

Enclosure 2

MFN 16-041

GEH's Response to RAI 13.03-1

ABWR DCD Revision 6 Markups

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Add: The TCS radiological habitability is comparable to the control room habitability under accident conditions.

2.17.1 Emergency Response Facilities

Design Description

The Technical Support Center (TSC) and Operational Support Center (OSC) are the only emergency facilities within the scope of the ABWR Standard Plant.

The purpose of the TSC is to provide management and technical support to personnel in the Main Control Room during emergency conditions. The TSC is non-safety-related and is not Seismic Category I. The TSC is located in the Service Building and has sufficient space to accommodate at least 25 individuals. The TSC has voice communication equipment for communication with the Main Control Room, Emergency Operations Facility, OSC and NRC Headquarters Operation Center.

The TSC has displays for the plant parameters listed in Table 2.7.1a, Item B, Fixed Position Displays.

The purpose of the OSC is to provide an assembly area separate from the Main Control Room and TSC where licensee operations support personnel can report in an emergency. The OSC is non-safety-related and is not Seismic Category I. The OSC is located in the Service Building and has voice communication equipment for communication with the main control room and the TSC.

Inspections, Tests, Analyses and Acceptance Criteria

Table 2.17.1 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be performed for the Emergency Response Facilities.

Table 2.17.1 Emergency Response Facilities

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The TSC and OSC are located in the Service Building.	1. An inspection will be performed for the location of the TSC and OSC.	1. The TSC and OSC are in different locations in the Service Building. The TSC is adjacent to the passage from the Service Building to the Control Building.
2. The TSC has sufficient space to accommodate at least 25 individuals.	2. An inspection will be performed of the floor space in the TSC.	2. The TSC has at least 175 m ² of floor space.
3. The TSC has voice communication equipment for communication with the Main Control Room, Emergency Operations Facility, OSC, and NRC Headquarters Operation Center.	3. A test will be performed of the TSC voice communication equipment.	3. The TSC voice communication with the Main Control Room, Emergency Operations Facility, OSC, and NRC Headquarters Operation Center is audible and intelligible at each location.
4. The TSC has displays for the plant parameters listed in Table 2.7.1a, Item B, Fixed Position Displays.	4. An inspection will be conducted on the displays for the TSC.	4. Displays exist or can be retrieved in the TSC for the plant parameters listed in Table 2.7.1a, Item B.
5. The OSC has voice communication equipment for communication with the main control room and TSC.	5. A test will be performed of the OSC voice communication equipment.	5. The OSC voice communication with the Main Control Room and TSC is audible and intelligible at each location.
6. The TCS has comparable habitability to the control room habitability under accident conditions.	6. An inspection of the as-built TSC habitability system will be performed, including a test of its capabilities.	6. The TSC radiological habitability is comparable to the control room habitability under accident conditions such that doses to an individual do not exceed 5 rem whole body radiation exposure or 30 rem thyroid over the 30-day post-accident period.

- (4) In the event of a loss of offsite electric power, the Service Building HVAC System is shut down.
- (5) The clean areas served by the clean area HVAC system has an emergency filter train. It is manually operated. In an emergency it supplies filtered air for the TSC, OSC, lunch room, offices, health physics lab, security offices, and other normally clean areas.

