US-APWR DCD Tier 1 Enhancement Project

Tuesday 3/15 AM Handout 4

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2.7.5.2 Engineered Safety Features Ventilation System (ESFVS)

The ESFVS of the US-APWR ~~is designed to~~ provides ~~conditioning~~ conditioned air to ~~maintain the proper environmental conditions within plant~~ areas that house ESF equipment. ~~The system's function is to support and assure the safe and continuous operation of the ESF equipment during abnormal and accident conditions.~~ OOOO

The ESFVS includes:

- Annulus emergency exhaust system
- Class 1E electrical room HVAC system
- Safeguard component area HVAC system
- Emergency feedwater pump area HVAC system
- Safety related component area HVAC system

2.7.5.2.1 Design Description

2.7.5.2.1.1 Annulus Emergency Exhaust System

~~**System Purpose and Functions**~~

The annulus emergency exhaust system is ~~an ESF~~a safety-related system ~~designed for~~ that removes fission products ~~removal and retention~~ by filtering the air it exhausts from penetration and safeguard component areas following accidents. The annulus emergency exhaust system maintains the penetration and safeguard component areas at a negative pressure. ~~The annulus emergency exhaust system is a safety-related system~~ A

~~**Location and Functional Arrangement**~~

The annulus emergency exhaust system is located within the reactor building. As shown in Figure 2.7.5.2-1, the annulus emergency exhaust system consists of two redundant divisions, each sized to have 100% capacity. Each division includes an exhaust filtration unit and fan.

~~**Key Design Features**~~

~~The key design features of the annulus emergency exhaust system are reflected in the system design bases, which include:~~ B

- ~~The annulus emergency exhaust system is designed to remove the airborne radioactive material that may leak from containment or ECCS and CSS components.~~

- The annulus emergency exhaust system exhausts air and maintains a negative pressure at least 0.25 inches w.g. in the penetration and safeguard component areas relative to the adjacent areas.

- The annulus emergency exhaust filtration unit consists, in direction of airflow, of a high efficiency filter and a HEPA filter. C

- The adverse effects associated with the tornado depressurization of the air exhaust line are prevented by the specially designed tornado damper in the exhaust line. D

- The annulus emergency filtration units are physically separated from the other divisions by a structural barrier, which also serves as a fire barrier. E

Seismic and ASME Code Classifications

The seismic classifications for system components are identified in Table 2.7.5.2-1. The system components are not designed or constructed to ASME Code Section III requirements. F

System Operation

The annulus emergency exhaust system operates under accident conditions to exhaust air from the penetration and safeguard component areas and maintain a negative pressure. G

Alarms, Displays, and Controls

Table 2.7.5.2-2 identifies alarms, displays, and controls associated with the system that are located in the MCR. H

Logic

Upon receipt of the ECCS actuation signal, the annulus emergency exhaust system automatically starts. I

Interlocks

The dampers in the annulus emergency exhaust system reposition upon receipt of their respective fan run signals to establish the required flow path. J

Class 1E Electrical Power Sources and Divisions

The components identified in Table 2.7.5.2-1 as Class 1E are powered from their respective Class 1E divisions, and separation is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E cable. K

Equipment to be Qualified for Harsh Environments

The annulus emergency exhaust system is located in controlled environmental conditions that would exist before, during, and following a design basis event. Therefore, the annulus emergency exhaust system equipment is not qualified for harsh environments. L

Interface Requirements

There are no safety-related interfaces with systems outside of the certified design. M

Numeric Performance Values

Selected numerical performance values of the annulus emergency exhaust system used in the safety analysis are shown on the table below: N

Penetration and Safeguard Component Areas negative pressure arrival time	240 sec
Filter efficiencies for Particulates	99%

2.7.5.2.1.2 Class 1E Electrical Room HVAC System

System Purpose and Functions O

The Class 1E electrical room HVAC system is a safety-related system that provides conditioning conditioned air to maintain the proper environmental conditions within the Class 1E I&C rooms, Class 1E electrical rooms, Class 1E battery rooms, Class 1E UPS Rooms and Class 1E battery charger rooms. The Class 1E electrical room HVAC system is a safety-related system.

Location and Functional Arrangement

The Class 1E electrical room HVAC system is located within the reactor building. As shown in Figure 2.7.5.2-2, the Class 1E electrical room HVAC system consists of four redundant divisions, each sized to satisfy 100% of the cooling demand of two divisions of the equipment they serve. Each system includes an air handling unit, a return air fan and a battery room exhaust fan.

Key Design Features

The Class 1E electrical room HVAC system provides conditioning air to maintain the proper environmental conditions within the Class 1E electrical rooms during all plant operating conditions. P

The adverse effects associated with the tornado depressurization of the outside air intakes and exhaust openings are prevented by the specially designed tornado dampers located at the outside air intakes and exhaust opening. Q

The battery rooms are ventilated with sufficient supply and exhaust airflow during all modes of operation in order to limit the hydrogen concentration. R

All duct penetrations in fire walls are protected by fire dampers to prevent the spread of fire from the affected area to the adjacent redundant component areas. S

Air supply, return and exhaust fan housings are designed to resist penetration of internally generated missiles in the event of fan rotor failure. T

The Class 1E electrical room air handling units, Class 1E electrical room return air fans and Class 1E battery room exhaust fans are physically separated by a structural barrier, which also serves as a fire barrier. U

Seismic and ASME Code Classifications

The seismic classifications for system components are identified in Table 2.7.5.2-1. The system components are not designed or constructed to ASME Code Section III requirements V

System Operation

The Class 1E electrical room HVAC system provides conditioning air to maintain the proper environmental conditions within the Class 1E electrical rooms during all plant operating conditions, including normal plant operations, abnormal and accident conditions. W

Alarms, Displays, and Controls

Table 2.7.5.2-2 identifies alarms, displays, and controls associated with the system that are located in the MCR. X

Logic

Upon receipt of the ECCS actuation signal, the Class 1E electrical room HVAC system automatically starts, or continues to operate if running. Y

Interlocks

The dampers in the Class 1E electrical room HVAC system reposition upon receipt of their respective fan run signals to establish the required flow path. Z

Class 1E Electrical Power Sources and Divisions

The components identified in Table 2.7.5.2-1 as Class 1E are powered from their respective Class 1E divisions, and separation is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E cable. AA

~~**Equipment to be Qualified for Harsh Environments**~~

~~The Class 1E electrical room HVAC system is located in controlled environmental conditions that would exist before, during, and following a design basis event. Therefore, the Class 1E electrical room HVAC system equipment is not qualified for harsh environments.~~ BB

~~**Interface requirements**~~

~~There are no safety-related interfaces with systems outside of the certified design.~~ CC

~~**Numeric Performance Values**~~

~~When necessary to demonstrate satisfaction of a design commitment, numeric performance values for selected components have been specified as ITAAC acceptance criteria in Table 2.7.5.2-3.~~ DD

2.7.5.2.1.3 Safeguard Component Area HVAC System

~~**System Purpose and Functions**~~

The safeguard component area HVAC system is a safety-related system that provides ~~conditioning~~ conditioned air ~~to maintain the proper environmental conditions~~ to each controlled area of the safeguard components area. The safeguard component area HVAC system is a safety-related system. EE

~~**Location and Functional Arrangement**~~

The safeguard components area HVAC system is located within the reactor building. As shown in Figure 2.7.5.2-3, ~~the~~each safeguard component area HVAC system ~~provides~~includes ~~four~~one 100% capacity air handling units. PPPP

~~**Key Design Features**~~

~~The safeguard components area HVAC system provides conditioning air to maintain the proper environmental conditions within safeguard component areas, when the respective equipment is operating.~~ FF

~~Air handling unit fan housings are designed to resist penetration of internally generated missiles in the event of fan rotor failure.~~ GG

~~The safeguards component area air handling units are physically separated from the other divisions by a structural barrier, which also serves as a fire barrier.~~

~~**Seismic and ASME Code Classifications**~~

~~The seismic classifications for system components are identified in Table 2.7.5.2-1. The system components are not designed or constructed to ASME Code Section III requirements.~~ HH

System Operation

The safeguard com ponent area HVAC system provides conditioning air to maintain the proper environmental conditions within the safeguard component area during abnormal and accident conditions. II

Alarms, Displays, and Controls

Table 2.7.5.2-2 identifies alarms, displays, and controls associated with the system that are located in the MCR. JJ

Logic

Upon receipt of high area temperature signal, each respective air handling unit is actuated. KK

Interlocks

The dampers in the safeguard component area HVAC system reposition upon receipt of their respective fan run signals to establish the required flow path. LL

Class 1E Electrical Power Sources and Divisions

The components identified in Table 2.7.5.2-1 as Class 1E are powered from their respective Class 1E divisions, and separation is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E cable. MM

Equipment to be Qualified for Harsh Environments

The safeguard component area HVAC system is located in controlled environmental conditions that would exist before, during, and following a design basis event. Therefore, the safeguard component area HVAC system equipment is not qualified for harsh environments. NN

Interface Requirements

There are no safety-related interfaces with systems outside of the certified design. OO

Numeric Performance Values

When necessary to demonstrate satisfaction of a design commitment, numeric performance values for selected components have been specified as ITAAC acceptance criteria in Table 2.7.5.2-3. PP

2.7.5.2.1.4 Emergency Feedwater Pump Area HVAC System

System Purpose and Functions

The emergency feedwater pump area HVAC system is a safety-related system that provides conditioning conditioned air to maintain the proper environmental conditions to each emergency feedwater pump area. The emergency feedwater pump area HVAC system is a safety-related system. QQ

Location and Functional Arrangement

The emergency feedwater pump area HVAC system is located within the reactor building. As shown in Figure 2.7.5.2-4, the each emergency feedwater pump area room HVAC system provides includes air handling units. Each pump room is provided with one 100% capacity air handling unit on a separate division. PPPP

Key Design Features

The emergency feedwater pump area HVAC system provides conditioning air to maintain the proper environmental conditions within emergency feedwater pump areas, when the respective equipment is operating. RR

The adverse effects associated with the tornado depressurization of the outside air intakes and exhaust openings are prevented by the specially designed tornado dampers located at the outside air intakes and exhaust opening. SS

Air handling unit fan housings are designed to resist penetration of internally generated missiles in the event of fan rotor failure. TT

The emergency feedwater pump area air handling units are physically separated from the other divisions by a structural barrier, which also serves as a fire barrier.

Seismic and ASME Code Classifications

The seismic classifications for system components are identified in Table 2.7.5.2-1. The system components are not designed or constructed to ASME Code Section III requirements. UU

System Operation

The emergency feedwater pump area HVAC system provides conditioning air to maintain the proper environmental conditions within the emergency feedwater pump areas during abnormal and accident conditions. VV

Alarms, Displays, and Controls

~~Table 2.7.5.2-2 identifies alarms, displays, and controls associated with the system that are located in the main control room.~~ WW

~~**Logic**~~

~~Upon receipt of high area temperature signal, each respective air handling unit is actuated.~~ XX

~~**Interlocks**~~

~~There are no interlocks needed for direct safety functions related to the emergency feedwater pump area HVAC system.~~ YY

~~**Class 1E Electrical Power Sources and Divisions**~~

~~The components identified in Table 2.7.5.2-1 as Class 1E are powered from their respective Class 1E divisions, and separation is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E cable.~~ ZZ

~~**Equipment to be Qualified for Harsh Environments**~~

~~The emergency feedwater pump area HVAC system is located in controlled environmental conditions that would exist before, during, and following a design basis event. Therefore, the emergency feedwater pump area HVAC system equipment is not qualified for harsh environments.~~ AAA

~~**Interface Requirements**~~

~~There are no safety-related interfaces with systems outside of the certified design.~~ BBB

~~**Numeric Performance Values**~~

~~When necessary to demonstrate satisfaction of a design commitment, numeric performance values for selected components have been specified as ITAAC acceptance criteria in Table 2.7.5.2-3.~~ CCC

2.7.5.2.1.5 Safety Related Component Area HVAC System

~~**System Purpose and Functions**~~

The safety related component area HVAC system is a safety-related system that~~, a safety-related system,~~ provides ~~conditioning~~ conditioned air to ~~maintain the proper environmental conditions to~~ each area of the safety-related component areas listed below. DDD

- Component cooling water pump area
- Essential chiller unit area

- Charging pump area
- Annulus emergency exhaust filtration unit area
- Penetration area
- Spent fuel pit pump area

~~Location and Functional Arrangement~~

The safety related component area HVAC system is located within the reactor building and power source buildings. As shown in Figure 2.7.5.2-5, ~~the~~ each safety related component area HVAC system ~~provides air handling units. Each area it serves is provided with~~ one 100% capacity air handling unit. EEE

~~Key Design Features~~

~~The safety related component area HVAC system provides conditioning air to maintain the proper environmental condition in each individual safety-related component area, when the respective equipment is operating.~~ FFF

~~Air handling unit fan housings are designed to resist penetration of internally generated missiles in the event of fan rotor failure.~~ GGG

~~The safety-related component area air handling units are physically separated from the other divisions by a structural barrier, which also serves as a fire barrier.~~

~~Seismic and ASME Code Classifications~~

~~The seismic classifications for system components are identified in Table 2.7.5.2-1. The system components are not designed or constructed to ASME Code Section III requirements.~~ HHH

~~System Operation~~

~~The safety related component area HVAC system provides conditioning air to maintain the proper environmental conditions within the individual safety-related equipment rooms during abnormal and accident conditions.~~ III

~~Alarms, Displays, and Controls~~

~~Table 2.7.5.2-2 identifies alarms, displays, and controls associated with the system that are located in the main control room.~~ JJJ

~~Logic~~

~~Upon receipt of high area temperature signal, each respective air handling unit is actuated.~~ KKK

Interlocks

There are no interlocks needed for direct safety functions related to the safety related component area HVAC system. LLL

Class 1E Electrical Power Sources and Divisions

The components identified in Table 2.7.5.2-1 as Class 1E are powered from their respective Class 1E divisions, and separation is provided between Class 1E divisions, and between Class 1E divisions and non-Class 1E cable. MMM

Equipment to be Qualified for Harsh Environments

The safety related component area HVAC system is located in controlled environmental conditions that would exist before, during, and following a design basis event. Therefore, the safety related component area HVAC system equipment is not qualified for harsh environments. NNN

Interface Requirements

There are no safety-related interfaces with systems outside of the certified design. OOO

Numeric Performance Values

When necessary to demonstrate satisfaction of a design commitment, numeric performance values for selected components have been specified as ITAAC acceptance criteria in Table 2.7.5.2-3. PPP

1.a The functional arrangement of the ESFVS is as described in the Design Description of Subsection 2.7.5.2.1 and as shown in Figures 2.7.5.2-1 through 2.7.5.2-5. QQQ

1.b Each mechanical division of the annulus emergency exhaust system filtration units identified in Table 2.7.5.2-1 is physically separated from the other divisions of the annulus emergency exhaust system so as not to preclude accomplishment of the safety function. RRR

1.c Each mechanical division of the Class 1E electrical room air handling units, Class 1E electrical room return air fans and Class 1E battery room exhaust fans identified in Table 2.7.5.2-1 is physically separated from the other divisions of the Class 1E electrical room HVAC system so as not to preclude accomplishment of the safety function.

1.d Each mechanical division of the safeguard component area air handling units identified in Table 2.7.5.2-1 is physically separated from the other divisions of the safeguard component area HVAC system so as not to preclude accomplishment of the safety function.

1.e Each mechanical division of the emergency feedwater pump area air handling units identified in Table 2.7.5.2-1 is physically separated from the other divisions of the emergency feedwater pump area HVAC system so as not to preclude accomplishment of the safety function.

1.f Each mechanical division of the safety-related component area air handling units identified in Table 2.7.5.2-1 is physically separated from the other divisions of the safety-related component area HVAC system so as not to preclude accomplishment of the safety function.

2. The seismic Category I equipment, identified in Table 2.7.5.2-1, can withstand seismic design basis loads without loss of safety function. SSS

3.a Class 1E equipment, identified in Table 2.7.5.2-1, is powered from its respective Class 1E division. TTT

3.b Separation is provided between redundant divisions of Class 1E cables, and between Class 1E cables and non-Class 1E cables.

4.a The annulus emergency exhaust system meets the numerical performance values used in the safety analysis. UUU

4.b The Class 1E electrical room HVAC system provides conditioned air to maintain area temperature within design limits in the Class 1E electrical rooms during plant operating conditions, including normal plant operations, abnormal and accident conditions and relative humidity limits in the remote shutdown room during plant operating conditions, including normal plant operations, abnormal and accident conditions. VVV

4.c The Class 1E electrical room HVAC system provides battery room ventilation to maintain hydrogen concentration within the design limit during all plant operating conditions, including normal plant operations. WWW

4.d The safeguard component area HVAC system provides conditioned air to maintain area temperature within design limits in the safeguard component areas when the respective equipment is operating during a design basis accident or LOOP. XXX

4.e The emergency feedwater pump area HVAC system provides conditioned air to maintain area design temperature limits within the emergency feedwater pump areas when the respective equipment is operating during a design basis accident or LOOP. YYY

4.f The safety-related component area HVAC system provides conditioned air to maintain area temperature within design limits in each individual safety-related component area, when the respective equipment is operating during a design basis accident or LOOP. ZZZ

5.a The remotely operated dampers, identified in Table 2.7.5.2-1, as having PSMS control, perform an active safety function after receiving a signal from PSMS. AAAA

5.b After loss of motive power, the remotely operated dampers, identified in Table 2.7.5.2-1, assume the indicated loss of motive power position. BBBB

5.c The fire dampers in the ductwork that penetrates the fire barriers that are required to protect safe-shutdown capability close under design flow conditions. CCCC

5.d Controls are provided in the MCR to open and close the remotely operated dampers identified in Table 2.7.5.2-2. DDDD

5.e The system dampers and tornado dampers, identified in Table 2.7.5.2-1, as having an active safety function perform an active safety function to change position as indicated in the table. EEEE

6.a Controls are provided in the MCR to start and stop the ESFVS air handling units and filtration units identified in Table 2.7.5.2-2. FFFF

6.b The annulus emergency exhaust filtration unit fans identified in Table 2.7.5.2-1 start and the isolation dampers identified in Table 2.7.5.4-1 perform an active safety function to close upon receipt of an ECCS actuation signal. GGGG

6.c The Class 1E electrical room HVAC system air handling unit fans identified in Table 2.7.5.2-1 start after receiving an ECCS actuation signal. HHHH

6.d The safeguard component area HVAC system, emergency feedwater pump area HVAC system, and the safety related component area HVAC system air handling unit fans identified in Table 2.7.5.2-1 start after receiving a high temperature signal. IIII

7. Alarms and displays identified in Table 2.7.5.2-2 are provided in the MCR. JJJJ

8. Alarms, displays and controls identified in Table 2.7.5.2-2 are provided in the RSC. KKKK

2.7.5.2.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.5.2-3 specifies the inspections, tests analyses, and associated acceptance criteria for the ESFVS. Table 2.7.3.5-5 specifies the ITAAC for the ECWS piping that supplies cooling water to the ESFVS air handling unit cooling coils.

