4. INTERFACE MATERIAL

An applicant for a combined license (COL) that references the ESBWR certified design must provide design features or characteristics that comply with the interface requirements for the plant design and inspections, tests, analyses, and acceptance criteria (ITAAC) for the site-specific portion of the facility design, in accordance with 10 CFR 52.80 (a).

Tier 1 interfaces are identified for the conceptual design portion of the Plant Service Water System for the certified design.

4.1 PLANT SERVICE WATER SYSTEM

Design Description

The Plant Service Water System (PSWS) is the heat sink for the Reactor Component Cooling Water System (RCCWS). The PSWS does not perform any safety-related function. There is no interface with any safety-related component. The PSWS provides the non-safety related functions to support the post-72 hour cooling for RCCWS. The PSWS system must have the volume of water necessary to accommodate losses due to evaporation, drift, etc. without make-up for seven days using the most limiting condition of operation as defined by the PRA model. The volume maintained must also ensure that the PSWS pumps have sufficient available net positive suction head at the pump suction location for the lowest probable water level of the heat sink. The most limiting condition equates to 2.02×10^7 MJ (1.92×10^{10} BTU) over a period of seven days.

The PSWS cooling towers and basins are not within the scope of the certified design. A specific design for this portion of the PSWS shall be selected for any facility, which has adopted the certified design. The plant-specific portion of the PSWS shall meet the interface requirements defined below.

Interface Requirements

The interface requirements are necessary for supporting the post 72-hour cooling function of the PSWS. The volume of water shall be sufficient such that no active makeup shall be necessary to remove 2.02×10^7 MJ (1.92×10^{10} BTU) over a period of seven days. Additionally, the PSWS pumps must have sufficient available net positive suction head at the pump suction location for the lowest probable water level of the heat sink. Consequently, verification of compliance with the interface requirements shall be achieved by inspections, tests, and analyses that are similar to those provided for the certified design. The combined license applicant referencing the certified design shall develop these inspections, tests, and analyses, together with their associated acceptance criteria.

4.2 OFFSITE POWER

Design Description

The offsite portion of the Preferred Power Supply (PPS) consists of at least two electrical circuits and associated equipment that are used to interconnect the offsite transmission system with the plant main generator and the onsite portions of the PPS. The PPS consists of the normal preferred and alternate preferred power sources and includes those portions of the offsite power system and the onsite power system required for power flow from the offsite transmission system to the safety-related Isolation Power Centers (IPC) incoming line breakers.

The interface between the normal preferred ESBWR certified plant onsite portion of the PPS and the site-specific offsite portion of the PPS is at the switchyard side terminals of the high side Motor Operated Disconnect (MOD) of the Unit Auxiliary Transformer (UAT) circuit breaker and main generator circuit breaker. The interface between the alternate preferred ESBWR certified plant onsite portion of the PPS and the site specific offsite portion of the PPS is at the switchyard side terminals of the Reserve Auxiliary Transformer (RAT) high side MODs.

Interface Requirements

A combined license applicant referencing the ESBWR certified design shall develop an ITAAC to verify that the as-built offsite portion of the PPS from the transmission network to the interface with the onsite portions of the PPS satisfy the applicable provisions of GDC 17. Specifically, the ITAAC shall verify:

(1) At least two independent circuits supply electric power from the transmission network to the interface with the onsite portions of the PPS.

(2) Each offsite circuit interfacing with the onsite portions of the PPS is adequately rated to supply the load requirements during design basis operating modes (refer to Table 2.13.1-2, Item 9).

(3) During steady state operation, the offsite portion of the PPS is capable of supplying voltage at the interface with the onsite portions of the PPS that will support operation of safety-related loads during design basis operating modes.

(4) During steady state operation, the offsite portion of the PPS is capable of supplying required frequency at the interface with the onsite portions of the PPS that will support operation of safety-related loads during design basis operating modes.

(5) The fault current contribution of the offsite portion of the PPS is compatible with the interrupting capability of the onsite fault current interrupting devices.