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 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

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 ~~9.3-1~~ 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 ~~9.3-1~~ 3.0-1.
2.(a) 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 design-basis events.	2.(a) Inspections of the configuration of the UHS will be performed.	2.(a) The RSW pump suction ~~from the UHS is located at elevation 0.5 feet MSL.~~lines are at Elev. 3.35 m MSL at the UHS basin wall.
2.(b) Makeup water to the UHS shall not be required for at least 30 days following a design-basis accident.	2.(b) An analysis will be performed of the need for makeup water for the UHS.	2.(b)(i) The minimum surface area and capacity of the UHS above the suction lines are ~~48,104~~34,240 square feet and ~~38 feet MSL~~2,165,500 cubic feet, respectively. 2.(b)(ii) A report exists that concludes the UHS is able to perform its safety-related function without makeup water for 30 days following a design basis accident.
3.(a) Active safety-related SSCs within the UHS shall have three divisions powered by their respective Class 1E divisions.	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.(a) The test signal exists in only the Class 1E division under test in the UHS system.
3.(b) Each division shall be physically separated.	3.(b) Inspections of the as-built UHS mechanical configuration shall be performed.	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.	3.(c) Inspections of the as-built UHS electrical system components shall be performed.	3.(c) Electrical isolation exists between Class 1E divisions **and non-Class 1E equipment**.
4. Displays and controls in the main control room and remote shutdown system (RSS) are provided for required functions 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 and controls exist in the main control room and as shown on Figure ~~9.3-1~~ 3.0-1.
5. The UHS is able to withstand the structural design-basis loads.	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 is able to withstand the structural design-basis loads.

Table 3.0-2 Offsite Power System

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
1. There is redundancy and independence in the offsite power system.	1.(a) Inspections of the as-built offsite power supply transmission system will be performed. 1.(b) Tests of the as-built offsite power system will be conducted by providing a test signal in only one offsite power circuit/system at a time.	1.(a)(i) Two or more offsite transmission circuits exist. (ii) The offsite transmission circuits are separated by a minimum distance of 50 feet (15.24 meters). (iii) The offsite transmission lines do not have a common takeoff structure or use a common structure for support. 1.(b) A test signal exists in only the circuit under test.
2. Site loads are protected from offsite voltage variations during steady-state operation.	2. Analyses of the transmission network (TN) voltage variability and steady-state load requirements for as-built SSCs will be performed.	2. A report exists which concludes that voltage variations of the offsite TN during steady-state operation will not cause voltage variations at the loads of more than plus or minus 10% of the loads nominal ratings.
3. Site loads are protected from offsite frequency variations.	3. Analyses of as-built site loads on the TN and TN frequency variability during normal steady-state conditions and periods of instability will be performed.	3. A report exists which concludes that the normal steady-state frequency of the offsite TN will be within plus or minus 2 hertz of 60 hertz during recoverable periods of system instability.
4. The offsite power system is adequately sized to supply necessary load requirements, during all design operating modes.	4. Analyses of the as-built 1E divisions and non-Class 1E load groups will be performed to determine their load requirements during all design operating modes.	4. A report exists which concludes that the offsite transmission circuits from the TN through and including the main step-up power transformers and RATs are sized to supply their load requirements, during all design operating modes, of their respective Class 1E divisions and non-Class 1E load groups.
5. The impedance of the offsite power system shall be compatible with the interrupting capability of the plants circuit interrupting devices.	5. Analyses of the impedance of the as-built main step-up transformer and RATs will be performed.	5. A report exists which concludes that the impedance of the main step-up transformer and RATs are compatible with the interrupting capability of the plant's circuit interrupting devices.
6. The offsite transmission power, instrumentation and control circuits are independent.	6. Tests of the as-built offsite power, instrumentation, and control system will be conducted by providing a test signal in only one offsite power circuit/system at a time.	6. A test signal exists in only the circuit under test.
7. Instrumentation and control system loads shall be compatible with the capacity and capability design requirements of the DC systems.	7. Analyses of offsite power control system and instrumentation loads shall be conducted.	7. A report exists which concludes that the offsite power control system and instrumentation loads are compatible with the capacity and capability of the DC systems.

Table 3.0-3 Makeup Water Preparation System (MWP)

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
1. The Makeup Water Preparation (MWP) System provides sufficient quantity and quality to meet plant demands during normal operations.	1. Inspections of the MWP system will be performed.	1.(a) The MWP has two divisions capable of producing at least 90 m^3/h of demineralized water each. 1.(b) Storage of demineralized water shall be at least 5320 m^3. 1.(c) Demineralized water shall be provided at a minimum flow rate of approximately 135m^3/hr at a temperature between 10°C to 38°C.

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 ~~9.3-1~~ 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 ~~9.3-1~~ 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.(a) Upon receipt of the simulated signal, the level switches actuate which close the valves and stop the pumps.
	2.(b) An analysis of the flooding of each RSW division will be performed.	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.
5. Displays and controls in the main control room and RSS are provided for required functions of the RSW system.	5. Inspections will be performed on the main control room and RSS displays and controls for the RSW system.	5. Displays and controls exist in the main control room and RSS as shown on Figure ~~9.3-1~~ 3.0-1.

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

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
6. ~~RSW System has vacuum breakers to prevent flooding of the Control Building after a RSW pipe break and after the RSW System pumps have stopped.~~Not Used.	6. ~~An inspection of the RSW System will be performed.~~Not Used.	6. ~~Vacuum breakers exist in each division of the RSW System.~~Not Used.
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. Tunnel structures used to route piping are designed for design basis seismic loads and are protected against site flooding.	8. A structural analysis will be performed to reconcile as-built data with the structural design basis. 8.(b) An inspection of the tunnels will be performed.	8.(a) A structural analysis report exists which concludes that the as-built tunnels are able to withstand the design basis loads. 8.(b) The tunnels have no openings that would permit external flooding from penetrating the tunnels.