Table 2.7.5.2-1 Engineered Safety Features Ventilation System Equipment Characteristics (Sheet 1 of 8)

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated ValveDemper	Class 1E/ Qual. For Harsh Envir.	PSMS Control	Active Safety Function	Loss of Motive Power Position
Annulus Emergency Exhaust System								
Annulus Emergency Exhaust Filtration Units	VRS-MFU-001 A, B	—	Yes	—	—/No	—	None	—
Annulus Emergency Exhaust Filtration Unit Fans	VRS-MFN-001 A, B	—	Yes	—	Yes/No	ECCS Actuation	Start	—
Penetration Annulus Area Exhaust Dampers	VRS-EHD-001 A, B		Yes	Yes	Yes/No	Fan ECCS startActuation	Transfer Open	Closed
Safeguard Component Area Exhaust Dampers	VRS-EHD-002 A, B	—	Yes	Yes	Yes/No	FanECCS StartActuation	Transfer Open	Closed
Annulus Emergency Exhaust Filtration Unit Outlet Dampers	VRS-EHD-003 A, B	—	Yes	Yes	Yes/No	FanECCS StartActuation	Transfer Open	Closed
Tornado Damper	VRS-OTD-004 A, B	—	Yes	—	—/No	—	Transfer Closed (Tornado condition)	–
Ductwork	—	—	Yes	—	—/No	—	None	–

Table 2.7.5.2-1 Engineered Safety Features Ventilation System Equipment Characteristics (Sheet 2 of 8)

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated ValveDamper	Class 1E/ Qual. For Harsh Envir.	PSMS Control	Active Safety Function	Loss of Motive Power Position
Class 1E Electrical Room HVAC System								
Class 1E Electrical Room Air Handling Units	VRS-MAH-201 A, B, C, D	—	Yes	—	—/No	—	None	—
Class 1E Electrical Room Air Handling Unit Fans	VRS-MFN-201 A, B, C, D	—	Yes	—	Yes/No	ECCS Actuation	Start	—
Class 1E Electrical Room Air Handling Unit Cooling Coils	VRS-MCL-201 A B C D	—	Yes	—	—/No	—	None	—
Class 1E Electrical Room Air Electric Unit Heating Coils	VRS-MEH-201 A B C D	—	Yes	—	Yes/No	ECCS Actuation	Energized	Deenergized
Class 1E Electrical Room Return Air Fans	VRS-MFN-202 A, B, C, D	—	Yes	—	Yes/No	ECCS Actuation	Start	—
Class 1E Battery Room Exhaust Fans	VRS-MFN-251 A,B,C,D	—	Yes	—	Yes/No	ECCS Actuation	Start	—
Class 1E Electrical Room Outside Air Intake Isolation Dampers	VRS-EHD-201 A,B,C,D	—	Yes	Yes	Yes/No	ECCS— Actuation	Transfer Open	Closed
Class 1E Electrical Room Air Handling Unit Outlet Dampers	VRS-EHD-202 A,B,C,D	—	Yes	Yes	Yes/No	ECCS Fan Start Actuation	Transfer Open	Closed
Class 1E Electrical Room Return Air Fan Inlet Dampers	VRS-EHD-203 A,B,C,D	—	Yes	Yes	Yes/No	ECCS ActuationFan	Transfer Open	Closed

Start

Table 2.7.5.2-1 Engineered Safety Features Ventilation System Equipment Characteristics (Sheet 3 of 8)

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated ~~Valve~~Damper	Class 1E/ Qual. For Harsh Envir.	PSMS Control	Active Safety Function	Loss of Motive Power Position
Class 1E Electrical Room Air Handling Unit Inlet Dampers	VRS-EHD-204 A,B,C,D	—	Yes	Yes	Yes/No	ECCS Actuation	Transfer Open	Closed
Class 1E Electrical Room Exhaust Line Isolation Dampers	VRS-AOD-205 A,B,C,D	—	Yes	Yes	Yes/No	ECCS Actuation	Transfer Closed	Closed
Class 1E Battery Room Exhaust Fan Inlet Dampers	VRS-EHD-251 A,B,C,D	—	Yes	Yes	Yes/No	~~ECCS Actuation~~Fan Start	Transfer Open	Closed
Class 1E Battery Room Exhaust Fan Outlet Dampers	VRS-EHD-252 A,B,C,D	—	Yes	Yes	Yes/No	~~ECCS Actuation~~Fan Start	Transfer Open	Closed
Tornado Dampers	VRS-OTD-206 A,B,C,D VRS-OTD-207A,B,C,D VRS-OTD-253 A,B,C,D	—	Yes	—	—/No	—	Transfer Closed (Tornado condition)	—
Ductwork	—	—	Yes	—	—/No	—	None	—
Class 1E Electrical Room Temperature	VRS-TS-210, 230, 250, 270	—	Yes	—	Yes/No	—	—	—

Table 2.7.5.2-1 Engineered Safety Features Ventilation System Equipment Characteristics (Sheet 4 of 8)

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated ~~Valve~~Damper	Class 1E/ Qual. For Harsh Envir.	PSMS Control	Active Safety Function	Loss of Motive Power Position
Safeguard Component Area HVAC System								
Safeguard Component Area Air Handling Units	VRS-MAH-301 A, B, C, D	—	Yes	—	—/No	—	None	—
Safeguard Component Area Air Handling Unit Fans	VRS-MFN-301 A, B, C, D	—	Yes	—	Yes/No	High Temperature	Start	—
Safeguard Component Area Air Handling Unit Cooling Coils	VRS-MCL-301 A, B, C, D	—	Yes	—	No	—	None	—
Safeguard Component Area Air Handling Unit Electric Heating Coils	VRS-MEH-301 A,B,C,D	—	Yes	—	Yes/No	Remote Manual	None	—
Safeguard Component Area Air Handling Unit Inlet Dampers	VRS-MOD-301 A, B, C, D	—	Yes	Yes	Yes/No	~~High Temperature~~Fan Start	Transfer Open	As is
Safeguard Component Area Air Handling Unit Outlet Dampers	VRS-MOD-302 A, B, C, D	—	Yes	Yes	Yes/No	~~High Temperature~~Fan Start	Transfer Open	As is
Ductwork	—	—	Yes	—	—/No	—	None	—
Safeguard Component Area Temperature	VRS-TS-305, 306, 307, 315, 316, 317, 325,326, 327, 335, 336, 337	—	Yes	—	Yes/No	—	—	—

Table 2.7.5.2-1 Engineered Safety Features Ventilation System Equipment Characteristics (Sheet 5 of 8)

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated ValveDamper	Class 1E/ Qual. For Harsh Envir.	PSMS Control	Active Safety Function	Loss of Motive Power Position
Emergency Feedwater Pump Area HVAC System								
Emergency Feedwater Pump Area Air Handling Units	VRS-MAH-401 A, B, C, D	—	Yes	—	—/No	—	None	—
Emergency Feedwater Pump Area Air Handling Unit Fans	VRS-MFN-401 A, B, C, D	—	Yes	—	Yes/No	High Temperature	Start	—
Emergency Feedwater Pump Area Air Handling Units Cooling Coils	VRS-RCCMCL-401 A, B, C, D	—	Yes	—	No	—	None	—
Emergency Feedwater Pump Area Air Handling Units Electric Heating Coils	VRS-MEH-401 A, B, C, D	—	Yes	—	Yes/No	Remote Manual	Energized	Deneregized
Tornado Damper	VRS-OTD-403A,D, -404A,D	—	Yes	—	–/No	—	Transfer Closed	—
Ductwork	—	—	Yes	—	—/No	—	None	—
Emergency Feedwater Pump Area Temperature	VRS-TS-401, 405, 406, 411, 415, 416, 421, 425, 426, 431, 435, 436	—	Yes	—	Yes/No	—	—	—
Safety Related Component Area HVAC System								

Component Cooling Water Pump Area Air Handling Units	VRS-MAH-501 A, B, C, D	—	Yes	—	—/No	—	None	—

Table 2.7.5.2-1 Engineered Safety Features Ventilation System Equipment Characteristics (Sheet 6 of 8)

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated ~~Valve~~Damper	Class 1E/ Qual. For Harsh Envir.	PSMS Control	Active Safety Function	Loss of Motive Power Position
Component Cooling Water Pump Area Air Handling Unit Fans	VRS-MFN-501 A, B, C, D	—	Yes	—	Yes/No	High Temperature	Start	—
Component Cooling Water Pump Area Air Handling Unit Fans Cooling Coils	VRS-MCL-501 A, B, C, D	—	Yes	—	—/No	—	None	—
Component Cooling Water Pump Area Air Handling Unit Fans Electric Heating Coils	VRS-MEH-501 A, B,C D	—	Yes	—	Yes/No	Remote Manual	Energized	Deenergized
Essential Chiller Unit Area Air Handling Units	VRS-MAH-511 A, B, C, D	—	Yes	—	—/No	—	None	—
Essential Chiller Unit Area Air Handling Unit Fans	VRS-MFN-511 A, B, C, D	—	Yes	—	Yes/No	High Temperature	Start	—
Essential Chiller Unit Area Air Handling Unit Cooling Coils	VRS-MCL-511 A, B, C, D	—	Yes	—	—/No	—	None	—
Essential Chiller Unit Area Air Handling Unit Heating Coils	VRS-MEH-511 A, B, C, D	—	Yes	—	Yes/No	Remote Manual	Energized	Deenergized
Charging Pump Area Air Handling Units	VRS-MAH-531 A, B	—	Yes	—	—/No	—	None	—
Charging Pump Area Air Handling Unit Fans	VRS-MFN-531 A, B	—	Yes	—	Yes/No	High Temperature	Start	—

Charging Pump Area Air Handling Unit Cooling Coils	VRS-MCL-531 A, B	—	Yes	—	—/No	—	None	—
Charging Pump Area Air Handling Unit Heating Coils	VRS-MEH-531 A, B	—	Yes	—	Yes/No	Remote Manual	Energized	Deenergized
Annulus Emergency Exhaust Filtration Unit Area Air Handling Units	VRS-MAH-541 A, B	—	Yes	—	—/No	—	None	—

Table 2.7.5.2-1 Engineered Safety Features Ventilation System Equipment Characteristics (Sheet 7 of 8)

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated ~~Valve~~Damper	Class 1E/ Qual. For Harsh Envir.	PSMS Control	Active Safety Function	Loss of Motive Power Position
Annulus Emergency Exhaust Filtration Unit Area Air Handling Unit Fans	VRS-MFN-541 A, B	—	Yes	—	Yes/No	High Temperature	Start	—
Annulus Emergency Exhaust Filtration Unit Area Air Handling Units Cooling Coils	VRS-MCL-541 A, B, C, D	—	Yes	—	—/No	—	None	—
Annulus Emergency Exhaust Filtration Unit Area Air Handling Units Electric Heating Coils	VRS-MEH-541 A, B, C, D	—	Yes	—	Yes/No	Remote Manual	Energized	Deenergized
Penetration Area Air Handling Units	VRS-MAH-551 A, B, C, D	—	Yes	—	—/No	—	None	—
Penetration Area Air Handling Unit Fans	VRS-MFN-551 A, B, C, D	—	Yes	—	Yes/No	High Temperature	Start	—
Penetration Area Air Handling Unit Cooling Coils	VRS-MCL-551 A, B, C, D	—	Yes	—	—/No	—	None	—
Penetration Area Air Handling Unit Electric Heating Coils	VRS-MEH-551 A,B,C,D	—	Yes	—	Yes/No	Remote Manual	Energized	Deenergized

QQQQ

Spent Fuel Pit Pump Area Air Handling Units	VRS-MAH-561 A, B	—	Yes	—	—/No	—	None	—
Spent Fuel Pit Pump Area Air Handling Unit Fans	VRS-MFN-561 A, B	—	Yes	—	Yes/No	High Temperature	Start	—
Spent Fuel Pit Pump Area Air Handling Unit Cooling Coils	VRS-MCL-561 A, B	—	Yes	—	—/No	—	None	—
Spent Fuel Pit Pump Area Air Handling Unit Electric Heating Coils	VRS-MEH-561 A,B,C,D	—	Yes	—	Yes/No	Remote Manual	Energized	Deenergized
Ductwork	—	—	Yes	—	—/No	—	None	—
Component Cooling Water Pump Area Temperature	VRS-TS-501, 504, 505, 511, 514, 515, 521, 524, 525, 531, 534, 535	—	Yes	—	Yes/No	—	—	—

Table 2.7.5.2-1 Engineered Safety Features Ventilation System Equipment Characteristics (Sheet 8 of 8)

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated DamperValve	Class 1E/ Qual. For Harsh Envir.	PSMS Control	Active Safety Function	Loss of Motive Power Position
Essential Chiller Unit Area Temperature	VRS-TS-541, 544, 545, 551, 554, 555, 561, 564, 565, 571, 574, 575	—	Yes	—	Yes/No	—	—	—
Charging Pump Area Temperature	VRS-TS-581, 584, 585, 591, 594, 595	—	Yes	—	Yes/No	—	—	—
Annulus Emergency Exhaust Filtration Unit Area Temperature	VRS-TS-601, 604, 605, 611, 614, 615	—	Yes	—	Yes/No	—	—	—
Penetration Area Temperature	VRS-TS-621, 624, 625, 631, 634, 635, 641, 644, 645, 651, 654, 655	—	Yes	—	Yes/No	—	—	—
Spent Fuel Pit Pump Area Temperature	VRS-TS-661, 664, 665, 671, 674, 675	—	Yes	—	Yes/No	—	—	—

NOTE:
Dash (-) indicates not applicable

Table 2.7.5.2-2 Engineered Safety Features Ventilation System Equipment Alarms, Displays and Control Functions (Sheet 1 of 4)

Equipment/Instrument Name	MCR/RSC Alarm	MCR Display	MCR/RSC Control Function	RSC Display
Annulus Emergency Exhaust System				
Annulus Emergency Exhaust Filtration Unit Fans (VRS-MFN-001 A, B)	No	Yes	Yes	Yes
Annulus Area Exhaust Dampers (VRS-EHD-001 A, B)	No	Yes	No	Yes
Safeguard Component Area Exhaust Dampers (VRS-EHD-002 A, B)	No	Yes	No	Yes
Annulus Emergency Exhaust Filtration Unit Outlet Dampers (VRS-EHD-003 A, B)	No	Yes	No	Yes
Class 1E Electrical Room HVAC System				
Class 1E Electrical Room Air Handling Unit Fans (VRS-MFN-201 A, B, C, D)	No	Yes	Yes	Yes
Class 1E Electrical Room Return Air Fans (VRS-MFN-202 A, B, C, D)	No	Yes	Yes	Yes
Class 1E Battery Room Exhaust Fans (VRS-MFN-251 A, B, C, D)	No	Yes	Yes	Yes
Class 1E Electrical Room Outside Air Intake Isolation Dampers (VRS-EHD-201 A, B, C, D)	No	Yes	No	Yes
Class 1E Electrical Room Air Handling Unit Outlet Dampers (VRS-EHD-202 A, B, C, D)	No	Yes	No	Yes
Class 1E Electrical Room Return Air Fan Inlet Dampers (VRS-EHD-203 A, B, C, D)	No	Yes	No	Yes

Table 2.7.5.2-2 Engineered Safety Features Ventilation System Equipment Alarms, Displays and Control Functions (Sheet 2 of 4)

Equipment/Instrument Name	MCR/RSC Alarm	MCR Display	MCR/RSC Control Function	RSC Display
Class 1E Electrical Room Air Handling Unit Inlet Dampers (VRS-EHD-204 A, B, C, D)	No	Yes	Yes	Yes
Class 1E Electrical Room Exhaust Line Isolation Dampers (VRS-AOD-205 A, B, C, D)	No	Yes	Yes	Yes
Class 1E Battery Room Exhaust Fan Inlet Dampers (VRS-EHD-251 A, B, C, D)	No	Yes	No	Yes
Class 1E Battery Room Exhaust Fan Outlet Dampers (VRS-EHD-252 A, B, C, D)	No	Yes	No	Yes
Class 1E Electrical Room Temperature (VRS-TCA-210, 230, 250, 270)	Yes	No	No	No
Safeguard Component Area HVAC System				
Safeguard Component Area Air Handling Unit Fans (VRS-MFN-301 A, B, C, D)	No	Yes	Yes	Yes
Safeguard Component Area Air Handling Unit Inlet Dampers (VRS-MOD-301 A, B, C, D)	No	Yes	No	Yes
Safeguard Component Area Air Handling Unit Outlet Dampers (VRS-MOD-302 A, B, C, D)	No	Yes	No	Yes

Table 2.7.5.2-2 Engineered Safety Features Ventilation System Equipment Alarms, Displays and Control Functions (Sheet 3 of 4)

Equipment/Instrument Name	MCR/RSC Alarm	MCR Display	MCR/RSC Control Function	RSC Display
Safeguard Component Area Temperature (VRS-TCA-305, 315, 325, 335)	Yes	No	No	No
Emergency Feedwater Pump Area HVAC System				
Emergency Feedwater Pump Area Air Handling Unit Fans (VRS-MFN-401 A, B, C, D)	No	Yes	Yes	Yes
Emergency Feedwater Pump Area Temperature (VRS-TCA-401, 411, 421, 431)	Yes	No	No	No
Safety Related Component Area HVAC System				
Component Cooling Water Pump Area Air Handling Unit Fans (VRS-MFN-501 A, B, C, D)	No	Yes	Yes	Yes
Essential Chiller Unit Area Air Handling Unit Fans (VRS-MFN-511 A, B, C, D)	No	Yes	Yes	Yes
Charging Pump Area Air Handling Unit Fans (VRS-MFN-531 A, B~~, C, D~~)	No	Yes	Yes	Yes
Annulus Emergency Exhaust Filtration Unit Area Air Handling Unit Fans (VRS-MFN-541 A, B)	No	Yes	Yes	Yes
Penetration Area Air Handling Unit Fans (VRS-MFN-551 A, B, C, D)	No	Yes	Yes	Yes

RRRR

Table 2.7.5.2-2 Engineered Safety Features Ventilation System Equipment Alarms, Displays and Control Functions (Sheet 4 of 4)

Equipment/Instrument Name	MCR/RSC Alarm	MCR Display	MCR/RSC Control Function	RSC Display
Component Cooling Water Pump Area Temperature (VRS-TCA-501, 511, 521, 531)	Yes	No	No	No
Essential Chiller Unit Area Temperature (VRS-TCA-541, 551, 561, 571)	Yes	No	No	No
Charging Pump Area Temperature (VRS-TCA-581, 591)	Yes	No	No	No
Annulus Emergency Exhaust Filtration Unit Area Temperature (VRS-TCA-601, 611)	Yes	No	No	No
Penetration Area Temperature (VRS-TCA-621, 631, 641, 651)	Yes	No	No	No
Spent Fuel Pit Pump Area Temperature (VRS-TCA-661,671)	Yes	No	No	No

Table 2.7.5.2-3 Engineered Safety Features Ventilation System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 1 of 6)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1.a The functional arrangement of the ESFVS is as described in the Design Description of this Subsection 2.7.5.2.1, and as shown in Figures 2.7.5.2-1 through 2.7.5.2-5.	1.a An iInspection of the as-built ESFVS will be performed.	1.a The as-built ESFVS conforms with to the functional arrangement as described in the Design Description of this Subsection 2.7.5.2.1 and as shown in Figures 2.7.5.2-1 through 2.7.5.2-5.
1.b Each mechanical division of theThe annulus emergency exhaust system filtration units that areidentified in Table 2.7.5.2-1 are is physically separated from the other divisions of the annulus emergency exhaust system so as not to preclude accomplishment of the safety function.	1.b Inspections and analysis of the as-built annulus emergency exhaust system will be performed.	1.b A report exists and concludes that eachEach mechanical division of the as-built annulus emergency filtration units that are identified in Table 2.7.5.2-1 are is physically separated from other mechanical divisions of the system by spatial separation, barriers, or enclosures so as to assure that the functions of the safety related systems are maintainedfrom other mechanical divisions by structural barriers.
1.c Each mechanical division of theThe Class 1E electrical room air handling units, Class 1E electrical room return air fans and Class 1E battery room exhaust fans that are identified in Table 2.7.5.2-1 are is physically separated from the other divisions of the Class 1 E electrical room HVAC system so as not to preclude accomplishment of the safety function.	1.c Inspections and analysis of the as-built Class 1E electrical room HVAC system will be performed.	1.c A report exists and concludes that eachEach mechanical division of the as-built Class 1E electrical room air handling units, Class 1E electrical room return air fans and Class 1E battery room exhaust fans that are identified in Table 2.7.5.2-1 are is physically separated from other mechanical divisions of the system by spatial separation, barriers, or enclosures so as to assure that the functions of the safety related systems are maintainedfrom other mechanical divisions by structural barriers.

