

2.14 Containment and Environmental Control Systems

The information in this section of the reference ABWR DCD, including all subsections, tables, and figures, is incorporated by reference with the following departure.

STD DEP T1 2.14-1 ([Figure 2.14-8, Table 2.14-8](#))

2.14.8 ~~Flammability Control System~~ **(Not Used)**

~~The information in this section of the reference ABWR DCD, including all subsections, tables, and figures, has been deleted in accordance with the following standard departure:~~

~~The Flammability Control System (FCS) was eliminated in accordance with pages B-13 through B-17 of ABWR Licensing Topical Report NEDE-33330P, "Advanced Boiling Water Reactor (ABWR) Hydrogen Recombiner Requirements Elimination," Rev. 1 dated September, 2007. The information in the Licensing Topical Report is incorporated by reference.~~

~~Design Description~~

~~The Flammability Control System (FCS) is provided to control the potential buildup of hydrogen and oxygen in the containment from radiolysis of water after a design basis loss of coolant accident (LOCA). The system consists of two independent and redundant hydrogen and oxygen recombiners. Cooling water required for operation of the system after a LOCA is taken from the Residual Heat Removal (RHR) System. Figure 2.14.8 shows the basic system configuration and scope.~~

~~The FCS is classified as safety related.~~

~~After a LOCA, the system can be manually actuated from the main control room if high oxygen concentrations exist in the primary containment. Each recombiner removes gas from the drywell, recombines the oxygen with hydrogen, and returns the gas mixture, along with the condensate to the wetwell.~~

~~The system is classified as Seismic Category I. Figure 2.14.8 shows ASME Code class for the FCS piping and components.~~

~~The FCS is located in the Reactor Building.~~

~~Each of the two FCS divisions is powered from the respective Class 1E division as shown on Figure 2.14.8. In the FCS, independence is provided between Class 1E divisions, and also between the Class 1E divisions and non-Class 1E equipment.~~

~~Each mechanical division of the FCS (Divisions B and C) is physically separated from the other division.~~

~~The FCS has the following displays and controls in the main control room:~~

- ~~(1) Controls and status indication for the valves shown on Figure 2.14.8.~~

~~(2) Controls and status indication for the recombiner unit.~~

~~FCS Components with display and control interfaces with the Remote Shutdown System (RSS) is shown on Figure 2.14.8.~~

~~The safety related electrical equipment shown on Figure 2.14.8 and included in the recombiner units, is qualified for a harsh environment.~~

~~The motor operated valves (MOVs) shown on Figure 2.14.8 and active safety related MOVs in the recombiners, if any, have active safety related functions to both open and close, and perform these functions under differential pressure, fluid flow, and temperature conditions.~~

~~The check valves (CVs) shown on Figure 2.14.8 have active safety related functions to both open and closed under system pressure, fluid flow, and temperature conditions.~~

~~The pneumatic valves shown on Figure 2.14.8 fail to the closed position in the event of loss of pneumatic pressure or loss of electrical power to the valve actuating solenoids.~~

~~**Inspections, Tests, Analyses and Acceptance Criteria**~~

~~Table 2.14.8 provides a definition of the inspections, tests, and/or analyses, together with associated acceptance criteria, which will be undertaken for the FCS.~~

Table 2.14.8 Flammability Control System

Design Commitment	Inspections, Tests, Analyses and Acceptance Criteria	Acceptance Criteria
1- The basic configuration for the FCS is as shown on Figure 2.14.8.	1- Inspections of the as-built system will be conducted.	1- The as-built FCS conforms with the basic configuration shown on Figure 2.14.8.
2- The ASME Code components of the FCS 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 FCS required to be pressure tested by the ASME code.	2- The results of the pressure test of the ASME code components of the FCS conform with the requirements in the ASME Code, Section III.
3- Each of the two FCS divisions is powered from the respective Class 1E division as shown on Figure 2.14.8. In the FCS, independence is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E equipment.	3- a- Tests will be performed in the FCS 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 FCS will be performed.	3- a- The test signal exists only in the Class 1E division under test in the FCS. b- Physical separation or electrical isolation exists between Class 1E divisions in the FCS. Physical separation or electrical isolation exists between Class 1E divisions and non-Class 1E equipment in the FCS.
4- Each mechanical division of the FCS (Divisions B, C) is physically separated from the other divisions.	4- Inspections of the as-built FCS will be conducted.	4- Each mechanical division of the FCS is physically separated from the other mechanical divisions of FCS by structural and/or fire barriers.
5- Main control room displays and controls provided for the FCS are as defined in Section 2.14.8.	5- Inspections will be performed on the main control room displays and controls for the FCS.	5- Displays and controls exist or can be retrieved in the main control room as defined in Section 2.14.8.
6- RSS display and control provided for the FCS are as defined in Section 2.14.8.	6- Inspections will be performed on the RSS display and control for the FCS.	6- Display and control exists on the RSS as defined in Section 2.14.8.
7- MOVs designated in Section 2.14.8 as having an active safety related function open and close under differential pressure and fluid flow and temperature conditions.	7- Tests of installed valves for both opening and closing will be conducted under preoperational differential pressure, fluid flow, and temperature conditions.	7- Upon receipt of the actuating signal, each MOV both opens and closes, depending on the valve's safety function.

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8- CVs designated in Section 2.14.8 as having an active safety-related function open and close under system pressure, fluid flow, and temperature conditions.	8- Tests of installed valves for both opening and closing will be conducted under preoperational system pressure, fluid flow, and temperature conditions.	8- Based on the direction of the differential pressure across the valve, each CV opens or closes depending upon the valve's safety functions.
9- The pneumatic valves shown on Figure 2.14.8 fail close in the event of loss of pneumatic pressure or loss of electrical power to the valve actuating solenoid.	9- Tests will be conducted on the as-built FCS pneumatic valves.	9- The pneumatic valves shown on Figure 2.14.8 fail close in the event of loss of pneumatic pressure or loss of electrical power to the valve actuating solenoid.

Figure 2.14-8 ~~Flammability Control System~~ Not Used

