2.9 Radioactive Waste System

2.9.1 Radwaste System

Design Description

The Radwaste (RW) System consists of a liquid waste system, a solid waste system and a radioactive drain transfer system . The liquid waste system includes primary containment penetrations, and inboard and outboard motor-operated isolation valves for the high conductivity and low conductivity waste drains from the lower drywell. The liquid waste system collects, treats, monitors, and either recycles treated radioactive liquid wastes within the plant or discharges them to the environs. The solid waste system sorts, processes, monitors and packages processed solid radwastes for shipment to an offsite disposal facility.

The RW System is classified as non-safety-related with the exception of the primary containment isolation function.

The primary containment penetrations and isolation valves are classified as Seismic Category I and ASME Code Class 2. The back flow check valves in the emergency core cooling system (ECCS) equipment room sumps are classified as Seismic Category I.

The RW System processing equipment is located in the Radwaste Building.

The inboard containment isolation valves are powered from Class 1E Division II, and the outboard isolation valves are powered from Class 1E Division I. In the RW System, independence is provided between Class 1E divisions, and also between the Class 1E divisions and non-Class 1E equipment.

The main control room has control and open/close status indications for the primary containment isolation valves.

The safety-related electrical equipment that provides containment isolation, located in the primary containment and the Reactor Building, is qualified for a harsh environment.

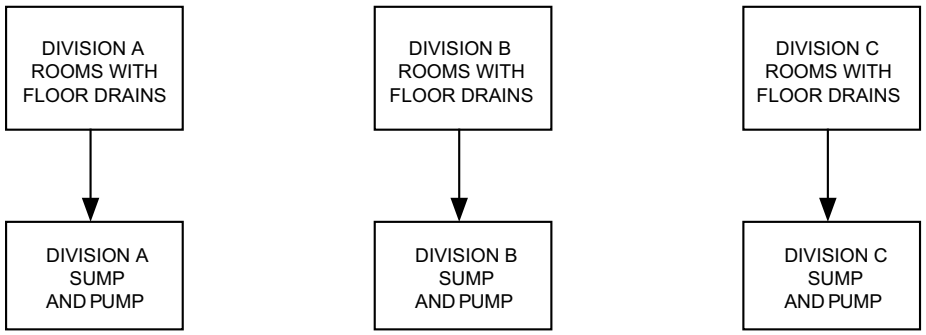
The primary containment isolation motor-operated valves (MOVs) have active safety-related function to close and perform these functions under differential pressure, fluid flow, and temperature conditions.

The liquid waste system has one discharge line which has a radiation monitor. Discharge flow is terminated on receipt of a high radiation signal from this monitor.

The radioactive drain transfer system in each divisional area of the ECCS pump rooms and the Control Building are physically separated from drains in the other divisions. Figures 2.9.1a and 2.9.1b show the basic system configuration and scope.

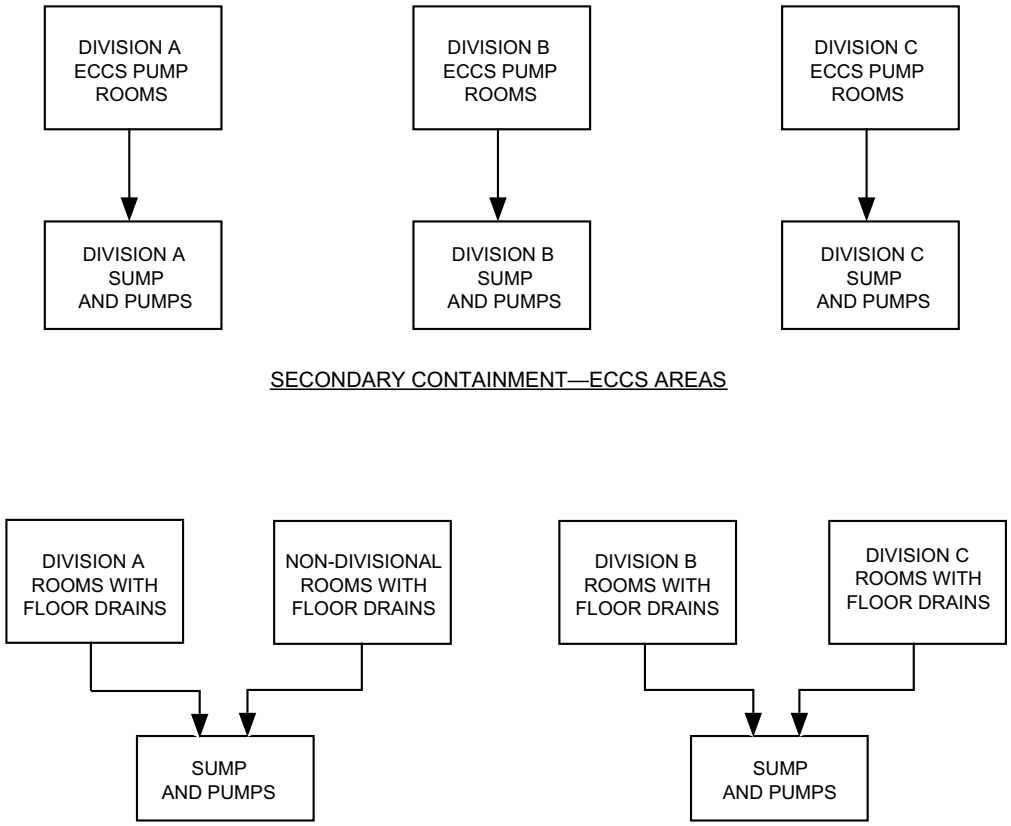
Inspections, Tests, Analyses and Acceptance Criteria