1.d Each mechanical division of theThe safeguard component area air handling units that are identified in Table 2.7.5.2-1 are is physically separated from the other divisions of the safeguard component area HVAC system so as not to preclude accomplishment of the safety function.	1.d Inspections and analysis of the as-built safeguard component area HVAC system will be performed.	1.d A report exists and concludes that eachEach mechanical division of the as-built safeguard component area air handling units that are identified in Table 2.7.5.2-1 are is physically separated from other mechanical divisions of the system by spatial separation, barriers, or enclosures so as to assure that the functions of the safety related systems are maintainedfrom other mechanical divisions by structural barriers.
1.e Each mechanical division of theThe emergency feedwater pump area air handling units that are identified in Table 2.7.5.2-1 are is physically separated from the other divisions of the emergency feedwater pump area HVAC system so as not to preclude accomplishment of the safety function.	1.e Inspections and analysis of the as-built emergency feedwater pump area HVAC system will be performed.	1.e A report exists and concludes that eachEach mechanical division of the as-built emergency feedwater pump area air handling units that are identified in Table 2.7.5.2-1 are is physically separated from other mechanical divisions of the system by spatial separation, barriers, or enclosures so as to assure that the functions of the safety related systems are maintainedfrom other mechanical divisions by structural barriers.

Table 2.7.5.2-3 Engineered Safety Features Ventilation System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 2 of 6)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1.f Each mechanical division of the~~The~~ safety-related component area air handling units~~ that are identified in Table 2.7.5.2-1 are~~ is physically separated from the other divisions of the safety-related component area HVAC system so as not to preclude accomplishment of the safety function.	1.f Inspections and analysis of the as-built safety-related component area HVAC system will be performed.	1.f A report exists and concludes that each~~Each~~ mechanical division of the as-built safety-related component area air handling units~~ that are identified in Table 2.7.5.2-1 are~~ is physically separated from other mechanical divisions of the system by spatial separation, barriers, or enclosures so as to assure that the functions of the safety related systems are maintained~~from other mechanical divisions by structural barriers~~.
2. The seismic Category I equipment, identified in Table 2.7.5.2-1, ~~is designed to~~can withstand seismic design basis loads without loss of safety function.	2.i Inspections will be performed to verify that the ~~seismic~~ as-built seismic Category I ~~as-built~~ equipment identified in Table 2.7.5.2-1 is located in ~~the reactor building and power source building~~a seismic Category I structure.	2.i The as-built seismic Category I ~~as-built~~ equipment identified in Table 2.7.5.2-1 is located in ~~the reactor building and power source building~~a seismic Category I structure.
	2.ii Type tests, ~~and/or~~ analyses, or a combination of type tests and analyses of ~~the~~ seismic Category I equipment identified in Table 2.7.5.2-1 will be performed using analytical assumptions, or will be performed under conditions, which bound the seismic design basis requirements.	2.ii ~~The result of the type tests and/or analyses concludes~~ A report exists and concludes that the seismic Category I equipment identified in Table 2.7.5.2-1 can withstand seismic design basis loads without loss of safety function.
	2.iii Inspections and analyses will be performed to verify that ~~on~~ the as-built seismic Category I equipment identified in Table 2.7.5.2-1, ~~equipment~~ including anchorages, is seismically bounded by the tested or analyzed conditions.	2.iii A report exists and concludes that the ~~The~~ as-built seismic Category I equipment identified in Table 2.7.5.2-1, including anchorages, is seismically bounded by the tested or analyzed conditions.

3.a The Class 1E componentsequipment, identified in Table 2.7.5.2-1, are is powered from their its respective Class 1E division.	3.a A test will be performed on each division of the as-built components Class 1E equipment identified in Table 2.7.5.2-1 by providing a simulated test signal only in the Class 1E division under test.	3.a The simulated test signal exists at the as-built Class 1E equipment identified in Table 2.7.5.2-1, under test.
3.b. Separation is provided between redundant Class 1E divisions of Class 1E cables, and between Class 1E divisions cables and non-Class 1E cables.	3.b Inspections of the as-built Class 1E divisional cables will be performed.	3.b Physical separation or electrical isolation is provided in accordance with R.G 1.75, between the as-built cables of redundant Class 1E divisionscables and between Class 1E divisions cables and non-Class 1E cables.

Table 2.7.5.2-3 Engineered Safety Features Ventilation System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 3 of 6)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4.a The annulus emergency exhaust system is capable of meeting meets the selected numerical performance values used in the safety analysis listed in Subsection 2.7.5.2.1.1.	4.a.i Type tests, and analyses, or tests and analyses, of filter efficiencies for the annulus emergency exhaust system will be performed on both divisions.	4.a.i A report exists and concludes that the as-built annulus emergency exhaust system is capable of meetingmeets or exceeds a the filter efficienciesefficiency of 99% identified in Subsection 2.7.5.2.1.1 on both in each divisions.
	4.a.ii A Test test of negative pressure arrival time for the as-built annulus emergency exhaust system will be performed on both divisions.	4.a.ii The as-built annulus emergency exhaust system is capable of drawingdraws down all four penetration areas and all four safeguard component areas to less than or equal to -0.25 inches w.g. relative to adjacent areas within 240 seconds the arrival time identified in Subsection 2.7.5.2.1.1 on both for each divisions.
4.b The Class 1E electrical room HVAC system provides conditioning conditioned air to maintain area design temperature within design limits in the Class 1E electrical rooms during all plant operating conditions, including normal plant operations, abnormal and accident conditions and to maintain relative humidity limits in the remote shutdown room during plant operating conditions, including normal plant operations, abnormal and accident conditions.	4.b Tests and analyses of the as-built Class 1E electrical room HVAC system will be performed for all four divisions.	4.b The A report exists and concludes that the as-built Class 1E electrical room HVAC system is capable of providing conditioning conditioned air to maintain area design temperature within design limits within the Class 1E electrical rooms during all plant operating conditions, including normal plant operations, abnormal and accident conditions and to maintain relative humidity limits in the remote shutdown room during plant operating conditions, including normal plant operations, abnormal and accident conditions.

4.c The Class 1E electrical room HVAC system provides battery room ventilation to maintain hydrogen concentration within the design limit during all plant operating conditions, including normal plant operations, abnormal and accident conditions.	4.c Tests and analyses of the as-built Class 1E electrical room HVAC system will be performed for all four divisions.	4.c The A report exists and concludes that the as-built Class 1E electrical room HVAC system is capable of providing battery room ventilation to maintain hydrogen concentration below 21% by battery room volume. during all plant operating conditions, including normal plant operations, abnormal and accident conditions.
4.d The safeguard component area HVAC system provides conditioning conditioned air to maintain area design temperature within design limits within the safeguard component areas when the respective equipment is operating during a design basis accident or LOOP.	4.d Tests and analyses of the as-built safeguard component area HVAC system will be performed for all four divisions.	4.d A report exists and concludes that the as-built safeguard component area HVAC system is capable of providing conditioning conditioned air to maintain area design temperature within design limits within the safeguard component areas when the respective equipment is operating during a design basis accident or LOOP.

Table 2.7.5.2-3 Engineered Safety Features Ventilation System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 4 of 6)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4.e The emergency feedwater pump area HVAC system provides conditioning conditioned air to maintain area design temperature limits within the emergency feedwater pump areas when the respective equipment is operating during a design basis accident or LOOP.	4.e Tests and analyses of the as-built emergency feedwater pump area HVAC system will be performed for all four divisions.	4.e A report exists and concludes that tThe as-built emergency feedwater pump area HVAC system is capable of providing conditioning conditioned air to maintain area design temperature limits within the emergency feedwater pump areas when the respective equipment is operating during a design basis accident or LOOP.
4.f The safety-related component area HVAC system provides conditioning conditioned air to maintain area design temperature within design limits in each individual safety-related component area, when the respective equipment is operating during a design basis accident or LOOP.	4.f Tests and analyses of the as-built safety-related component area HVAC system will be performed for each safety-related component area.	4.f A report exists and concludes that tThe as-built safety-related component area HVAC system is capable of providing conditioning conditioned air to maintain area design temperature within design limits in each individual safety-related component area, when the respective equipment is operating during a design basis accident or LOOP.
5.a The remotely operated dampers, identified in Table 2.7.5.2-1, as having PSMS control perform an active safety function to change position as indicated in the tableafter receiving a signal from PSMS.	5.a.i Tests of will be performed on the as-built remotely operated dampers identified in Table 2.7.5.2-1 as having PSMS control will be performed using a simulated signals.	5.a.i Each The as-built remotely operated dampers identified in Table 2.7.5.2-1 as having PSMS control perform the active safety function identified in the table after receiving an a simulated ECCS actuation signal or a high temperature signal.
	5.a.ii Tests of the as-built tornado dampers identified in Table 2.7.5.2-1 will be performed under preoperational test pressure, and fluid flow conditions.	5.a.ii Each as-built tornado damper changes position as identified in Table 2.7.5.2-1 .

5.b After loss of motive power, the remotely operated dampers, identified in Table 2.7.5.2-1, assume the indicated loss of motive power position.	5.b Tests of the as-built remotely operated dampers identified in Table 2.7.5.2-1 will be performed under the conditions of loss of motive power.	5.b Upon loss of motive power, each as-built remotely operated damper identified in Table 2.7.5.2-1 assumes the indicated loss of motive power position.
5.c The fire dampers in the ductwork that penetrates the fire barriers that are required to protect safe-shutdown capability close ~~fully when called upon to do so~~ under design air flow conditions.	5.c Type tests, tests, a combination of type tests and analyses, or a combination of tests and analyses of the fire dampers will be performed under the conditions which bound the design air conditions~~Tests of the as-built fire dampers will be performed~~.	5.c ~~Each as-built fire damper in ductwork that penetrates fire barrier~~A report exists and concludes that the fire dampers in the ductwork that penetrates a fire barrier that ~~are~~ is required to protect safe-shutdown capability close under ~~design air flow~~t conditions.

Table 2.7.5.2-3 Engineered Safety Features Ventilation System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 5 of 6)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
5.d Controls ~~exist~~ are provided in the MCR to open and close the remotely operated dampers identified in Table 2.7.5.2-2.	5.d Tests will be performed on the as-built remotely operated dampers ~~listed~~ identified in Table 2.7.5.2-2 using controls in the as-built MCR.	5.d Controls ~~exist~~ in the as-built MCR ~~to~~ open and close the as-built remotely operated dampers ~~listed~~ identified in Table 2.7.5.2-2.
5.e The system dampers and tornado dampers, identified in Table 2.7.5.2-1, as having an active safety function perform an active safety function to change position as indicated in the table.	5.e.i Tests of the as-built system dampers identified in Table 2.7.5.2-1 as having an active safety function will be performed under preoperational flow and differential pressure test conditions.	5.e.i Each as-built system damper changes position as identified in Table 2.7.5.2-1 as having an active safety function under preoperational test conditions.
	5.e.ii Tests of the as-built tornado dampers identified in Table 2.7.5.2-1 as having an active safety function will be performed under preoperational test conditions.	5.e.ii Each as-built tornado damper changes position as identified in Table 2.7.5.2-1 as having an active safety function under preoperational test conditions.
6.a. Controls ~~exist~~ are provided in the MCR to start and stop the ESFVS air handling units and filtration units identified in Table 2.7.5.2-2.	6.a.Tests will be performed on the as-built air handling units and filtration units identified in Table 2.7.5.2-2 using controls in the as-built MCR.	6.a Controls ~~exist~~ in the as-built MCR ~~to~~ start and stop the as-built air handling units and filtration units identified in Table 2.7.5.2-2.
6.b. The annulus emergency exhaust ~~system~~ filtration unit fans ~~system air handling unit fans~~ identified in Table 2.7.5.2-1 start and the isolation dampers identified in Table 2.7.5.4-1 perform an active safety function to ~~change~~ close ~~position simultaneously after receiving~~ upon receipt of an ECCS actuation signal.	6.b.i Tests of the as-built annulus emergency exhaust ~~system~~ filtration unit fans identified in Table 2.7.5.2-1 and isolation damper identified in Table 2.7.5.4-1 will be performed using a simulated signal.	6.b.i The as-built annulus emergency exhaust ~~system~~ filtration unit fans identified in Table 2.7.5.2-1 start and each of the as-built isolation dampers identified in Table 2.7.5.4-1 ~~performs the active safety function simultaneously after receiving~~ close upon receipt of a~~an~~ simulated ECCS actuation signal.
6.c.The Class 1E electrical room HVAC system air handling unit fans identified in Table 2.7.5.2-1 start after receiving an ECCS actuation signal.	6.c. Tests of the as-built Class 1E electrical room HVAC system air handling unit fans identified in Table 2.7.5.2-1 will be performed using a simulated signal.	6.c. The as-built Class 1E electrical room HVAC system air handling unit fans identified in Table 2.7.5.2-1 start after receiving ~~an~~ a simulated ECCS actuation signal.

6.d The safeguard component area HVAC system, emergency feedwater pump area HVAC system, and the safety related component area HVAC system air handling unit fans identified in Table 2.7.5.2-1 start after receiving a high temperature signal.	6.d Tests of the as-built safeguard component area HVAC system, emergency feedwater pump area HVAC system, and the safety related component area HVAC system air handling unit fans identified in Table 2.7.5.2-1 will be performed using a simulated signal.	6.d The as-built safeguard component area HVAC system, emergency feedwater pump area HVAC system, and the safety related component area HVAC system air handling unit fans identified in Table 2.7.5.2-1 start after receiving a simulated high temperature signal.

Table 2.7.5.2-3 Engineered Safety Features Ventilation System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 6 of 6)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
7. MCR aAlarms and displays of the ESFVS parameters identified in Table 2.7.5.2-2 can be retrievedare provided in the MCR.	7. Inspections will be performed for retrievability of the ESFVS parameters alarms and displays identified in Table 2.7.5.2-2 in the as-built MCR.	7. MCR aAlarms and displays identified in Table 2.7.5.2-2 can be retrieved in the as-built MCR.
8. RSC a Alarms, displays and controls are identified in Table 2.7.5.2-2 are provided in the RSC.	8.i Inspections will be performed for retrievability of the as-built RSC alarms, and displays and controls will be performedidentified in Table 2.7.5.2-2 in the as-built RSC.	8.i Alarms, and displays and controls exist on the as-built RSC as identified in Table 2.7.5.2-2 can be retrieved in the as-built RSC.
	8.ii Tests of the as-built RSC control functions identified in Table 2.7.5.2-2 will be performed.	8.ii Controls in the as-built RSC operate the as-built equipment identified in Table 2.7.5.2-2 with an RSC control function

