

## **9 AUXILIARY SYSTEMS**

### **9.1.3 Fuel Pool Cooling and Cleanup System**

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Appendix A, “Design Certification Rule for the U.S. Advanced Boiling Water Reactor,” to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants,” constitutes the standard design certification (DC) for the U.S. Advanced Boiling Water Reactor (ABWR) design. To document the U.S. Nuclear Regulatory Commission (NRC) staff’s review supporting initial certification of the ABWR, the staff issued a final safety evaluation report (FSER) in NUREG-1503, “Final Safety Evaluation Report Related to the Certification of the Advanced Boiling Water Reactor Design,” in July 1994 and NUREG-1503, Supplement 1, in May 1997.

The staff is documenting its review of the GE-Hitachi Nuclear Energy (GEH or the applicant) application for renewal of the ABWR DC in Supplement 2 to NUREG-1503. Chapter 1 of this supplemental FSER describes the staff’s review process for the ABWR DC renewal. This supplemental FSER section documents the NRC staff’s review specifically related to Chapter 9, “Auxiliary Systems,” Section 9.1.3, “Fuel Pool Cooling and Cleanup System,” of the GEH Design Control Document (DCD), Revision 7. Except as modified by this supplement to the FSER, the findings made in NUREG-1503 and its Supplement 1 remain in full effect.

### 9.1.3 Fuel Pool Cooling and Cleanup System

In a letter dated August 25, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15237A192), the applicant added spent fuel pool (SFP) level instruments that conform with applicable guidance specified in the Japan Lesson-Learned Project Directorate-Interim Staff Guidance (JLD-ISG)-2012-03, Revision 0, “Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation,” dated August 29, 2012 (ADAMS Accession No. ML12221A339). That guidance endorses with exceptions and clarifications, the methodologies described in the Nuclear Energy Institute (NEI) industry guidance document NEI 12-02, Revision 1, “Industry Guidance for Compliance with NRC Order EA-12-051, To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation,” issued August 2012 (ADAMS Accession No. ML122400399).

This change to the design of SFP instruments resulted in changes to the DCD Tier 2, Section 9.1.3, “Fuel Pool Cooling and Cleanup System,” which incorporated safety-related SFP instrumentation consisting of two independent wide-range level transmitters that transmit water level signals to the main control room. In addition, the water level signals will also be provided to the remote shutdown panels or other appropriate location accessible post-accident.

In addition, this change resulted in changes to the following ABWR DCD sections:

- DCD Tier 1, Section 2.6.2, “Fuel Pool Cooling and Cleanup System” including Figure 2.6.2 and Table 2.6.2
- DCD Tier 2, Chapter 1, Tables 1.8-21 and 1.8-22

These ABWR design enhancements would provide a potential COL applicant the means for meeting the rule requirements of 10 CFR 50.155, "Mitigation of Beyond-Design-Basis Events," (MBDBE rule) regarding requirements for safety-related SFP Instrumentation which codified the requirements stemming from Commission Order EA-12-051. The final MBDBE rule was published in the Federal Register on August 9, 2019 (84 FR 39684) with an effective date of September 9, 2019. The staff review of these changes and other changes associated with the new SFP instrumentation is provided in Section 22.2 of this FSER supplement.

## References

1. 10 CFR 50.155, "Mitigation of Beyond-Design Basis Events."
2. 10 CFR Part 52, Appendix A, "Design Certification Rule for the U.S. Advanced Boiling Water Reactor."
3. NRC, NUREG 1503, "Final Safety Evaluation Report Related to the Certification of the Advanced Boiling Water Reactor Design," July 1994 (ADAMS Accession No. ML080670592).
4. NRC, NUREG 1503, "Final Safety Evaluation Report Related to the Certification of the Advanced Boiling Water Reactor Design," Supplement 1, May 1997 (ADAMS Accession No. ML080710134).
5. GEH, ABWR Standard Plant Design Certification Renewal Application Design Control Document, Revision 5, Tier 1 and Tier 2, December 2010 (ADAMS Accession No. ML110040323).
6. GEH, ABWR Standard Plant Design Certification Renewal Application Design Control Document, Revision 6, Tier 1 and Tier 2, February 2016 (ADAMS Accession No. ML16214A015).
7. GEH, ABWR Standard Plant Design Certification Renewal Application Design Control Document, Revision 7, Tier 1 and Tier 2, December 2019 (ADAMS Accession No. ML20007E371).
8. JLD-ISG-2012-03, Revision 0, "Compliance with Order EA 12-051, Reliable Spent Fuel Pool Instrumentation," August 29, 2012 (ADAMS Accession No. ML12221A339).
9. Order EA 12-051, "Order Modifying Licenses with regard to Reliable Spent Fuel Pool Instrumentation," March 12, 2012 (ADAMS Accession No. ML12056A044).
10. NEI 12-02, Revision 1, "Industry Guidance for Compliance with NRC Order EA-12-051, To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," August 2012 (ADAMS Accession No. ML122400399).