Table 3.0-6 Turbine Service Water System (TSW)

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

Table 3.0-7 Communication System

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

Table 3.0-8 Site Security

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

Table 3.0-9 Circulating Water System (CW)

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
1.The circulating water condenser valves are closed in the event of a system isolation signal from the condenser area flood level switches.	1.Testing of the as-built CW System will be performed using simulated flood level signals.	1.The circulating water condenser valves close and the CW pumps are tripped following receipt of a system isolation signal from the condenser area level switches.

Table 3.0-10 Heating, Ventilating and Air Conditioning System (HVAC)

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

Table 3.0-11 Backfill under Category 1 Structures

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
1.Backfill under Category 1 structures is compacted to not less than 95% of maximum dry density and within plus or minus 3% of the optimum moisture content.	1.Testing will be performed during placement of the backfill materials.	1.The installed backfill under Category 1 structures meets the minimum soil density design requirements.

Table 3.0-12 Breathing Air System (BA)

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
1. The Basic BA System containment penetration has one locked closed isolation valve inside and one locked closed isolation valve outside containment..	1. Inspections of the as-built system will be conducted.	1. The as-built BA System containment penetration has one locked closed isolation valve inside and one locked closed isolation valve outside containment.
2. The ASME Code components of the BA System retain their pressure boundary integrity under internal pressures that will be experienced during service.	2. A pressure test will be conducted on those Code components of the BA System required to be pressure tested by the ASME Code.	2. The results of the pressure test of the ASME Code components of the BA System conform with the requirements in ASME Code Section III.

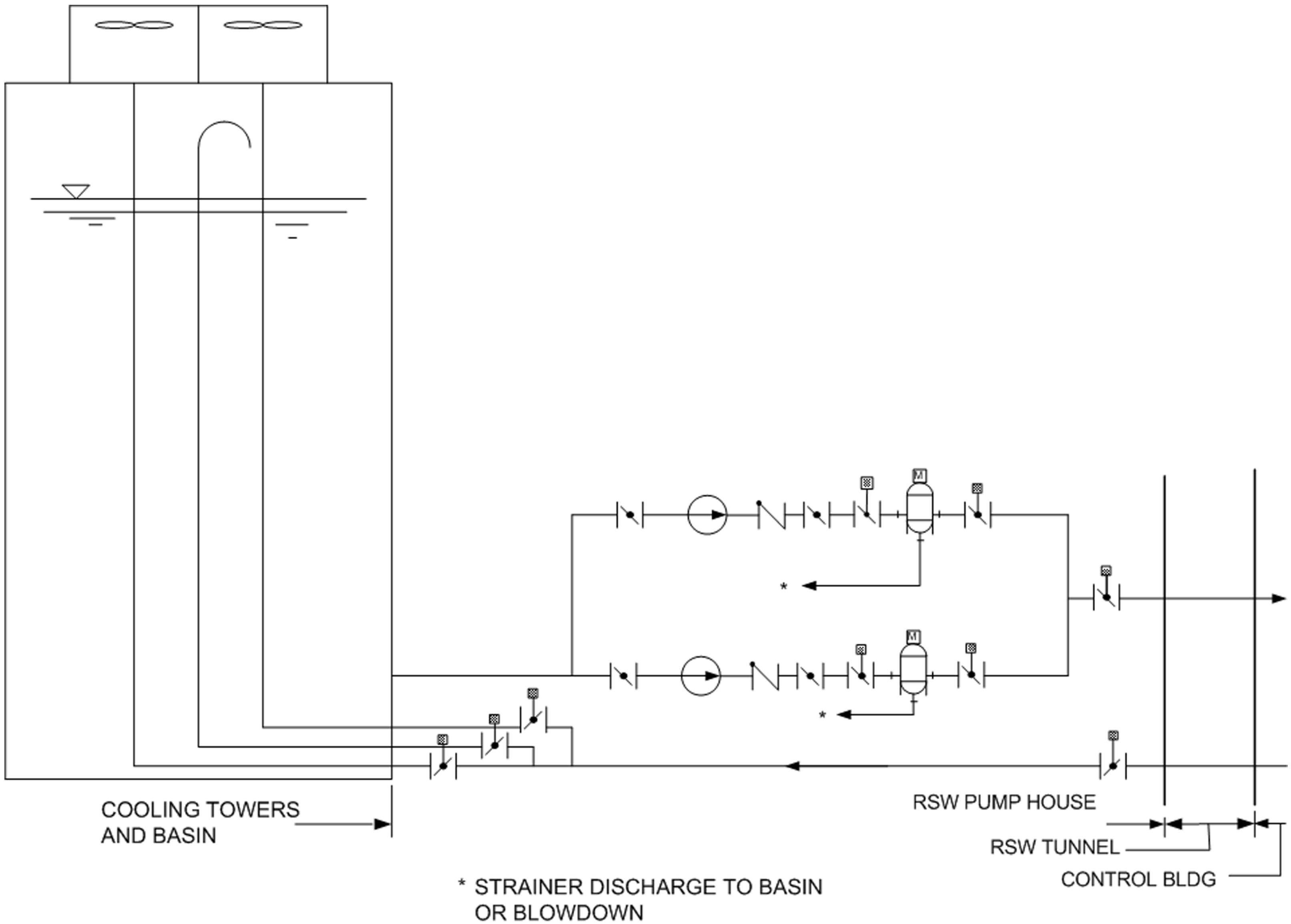

Figure 3.0-1 UHS and Reactor Service Water System