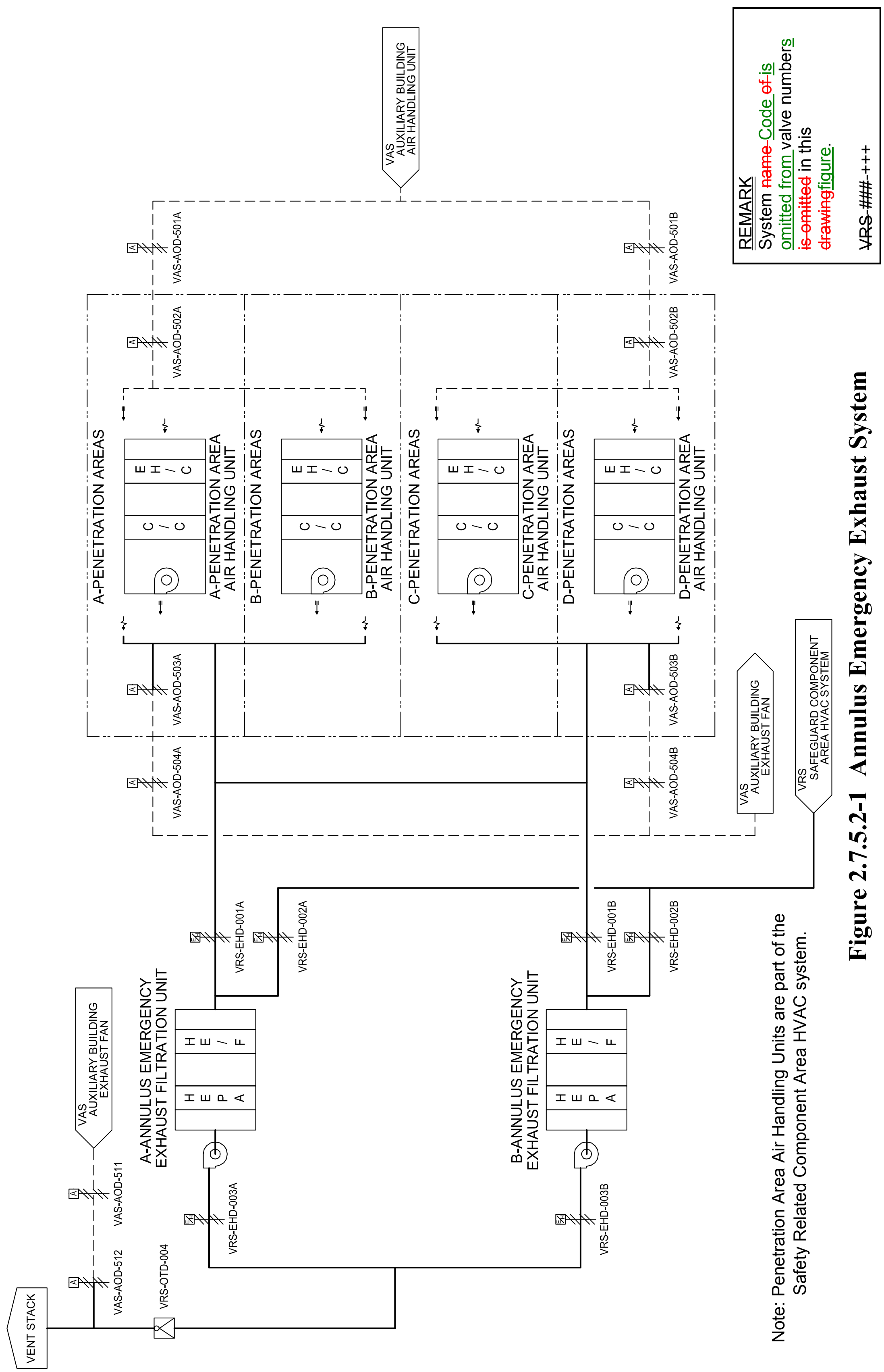
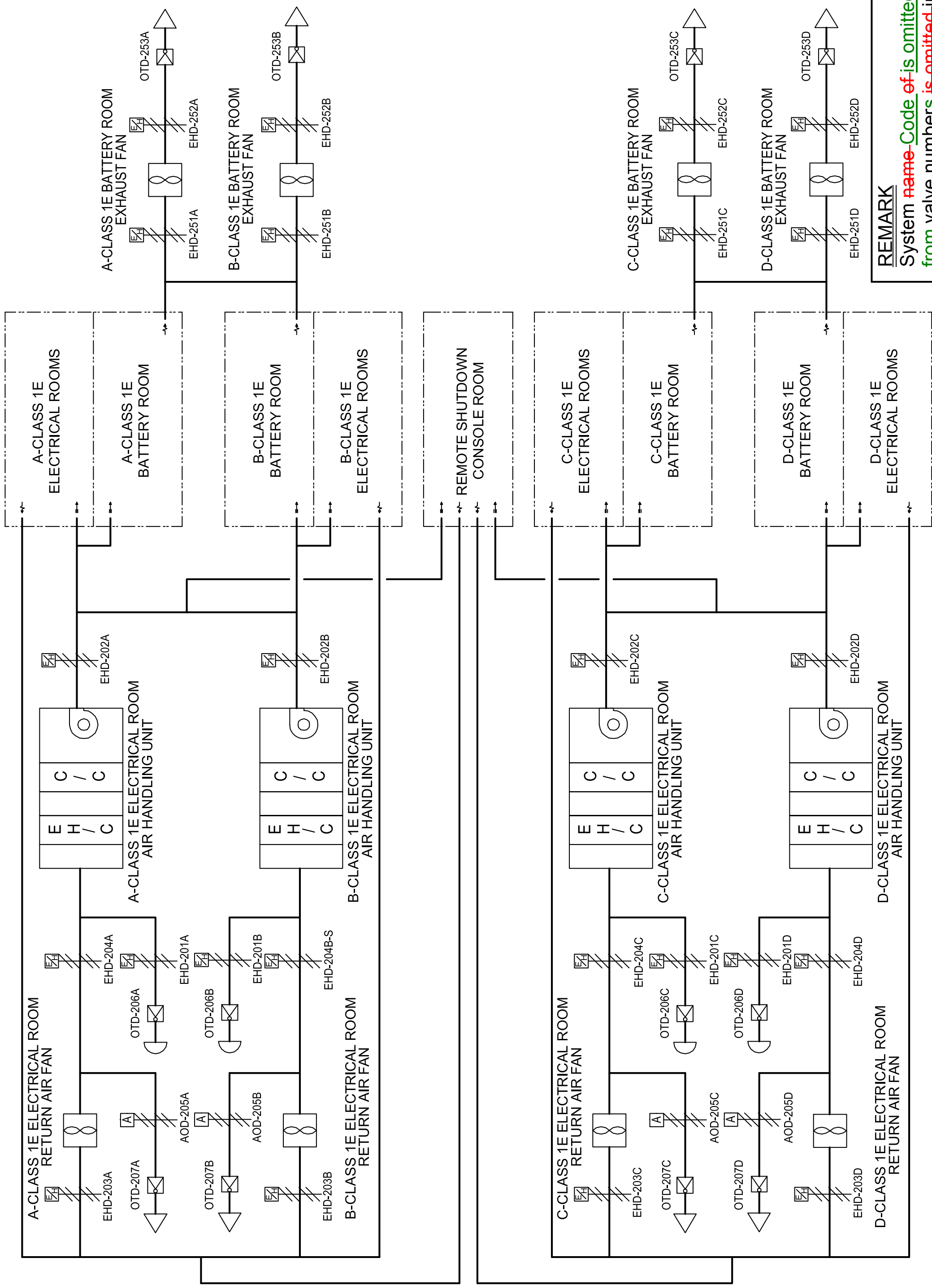
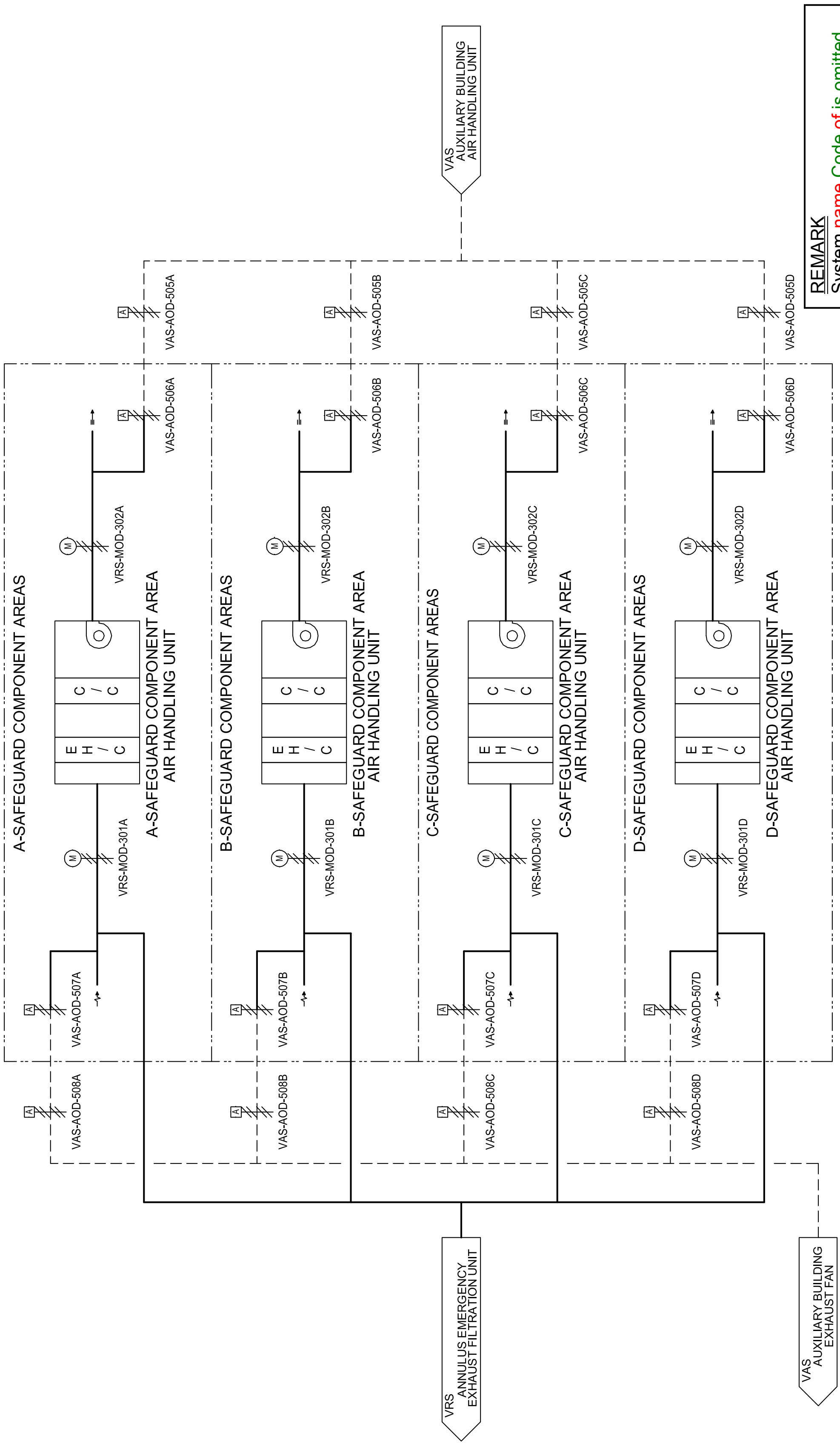


Figure 2.7.5.2-1 Annulus Emergency Exhaust System



REMARK
System ~~name~~ Code ~~of~~ is omitted from valve numbers ~~is omitted~~ in this ~~drawing~~figure.
~~VRS-###~~-+++

Figure 2.7.5.2-2 Class 1E Electrical Room HVAC System



REMARK
System ~~name~~ Code ~~of~~ is omitted valve numbers is omitted in this ~~drawing~~figure.

~~VRS~~-~~###~~-+++

Figure 2.7.5.2-3 Safeguard Component Area HVAC System

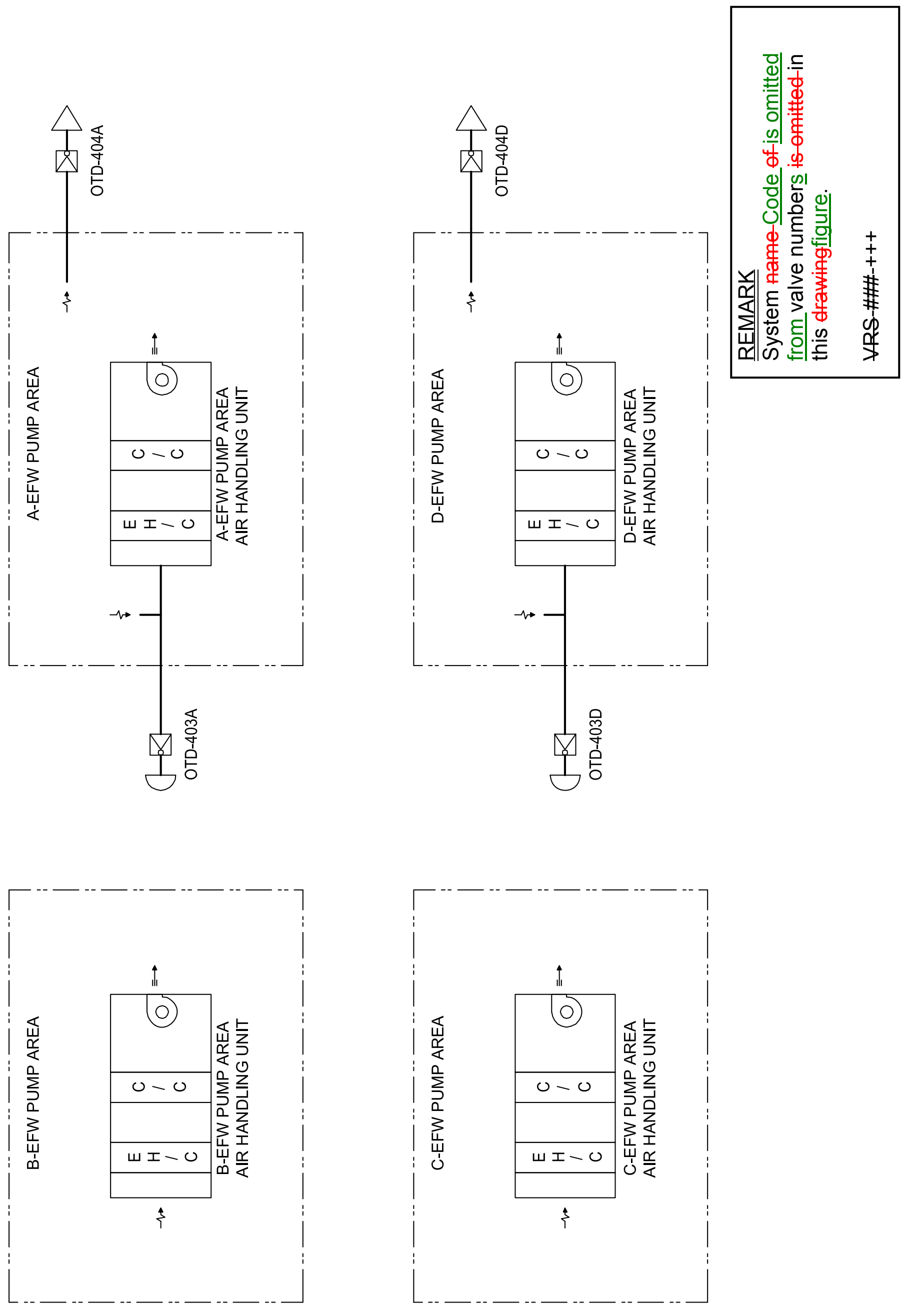
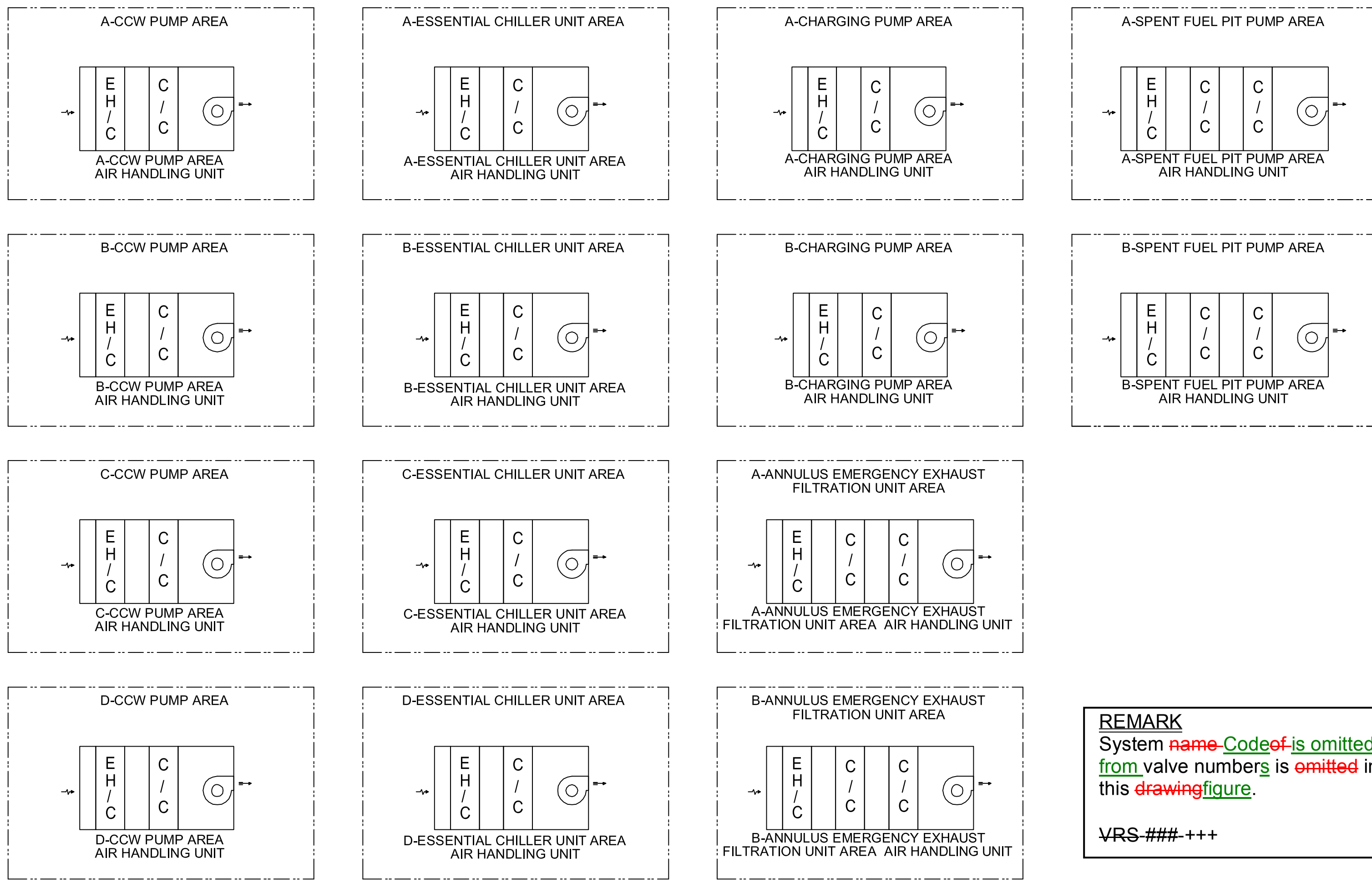


Figure 2.7.5.2-4 Emergency Feedwater Pump Area HVAC System



REMARK
System ~~name~~ Code~~of~~ is omitted from valve numbers is ~~omitted~~ in this ~~drawing~~figure.

~~VRS-###~~-+++

Note: Penetration Area Air Handling Units are shown in Figure 2.7.5.2-1 Annulus Emergency Filtration System.

