3.0 Site-Specific ITAAC

The reference ABWR DCD Tier 1, Chapter 4.0, “Interface Requirements,” identifies significant design provisions for interface between systems within the scope of the ABWR standard design and other systems that are wholly or partially outside the scope of the ABWR standard design. The interface requirements define the attributes and performance characteristics that the out-of-scope (site-specific) portion of the plant must have in order to support the certified ABWR design.

The STP 3 & 4 site-specific systems and activities that require ITAAC because they have a safety-related, safety-significant, or risk significant function are listed below:

- Ultimate Heat Sink (UHS)
- Offsite Power System
- Makeup Water Preparation (MWP) System
- Reactor Service Water (RSW) System
- Communication System (See Section 4.0 - Emergency Planning ITAAC)
- Site Security (See Section 5.0 - Physical Security ITAAC)
- Circulating Water (CW) System
- Backfill under Category 1 Structures
- Breathing Air (BA) System
- Waterproofing Membrane
- Design Reports for ASME Class 1, 2, and 3 Components
- Pipe Break Analysis Report for the As-designed Plant
- Diesel Generator Fuel Oil Storage Vaults

Table 3.0-1 Ultimate Heat Sink (UHS)

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
1. The basic configuration of the UHS is as shown on Figure 3.0-1.	1. Inspections of the as-built system will be conducted.	1. The as-built UHS conforms with the basic configuration shown on Figure 3.0-1.
2.The UHS has sufficient cooling water to supply the RSW system for normal plant operation and to permit safe shutdown and cooldown of the plant and maintain the plant in a safe shutdown condition for for at least 30 days following a design-basis event without makeup water to the UHS. The water level at the end of the 30-day period must still be adequate to provide the required suction head to the RSW pumps when operating at their design flow rate.	2.(a) An analysis will be performed which shows that the UHS has sufficient volume and surface area to meet the cooling requirements to permit cooldown and maintain the plant in a safe shutdown condition for at least 30 days following design basis accidents without any makeup water to the UHS. The analysis will also show that there is sufficient water level at the end of the 30 days to provide adequate suction head to the RSW pumps when operating at their design flow rate. 2.(b) Inspections will be performed of the UHS configuration.	2.(a) A report exists which concludes that the UHS is capable of supplying the RSW system for normal plant operation and permit safe shutdown and cooldown of the plant and maintain the plant in safe shutdown condition without makeup for 30 days following a design basis accident. 2.(b)(i) The minimum surface area and capacity of the UHS above the suction lines are 34,240 square feet and 2,165,500 cubic feet, respectively at the UHS basin low-low level. 2.(b)(ii) The RSW pump suction lines are at Elev. 3.35m MSL at the UHS basin wall.
3.(a) Active safety-related SSCs within the UHS shall have three divisions powered by their respective Class 1E divisions. 3.(b) Each division shall be physically separated.	3.(a) Test will be performed on the UHS system by providing a test signal to only one Class 1E division at a time. 3.(b) Inspections of the as-built UHS mechanical configuration shall be performed.	3.(a) The test signal exists in only the Class 1E division under test in the UHS system. 3.(b) Each mechanical division of the UHS is physically separated from other mechanical divisions of the UHS system by structural and/or fire barriers.
3.(c) Each division shall be electrically independent of the other divisions and independent of non-Class 1E.	3.(c) Inspections of the as-built UHS electrical system components shall be performed.	3.(c) Electrical isolation exists between Class 1E divisions, and between Class 1E divisions and non-Class 1E.

