

Enclosure 1

MFN 15-063

GEH Response to Item #5 - Minimize Contamination

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NRC- Suggested Design Changes Item #5 - Minimize Contamination

Include 10 CFR 20.1406 design features to minimize contamination and the generation of reactor waste.

GEH Response:

ABWR will meet the requirements of 10 CFR 20.1406, to the extent practicable, with respect to minimizing contamination, of the facility and the environment, facilitating eventual decommissioning, and minimizing, to the extent practicable, the generation of radioactive waste by following the guidance developed in Regulatory Guide 4.21.

ABWR DCD Tier 2 Subsection 12.3.1.5, "Minimization of Contamination and Radioactive Waste Generation," has been created to provide a general description of the design and operational objectives taken from the Regulatory Position of Regulatory Guide 4.21. DCD Tier 2, Table 12.3-8 has been added to provide a cross reference to design features for the ABWR systems/structures and associated DCD subsections that address contamination minimization.

DCD Tier 2, Table 12.3-8 identifies the DCD chapter and subsections that discuss implementation of the design objectives from Regulatory Guide 4.21. Both generic and specific design objective examples are also included in Subsection 12.3.1.5.1. The systems listed are of varied construction, purpose and function, and as such, not all of the design objectives or concepts are represented by a design feature in each identified system subsections.

Regulatory objectives that are operational or procedural in nature will be addressed by the COL Applicant. COL license information has been added in DCD Tier 2 Subsection 12.3.7.5.

The following systems and structures were reviewed for applicability of 10 CFR 20.1406 requirements:

- Chapter 3 - Design of Structures, Components, Equipment and Systems
 - 3.1 Conformance With NRC General Design Criteria (3.1.2)
 - 3.4 Water Level (Flood) Design (3.4.1)
 - 3.7 Seismic Design (3.7.3)
 - 3.8 Seismic Category 1 Structures (3.8.1, 3.8.4)
- Chapter 4 – Reactor
 - 4.1 Summary Description (4.1.2)
 - 4.5 Reactor Materials (4.5.1)
 - 4.6 Functional Design of Reactivity Control System (4.6.2)
- Chapter 5 - Reactor Coolant System and Connected Systems
 - 5.1 Summary Description
 - 5.2 Integrity of Reactor Coolant Pressure Boundary (5.2.1, 5.2.3, 5.2.5)
 - 5.3 Reactor Vessel (5.3.1, 5.3.3)
 - 5.4 Component and Subsystem Design (5.4.8)

- Chapter 6 – Engineered Safety Features
 - 6.1 Engineered Safety Feature Materials (6.1.2)
 - 6.2 Containment Systems (6.2.3, 6.2.4)
 - 6.5 Fission Products Removal and Control Systems (6.5.3)
- Chapter 9 – Auxiliary Systems
 - 9.1 Fuel Storage and Handling (9.1.1, 9.1.2, 9.1.3, 9.1.4)
 - 9.2 Water Systems (9.2.8, 9.2.9, 9.2.10, 9.2.11, 9.2.14, 9.2.15)
 - 9.3 Process Auxiliaries (9.3.2, 9.3.3)
 - 9.4 Air Conditioning, Heating, Cooling and Ventilation Systems (9.4.1, 9.4.4, 9.4.5, 9.4.6, 9.4.8)
- Chapter 10 – Steam and Power Conversion System
 - 10.3 Main Steam Supply System (10.3.2)
 - 10.4 Other Features of Steam and Power Conversion System (10.4.1, 10.4.2, 10.4.3, 10.4.6, 10.4.7)
- Chapter 11 – Radioactive Waste Management
 - 11.1 Source Terms (11.1.5)
 - 11.2 Liquid Waste Management System (11.2.1, 11.2.2, 11.2.3, 11.2.5)
 - 11.3 Gaseous Waste Management System (11.3.1, 11.3.3, 11.3.4)
 - 11.4 Solid Waste Management System (11.4.1, 11.4.2)
 - 11.5 Process and Effluent Radiological Monitoring and Sampling Systems (11.5.1, 11.5.2)
- Chapter 12 – Radiation Protection
 - 12.3 Radiation Protection Design Features (12.3.1, 12.3.3)

A review of these structures/systems in the DCD was performed using applicable contamination control design measures taken from Appendix A of Regulatory Guide 4.21. The reviews were targeted at either structural/architectural, HVAC, or mechanical process contamination control features based on the system or structure function. The design review examined individual Appendix A design related contamination control measures that may apply to a given system or structure.

Not all of the above systems have significant features, which addressed 10 CFR 20.1406 requirements. The Standby Liquid Control, and Turbine Generator systems do not have significant contamination during operations and have little propensity for significant radioactive leakage leading to resultant contamination of the facility or environment. High-energy systems associated with the reactor coolant pressure boundary such as Nuclear Steam Supply, Reactor Water Cleanup, Shutdown Cooling, Main Steam, and Feedwater were determined to present a low probability of plant contamination in which any system leakage would be quickly detected. Leakage in these systems is identified by flow, level, temperature, pressure and other

parameters monitored by numerous plant systems and action would be immediately taken to correct system leakage. For example, the Leakage Detection and Isolation System would also serve to detect any leakage near the reactor coolant pressure boundary.

As a result of the design review process described above, DCD Tier 2, Table 12.3-8 provides a cross reference to design features in the specified DCD chapters and subsections that address the requirements of 10 CFR 20.1406.

Impact on DCD

DCD Tier 2, Chapter 12 Subsection 12.3.1.5, Subsection 12.3.7.5 and Table 12.3-8 will be added as noted in the attached markups. In addition, Table 1.8-20, Table 1.9-1 and Subsection 12.3.8 are modified accordingly. The ABWR DCD Rev 5 marked up pages are provided in Enclosure 2.