Figure 2.7.5.2-5 Safety Related Component Area HVAC System

Item No.	Explanation/Basis for Change
Design Description 2.7.5.2	
OOOO	Notes 1 and 2. See items VVV, WWW, XXX, YYY and ZZZ.
Design Description 2.7.5.2.1.1 Annulus Emergency Exhaust System	
A	Deleted the subheadings to provide consistency with other Tier 1 sections. Moved information about maintaining negative pressure from *"Key Design Features"*. See item E.
B	Deleted the first sentence and first two bullets because the information is redundant to above paragraphs. This change does not alter the response to RAI 54, 14.3.7.3.6-5 or 14.3.7.3.6-6. This change does not alter the response to RAI 54, 14.3.7.3.6-12.
C	Deleted text describing components in airflow because information is in Figure 2.7.5.1-1. See item PPP.
D	Note 1 and Note 2. See items QQQ and ITAAC AC #5.aii and AC 5.aii. This change alters the response to RAI 54, 14.3.7.3.6-22
E	Note 1 and Note 2. See item RRR. This change alters the response to RAI 184, 14.03.07-19.
F	Note 1 and Note 2. See item RRR. . Deleted negative statement regarding ASME components. This change alters the response to RAI 242, 14.03.03-11.
G	Relocated portions of the text to the Introduction. Refer to item A.
H	Note 1 and Note 2. See item JJJJ.
I	Deleted text because system logic information is redundant to Table 2.7.5-2.
J	Deleted the text because the interlock information is redundant to Table 2.7.5-2.
K	Note 1 Note 2. See item SSS.
L	Deleted the text regarding EQ because no negative information from Tier 1 Design Description information is required.
M	Deleted negative information from Tier 1 Design Description. This change does not alter the response to RAI 54, 14.3.7.3.6-1.
N	Note 1 and Note 2. See item and UUU. This change alters the response to RAI 54, 14.3.7.3.6-5 or 14.3.7.3.6-6 This change alters the response to RAI 54, 14.3.7.3.6-14.
Design Description 2.7.5.2.1.2 Class 1E Electrical Room HVAC System	
O	Deleted the subheadings to provide consistency with other Tier 1 sections and

Item No.	Explanation/Basis for Change
	editorial change.
P	Deleted the first paragraph of Key Design Features because it is redundant to text in the first paragraph of the section.
Q	Note 1 and Note 2. See item PPP. This change alters the response to RAI 54, 14.3.7.3.6-22.
R	Note 1 and Note 2. See item WWW. This change does not alter the response to RAI 54, 14.3.7.3.4-12.
S	Note 1 and Note 2. See item CCCC.
T	Deleted the fifth paragraph regarding internally generated missiles because it redundant to Table 2.2-4 ITAAC # 21 and Section 2.2.5. This change alters the response to RAI 54, 14.3.7.3.6-17.
U	Note 1 and Note 2. See item CCCC. This change alters the response to RAI 184, 14.03.07-19.
V	Note 1 and Note 2. Deleted negative statement regarding ASME components See item RRR. This change alters the response to RAI 242, 14.03.03-11.
W	Deleted text because it is redundant to the introductory text.
X	Note 1 and Note 2. See Item #JJJJ.
Y	Deleted the text because the logic information is redundant to Table 2.7.5-2.
Z	Deleted text because interlock information is redundant to Table 2.7.5-2.
AA	Note 1 Note 2. See item SSS.
BB	Deleted negative information from Tier 1 Design Description.
CC	Deleted the text on interface requirements because no negative information from Tier 1 Design Description information is required. This change does not alter the response to RAI 54, 14.3.7.3.6-1.
DD	Note 1 and Note 2. See items UUU and VVV. This change alters the response to RAI 54, 14.3.7.3.6-11.
Design Description 2.7.5.2.1.3 Safeguard Component Area HVAC System	
EE	Deleted the subheadings to provide consistency with other Tier 1 sections and editorial change.
PPPP	Consistency and technical accuracy changes.
FF	Deleted the heading and first paragraph of “Key Design Features” because it is redundant to text in the first paragraph of the section.
GG	Deleted the paragraph regarding internally generated missiles because it redundant to Table 2.2-4 ITAAC # 21 and Section This change alters the response to RAI 184, 14.03.07-19.

Item No.	Explanation/Basis for Change
HH	Note 1 and Note 2. See item RRR. This change alters the response to RAI 242, 14.03.03-11.
II	Deleted the text regarding conditioned air because it is redundant to the introductory text
JJ	Note 2. See Item JJJJ.
KK	Deleted the text because the logic information is redundant Table 2.7.5-2.
LL	Deleted the text because the interlock information is redundant to Table 2.7.5-2.
MM	Note 1 Note 2. See item TTT.
NN	Deleted negative statements regarding EQ from Tier 1.
OO	Deleted negative information from Tier 1 Design Description. This change does not alter the response to RAI 54, 14.3.7.3.6-1.
PP	Note 1 and Note 2. See item WWW. This change does not alter the response to RAI 54, 14.3.7.3.2-9.
Design Description 2.7.5.2.1.4 Emergency Feedwater Pump Area HVAC System	
QQ	Deleted the subheadings to provide consistency with other Tier 1 sections and editorial change.
PPPP	Consistency and technical accuracy changes.
RR	Deleted the first sentence of Key Design Features because it is redundant to the introductory text
SS	Note 1 and Note 2. See item PPP. This change alters the response to RAI 54, 14.3.7.3.6-22.
TT	Deleted the paragraph regarding internally generated missiles because it redundant to Table 2.2-4 ITAAC # 21 and Section 2.2.5. This change alters the response to RAI 54, 14.3.7.3.6-17. This change alters the response to RAI 184, 14.03.07-19
UU	Note 1 and Note 2. Deleted negative statement regarding ASME components. See item SSS. This change alters the response to RAI 242, 14.03.03-11.
VV	Deleted the text of discussing system operation because it is redundant to the introductory text.
WW	Note 1 and Note 2. See Item JJJJ.
XX	Deleted the text because the logic information is redundant to Table 2.7.5-2.
YY	Deleted the text because the interlock information is redundant to Table 2.7.5-2.
ZZ	Note 1 and Note 2. See item SSS.
AAA	Deleted negative information from Tier 1 Design Description.
BBB	Deleted negative information from Tier 1 Design Description. This change does not alter the response to RAI 54, 14.3.7.3.6-1.
CCC	Note 1 and Note 2. See item XXX.

Item No.	Explanation/Basis for Change
	This change alters the response to RAI 14.03.07-43.
Design Description 2.7.5.2.1.5 Safety Related Component Area HVAC System	
DDD	Deleted the subheadings to provide consistency with other Tier 1 sections and changes for accuracy of description.
EEE	Change for accuracy of description.
FFF	Deleted the first paragraph of Key design features because it is redundant to the introductory text and editorial change. This change does not alter the response to RAI 64,9.4.5-16.
GGG	Note 1 and Note 2. See item RRR. This change alters the response to RAI 184, 14.03.07-19.
HHH	Note 1 and Note 2. Deleted negative statement regarding ASME components. See item SSS.
III	Text for System Operation was deleted because it is redundant to the introductory text
JJJ	Note 2. See Item JJJJ.
KKK	Deleted text because system logic information is redundant to Table 2.7.5-2.
LLL	Deleted the text because the interlock information is redundant to Table 2.7.5-2.
MMM	Note 1and Note 2. See item TTT.
NNN	Deleted negative statements from Tier 1Design Description..
OOO	Deleted negative information from Tier 1 Design Description. This change alters the response to RAI 54, 14.3.7.3.6-1.
PPP	Note 1 and Note 2. See item YYY.
QQQ	Note 1.
RRR	Note 1.
SSS	Note 1. See items F, V, UU and HHH.
TTT	Note 1. See items K, AA, MM, ZZ and MMM.
UUU	Note 1. See items B and N.
VVV	Note 1.
WWW	Note 1. See item R
XXX	Note 1. See item PP.
YYY	Note 1. See item CCC.
ZZZ	Note 1. See item NNN.
AAAA	Note 1. See item D.
BBBB	Note 1.
CCCC	Note 1. See item S.
DDDD	Note 1.
EEEE	Note 1.
FFFF	Note 1.
GGGG	Note 1.
HHHH	Note 1.
IIII	Note 1.

Item No.	Explanation/Basis for Change
JJJJ	Note 1.
KKKK	Note 1.
Table 2.7.5.2-1	
SSSS	Changes to Table heading for technical accuracy.
LLLL	Added fan cooling unit cooling coils for each corresponding fan unit in the table in response to RAI 404, 14.03.03-22. Added electric heating coils for technical completeness for all each corresponding fan unit. This change alters the response to RAI 242, 14.03.03-11.
MMMM	Corrected the equipment name for VRS-EHD-001. Corrected PSMS Control signals. This change does not alter the response to RAI 54, 14.3.7.3.6-8.
NNNN	Corrected the equipment name in response to RAI 583, 9.4.5-11.
QQQQ	Corrected PSMS control signals in multiple locations in the table to provide technical accuracy.
Table 2.7.5.2-2	
RRRR	Delete tag number VRS-MFN-531 C, D from Charging Pump Area Air Handling Unit Fans column for technical accuracy.
ITAAC Table 2.7.5.2-3	
1.a	DC, ITA, AC – Generic changes to ITAAC for functional arrangement to provide clarity and consistency. [RIS, Scope, 2nd bullet.]
1.b through 1.f	DC, ITA and AC of ITAAC 1.b through 1.f. – Generic changes made to ITAAC for mechanical separation to provide clarity and consistency. [RIS, Scope, 2nd bullet.] This change alters the response to RAI 184, 14.03.07-19.
2	DC, ITA, AC – Generic changes to ITAAC for seismic qualification to provide clarity and consistency. [RIS, Scope, 2nd bullet.] See item D.
3.a	DC, ITA – Generic changes to ITAAC for electrical separation to provide clarity and consistency. [RIS, Scope, 2nd bullet.] The change alters the response RAI 184, 03.07-16 and 03.07-17.
3.b	DC, ITA – Generic changes to ITAAC for electrical separation to provide clarity and consistency. [RIS, Scope, 2nd bullet.] The change alters the response RAI 184, 14.03.07-17. The change alters the response RAI 191, 14.03.04-09.
4.a	DC – Editorial correction and clarification of operating modes. – AC 4.a.i Revised to make the AC consistent with the ITA requirements, and

Item No.	Explanation/Basis for Change
	to reflect the revised DC. ITA – Revised the ITA to include analysis options Requirements for numerical performance values have been moved from the DD to the AC ITAAC 4.a.i. This change alters the response to RAI 54, 14.3.7.3.6-18. This change alters the response to RAI 54, 14.3.7.3.6-4. This change alters the response to RAI 54, 14.3.7.3.6-11 and 14.3.7.3.6-14. This change alters the response to RAI 184, 14.03.07-26 . This change alters the responses to RAI 381, 14.03.07-43.
	– ITA and AC. 4.a.ii Requirements for numerical performance values have been moved from the DD to the AC ITAAC 4.a.ii. This change alters the response RAI 184, 14.03.07-26. This change alters the response to RAI 54, 14.3.7.3.6-5, 14.3.7.3.6-6 and 14.3.7.3.6-23.
4.b	DC and AC – Editorial change to standard wording. This change alters the response to RAI 474, 09.04.05-10.This change alters the response to RAI 54, 14.3.7.3.6-23. This change alters the response to RAI 54, 14.3.7.3.6-4. This change alters the response to RAI 54, 14.3.7.3.6-14. This change alters the response to RAI 184, 14.03.07-26.
4.c	DC – Editorial change to be consistent with DC 4.b. AC – Revised the AC c to be consistent with the DC. Additional text regarding plan operating modes is included in response to RAI 474, 09.04.05-10. This change alters the response to RAI 184, No.14.03.07-26.
	DC – Additional text added in response to RAI 474, 09.04.05-10. AC – Revised for consistency with DC. This change alters the response to RAI 54,14.3.7.3.6-14. This change alters the response to RAI 381, 14.03.07-40 and 14.03.07-43..
4.d	DC – Additional text added in response to RAI 474, 09.04.05-10. AC – Revised to be consistent with the DC. This change alters the response to RAI 54, 14.03.07-5 and 14.3.7.3.6-14. This change alters the response to RAI 184, 14.03.07-26. This change alters the response to RAI 474, 09.04.05-10.
4.e	DC

Item No.	Explanation/Basis for Change
	– Additional text added in response to RAI 474, 09.04.05-10. AC – Revised to be consistent with the DC This change alters the response to RAI 54, 14.03.07-26. and This change alters the response to RAI 54, 14.03.07.03.06-14. This change alters the response to RAI 474, 09.04.05-10.
4.f	DC – editorial change for clarity. AC – Revised to be consistent with the DC. This change alters the response to RAI 54, RAI 14.3.7.3.6-14. This change alters the response to RAI 184, 14.03.07-26. This change alters the response to RAI 474, 09.04.05-10.
5.a	5.a DC – Generic changes to ITAAC for isolation dampers to provide clarity and consistency. [RIS, Scope, 2nd bullet.] 5.a.i ITA, AC – Generic changes to ITAAC for isolation dampers to provide clarity and consistency. [RIS, Scope, 2nd bullet.] – Number is changed to 5.a 5.a.ii ITA, AC – Deleted because this ITAAC is relocated in ITAAC Item 5.e.ii. This change alters the response to RAI 54 14.3.7.3.6-16. This change does not alter the response to RAI 54, 14.3.7.3.6-19. This change alters the response to RAI 54, 14.3.7.3.6-7. This change alters the response to RAI 184, 14.03.0-22
5.b	Generic changes to ITAAC for isolation dampers to provide clarity and consistency. [RIS, Scope, 2nd bullet.]
5.c	DC – Generic changes to ITAAC for MOVs adapted for dampers to provide clarity and consistency. [RIS, Scope, 2nd bullet.] ITA – Revised to specify the correct ITA for the DC. [RIS, Focus, 6th and 7th bullets.] AC – Revised to provide AC for the ITA and DC requirements, and editorial changes. [RIS, Focus, 7th bullet.]. Revised to show type tests vs tests for dampers. This change alters the response to RAI 30, 09.05.01-11.
	ITA – changed to specify type tests. AC – changed to be consistent with the ITA.
5.d	DC

Item No.	Explanation/Basis for Change
	– minor editorial change ITA – editorial changes to provide clarity. This change alters the response to RAI 452, 14.03.02-13.
5.e	DC, ITA, AC ITAAC is added to verify the active safety function of remotely operated dampers and tornado dampers.
6.a	Generic changes to ITAAC for MCR controls to provide clarity and consistency. [RIS, Scope, 2nd bullet.]. This change alters the response to RAI 184, 14.03.0-22
6.b	Generic changes to ITAAC for automatic actuation signals to provide clarity and consistency. [RIS, Scope, 2nd bullet.]. Deleted the ITAAC for isolation dampers because this is redundant with ITAAC Item 5.a. This change alters the response to RAI 54, 14.3.7.3.6-7 This change alters the response to RAI 184,14.03.07-22.
6.c	Generic changes to ITAAC for automatic actuation signals to provide clarity and consistency. [RIS, Scope, 2nd bullet.]. This change alters the response to RAI 184,14.03.07-22.
6.d	Generic changes to ITAAC for automatic actuation signals to provide clarity and consistency. [RIS, Scope, 2nd bullet.]. This change alters the response to RAI 184 14.03.07-22.
7	Generic changes to ITAAC for MCR alarms and displays to provide clarity and consistency. [RIS p7, ITAAC Scope] See items H,X,JJ,WW and III This change alters the response to RAI 184, 14.03.07-18.
8	DC, ITA, AC – Generic changes to ITAAC for RSC alarms, displays and controls to provide clarity and consistency. [RIS, Scope, 2nd bullet.] This change alters the response to RAI 184, 14.03.07-18, and the revisions included in UAP-HF-10043 (for ITA/AC 8.ii). See item III. This change alters the response RAI 54, 14.3.7.3.6-20.
	Figures 2.7.5.2-1 thru 2.7.5.2-5
	Editorial change to the note addressing omission of system numbers in valve designations This change does not alter the response to RAI 583, 9.4.5-11 This change does not alter the response to RAI 64, 9.4.5-16.

Note 1: Revised to provide consistency between the Design Description (DD) and the Design Commitment (DC) in the ITAAC table. Revised text to include only the necessary attributes for ITAAC.

Note 2: Text relocated within the DD section to align with the sequence and numbering of the corresponding DC in the ITAAC table.

2.7.5.3 Containment Ventilation System (CVVS)

A

2.7.5.3.1 Design Description

The CVVS is designed to controls and maintains the environment temperature and radioactivity concentration within the containment at a level suitable for plant equipment operations. and to allow the safe access to the containment for the operating personnel during inspection and maintenance periods.

B

The CVVS includes:

- Containment purge system
- Containment fan cooler system
- Control rod drive mechanism (CRDM) cooling system
- Reactor cavity cooling system

2.7.5.3.1 Design Description

2.7.5.3.1.1 Containment Purge System

C

System Purpose and Functions

The containment purge system maintains sufficiently low concentrations of radioactivity in the containment atmosphere to allow access during maintenance and inspection activities. The containment purge system also provides means of relieving pressure build-up resulting from instrument air leakage and containment temperature fluctuations. The containment purge system has a safety function to support the containment isolation function as described in Subsection 2.11.2. With the exception of the containment isolation valves, the containment purge system is a non safety-related system.

Location and Functional Arrangement

The major components of the containment purge system are located in the reactor building and auxiliary building. The containment purge system consists of the containment low volume purge system and the containment high volume purge system. The containment low volume purge system consists of two containment low volume purge air handling units and two exhaust filtration units. The containment high volume purge system consists of a containment high volume purge air handling unit and an exhaust filtration unit.

Key Design Features

D

The key design features of the containment purge system are reflected in the system design bases, which include:

- The containment purge system has the capability to close the safety-related, seismic Category I, containment isolation valves during a design basis accident.

- The low volume purge exhaust airflow is made to pass through a HEPA filter and a charcoal absorber by an exhaust fan, prior to being discharged to the atmosphere through the vent stack.

E

- The high volume purge exhaust airflow is made to pass through a HEPA filter by an exhaust fan, prior to being discharged to the atmosphere through the vent stack.

Seismic and ASME Code Classifications

The containment penetration piping and related isolation valves meet seismic Category I requirements. The containment penetration piping and the related isolation valves comply with requirements of the ASME Code Section III Class 2.

F

The containment purge system equipment and ductwork, including supports,in areas containing safety-related equipment are seismic Category II, except for the containment isolation valves and penetration piping, to prevent adverse interaction with other safety-related systems during a seismic event.

G

System Operation

The important aspects of system operation are specified under “Logic“.

H

Alarms, Displays, and Controls

With the exception of the containment isolation valves, there are no important alarms, displays, and controls.

I

Logic

The containment isolation valves in the containment purge system operate upon receipt of a containment isolation signal, as described in Subsection 2.11.2.

J

Interlocks

There are no interlocks needed for direct safety functions related to the containment purge system.

K

Class 1E Electrical Power Sources and Divisions

There are no Class 1E power sources for the containment purge system except the containment isolation valves.

L

Equipment to be Qualified for Harsh Environments

~~The safety-related portions of the containment purge system to be qualified for harsh environments are identified in Subsection 2.11.2.~~ M

~~**Interface Requirements**~~ N

~~There are no safety-related interfaces with systems outside of the certified design.~~

~~**Numeric Performance Values**~~ O

~~Not applicable.~~

2.7.5.3.1.2 Containment Fan Cooler System P

~~**System Purpose and Functions**~~

The containment fan cooler system ~~is designed to~~ maintains containment air temperature below 120°F during ~~the~~ normal operation of the plant. The containment fan cooler system is used to prevent containment over pressurization for severe accident mitigation. The containment fan cooler system is a non safety-related system. Q

~~**Location and Functional Arrangement**~~

The containment fan cooler system is located in the containment. The containment fan cooler system consists of four fan cooler units.

~~**Key Design Features**~~

~~The containment fan cooler system maintains containment air temperature below 120°F during the normal operation of the plant.~~ R

~~**Seismic and ASME Code Classifications**~~

~~The containment fan cooler system is not designed to ASME Code Section III requirements. However, almost all of the containment fan cooler system components meet seismic Category II.~~ S

~~**System Operation**~~

~~There is no important system operation.~~ T

~~**Alarms, Displays, and Controls**~~

~~There are no important alarms, displays, and controls.~~

~~**Logic**~~

~~There is no logic needed for direct safety functions related to the containment fan cooler system.~~

Interlocks

There are no interlocks needed for direct safety functions related to the containment fan cooler system.

Class 1E Electrical Power Sources and Divisions

Not applicable.

Equipment to be Qualified for Harsh Environments

Not applicable.

Interface Requirements

There are no safety-related interfaces with systems outside of the certified design.

Numeric Performance Values

Not applicable.

T

2.7.5.3.1.3 Control Rod Drive Mechanism (CRDM) Cooling System

U

System Purpose and Functions

The CRDM cooling system is designed to removes heat dissipated by the CRDM. The CRDM cooling system is a non safety-related system.