Table 2.9.1 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be undertaken for the Radwaste System.



NOTES:
1. THE SYSTEM HAS NO VALVES, PUMPS, OR OTHER ACTIVE COMPONENTS IN THE DRAINAGE PATHS.

Figure 2.9.1a Radioactive Drain Transfer System



NOTES:
1. THE SYSTEM HAS NO VALVES, PUMPS, OR OTHER ACTIVE COMPONENTS IN THE DRAINAGE PATHS.

Figure 2.9.1b Radioactive Drain Transfer System

Table 2.9.1 Radwaste System

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
1. The basic configuration for the RW System is described in Section 2.9.1.	1. Inspection of the as-built system will be conducted.	1. The as-built RW System conforms with the basic configuration described in Section 2.9.1.
2. The ASME Code components of the RW System retain their pressure boundary integrity under internal pressures that will be experienced during service.	2. A hydrostatic test will be conducted on those Code components of the RW System required to be hydrostatically tested by the ASME Code.	2. The results of the hydrostatic test of the ASME Code components of the RW System conform with the requirements in the ASME Code, Section III.
3. The inboard containment isolation valves are powered from Class 1E Division II, and the outboard isolation valves are powered from Class 1E Division I. In the RW System, independence is provided between Class 1E divisions and non-Class 1E equipment.	3. a. Tests will be performed on the RW System by providing a test signal in only one Class 1E division at a time. b. Inspection of the as-installed Class 1E divisions in the RW System will be performed.	3. a. The test signal exists only in the Class 1E division under test in the RW System. b. In the RW System, physical separation or electrical isolation exists between Class 1E divisions. Physical separation or electrical isolation exists between these Class 1E divisions and non-Class 1E equipment.
4. Main control room displays and controls provided for the RW System are as defined in Section 2.9.1.	4. Inspections will be performed on the main control room displays and controls for the RW System.	4. Displays and controls exist or can be retrieved in the main control room as defined in Section 2.9.1.
5. MOVs designated in Section 2.9.1 as having an active safety-related function close under differential pressure, fluid flow, and temperature conditions.	5. Tests of installed valves for closing will be conducted under preoperational differential pressure, fluid flow, and temperature conditions.	5. Upon receipt of the actuating signal, each MOV closes.
6. The liquid waste system has one discharge line which has a radiation monitor. Discharge flow is terminated on receipt of a high radiation signal from this monitor.	6. Tests will be conducted on the as-built liquid waste system using a simulated high radiation signal.	6. The discharge flow terminates upon receipt of a simulated high radiation signal.

Table 2.9.1 Radwaste System (Continued)

Inspections, Tests, Analyses and Acceptance Criteria		
Design Commitment	**Inspections, Tests, Analyses**	**Acceptance Criteria**
7. The radioactive drain transfer system in each divisional area of the ECCS pump rooms and the Control Building are physically separated from drains in the other divisions.	7. Tests will be conducted on the as-built system by individually pressuring each divisional area drains with water and observing other divisional area drains for interdivisional leakage.	7. No interconnection exist (i.e. no water leakage in to other divisions not being tested).