency have documented the benchmarking and validation of the MAAP 4 code. O'Kula Decl. at ¶ 26.

Response: Admitted.

12. The NRC Staff has found use of the MAAP code acceptable by numerous license

renewal applicants in simulating severe accident phenomenology for supporting SAMA analysis. O'Kula Decl. at ¶¶ 27-28.

Response: Admitted.

C. Comparison of NUREG-1465 Computer Codes with MAAP

13. The use of plant-specific source terms derived from the MAAP code is preferred over the use of generic source terms extracted from NUREG-1465 for a SAMA analysis, which evaluates plant specific design and operational changes. O'Kula Decl. at ¶¶ 12-13, 18, 31-32, 45, 75.

Response: Admitted.

14. NextEra used the MAAP 4 code to integrate plant-specific information within the Level 2 PRA for the Seabrook SAMA analysis to obtain source term groups, descriptions, and release category information for 13 release categories evaluated during Seabrook's Level 2 PRA. O'Kula Decl. at ¶¶ 30, 34-35.

Response: Admitted.

15. NUREG-1465 postulates generic release fractions and a single, generic source term for use in determining compliance with 10 C.F.R. Part 100 reactor siting criteria. O'Kula Decl. at ¶¶ 37-38, 45-46.

Response: Admitted.

16. NUREG-1465 quantifies only the amount and types of radioactive material released into containment following a severe accident, not the environment. O'Kula Decl. at ¶¶ 36, 39-40.

Response: Admitted.

17. NUREG-1465 provides data only for a single PWR release into the containment and its source term is a generic source term with no basis in plant-specific information and data from Seabrook. O'Kula Decl. at ¶ 46.

Response: Admitted.

18. A SAMA analysis requires a plant-specific evaluation of the spectrum of plant-specific releases to the environment. O'Kula Decl. at ¶¶ 12-13, 27, 31-32, 45-47, 57, 75.

Response: Admitted.

19. The MAAP 4-generated source terms used in Seabrook's Level 2 PRA account for the risk associated with a range of timing and containment damage scenarios for Seabrook. O'Kula Decl. at ¶¶ 43-44, 47.

Response: Admitted.

20. Unlike NUREG-1465, MAAP quantifies fission product removal mechanisms (including active or passive engineered safety features, and natural processes) in modeling the release of radionuclides into the environment following a postulated severe accident. O'Kula

Decl. at ¶¶ 39-41.

Response: Admitted.

D. Comparison of Legacy Codes or Code Versions, and Older Versions of the MAAP Code, with the MAAP 4 Code

21. Comparisons of earlier versions of MAAP to earlier versions of MELCOR or its predecessor, the Source Term Code Package ("STCP"), are not material to NextEra's use of the current versions of MAAP today. O'Kula Decl. at ¶¶ 55-59, 61-62, 71, 74-75.

Response: Admitted.

22. Neither Draft NUREG-1150 nor the BNL Report compared release fractions obtained from the MAAP 4 code used in the Seabrook SAMA analysis. O'Kula Decl. at ¶¶ 53-55.

Response: Admitted.

23. Draft NUREG-1150 compares release fractions obtained from early versions of the MAAP code (Versions 1.1 through 3.0) against release fractions obtained from an alternative legacy code, the STCP code. O'Kula Decl. at ¶¶ 53, 55.

Response: Admitted.

24. The BNL Report compares release fractions obtained from MAAP Version 3B against release fractions obtained from alternative legacy codes (the STCP code) and code versions (specifically, an older version of the MELCOR code) identified in NUREG-1150. O'Kula Decl. at ¶¶ 54-55, 62.

Response: Admitted.

25. The BNL Report's comparison of release fractions from Catawba and Sequoyah are immaterial to the Seabrook SAMA analysis because those plants have significantly different design features for control and mitigation of radioactive release in a severe accident (e.g., ice condenser containments), than Seabrook, which has a dry, ambient air containment. O'Kula Decl. at ¶ 61.

Response: Admitted. The BNL comparison of release fractions from Catawba and Sequoyah are immaterial to the Seabrook SAMA analysis because of differences described, they are also inaccurate because of the comparison method utilized in the report. A more accurate comparison of release fractions shows that Seabrook does reasonably compare to Sequoyah, regardless of plant differences. *See* Declaration of Randy Gauntt Concerning the Motion for Summary Disposition of Contention 4B at ¶¶ 15-17. Additionally, a comparison to a more similar reactor type shows that Seabrook release fraction are reasonable and slightly conversation. *See id.* at ¶¶ 18-23.

26. The NRC Staff has found that the STCP/MELCOR and MAAP codes produce consistent results when used to compare release fractions for a single plant. Specifically, the Staff reviewed MAAP-based source term estimates for the major release categories and found those predictions to be in reasonable agreement with estimates of NUREG-1150 for the closest corresponding release scenarios. O'Kula Decl. at ¶ 60.

Response: Admitted to the extent that the NRC staff Supplemental Environmental Impact Statement for Catawba found that the MAPP produced reasonable consistent source terms with the source terms developed by MELCOR in NUREG-1150 for Catawba. **Denied** to the extent that the Staff has made a regulatory finding regarding MAPP and MELCOR performance under all uses.

27. The understanding of severe accident modeling has improved considerably over time. As the State-of-the-Art Reactor Consequence Analyses ("SOARCA") Project demonstrated, current modeling of severe accidents shows a much smaller and delayed radioactive release than was recognized in earlier studies and calculated with older computer code models. O'Kula Decl. at ¶¶ 11, 57, 59, 61-64, 68, 75.

Response: Admitted.

28. The release fractions obtained using the MAAP Version 4.0.7 code within Seabrook's Level 2 PRA are reasonably consistent with release fractions for the Surry Power Station (another PWR with a dry, ambient air containment) obtained in the SOARCA project using the MELCOR Version 1.8.6 code. O'Kula Decl. at ¶¶ 68, 70, 72.

Response: Admitted to the extent that Seabrook's SAMA analysis produced reasonably consistent release fractions as the Surry Power Station SOARCA analysis. **Denied** to the extent that Surry Power Plant has large dry ambient containment.

Respectfully submitted,

Signed (electronically) by

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