V

Location and Functional Arrangement

The CRDM cooling system is located in the containment. The CRDM cooling system consists of one CRDM cooling unit and two CRDM cooling fans.

Key Design Features

The CRDM cooling system removes heat dissipated by the CRDM during normal plant operation.

W

Seismic and ASME Code Classifications

The CRDM cooling system is not designed to ASME Code Section III requirements. The CRDM cooling system equipment and ductwork, including supports, in areas containing safety-related equipmentareseismic Category II, to prevent adverse interaction with other safety-related systems during a seismic event.

X

System Operation

There is no important system operation.

Alarms, Displays, and Controls Y

There are no important alarms, displays, and controls.

Logic

There is no logic needed for direct safety functions related to the CRDM cooling system.

Interlocks

There are no interlocks needed for direct safety functions related to the CRDM cooling system.

Class 1E Electrical Power Sources and Divisions

Not applicable.

Equipment to be Qualified for Harsh Environments

Not applicable.

Interface Requirements

There are no safety-related interfaces with systems outside of the certified design.

Numeric Performance Values

Not applicable.

2.7.5.3.1.4 Reactor Cavity Cooling System Z

System Purpose and Functions

The reactor cavity cooling system is designed to removes the heat dissipated by transferred from the reactor vessel and the reactor vessel support structure, and the heat generated by gamma radiation and fast neutron bombardment on in the primary shield wall. The reactor cavity cooling system is a non safety-related system. AA

Location and Functional Arrangement

The reactor cavity cooling system is located in the containment. The reactor cavity cooling system consists of two 100% capacity fans.

Key Design Features

The reactor cavity cooling system removes the heat dissipated by the reactor vessel and the reactor vessel support structure, and the heat generated by gamma radiation and fast neutron bombardment on the primary shield wall. BB

Seismic and ASME Code Classifications

The reactor cavity cooling system is not designed to ASME Code Section III requirements. However, almost all of the reactor cavity cooling system components meet seismic Category II. CC

System Operation

There is no important system operation. DD

Alarms, Displays, and Controls

There are no important alarms, displays, and controls.

Logic

There is no logic needed for direct safety functions related to the reactor cavity cooling system.

Interlocks

There are no interlocks needed for direct safety functions related to the reactor cavity cooling system.

Class 1E Electrical Power Sources and Divisions

Not applicable.

Equipment to be Qualified for Harsh Environments

Not applicable.

Interface Requirements

There are no safety-related interfaces with systems outside of the certified design.

Numeric Performance Values

Not applicable.

1. The functional arrangement of the CVVS is as described in the Design Description of Subsection 2.7.5.3.1. EE

2. Deleted. FF

3. The fire dampers in the ductwork of the containment purge system that penetrates the fire barriers required to protect safe shutdown capability close under design airflow conditions. GG

4. Non-safety related CVVS equipment and ductwork, including supports, whose failure could adversely interact with safety related SSCs meet seismic Category II requirements.

HH

2.7.5.3.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.5.3-1 specifies the inspections, tests, analyses, and associated acceptance criteria for the CVVS. The ITAAC associated with the equipment, components and piping of the CVVS and non-ECWS that also comprise a portion of the CIS are described in Table 2.11.2-2.

Table 2.7.5.3-1 Containment Ventilation System Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the CVVS is as described in the Design Description of this Subsection 2.7.5.3.1.	1. Inspections of the as-built CVVS will be performed.	1. The as-built CVVS conforms towith the functional arrangement as described in Design Description of this Subsection 2.7.5.3.1.
2. Deleted.	2. Deleted.	2. Deleted.
3. The fire dampers in the ductwork of the containment purge system that penetrates the fire barriers required to protect safe shutdown capability close under design air flow conditions.	3. Type tests, tests, a combination of type tests and analyses, or a combination of tests and analyses of the fire dampers will be performed under the conditions which bound the design air conditions.Type tests of the fire dampers will be performed.	3. A report exists and concludes that the fire dampers in the ductwork of the containment purge system that penetrates the fire barriers that are required to protect safe-shutdown capability close under the conditions which bound design air flow conditions.
4. Non-safety related CVVS equipment and ductwork, including supports, whose failure could adversely interact with safety related SSCs meet seismic Category II requirements.in areas containing safety-related equipment are seismic Category II.	4.i Analysis will be performed to demonstrate that non-safety related CVVS equipment and ductwork, including supports, do not adversely interact with safety related SSCs during and after an SSE.A combination of analysis and inspection will be performed.	4.i Reports exist and conclude that the as-built non-safety related CVVS equipment and ductwork, including supports, whose failure could adversely impact safety related SSCs do not adversely interact with in areas containing safety-related equipment are seismic Category II to prevent adverse interaction with other safety-related systems during and after an SSEa seismic event.
	4.ii Inspection will be performed to verify that the as-built non-safety related CVVS equipment and ductwork, including supports, are installed in accordance with the configurations specified by the analyses.	4.ii The as-built non-safety related CVVS equipment and ductwork, including supports whose failure could adversely interact with safety related SSCs are installed in accordance with the configurations specified by the analyses.

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.7.5.3

Item No.	Explanation/Basis for Change
Design Description 2.7.5.3.1	
A	Relocated Design Description heading and numbering to be before the introductory paragraph.
B	Revised text to remove details that do not belong in Tier 1.
Design Description 2.7.5.3.1.1	
C	Deleted text to provide consistency among Tier 1 sections. Subheadings are deleted from the Design Description. This change does not alter the response to RAI 184, question 14.03.07-27, DCD_14.3.7-27
D	Deleted introductory sentence and first bullet because containment penetration closure capability is addressed in Section 2.11.2.
E	Deleted text describing details of the system that do not belong in Tier 1.
F	Deleted redundant text. See item C.
G	Notes 1 and 2. See item HH. This change alters the response to RAI 242, 14.03.03-11. This change alters the response to RAI 73, question 06.05.01-1. This change alters the response to RAI 558, 06.05.01-17.
H	Deleted text not required for Tier 1.
I	Deleted text because containment isolation valve control alarms and displays are s addressed in Section 2.11.2.
J	Deleted text because containment isolation valve logic is addressed in Section 2.11.2.
K	Deleted negative statements from Tier 1.
L	Deleted text because Class 1E power for containment isolation valves is addressed in Section 2.11.2.
M	Deleted text because environmental qualification containment for isolation valves is addressed in Section 2.11.2.
N	Deleted negative statements from Tier 1.
O	Deleted negative statements from Tier 1.
Design Description 2.7.5.3.1.2	
P	Editorial corrections/changes and to provide consistency among Tier 1 sections. Subheadings are deleted from the Design Description
Q	Editorial changes and to provide consistency and added discussion of severe accident mitigation function. See item R.
R	Deleted redundant text which appears in the introductory paragraph. See item Q.
S	- Deleted text because it is redundant to Table 2.5.3-14.03.03-11. This change alters the response to RAI 242, 14.03.03-11, RAI 404, 14.03.03-22 and RAI 558, 06.05.01-17. This change does not alter the response to RAI 73, 6.5.1-14.
T	Deleted the negative statements from Tier 1.
Design Description 2.7.5.3.1.3	
U	Editorial corrections/changes and to provide consistency among Tier 1 sections. Subheadings are deleted from the Design Description.

V	Editorial change in Introductory text to provide consistency among Tier 1 sections
W	Deleted redundant text which appears in the introductory paragraph.
X	Deleted text because it is redundant to Table 2.5.3-1. This change alters the response to RAI 242, 14.03.03-11. This change alters the response to RAI 73, question 06.05.01-1. This change does not alter the response to RAI 558, 06.05.01-17.
Y	Deleted negative statements from Tier 1.
Design Description 2.7.5.3.1.4	
Z	Editorial corrections/changes and to provide consistency among Tier 1 sections. Subheadings are deleted from the Design Description.
AA	Editorial changes and to provide consistency and deleted discussion that is not required for Tier 1. See item AA.
BB	Deleted redundant text which appears in the introductory paragraph. See item AA.
CC	Deleted text because it is redundant to Table 2.5.3-1. This change alters the response to RAI 242, 14.03.03-11. This change alters the response to RAI 73, question 06.05.01-1. This change does not alter the response to RAI 558, 06.05.01-17.
DD	Deleted negative statements from Tier 1.
EE	Notes 1 and 2.
FF	Placeholder to provide consistent numbering. ITAAC Deleted in Rev. 2.
GG	Notes 1.
HH	Notes 1 and 2. See Items F, G, X and CC.
Table 2.7.5.3-1	
1	DC, ITA, AC – Generic changes to ITAAC for functional arrangement to provide clarity and consistency. [RIS, Scope, 2nd bullet.]
2	Placeholder to provide consistent numbering. for ITAAC item that was previously deleted in response to. RAI 184, Question 14.03.07-27. No changes.
3	Added new ITAAC after Rev 2 of Tier 1for the inspection of the fire dampers in response to RAI 558, 06.05.01-15. No changes.
4	Added new ITAAC after Rev 2 of Tier 1 in response to RAI 558, 06.05.01-17. This change alters the response to RAI 242, 14.03.03-11. This change alters the response to RAI 73, question 06.05.01-1. This change alters the response to RAI 558, 06.05.01-17.

Note 1: Revised to provide consistency between the Design Description (DD) and the Design Commitment (DC) in the ITAAC table. Revised text to include only the necessary attributes for ITAAC.

Note 2: Text relocated within the DD section to align with the sequence and numbering of the corresponding DC in the ITAAC table.

2.7.5.4 Auxiliary Building Ventilation System (ABVS) A

2.7.5.4.1 Design Description

The ABVS ~~is designed to~~ provides conditioned air ~~proper environmental conditions~~ throughout all areas of the reactor building, the power source building, the auxiliary building and the access building during normal plant operation. B

The ABVS includes:

- Auxiliary building HVAC system
- Non-Class 1E electrical room HVAC system
- Main steam / feedwater piping area HVAC system
- Technical support center HVAC system

~~**2.7.5.4.1 Design Description**~~

2.7.5.4.1.1 Auxiliary Building HVAC System

~~**System Purpose and Functions**~~

The auxiliary building HVAC system ~~is designed to provide conditioning~~provides conditioned air to maintain ~~the proper~~ environmental conditions for areas housing mechanical and electrical equipment (including area housing ESF equipment) in the reactor building, power source building, auxiliary building and access building during normal plant operation. ~~With the exception of the isolation dampers, the auxiliary building HVAC system is a non safety-related system.~~ C

Location and Functional Arrangement

The major components of auxiliary building HVAC system are located in the auxiliary building. The auxiliary building HVAC system consists of supply and exhaust systems. ~~The supply system has two 50% capacity air handling units, both air handling units are connected to a common air distribution ductwork supplying air to served areas. The exhaust system has three 50% capacity exhaust fans.~~ The ABVS exhaust flow is aligned to the plant vent stack. ~~and is capable of providing dilution flow to gaseous effluent stream prior to release.~~ D

The auxiliary building HVAC system and containment low volume purge system are cross tied. This crosstie allows the exhaust flow from the auxiliary building HVAC system to be redirected to the containment low volume purge manually upon a high radiation alarm in the auxiliary building HVAC ductwork.

~~**Key Design Features**~~

The key design features of the auxiliary building HVAC system are reflected in the system design bases, which include: E

- The auxiliary building HVAC system has the capability to close the safety-related, seismic Category I isolation dampers of the penetration and safeguard component areas during a design basis accident, as shown in Figure 2.7.5.2-1 and Figure 2.7.5.2-3. F
- The auxiliary building HVAC system has the capability to close safety-related, seismic Category I isolation dampers to prevent the back flow from the annulus emergency exhaust system during a design basis accident, as shown in Figure 2.7.5.2-1.
- The auxiliary building HVAC system equipment and ductwork, including supports, in areas containing safety-related equipment are seismic Category II, except for the seismic Category I isolation dampers and associated ductwork, to prevent adverse interaction with other safety-related systems during a seismic event. G
- The auxiliary building HVAC system provides conditioning air to maintain the proper environmental conditions for the areas it serves during normal plant condition. H
- The ABVS has the non-safety related capability of providing dilution flow to the gaseous stream prior to its release from the plant vent stack. I
- The auxiliary building HVAC system and containment low volume purge system are cross connected to allow the exhaust from the radiological controlled areas to be filtered by the containment low volume purge exhaust filtration units. J
- Airborne radioactivity is monitored inside the exhaust air duct from the controlled areas. K

The ventilation system has fire dampers to limit the spread of fire and combustion products. The fire dampers are capable of closing against full airflow. L

Seismic and ASME Code Classifications

The auxiliary building HVAC system equipment and ductwork, including supports, in areas containing safety-related equipment are seismic Category II, except for the seismic Category I isolation dampers identified in Table 2.7.5.4-1 are qualified as seismic Category I to prevent adverse interaction with other safety-related systems during a seismic event. The system components are not designed or constructed to ASME Code Section III requirements. M N

System Operation

The important aspects of system operation are specified under "Logic". O

Alarms, Displays, and Controls

~~Table 2.7.5.4-2 identifies alarms, displays, and controls associated with the system that are located in the MCR.~~ P

~~**Logic**~~

~~The isolation dampers identified in Table 2.7.5.4-1 operate upon receipt of the ECCS actuation signal~~. Q

~~**Interlocks**~~

~~There are no interlocks needed for direct safety functions related to the auxiliary building HVAC system.~~ R

~~**Class 1E Electrical Power Sources and Divisions**~~

~~There are no Class 1E power sources for the auxiliary building HVAC system except for the isolation dampers identified in Table 2.7.5.4-1.~~ S

~~**Equipment to be Qualified for Harsh Environments**~~

~~Not applicable.~~ T

~~**Interface Requirements**~~

~~There are no safety-related interfaces with systems outside of the certified design~~ U

~~**Numeric Performance Values**~~

~~Not applicable.~~ V

2.7.5.4.1.2 Non-Class 1E Electrical Room HVAC System

~~**System Purpose and Functions**~~ W

The non-Class 1E electrical room HVAC system ~~is designed to~~ provides ~~conditioning~~ conditioned air to maintain ~~the proper~~ environmental conditions for equipment in the electrical rooms during normal plant operation and LOOP. The non-Class 1E electrical room HVAC system is powered by the alternate ac power source during a LOOP.. The non-Class 1E electrical room HVAC system is a non safety-related system. X

~~**Location and Functional Arrangement**~~

The major components of non-Class 1E electrical room HVAC system are located in the auxiliary building. The non-Class 1E electrical room HVAC system consists of two 50% capacity air handling units, return air fans, and two 100% capacity battery room exhaust fans.

~~**Key Design Features**~~

The non-Class 1E electrical room HVAC system provides conditioning air to maintain the proper environmental conditions within non-Class 1E electrical rooms during normal plant operation and LOOP. The non-Class 1E electrical room HVAC system is powered by the alternate ac power source during a LOOP. Y

The ventilation system has fire dampers to limit the spread of fire and combustion products. The fire dampers are capable of closing against full airflow. Z

Seismic and ASME Code Classifications

The non-Class 1E electrical room HVAC system is non-seismic category and is not designed to ASME Code Section III requirements. AA

System Operation

There is no important system operation.

Alarms, Displays, and Controls

There are no important alarms, displays, and controls.

Logic

There is no logic needed for direct safety functions related to the non-Class 1E electrical room HVAC system.

Interlocks

There are no interlocks needed for direct safety functions related to the non-Class 1E electrical room HVAC system.

Class 1E Electrical Power Sources and Divisions

Not applicable.

Equipment to be Qualified for Harsh Environments

Not applicable.

Interface Requirements

There are no safety-related interfaces with systems outside of the certified design.

Numeric Performance Values

Not applicable.

2.7.5.4.1.3 Main Steam / Feedwater Piping Area HVAC System

System Purpose and Functions BB

The main steam / feedwater piping area HVAC system designed to provides conditioning conditioned air to maintain the proper environmental conditions in each of the main steam / feedwater piping areas. The main steam / feedwater piping area HVAC system is a non safety-related system.

Location and Functional Arrangement

The major components of main steam / feedwater piping area HVAC system are located in the reactor building. The system consists of four 50% capacity air handling units. Each pair of air handling units services one of two main steam / feedwater piping areas.

Key Design Features

The main steam / feedwater piping area HVAC system provides conditioning air to maintain the proper environmental conditions within main steam / feedwater piping areas during normal plan operation. CC

Seismic and ASME Code Classifications

The main steam / feedwater piping area HVAC system is non-seismic category and is not designed to ASME Code Section III requirements. DD

System Operation

There is no important system operation.

Alarms, Displays, and Controls

There are no important alarms, displays, and controls.

Logic

There is no logic needed for direct safety functions related to the main steam / feedwater piping area HVAC system.

Interlocks

There are no interlocks needed for direct safety functions related to the main steam / feedwater piping area HVAC system.

Class 1E Electrical Power Sources and Divisions

Not applicable.

Equipment to be Qualified for Harsh Environments

~~Not applicable.~~

~~**Interface Requirements**~~

~~There are no safety-related interfaces with systems outside of the certified design.~~

~~**Numeric Performance Values**~~

~~Not applicable.~~

2.7.5.4.1.4 Technical Support Center HVAC System

~~**System Purpose and Functions**~~ EE

The technical support center (TSC) HVAC system is a non safety-related system that ~~designed to~~ provides ~~conditioning~~ conditioned air to maintain ~~the proper~~ environmental conditions in the TSC during normal plant and accident conditions. The TSC HVAC system also maintains TSC habitability and permits personnel occupancy during plant accident conditions. The TSC HVAC system is powered by the alternate ac power source during a LOOP. ~~The TSC HVAC system is a non safety-related system.~~ FF

~~**Location and Functional Arrangement**~~

The major components of TSC HVAC system are located in the auxiliary building. The TSC HVAC system consists of one 100% capacity TSC air handling unit, one 100% capacity emergency filtration unit classified as non-safety and one 100% toilet/kitchen exhaust fan. The TSC emergency filtration unit consists in direction of airflow, a high efficiency filter, an electric heating coil, a HEPA filter, a charcoal absorber, and a high efficiency filter. GG

~~**Key Design Features**~~

~~The key design features of the TSC HVAC system are reflected in the system design bases, which include:~~ AAA

- ~~The TSC HVAC system is designed to provide conditioning air to maintain the proper environmental condition of the TSC during normal plant and accident conditions.~~ HH
- ~~The TSC HVAC system is powered by the alternate ac power source during a LOOP.~~ YY
- ~~The TSC emergency filtration unit consists in direction of airflow, a high efficiency filter, an electric heating coil, a HEPA filter, a charcoal absorber, and a high efficiency filter.~~ II

~~The ventilation system has fire dampers to limit the spread of fire and combustion products. The fire dampers are capable of closing against full airflow. The heat~~ ZZ detectors located in the charcoal filter housing when detecting the presence of smoke or heat respectively will alarm in the MCR.

Seismic and ASME Code Classifications JJ

The TSC HVAC system is non-seismic category and is not designed to ASME Code Section III requirements.

System Operation

There is no important system operation.

Alarms, Displays, and Controls

There are no important alarms, displays, and controls.

Logic

There is no logic needed for direct safety functions related to the TSC HVAC system.