Table 3.0-1 Ultimate Heat Sink (UHS)

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
4. Displays, alarms, and controls in the main control room and remote shutdown system (RSS) are provided for water level and temperature of the UHS system.	4. Inspections will be performed on the main control room and RSS displays and controls for the UHS system.	4. Displays, alarms, and controls exist in the main control room and RSS and as shown on Figure 3.0-1 for water level and temperature monitoring, with controls in the RSS for components required for UHS operation.
5. The UHS Basin, Reactor Service Water Pump House, and UHS Cooling Tower Enclosure are classified as Seismic Category I. These structures are designed and constructed to accommodate the dynamic and static loading conditions associated with the various loads and load combinations which form the structural design basis. The structural design basis loads are those associated with: (1) Natural phenomena—wind, floods, tornadoes (including tornado missiles), earthquakes, rain and snow. (2) Internal events—floods, pipe breaks and missiles. (3) Normal plant operation—live loads, dead loads and temperature effects.	5. A structural analysis will be performed that reconciles the as-built data with the structural design-basis.	5. A structural analysis report exists which concludes that the as-built UHS Basin, Reactor Service Water Pump House, and UHS Cooling Tower Enclosure are able to withstand the structural design-basis loads.

Table 3.0-4 Potable and Sanitary Water System

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
No entry for this system.		

Table 3.0-5 Reactor Service Water System (RSW)

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
1. The basic configuration of the site-specific RSW is as shown on Figure 3.0-1.	1. Inspections of the as-built system will be conducted.	1. The as-built RSW conforms with the basic configuration shown on Figure 3.0-1.
2. Each division is sized to prevent flooding greater than 5 meters above the floor level in each RCW heat exchanger room.	2.(a) Tests of the RSW water level switches will be performed using simulated signals. 2.(b) An analysis of the flooding of each RSW division will be performed.	2.(a) Upon receipt of the simulated signal, the level switches actuate which close the valves and stop the pumps. 2.(b) A report exists which concludes the internal flooding will not exceed 5 meters in each RCW heat exchanger room.
3.(a) Active safety-related SSCs within the RSW shall have three divisions powered by their respective Class 1E divisions.	3.(a) Test will be performed on the RSW system by providing a test signal to only one Class 1E division at a time.	3.(a) The test signal exists in only the Class 1E division under test in the RSW system.
3.(b) Each division shall be physically separated.	3.(b) Inspections of the as-built RSW mechanical configuration shall be performed.	3.(b) Each mechanical division of the RSW system is physically separated from other mechanical divisions of the RSW system by a structural boundary with a three-hour fire rating.
3.(c) Each division shall be electrically independent of the other divisions.	3.(c) Inspections of the as-built RSW electrical system components shall be performed.	3.(c) Electrical isolation exists between Class 1E divisions.
3.(d) Each division shall be capable of removing the design basis heat load of the RSW heat exchangers in that division.	3.(d) An analysis will be performed of the heat removal capability of each RSW division.	3.(d) A report exists which concludes that each RSW division can remove the design basis heat load as specified in Section 2.11.3 of Tier 1 of the reference ABWR DCD.
3.(e) Interdivisional flood control shall be provided to preclude flooding in more than one division.	3.(e) An inspection will be performed of the structural features separating the RSW divisions.	3.(e) The RSW divisions are separated by walls and water-tight doors.
4. On a LOCA and/or LOPP signal, any closed valves for standby heat exchangers are automatically opened and the standby pumps automatically start.	4. Using simulated LOCA and/or LOPP signals, tests will be performed on standby heat exchanger inlet and outlet valves.	4. Upon receipt of simulated LOCA and/or LOPP signals, the standby heat exchanger inlet and outlet valves open. The standby pumps start.

Table 3.0-5 Reactor Service Water System (RSW) (Continued)

