

2.3 Severe Accident Systems

2.3.1 Combustible Gas Control System

1.0 Description

The combustible gas control system (CGCS) prevents damage to the containment or emergency equipment, in the event of a severe accident with core degradation, by controlling the combustible gas concentration in containment.

The CGCS does not provide any safety related functions.

The CGCS provides the following non-safety related functions:

- Mixing of the containment atmosphere.
- Controlling combustible gases concentrations.
- Ensuring containment structural integrity by limiting the pressure to within the containment design pressure resulting from a combustible gas ignition from the most severe accident.

2.0 Mechanical Design Features

2.1 The CGCS contains the passive autocatalytic recombiners (PAR), mixing dampers, and hydrogen foils.

3.0 Electrical Power Design Features

3.1 Mixing dampers listed in Table 2.3.1-1 fail open on loss of power.

4.0 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.3.1-2 lists the CGCS ITAAC.

Table 2.3.1-1—CGCS Equipment Design (3 Sheets)

Equipment Description	Equipment Location
Recombiner 30JMT10 AT001	Room 30UJA18-019, surge line area
Recombiner 30JMT10 AT002	Room 30UJA18-007, SG loop 3 area
Recombiner 30JMT10 AT003	Room 30UJA18-008, SG loop 4 area
Recombiner 30JMT10 AT004	Room 30UJA18-003, SG loop 1 area
Recombiner 30JMT10 AT005	Room 30UJA18-004, SG loop 2 area
Recombiner 30JMT10 AT006	Room 30UJA18-018, spray valves area
Recombiner 30JMT10 AT007	Room 30UJA23-019, pressurizer area
Recombiner 30JMT10 AT008	Room 30UJA23-006, RCP loop 3 area
Recombiner 30JMT10 AT009	Room 30UJA23-015, annual space accumulator tank loop 3 (0°-90°) area
Recombiner 30JMT10 AT010	Room 30UJA23-006, RCP loop 3 area
Recombiner 30JMT10 AT011	Room 30UJA23-007, SG loop 3 area
Recombiner 30JMT10 AT012	Room 30UJA23-008, SG loop 4 area
Recombiner 30JMT10 AT013	Room 30UJA23-016, annual space accumulator tank loop 4 (90°-180°) area
Recombiner 30JMT10 AT014	Room 30UJA23-009, RCP loop 4 area
Recombiner 30JMT10 AT015	Room 30UJA23-009, RCP loop 4 area
Recombiner 30JMT10 AT016	Room 30UJA15-001, reactor cavity
Recombiner 30JMT10 AT017	Room 30UJA23-002, RCP loop 1 area
Recombiner 30JMT10 AT018	Room 30UJA23-002, RCP loop 1 area
Recombiner 30JMT10 AT019	Room 30UJA23-013, annual space accumulator tank loop 1 (180°-270°) area
Recombiner 30JMT10 AT020	Room 30UJA23-003, SG loop 1 area
Recombiner 30JMT10 AT021	Room 30UJA23-004, SG loop 2 area
Recombiner 30JMT10 AT022	Room 30UJA23-005, RCP loop 2 area
Recombiner 30JMT10 AT023	Room 30UJA23-014, annual space accumulator tank loop 2 (270°-0°) area
Recombiner 30JMT10 AT024	Room 30UJA23-005, RCP loop 2 area
Recombiner 30JMT10 AT025	Room 30UJA29-019, pressurizer area
Recombiner 30JMT10 AT026	Room 30UJA29-016, access area (equipment hatch)
Recombiner 30JMT10 AT027	Room 30UJA29-013, set down area operating floor
Recombiner 30JMT10 AT028	Room 30UJA29-018 operating floor access area
Recombiner 30JMT10 AT029	Room 30UJA34-019, pressurizer heat safety relief valves

Table 2.3.1-1—CGCS Equipment Design (3 Sheets)

Equipment Description	Equipment Location
Recombiner 30JMT10 AT030	Room 30UJA34-007, SG loop 3 area
Recombiner 30JMT10 AT031	Room 30UJA34-007, SG loop 3 area
Recombiner 30JMT10 AT032	Room 30UJA34-008, SG loop 4 area
Recombiner 30JMT10 AT033	Room 30UJA34-008, SG loop 4 area
Recombiner 30JMT10 AT034	Room 30UJA34-003, SG loop 1 area
Recombiner 30JMT10 AT035	Room 30UJA34-003, SG loop 1 area
Recombiner 30JMT10 AT036	Room 30UJA34-004, SG loop 2 area
Recombiner 30JMT10 AT037	Room 30UJA34-004, SG loop 2 area
Recombiner 30JMT10 AT038	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT039	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT040	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT041	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT042	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT043	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT044	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT045	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT046	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT047	Room 30UJA40-001, dome area
Mixing damper 30JMT20AA001	Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms
Mixing damper 30JMT20AA002	Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms
Mixing damper 30JMT20AA003	Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms
Mixing damper 30JMT20AA004	Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms
Mixing damper 30JMT20AA005	Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms
Mixing damper 30JMT20AA006	Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms
Mixing damper 30JMT20AA007	Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms
Mixing damper 30JMT20AA008	Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms
Rupture and convection foils, combined minimum area of 107ft ² . ¹	SG (Loop 1 and Loop 2) pressure equalization ceiling

Table 2.3.1-1—CGCS Equipment Design (3 Sheets)

Equipment Description	Equipment Location
Rupture and convection foils, combined minimum area of 107ft ² . ¹	SG (Loop 3 and Loop 4) pressure equalization ceiling

- 1) The combined minimum area of 214 ft² (107 ft² per SG pressure equalization ceiling) is based on analyses that safety significant CGCS performance is maintained with 75% of foils failing to open. Therefore, $(0.25) \cdot (375 \text{ ft}^2 \text{ rupture foils}) + (0.25) \cdot (480 \text{ ft}^2 \text{ convection foils}) = 214 \text{ ft}^2$.

Table 2.3.1-2—CGCS ITAAC

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
2.1	The CGCS contains PAR, mixing dampers, and rupture and convection foils.	An inspection will be performed of the equipment listed in Table 2.3.1-1.	The CGCS contains the PAR, mixing dampers, and rupture and convection foils listed in Table 2.3.1-1.
3.1	Mixing dampers listed in Table 2.3.1-1 fail open on loss of power.	Testing will be performed for the mixing dampers listed in Table 2.3.1-1 to fail open on loss of power.	Following loss of power, the mixing dampers listed in Table 2.3.1-1 fail open.