Interlocks

There are no interlocks needed for direct safety functions related to the TSC HVAC system.

Class 1E Electrical Power Sources and Divisions

Not applicable.

Equipment to be Qualified for Harsh Environments

Not applicable.

Interface Requirements

There are no safety-related interfaces with systems outside of the certified design.

Numeric Performance Values

Not applicable

1. The functional arrangement of the ABVS is as described in the Design Description of Subsection 2.7.5.4.1 and as shown in Figures 2.7.5.2-1 and 2.7.5.2-3. KK

2. The seismic Category I equipment identified in Table 2.7.5.4-1 can withstand seismic design basis loads without loss of safety function. LL

3.a Class 1E equipment identified in Table 2.7.5.4-1 is powered from its respective Class 1E division. MM

3.b. Separation is provided between redundant divisions of ABVS Class 1E cables and between Class 1E cables and non-Class 1E cables. NN

4.a The remotely operated dampers identified in Table 2.7.5.4-1 as having PSMS control, perform an active safety function after receiving a signal from PSMS. OO

4.b After loss of motive power, the remotely operated dampers identified in Table 2.7.5.4-1, assume the loss of motive power position. PP

4.c The fire dampers in the ductwork that penetrates the fire barriers that are required to protect safe-shutdown capability close fully when called upon to do so. QQ

5. Controls are provided in the MCR to open and close the remotely operated isolation dampers identified in Table 2.7.5.4-2. RR

6. Alarms and displays identified in Table 2.7.5.4-2 are provided in the MCR. SS

7. Alarms, displays and controls identified in Table 2.7.5.4-2 are provided in the RSC. TT

8. The TSC HVAC system provides a habitable workspace environment for the TSC under all plant operating conditions, including normal plant operations, abnormal and accident conditions. UU

9. The auxiliary building HVAC system provides conditioned air to maintain the proper environmental conditions for areas housing mechanical and electrical equipment (including areas housing ESF equipment) in the reactor building, power source building, auxiliary building and access building during normal plant operation. VV

10. The auxiliary building HVAC system provides a flowrate that maintains a slightly negative pressure in the controlled areas. WW

11. Non-safety related ABVS equipment and ductwork, including supports, whose failure could adversely interact with safety related SSCs meet seismic Category II requirements. XX

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

Table 2.7.5.4-3 specifies the inspections, tests analyses, and associated acceptance criteria for the ABVS.

Table 2.7.5.4-1 Auxiliary Building Ventilation System Equipment Characteristics

Equipment Name	Tag No.	ASME Code Section III Class	Seismic Category I	Remotely Operated ~~Valve~~Damper	Class 1E/ Qual. For Harsh Envir.	PSMS Control	Active Safety Function	Loss of Motive Power Position
Auxiliary Building HVAC System								
Penetration Area Supply Line Isolation Dampers	VAS-AOD-501 A, B, 502 A, B	—	Yes	Yes	Yes/No	ECCS Actuation	Transfer Closed	Closed
Penetration Area Exhaust Line Isolation Dampers	VAS-AOD-503 A, B, 504 A, B	—	Yes	Yes	Yes/No	ECCS Actuation	Transfer Closed	Closed
Safeguard Component Area Supply Line Isolation Dampers	VAS-AOD-505 A, B, C, D, 506 A, B, C, D	—	Yes	Yes	Yes/No	ECCS Actuation	Transfer Closed	Closed
Safeguard Component Area Exhaust Line Isolation Dampers	VAS-AOD-507 A, B, C, D, 508 A, B, C, D	—	Yes	Yes	Yes/No	ECCS Actuation	Transfer Closed	Closed
Auxiliary Building HVAC System Exhaust Line Isolation Dampers	VAS-AOD-511, 512	—	Yes	Yes	Yes/No	ECCS Actuation	Transfer Closed	Closed

Table 2.7.5.4-2 Auxiliary Building Ventilation System Equipment Alarms, Displays and Control Functions

Equipment/Instrument Name	MCR/RSC Alarm	MCR Display	MCR/RSC Control Function	RSC Display
Penetration Area Supply Line Isolation Dampers (VAS-AOD-501 A, B, 502 A, B)	No	Yes	Yes	Yes
Penetration Area Exhaust Line Isolation Dampers (VAS-AOD-503 A, B, 504 A, B)	No	Yes	Yes	Yes
Safeguard Component Area Supply Line Isolation Dampers (VAS-AOD-505 A, B, C, D, 506 A, B, C, D)	No	Yes	Yes	Yes
Safeguard Component Area Exhaust Line Isolation Dampers (VAS-AOD-507 A, B, C, D, 508 A, B, C, D)	No	Yes	Yes	Yes
Auxiliary Building HVAC system Exhaust Line Isolation Dampers (VAS-AOD-511, 512)	No	Yes	Yes	Yes

Table 2.7.5.4-3 Auxiliary Building Ventilation System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 1 of 3)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the ABVS is as described in the Design Description of ~~this~~ Subsection 2.7.5.4.1 and as shown in Figures 2.7.5.2-1 and. 2.7.5.2-3.	1. Inspection~~s~~ of the as-built ABVS will be performed.	1. The as-built ABVS conforms ~~with~~ to the functional arrangement as described in the Design Description of ~~this~~ Subsection 2.7.5.4.1 and as shown in Figures 2.7.5.2-1 and 2.7.5.2-3..
2. The seismic Category I ~~auxiliary building HVAC system isolation dampers~~equipment identified in Table 2.7.5.4-1 ~~are designed to~~can withstand seismic design basis loads without loss of safety function.	2.i Inspections will be performed to verify that the as-built seismic Category I ~~isolation dampers~~equipment identified in Table 2.7.5.4-1 ~~are~~ is located in ~~the reactor building~~a seismic Category I structure.	2.i The as-built seismic Category I ~~isolation dampers~~equipment identified in Table 2.7.5.4-1 ~~are~~ is located a seismic Category I structure~~in the reactor building~~.
	2.ii Type tests, ~~and/or~~ analyses, or a combination of type tests and analyses ~~the~~ of seismic Category I equipment ~~isolation dampers~~ identified in Table 2.7.5.4-1 will be performed using analytical assumptions, or will be performed under conditions, which bound the seismic design basis requirements.	2.ii ~~The result of the type tests and/or analyses~~A report exists and concludes that the seismic Category I ~~isolation dampers~~ equipment identified in Table 2.7.5.4-1 can withstand seismic design basis loads without loss of safety function.
	2.iii Inspections and analyses will be performed to verify that ~~on~~ the as-built seismic Category I ~~isolation dampers~~equipment identified in Table 2.7.5.4-1, including anchorages, is seismically bounded by the tested or analyzed conditions.	2.iii ~~The~~ A report exists and concludes that the as-built seismic Category I ~~isolation dampers~~ equipment identified in Table 2.7.5.4-1, including anchorages, ~~are~~ is seismically bounded by the tested or analyzed conditions.

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
3.a The Class 1E isolation dampersequipment identified in Table 2.7.5.4-1 are is powered from their its respective Class 1E division.	3.a A test will be performed on each division of the as-built isolation dampersClass 1E equipment identified in Table2.7.5.4-1 by providing a simulated test signal only in the Class 1E division under test.	3.a The simulated test signal exists at the as-built Class 1E isolation dampersequipment, identified in Table 2.7.5.4-1, under test.
3.b. Separation is provided between redundant divisions of ABVS Class 1E cablesdivisions, and between Class 1E divisions cables and non-Class 1E cables.	3.b Inspections of the as-built Class 1E divisional cables will be performed.	3.b Physical separation or electrical isolation is provided in accordance with RG 1.75 between the- as-built- cables of redundant ABVS Class 1E divisions and between Class 1E divisions cables and non-Class 1E cables.

Table 2.7.5.4-3 Auxiliary Building Ventilation System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 2 of 3)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4.a The isolation remotely operated dampers -identified in Table 2.7.5.4-1 as having PSMS control, perform an active safety function after receiving a signal from PSMS.	4.a Tests will be performed onof the as-built isolation remotely operated dampers identified in Table 2.7.5.4-1 as having PSMS control using a simulated signal.	4.a Each as-built isolation remotely operated dampers identified in Table 2.7.5.4-1 as having PSMS control, performs the active safety function identified in the table Table 2.7.5.4-1 after receiving a simulated signal.
4.b After loss of motive power, the isolation remotely operated dampers identified in Table 2.7.5.4-1, assume the closed loss of motive power position.	4.b Tests of the as-built isolation remotely operated dampers will be performed under the conditions of loss of motive power.	4.b Upon loss of motive power, each as-built isolation remotely operated damper identified in Table 2.7.5.4-1 assumes the indicated closed loss of motive power position.
4.c The fire dampers in the ductwork that penetrates the fire barriers that are required to protect safe-shutdown capability close fully when called upon to do sounder design air flow conditions.	4.c Type tests, tests, a combination of type tests and analyses, or a combination of tests and analyses of the as-built fire dampers will be performed under the conditions which bound the design air flow conditions.	4.c Each as-built A report exists and concludes that the fire dampers in the ductwork that penetrates a fire barrier that are is required to protect safe-shutdown capability close under design air flowthe conditions which bound design air flow conditions.
5. Controls exist are provided in the MCR to open and close the remotely operated isolation dampers identified in Table 2.7.5.4-2.	5. Tests will be performed on the as-built remotely operated isolation dampers listed identified in Table 2.7.5.4-2 using controls in the as-built MCR.	5. Controls exist in the as-built MCR to open and close the as-built remotely operated valves dampers listed identified in Table 2.7.5.4-2.
6. MCR alarmsAlarms and displays of the parameters identified in Table 2.7.5.4-2 can be retrievedare provided in the MCR.	6. Inspections will be performed for retrievability of the alarms and displays identified in Table 2.7.5.4-2 as-built ABVS parameters in the as-built MCR.	6. MCR alarmsAlarms and displays identified in Table 2.7.5.4-2 can be retrieved in the as-built MCR.

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
7. RSC alarmsAlarms, displays and controls are identified in Table 2.7.5.4-2 are provided in the RSC.	7.i Inspections will be performed for retrievability of the alarms and displays identified in Table 2.7.5.4-2 in the as-built RSC.of the as-built RSC alarms, displays and controls will be performed.	7.i Alarms and, displays and controls exist on the as-built RSC as identified in Table 2.7.5.4-2 can be retrieved in the as-built RSC.
	7.ii Tests of the as-built RSC controls control functions identified in Table 2.7.5.4-2 will be performed.	7.ii Controls exist to operate eachin the as-built RSC operate the as-built control functionequipment identified in Table 2.7.5.4-2 with an RSC control function.

Table 2.7.5.4-3 Auxiliary Building Ventilation System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 3 of 3)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
8. The TSC HVAC system provides a habitable workspace environment for the TSC under all plant operating conditions, including normal plant operations, abnormal and accident conditions.	8.a Tests and analyses of the as-built TSC HVAC system will be performed.	8.a A report exists and concludes that theThe as-built TSC HVAC system is capable of providing conditioned air to maintain the properarea design temperature for the TSC during all plant operating conditions, including normal plant operations, abnormal and accident conditions.
	8.b Tests and inspections of the as-built TSC HVAC system will be performed.Deleted.	8.b Controls and displays are provided in the as-built MCR to operate and monitor the status of the TSC HVAC system.Deleted.
9. The ABVS auxiliary building HVAC system provides conditioning conditioned air to maintain the proper environmental conditions design temperature limits for the areas houses the safety-related componentshousing mechanical and electrical equipment (including areas housing ESF equipment) in the reactor building, power source building, auxiliary building and access building during normal plant operations.	9. Tests and analyses of the as-built auxiliary building HVAC system ABVS will be performed.	9. A report exists and concludes thatThe the as-built ABVS auxiliary building HVAC system is capable of providing conditioned air to maintain design temperature limits for the area houses the safety-related components areas housing mechanical and electrical equipment (including areas housing ESF equipment) in the reactor building, power source building, auxiliary building and access building during normal plant operations.
10. The auxiliary building HVAC systemABVS is capable of providing properprovides a flow rate to that maintains a slightly negative pressure in the controlled areas.	10. Tests and analyses of the as-built ABVS auxiliary building HVAC system will be performed.	10. The A report exists and concludes that the as-built ABVS auxiliary building exhaust fans is capable of providingprovides a proper flow rate > 108,000 cfm to maintain a slightly negative pressure in the controlled areas.

11. Non-safety related ABVS equipment and ductwork, including supports, whose failure could adversely interact with safety related SSCs meet seismic Category II requirements during and after an SSE in areas containing safety-related equipment are seismic Category II.	11.i Analysis will be performed to demonstrate that as-built non safety-related CVVS equipment and ductwork, including supports, does not adversely interact with safety related SSCs during and after an SSE.A combination of analysis and inspection will be performed..	11.i Reports exist and conclude that the as-built non-safety related ABVS equipment and ductwork, including supports, whose failure could adversely impact safety related SSCs does not adversely interact with in areas containing safety-related equipment are seismic Category II to prevent adverse interaction with other safety-related systems during a seismic eventand after an SSE.
	11.ii Inspection will be performed to verify that the as-built non-safety related ABVS equipment and ductwork, including supports, are installed in accordance with the configurations specified by the analyses.	11.ii The as-built non-safety related ABVS equipment and ductwork, including supports whose failure could adversely interact with safety related SSCs are installed in accordance with the configurations specified by the analyses.

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.7.5.4

Item No.	Explanation/Basis for Change
Design Description 2.7.5.4.1	
A	Relocated Design Description heading to the beginning of the section.
B	Editorial change for Tier 1 consistency.
C	Subheadings are deleted from the Design Description and editorial changes to provide consistency among Tier 1 sections.
D	Deleted wording regarding system capacities and dilution flow to gaseous effluent because it is not a level of detail required for Tier 1 and consolidated following paragraph into existing sentence. This change alters the response to RAI No. 355, Question No. 09.04.03-4.
E	Deleted text because it is not needed in Tier 1.
F	Notes 1 and 2. See items MM and NN.
G	Notes 1 and 2. See items JJ and VV. This change alters the response to RAI No. 54, RAI 14.3.7.3.4-4 and RAI 14.3.7.3.4-5 This change alters the response to RAI No. 54, 14.3.7.3.4-11.
H	Notes 1 and 2. See item TT.
I	Deleted text describing dilution air flow because it is beyond the level of detail required in Tier 1. This change alters the response to RAI No. 355, 09.04.03-4.
J	Deleted text because it is redundant to information in previous text.
K	Deleted text because it is redundant to information in Table 2.7.6.13-2 “Airborne Radioactivity Monitoring System Equipment Characteristics” This change alters the response to RAI 483, 09.04.03-08.
L	Note 1 and 2. See item OO. This change alters the response to RAI No. 381, 14.03.07-41.
M	Note 1 and 2. See items JJ and VV. This change alters the response to RAI 558, 06.05.01-17.
N	Deleted negative statements from Tier 1.
O	Deleted text because it below level of detail required for Tier 1.
P	Notes 1 and 2. See Items RR and SS.
Q	Notes 1 and 2. See Item OO.
R	Deleted negative statements from Tier 1.
S	Notes 1 and 2. See Item MM.
T	Deleted negative statements from Tier 1.
U	Deleted negative statements from Tier 1.
V	Deleted negative statements from Tier 1.
Design Description 2.7.5.4.1.2	
W	Editorial corrections/changes and to provide consistency among Tier 1 sections. Subheadings are deleted from the Design Description.
X	Deleted redundant text and relocated text to introductory paragraphs. See item Y.
Y	Relocated Design Description text to introductory text. See item X.
Z	Note 1 and 2. See item QQ.
AA	Deleted negative statements from Tier 1 for the remainder of this subsection.
Design Description 2.7.5.4.1.3	

BB	Editorial corrections/changes and to provide consistency among Tier 1 sections. Subheadings are deleted from the Design Description.
CC	Deleted redundant text.
DD	Deleted negative statements from Tier 1 for the remainder of this subsection.
Design Description 2.7.5.4.1.4	
EE	Editorial corrections/changes and to provide consistency among Tier 1 sections. Subheadings are deleted from the Design Description.
FF	Revised introductory text and relocated from text to introductory paragraph. See item II.
GG	Relocated from Key Design Features. See item YY
HH	Notes 1 and 2. See item UU.
II	Relocated to Key Design Features. See items FF and GG.
JJ	Deleted negative statements from Tier 1 for the remainder of this subsection
KK	Note 1.
LL	Notes 1 and 2. See Items G and M.
MM	Notes 1 and 2. See Item S.
NN	Note 1.
OO	Notes 1 and 2. This change alters the response to RAI 483, 09.04.03-08. See Item E and O. This change alters the response to RAI No. 54, 14.3.7.3.4-11.
PP	Note 1.
QQ	Notes 1 and 2.. See Items L, Z, ZZ.
RR	Notes 1 and 2. See items P.
SS	Notes 1 and 2. See items Q.
TT	Note 1.
UU	Note 1.
VV	Note 1.
WW	Note 1.
XX	Note 1 See items G and M.
YY	Relocated text to introduction. See item FF.
ZZ	Notes 1 and 2. See item QQ.
AAA	Deleted text not required in Tier 1.
Table 2.7.5.4-1	
	Changed to use a consistent table heading for clarity.
Table 2.7.5.4-2	
	No Changes.
Table 2.7.5.4-3	
	No Changes.
1	DC, ITA, AC – Generic changes to ITAAC for functional arrangement to provide clarity and consistency. [RIS, Scope, 2nd bullet.]
2	DC, AC – Generic changes to ITAAC for seismic to provide clarity and consistency. [RIS, Scope, 2nd bullet.]

3.a	DC, ITA, AC – Generic changes to ITAAC for electrical separation to provide clarity and consistency. [RIS, Scope, 2nd bullet.]. This change alters the response to RAI No. 54, 14.3.4.3.4-10 and RAI No. 184, 14.03.07-16.
3.b	DC, AC – Generic changes to ITAAC for electrical separation to provide clarity and consistency. [RIS, Scope, 2nd bullet.]. This change alters the response to RAI No. 191, 14.03.04-09
4.a	DC, ITA, AC Editorial corrections for consistency in Tier 1. [RIS, Scope, 2nd bullet.]
4.b	DC, ITA, AC Editorial corrections for consistency in Tier 1. [RIS, Scope, 2nd bullet.]
4.c	DC – Editorial changes. ITA and AC Revised to provide the correct ITA, and make AC comport with ITA revision, and editorial corrections. [RIS, Scope, 2nd bullet.].
5	DC, AC – Generic changes to ITAAC for MCR controls to provide clarity and consistency. [RIS, Scope, 2nd bullet.]. This change alters the response to RAI No. 54, 14.03.07.03.04-11.
6.	DC, AC – Generic changes to ITAAC for MCR alarms and displays to provide clarity and consistency. [RIS, Scope, 2nd bullet.]This change alters the response to RAI No. 54, 14.03.07.03.04-11
7.	DC, ITA, AC – Generic changes to ITAAC for RSC alarms, displays and controls to provide clarity and consistency. [RIS, Scope, 2nd bullet.] This change alters the response to RAI No. 54, 14.03.07.03.04-11 with additional editorial changes and.
8.	8.a ITA – Revised to correct the system designator in the ITAAC, and to provide additional clarifications to the DC and AC. Revised AC to specify a report for the analysis ITA. 8.b – Deleted because the capability can be verified in ITAAC #8.a. This change alters the response to RAI 195, 14.03.10-2.
9.	DC, ITA and AC. Revised to correct the system designator in the ITAAC, and to provide additional clarifications to the DC and AC. Revised AC to specify a report for the analysis ITA. This change alters the response to RAI 483, 09.04.03-08.