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
7. For each division of RSW the heat exchanger inlet and outlet valves close, the pumps trip, and the isolation valves close upon receipt of a signal indicating Control Building flooding in that division.	7. Using simulated signals, tests will be performed on the RSW System pumps and valves by providing a test signal in only one Class 1E division at a time.	7. The heat exchanger inlet and outlet valves close, the pumps trip, and the isolation valves close, and alarms are received in the MCR upon receipt of a signal indicating flooding in that division of has reached the appropriate level setpoint in the Control Building.
8. The Reactor Service Water Piping Tunnels are classified as Seismic Category I. These tunnels are designed and constructed to accommodate the dynamic and static loading conditions associated with the various loads and load combinations which form the structural design basis. The structural design basis loads are those associated with: (1) Natural phenomena – wind, floods, tornadoes (including tornado missiles), earthquakes, rain and snow. (2) Internal events – floods, pipe breaks and missiles. (3) Normal plant operation – live loads, dead loads and temperature effects.	8.(a) A structural analysis will be performed to reconcile as-built data with the structural design basis. 8.(b) An inspection of the Reactor Service Water Piping Tunnels will be performed.	8.(a) A structural analysis report exists which concludes that the as-built Reactor Service Water Piping Tunnels are able to withstand the design basis loads. 8.(b) The Reactor Service Water Piping Tunnels have no openings that would permit external flooding from penetrating the tunnels.
9. The RSW Piping Tunnel and RSW Pump House are protected against external floods by having: a. External walls below design basis flood level that are equal to or greater than 0.6 m thick to prevent groundwater seepage. b. Tunnels below design basis flood level not penetrating exterior walls of the RSW Pump House and Control Building. c. Penetration seals with flood protection features.	9. Inspection of the as-built structure will be conducted.	9. a. External walls below design basis flood level are equal to or greater than 0.6 m thick to prevent groundwater seepage. b. Tunnels below design basis flood level do not penetrate exterior walls of the RSW Pump House and Control Building. c. The penetration seals are provided with flood protection features.

Table 3.0-17 Diesel Generator Fuel Oil Storage Vaults

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
1. (a) The Diesel Generator Fuel Oil Storage Vaults are classified as Seismic Category I. These vaults are designed and constructed to accommodate the dynamic and static loading conditions associated with the various loads and load combinations which form the structural design basis. The loads are those associated with: i. Natural phenomena-wind, floods, tornadoes (including tornado missiles), earthquakes, rain and snow. ii. Internal events-floods, pipe breaks and missiles. iii. Normal plant operation-live loads, dead loads and temperature effects. 1. (b) Any access opening in the vaults below the flood level will be protected from external flooding with flood protection features.	1. (a) A structural analysis will be performed to reconcile as built data with the structural design basis as defined in the Design Requirement. 1. (b) An inspection of the vaults will be performed.	1. (a) A structural analysis report exists which concludes that the as-built Diesel Generator Fuel Oil Storage Vaults are able to withstand the design basis loads as defined in the Design Requirement. 1. (b) The vaults have no unprotected openings that would permit external flooding to penetrate into the vaults.