9.4.8.2 System Description

- (1) The Clean Area HVAC System supplies filtered, heated or cooled air to both the clean and controlled areas through a central fan system consisting of an outside air intake, Air Conditioning Unit consisting of filters, heating coils, cooling coils, two 50% capacity supply air fans and supply air ductwork.
- (2) The Clean Area HVAC System has two 50% capacity exhaust air fans. They take air from the clean areas through the exhaust ducts and discharge the air on the Service Building roof.
- (3) The Controlled Area HVAC System routes potentially contaminated air to two 50% capacity exhaust air fans to discharge the air to the common plant stack.
- (4) The potentially contaminated areas are maintained at a slightly lower pressure than the surrounding clean areas and, therefore, the air flows from the clean areas to these potentially contaminated areas.
- (5) Pressure control dampers are employed between clean and potentially contaminated areas and are of the backflow type and fail closed. This minimizes the backflow of contaminated air to clean areas when there is a loss of power and subsequent fan system shutdown.
- (6) The clean area HVAC system is provided with an emergency filter train consisting of a heater/demister, prefilter, HEPA filter, 5.1 cm charcoal filter bed, a second HEPA filter, and two fans.
- (7) Controls and Instrumentation
 - (a) Each fan and each exhaust filter package is controlled by hand switches located on local control panels. Pertinent system flow rates and temperatures are also indicated on the local control panels. Trouble on local control panel is annunciated on the main control board.
 - (b) Controls are pneumatic and electric.
 - (c) Radiation monitors and provisions for toxic gas monitors at the supply air inlet with alarms to TSC.

- Add: The COL applicant will perform TSC radiological consequence analyses, considering plant and site conditions, to ensure that TSC radiological habitability design features ensure that doses to an individual do not exceed 5 rem whole body or 30 rem thyroid over the 30-day post-accident period. These acceptance criteria are consistent with NUREG-0696, which references GDC-19 and SRP 6.4. These analyses will ensure that the equipment described in this section provides adequate TSC habitability.
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annunciated on the local control panel. Trouble on the local panel is
annunciated in the main control room.
- (8) All power and water is provided from non-safety-related sources.
- (9) The COL applicant will provide a detailed P&ID, system flow rates an equipment list, and compliance with RG 1.140 and toxic gas protection requirements and description of radiation monitors (if any) at the supply air inlet, for the Service Building HVAC system, including the TSC and the OSC, for NRC review. (See Subsection 9.4.10.1 for COL License Information.)

9.4.8.3 Safety Evaluation

- (1) The Service Building HVAC System is not safety-related and is not required to assure either the integrity of the reactor coolant pressure boundary or the capability to shut down the reactor and maintain it in a safe shutdown conditions.
- (2) Pressure control dampers are employed between clean and potentially contaminated areas and are of the backflow type and fail closed. This minimizes the backflow of contaminated air to clean areas when there is a loss of power and subsequent fan system shutdown.
- (3) The system incorporates features to assure its reliable operation over the full range of normal station conditions.
- (4) Clean areas are provided with emergency filtration system and a high radiation mode of operation.
- (5) There are no sources (except health physics samples and calibration sources) of radioactivity inside the Service Building. However, the radiation levels inside the controlled area of the Service Building can become to high due to leakage from the secondary containment or from the Turbine Building. If this happens, the controlled area HVAC system can be manually isolated to prevent releases to the environment via the subject HVAC system exhaust.

9.4.8.4 Testing and Inspection

All equipment is factory inspected and tested in accordance with the applicable equipment specifications and codes. System ductwork and erection of equipment is inspected during various construction stages. Preoperational tests are performed on all mechanical components and the system is balanced for the design air, and water flows and system operating pressures. Controls, interlocks and safety devices on each system are checked, adjusted, and tested to ensure the proper sequence of operation. A final integrated preoperational test is conducted with all equipment and controls operational to verify the system performance.

9.4.10 COL License Information

9.4.10.1 Service Building HVAC System

The COL applicant shall provide a detailed P&ID, system flow rates and an equipment list, compliance with RG 1.140, toxic gas protection requirements, and description of radiation monitors at the supply air inlet (if any), for the Service Building HVAC system, including the TSC and OSC, for NRC review. (Subsection 9.4.8.2)

9.4.10.2 Radwaste Building HVAC System

The COL applicant shall supply detailed equipment lists and system flow rates and compliance with RG 1.140 for the Radwaste Building HVAC System (Subsection 9.4.6.2).

Add: The COL applicant will perform TSC radiological consequence analyses, considering plant and site conditions, to ensure that TSC radiological habitability design features ensure that doses to an individual do not exceed 5 rem whole body or 30 rem thyroid over the 30-day post-accident period.