10.	DC, ITA and AC – Revised to correct the system designator in the ITAAC, and to provide additional clarifications to the DC and AC. Revised AC to specify a report for the analysis ITA. This change alters the response to RAI 483, 09.04.03-08.
11.	Added ITAAC in response to RAI 558, 06.05.01-17. These changes alter the response to RAI 558, 06.05.01-17.

Note 1: Revised to provide consistency between the Design Description (DD) and the Design Commitment (DC) in the ITAAC table. Revised text to include only the necessary attributes for ITAAC.

Note 2: Text relocated within the DD section to align with the sequence and numbering of the corresponding DC in the ITAAC table.

2.7.6.9 Fire Protection System

2.7.6.9.1 Design Description

System Purpose and Functions

The purpose of the fire protection system (FPS) is to minimize the adverse effects of fires on structures, systems, and components (SSCs) important to safety. The FPS detects and locates fires and provides the capability to extinguish or control the fire using fixed automatic and manual suppression systems, manual hose streams, and/or portable fire fighting equipment. Water is provided to hose stations for manual fire fighting in areas containing safe shutdown equipment following a safe shutdown earthquake. The FPS also supports the containment isolation function for piping penetrating the containment as described in Subsection 2.11.2. , The FPS is classified as a non safety-related, non-seismic system with the exception of the containment isolation functionvalves. A B C D

Location and Functional Arrangement

The FPS consists of a number of fire detection and suppression subsystems including:

- Detection systems for early detection and notification of a fire occurrence. Fire detection systems are provided where required by the fire hazard analysis (FHA).
- A water supply system including the fire pumps, adequate fire water supply source, yard main, and interior distribution piping.
- Fixed automatic and manual fire suppression systems and equipment, including hydrants, standpipes, hose stations and portable fire extinguishers. Manual fire suppression capability is provided in all areas of the plant containing safety-related equipment, including areas that have an automatic suppression system. E

Key Design Features

The FPS is designed to perform the following functions: G

1. The functional arrangement of the FPS is as described in the Design Description of Subsection 2.7.6.9. H

2. Detect and locate fires and provide operator indication of the location. Individual fire detectors provide fire detection capability and can be used to initiate fire alarms in areas containing safety-related equipment. I

3. There are two 100 percent capacity fire pumps: one pump is motor driven and one pump is diesel driven. J

Maintain 100 percent of fire pump design capacity, assuming failure of the largest fire pump or the loss of offsite power (LOOP). K

4.a Provide water to hose stations for manual fire fighting in areas containing safe-shutdown equipment following a safe shutdown earthquake. Under safe-shutdown earthquake loading, the standpipe system remains functional in areas containing equipment required for safe-shutdown. L

4.b DeletedThe seismic standpipe system can be supplied from a safety-related water source which capacity is at least 18,000 gallons. M

5. Deleted N

Provide sufficient water for the largest sprinkler system plus manual hose streams to support fire suppression activities for two hours or longer, but not less than 300,000 gallons.

Redundant water supply capability is provided. O

Provide6.a The FPS fire water supply is available as an alternative component cooling water source for severe accident prevention. P

6.b ProvideThe FPS fire water supply is available to the containment spray system and water injection to the reactor cavity for severe accident mitigation. Q

7. Deleted. R

Provides containment isolation for the piping penetrating the containment. S

Seismic and ASME Code Classifications T

The FPS is classified as a non safety-related, non-seismic system. Seismic design requirements are applied to portions of the standpipe system located in areas containing equipment required for safe shutdown. In addition, the FPS containment isolation valves and their associated piping are safety-related (ASME Class 2) and seismic Category I. U V

System Operation

The FPS normally operates in a standby readiness mode. The fire water supply piping is maintained full and pressurized by operation of a pressure source to allow immediate startup of a fire pump on demand. W

Alarms, Displays, and Controls

The FPS provides audible and visual alarms and system trouble annunciation in the MCR. 8. Displays indicated identified in Table 2.7.6.9-1 exist are provided in the main control room (MCR) that provides indication of fire system status.

Logic

There is no logic needed for direct safety functions related to the FPS.

Interlocks

There are no interlocks needed for direct safety functions related to the FPS.

Class 1E Electrical Power Sources and Divisions

The FPS containment isolation valves are connected to Class 1E buses.

Equipment to be Qualified for Harsh Environments

Not applicable.

Interface Requirements

The seismic standpipe system can be supplied from a safety-related water source which capacity is at least 18,000 gallons. Combined License applicant referencing the certified design is responsible to assure that the site-specific design meets the interface requirement and verify the conformance in the ITAAC process that are similar to those provided in the certified design. AA BB

Numeric performance values

Not applicable. CC

2.7.6.9.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.6.9-2 specifies the inspections, tests, analyses, and associated acceptance criteria for the FPS.

The ITAAC associated with the FPS equipment, components, and piping and that comprise a portion of the CIS are described in Table 2.11.2-2.

Table 2.7.6.9-1 Fire Protection System MCR Displays

Equipment Name	Display	Control Function
Lead Fire Pump	Yes (Run Status)	Start
Secondary Fire Pump	Yes (Run Status)	Start

Table 2.7.6.9-2 Fire Protection System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 1 of 2)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the FPS is as described in the Design Description of Subsection 2.7.6.9.	1. Inspections of the as-built FPS will be performed of the as-built FPS.	1. The as-built FPS conforms to the functional arrangement as described in the Design Description of this Subsection 2.7.6.9.
2. Individual fire detectors provide fire detection capability and can be used to initiate fire alarms in areas containing safety-related equipment.	2.i Tests will be performed on the as-built individual fire detectors in areas containing safety-related equipment using a simulated signal.	2.i The as-built Iindividual fire detectors provide fire detection capability and can be used to initiate fire alarms in areas containing safety-related equipment.
	2.ii An inspection will be performed to verify that as-built fire detectors are installed in areas containing safety-related equipment.	2.ii The as-built fire detectors are installed in areas containing safety-related equipment.
3. There are two 100 percent capacity fire pumps: one pump is motor driven and one pump is diesel driven.	3.i An inspectionanalysis of the as-built fire pumps will be performed to determine the 100 percent design flow rate for each fire pump.	3.i A report exists and concludes that Two as-built fire pumps each fire pump can provide the have 100 percent design flow rate to satisfy the demand of any automatic sprinkler system plus 500 gpm for fire hoses.: one pump is motor driven and one pump is diesel driven.
	3.ii Tests will be performed to confirm that the as-built fire pumps can provide the 100 percent design flow rate.	3.ii The as-built fire pumps are capable of achieving their 100 percent design flow rate.
	3.iii An inspection of the name plate of two as-built fire pumps will be performed.	3.iii The type and capacity of two as-built fire pumps as shown in the name plate of each pump are consistent with the design requirements of each pump, such that one pump is motor driven with 100% capacity and the other pump is diesel driven with 100% capacity.

4.a Under safe-shutdown earthquake loading, the standpipe system remains functional in areas containing equipment required for safe shutdown.	4.a An inspection will be performed of the as-built standpipe system as documented in a seismic design report.	4.a The seismic design report exists and concludes that the as-built standpipe system remains functional in areas containing equipment required for safe shutdown under safe-shutdown earthquake loading.
4.b Deleted~~The seismic standpipe system can be supplied from a safety-related water source which capacity is at least 18,000 gallons.~~	4.b Deleted~~An inspection of the as-built safety-related water source to the standpipe system will be performed.~~	4.b Deleted~~The as-built seismic standpipe system can be supplied from a safety-related water source which capacity is at least 18,000 gallons.~~

Table 2.7.6.9-2 Fire Protection System Inspections, Tests, Analyses, and Acceptance Criteria (Sheet 2 of 2)

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
5. DeletedThe fire protection water supply system has at least two water sources. Each source can supply the largest US-APWR sprinkler system plus manual hose streams (500 gpm) to support these fire suppression activities for a period of two hours or longer. The capacity of each source is not less than 300,000 gallons.	5. DeletedInspections will be performed of each as-built fire protection water source capability.	5. DeletedEach of the two as-built fire protection water supply sources has the capability to supply the largest US-APWR sprinkler system plus manual hose streams (500 gpm) to support these fire suppression activities for a period of two hours or longer, and the capacity of each source is not less than 300,000 gallons.
6.a The FPS fire water supply is available as an alternative component cooling water source for severe accident prevention.	6.a Inspection will be performed of the as-built FPS fire -water supply system.	6.a The as-built FPS fire water supply system is connected to component cooling water systemprovided as an alternative component cooling water source for severe accident prevention.
6.b The FPS fire water supply is available to the containment spray system and water injection to the reactor cavity for severe accident mitigation.	6.b Inspection will be performed on of the as-built FPS fire water supply system.	6.b The as-built FPS fire water supply system is providedis connected to the containment spray system and water injection line to the reactor cavity for severe accident mitigation.
7. Deleted.	7. Deleted.	7. Deleted.
8. Displays of the system parameters identified in Table 2.7.6.9-1 can be retrievedare provided in the MCR.	8. Inspections will be performed for retrievability of the as-built system parametersdisplays identified in Table 2.7.6.9-1 in the as-built MCR.	8. The as-built dDisplays indications identified of system parameters identified in Table 2.7.6.9-1 are verified and are can be retrieved in the as-built MCR.

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.7.6.9

Item No.	Explanation/Basis for Change
Design Description 2.7.6.9.1	
A	Text revised to include information for a more concise Design Description See Item I.
B	Text revised and relocated for a more concise Design Description. See Item L.
C	Text revised and relocated for a more concise Design Description. See Item S. This change alters the response to RAI 184, Question 14.03.07-27.
D	Text reworded for consistency and clarity. See Item V.
E	Text deleted, and text revised and relocated for a more concise Design Description. See item L.
G	Deleted text to include only necessary design information in the Design Description in accordance with NRC guidance in SRP Section 14.3.
H	Note 1
I	Note 1. Relocated and revised text for more concise Design Description. See Item A. Revised wording of ITAAC to remove "can be used to".
J	Note 1 and Note 2. See Item K.
K	Note 2. See Item J.
L	Note 1 and text relocated for more concise Design Description. See Items B and E.
M	Note 1. Deleted text to remove site specific information that is redundant to wording of Tier 1 section 3.2.2.
N	See Note 1. Deleted text to remove site specific information, to be addressed in the COL.
O	Deleted site specific text to include only necessary design information in the Design Description in accordance with NRC guidance in SRP Section 14.3.
P	Note 1.
Q	Note 1
R	Note 1.
S	Text revised and relocated for a more concise Design Description. See Item C. This change alters the response to RAI 184, Question 14.03.07-27.
T	Text deleted to include only necessary design information in the Design Description in accordance with NRC guidance in SRP Section 14.3.
U	Second sentence deleted because it was redundant to information covered in 4.a of Design Description. (See item L)
V	Text is deleted because this function is addressed in Section 2.11.2 and the reference to Section 2.11.2 is provided in the introductory paragraph. See Item D.
W	Deleted text to include only necessary design information in the Design Description in accordance with NRC guidance in SRP Section 14.3
X	First sentence deleted to include only necessary design information in the Design Description in accordance with NRC guidance in SRP Section 14.3.
Y	Note 1
Z	Deleted text to include only necessary design information in the Design Description in accordance with NRC guidance in SRP Section 14.3.
AA	First sentence deleted because it is site specific information covered in Tier 1, Section 3.2.2.
BB	Second sentence deleted to include only necessary design information in the Design Description in accordance with NRC guidance in SRP Section 14.3.

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.7.6.9

Item No.	Explanation/Basis for Change
CC	Deleted text to include only necessary design information in the Design Description in accordance with NRC guidance in SRP Section 14.3.
Table 2.7.6.9-1	
	No changes
ITAAC Table 2.7.6.4-2	
1	ITA, AC – Generic changes to ITAAC for functional arrangement to provide clarity and consistency. [RIS p.7, Scope, first bullet]
2	DC – Revised to remove, "can be used to" to provide clarity. [RIS p.4, Language, seventh bullet]. ITA – Revised ITA to split into two activities Test and Inspection. [RIS p.5, Logic, seventh bullet]. AC – Revised AC to align with the ITA and DC requirements of tests and inspections, [RIS p.5, Logic, seventh bullet]. This change alters the response to RAI 183, Question 14.03.07-9.
3	ITA – Revised ITA split into separate activities for analysis, tests and inspections. [RIS p.5, Logic, seventh bullet]. AC - Revised AC to align with ITA separate requirements of analysis, tests and inspections., [RIS p.5, Logic, seventh bullet]. This change alters the response to RAI 183, Question 14.03.07-10.
4a	No changes
4b	DC, ITA and AC: Deleted – Site specific information not to be included in this section of Tier 1. This change alters the response to RAI 183, Question 14.03.07-11
5	DC, ITA and AC Deleted – Site specific information not to be included in this section of Tier 1 This change alters the response to RAI 183, Question 14.03.07-12.
6.a	ITA – Editorial Change for consistency with DD. AC Reworded for clarity. This does not impact the response to RAI 183, Question 14.03.07-11
6.b	ITA – Editorial change for consistency with DD. AC Reworded for clarity. This alters the response to RAI 183, Question 14.03.07-11.
7	No changes
8	DC, ITA, AC – Generic change to ITAAC for MCR controls to provide clarity and consistency. [RIS p.7, Scope, seventh bullet]. This change does not impact the response to RAI 184, Question 14.03.07-29.

Note 1: Revised to provide consistency between the Design Description (DD) and the Design Commitment (DC) in the ITAAC table. Revised text to include only the necessary attributes for ITAAC.

Note 2: Text relocated within the DD section to align with the sequence and numbering of the corresponding DC in the ITAAC table.

2.7 Auxiliary Systems

2.7.6.10 Communication Systems

2.7.6.10.1 Design Description

System Purpose and Functions

The plant's communication systems are not safety related. The communication systems provide for effective interplant intra-plant and plant-to-offsite communications during normal, transient, fire, accidents, off-normal phenomena (e.g., loss of offsite power), and security related events.

A

Location and Functional Arrangement

The following locations within the US-APWR facility contain communication system arrangements:

- Reactor building (R/B) and containment structure
- Turbine building (T/B)
- Power source building (PS/B)
- Auxiliary building (A/B)
- Access buildings (AC/B)

The US-APWR communication systems consist of the following physically independent systems:

- Public address system/page
- Telephone system
- Sound powered telephone system (SPTS)
- Plant radio system
- Offsite communications system including emergency communication systems
- Plant security communication systems

B

1. The functional arrangement of the communication systems is as described in the Design Description of Subsection 2.7.6.10.1.

C

2. The means exists for communications among the MCR, TSC, EOF, principal State and local emergency operations centers, and radiological field assessment teams.

3. The means exist for communications are provided from the MCR, TSC, and EOF to the NRC headquarters and regional office emergency operations centers, (including establishment of the emergency response data system (ERDS) [or its successor system] between the onsite computer system and the NRC Operations Center).

D

4. Deleted.

E

Key Design Features

Depending on the specific installed plant location, the selected components are qualified to operate in environments, as applicable.

The plant communication systems are arranged in a redundant fashion to provide for a minimum of two verbal communication paths between all plant locations as well as external communications.

The plant communication systems are independent of each other and either have a built-in dc battery power source (e.g., portable radios) or are powered from non-safety related uninterruptible power supply (UPS) systems.

F

Seismic and ASME Code Classifications

Not applicable.

System Operation

The plant communication systems are used for conveying verbal information as well as facsimile transmissions and digital based communications. Emergency telephones are color-coded to distinguish them from normal telephones.

Interfaces Requirements

There are no safety-related interfaces with systems outside of the certified design.

2.7.6.10.2 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.7.6.10-1 provides the inspections, tests, analyses, and associated acceptance criteria for the Communication Systems.

Table 2.12-1 provides the inspections, tests, analyses, and acceptance criteria for the Physical Security communications systems.

G

Table 2.7.6.10-1 Communication Systems Inspections ,Tests ,Analyses and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The functional arrangement of the communication systems is as described in the dDesign dDescription of this Subsection 2.7.6.10.1.	1. Inspection of the as-built communication systems will be performed.	1. The as-built communication systems conform with to the functional arrangement as described in the Design Description of Subsection 2.7.6.10.1.
2. The means exists for communications among the MCR, TSC, EOF, principal State and local emergency operations centers, and radiological field assessment teams.	2. A test of the as-built communication systems will be performed.	2. The as-built communications are established among the as-built MCR, TSC, EOF, principal State and local emergency operations centers, and radiological field assessment teams.
3. The means exist for communications from the MCR, TSC, and EOF to the NRC headquarters and regional office emergency operations centers, (including establishment of the emergency response data system (ERDS) [or its successor system] between the onsite computer system and the NRC Operations Center).	3. A test of the as-built communication systems will be performed.	3. The as-built communications are established from the as-built MCR, TSC and EOF to the NRC headquarters and regional office emergency operations centers, and an access port for ERDS [or its successor system] the emergency response data system is provided.
4. TSC has voice communication systems.Deleted.	4. Inspections of the as-built TSC voice communication systems will be performed.Deleted.	4. The as-built TSC voice communication equipment is installed, and voice transmission and reception are accomplished.Deleted.

Tier 1 Changes Explanation/Basis Document
Tier 1, Section 2.7.6.10

Item No.	Explanation/Basis for Change
Design Description Section 2.7.6.10.1	
A	Revised text to include only the necessary attributes for Tier 1 Design Description. Subheadings deleted throughout to provide consistent Design Description format in Tier 1.
B	Deleted reference to plant security communications as this is described in Tier 1 Section 2.12.
C	Note 1.
D	Note 1. Revised to make the reference to the emergency response data system more generic to accommodate possible future changes to the ERDS.
E	Note 1.
F	Revised text to include only the necessary attributes for Tier 1 Design Description and remove negative statements from Tier 1. This change alters the response to RAI 184, Revision 0, 14.03.07-29.
G	Added text to refer to Section 2.12 for security system communications ITAAC.
ITAAC Table 2.7.6.10-1	
1	DC and AC – Generic changes to ITAAC for functional arrangement to provide clarity and consistency. [RIS – Scope, 2nd bullet]
2	ITA – Editorial correction only.
3	DC, AC – Revised to make the reference to the emergency response data system more generic to accommodate possible future changes to the ERDS. [RIS – Scope, 1st bullet]
4	DC, ITA, AC – ITAAC deleted as it is redundant; TSC communications are verified by ITAAC #2 and #3.

Note 1: Revised to provide consistency between the Design Description (DD) and the Design Commitment (DC) in the ITAAC table. Revised text to include only the necessary attributes for ITAAC.

Note 2: Text relocated within the DD section to align with the sequence and numbering of the corresponding DC in the ITAAC table.