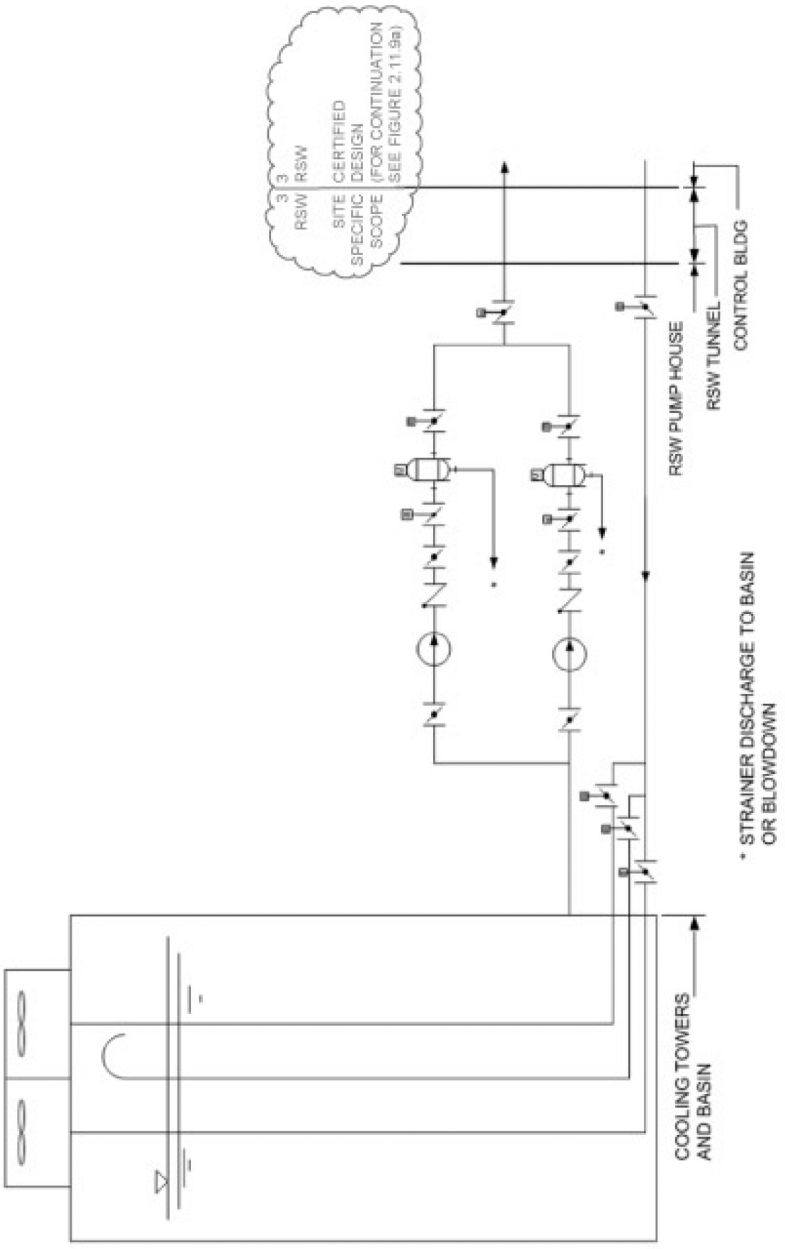

Figure 3.0-1 UHS and Reactor Service Water System

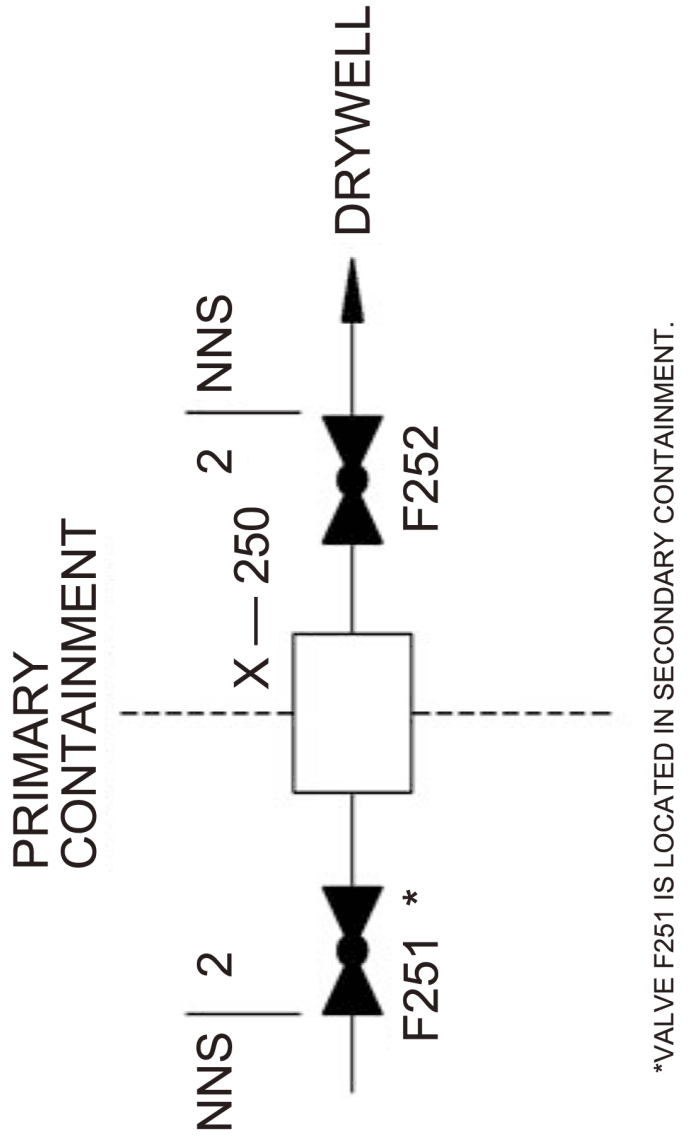

Figure 3.0-2 Breathing Air System Containment Isolation Configuration