## ArevaEPRDCPEm Resource

**From:** WELLS Russell D (AREVA NP INC) [Russell.Wells@areva.com]
**Sent:** Friday, February 27, 2009 7:41 PM
**To:** Getachew Tesfaye
**Cc:** BENNETT Kathy A (OFR) (AREVA NP INC); Pederson Ronda M (AREVA NP INC); DELANO Karen V (AREVA NP INC)
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 135, Supplement 1
**Attachments:** RAI 135 Supplement 1 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. (AREVA NP) provided responses to 5 of the 14 parts of the single question, Question 09.04.05-1, of RAI No. 135 on December 17, 2008. The attached file, "RAI 135 Supplement 1 Response US EPR DC.pdf" provides a technically correct and complete response to the remaining 9 parts of this question, as committed.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI Question 09.04.05-1, Parts 1 through 5, 7 and 13.

The following table indicates the respective pages in the response document, "RAI 135 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

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| RAI 135 — 09.04.05-1 (# 3) | 8 | 10 |
| RAI 135 — 09.04.05-1 (# 4) | 11 | 11 |
| RAI 135 — 09.04.05-1 (# 5) | 12 | 13 |
| RAI 135 — 09.04.05-1 (# 6) | 14 | 14 |
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This concludes the formal AREVA NP response to RAI 135, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

(Russ Wells on behalf of)

*Ronda Pederson*
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**From:** WELLS Russell D (AREVA US)
**Sent:** Wednesday, December 17, 2008 1:42 PM
**To:** 'Getachew Tesfaye'
**Cc:** 'John Rycyna'; Pederson Ronda M (AREVA US); BENNETT Kathy A (OFR) (AREVA US); DELANO Karen V (AREVA US); SLIVA Dana (EXT)
**Subject:** Response to U.S. EPR Design Certification Application RAI No. 135, FSAR Ch 9

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 135 Response US EPR DC.pdf" provides technically correct and complete responses to 5 of the 14 parts of the single question, Question 09.04.05-1.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI Question 09.04.05-1, Parts 11, 12 and 14.

The following table indicates the respective pages in the response document, "RAI 135 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

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| RAI 135 — 09.04.05-1 (# 11) | 14 | 14 |
| RAI 135 — 09.04.05-1 (# 12) | 15 | 15 |
| RAI 135 — 09.04.05-1 (# 13) | 16 | 16 |
| RAI 135 — 09.04.05-1 (# 14) | 17 | 17 |

A complete answer is not provided for 9 of the 14 parts of Question 09.04.05-1. The schedule for a technically correct and complete response to these parts is provided below.

| Question # | Response Date |
|---|---|
| RAI 135 — 09.04.05-1 (# 1) | February 27, 2009 |
| RAI 135 — 09.04.05-1 (# 2) | February 27, 2009 |
| RAI 135 — 09.04.05-1 (# 3) | February 27, 2009 |
| RAI 135 — 09.04.05-1 (# 4) | February 27, 2009 |
| RAI 135 — 09.04.05-1 (# 5) | February 27, 2009 |
| RAI 135 — 09.04.05-1 (# 6) | February 27, 2009 |
| RAI 135 — 09.04.05-1 (# 7) | March 27, 2009 |
| RAI 135 — 09.04.05-1 (# 10) | February 27, 2009 |

Sincerely,

(Russ Wells on behalf of)
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**From:** Getachew Tesfaye [mailto:Getachew.Tesfaye@nrc.gov]
**Sent:** Monday, November 17, 2008 2:25 PM
**To:** ZZ-DL-A-USEPR-DL
**Cc:** Nan Chien; Christopher Jackson; Peter Hearn; Joseph Colaccino; John Rycyna
**Subject:** U.S. EPR Design Certification Application RAI No. 135 (1183), FSARCh. 9

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on November 6, 2008, and on November 17, 2008, you informed us that the RAI is clear and no further clarification is needed. As a result, no change is made to the draft RAI. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,
Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/NARP
(301) 415-3361

**Hearing Identifier:** AREVA_EPR_DC_RAIs
**Email Number:** 276

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**Subject:** Response to U.S. EPR Design Certification Application RAI No. 135, Supplement 1
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**Response to**

**Request for Additional Information No. 135, Supplement 1 (1183), Revision 0**

**11/17/2008**

**U. S. EPR Standard Design Certification**
**AREVA NP Inc.**
**Docket No. 52-020**
**SRP Section: 09.04.05 - Engineered Safety Feature Ventilation System**
**Application Section: SRP 9.4**

**QUESTIONS for Containment and Ventilation Branch 1 (AP1000/EPR Projects) (SPCV)**

**Question 09.04.05-1:**

1. CRACS figures discrepancies

A review of the main control room air conditioning system (CRACS) P&IDs in FSAR Tier 2 Figures 9.4.1-1 and 9.4.1-2 shows that figure numbers and titles are incorrect.

Tier 2 FSAR Section 9.4.1.1 states that all components of the CRACS, are classified Seismic Category I. However, the FSAR Tier 2 Tables 3.2.2-1 and 3.11-1 and Figures 9.4.1-1 through 9.4.1-3 contradict this statement.

Tier 2 FSAR Figures 9.4.1-1, 9.4.1-2, and 9.4.1-3 show that many of the fire dampers and their associated ductwork are classified as Seismic Category II and electric heaters classified as non-seismic. This is contrary to the statement in Tier 2 FSAR Section 9.4.1.1 that all components of the CRACS are safety-related and designed to Seismic Category I. Additionally, Tier 2 FSAR Table 3.2.2-1 and 3.11-1 list some components NSC, NS-AQ and Seismic Category II.

Tier 1 FSAR Table 2.6.1-2 and Tier 2 Tables 3.2.2-1 and 3.11-1 lists two motorized dampers in the Division 2 – Air Intake Train 2 and Division 3 – Air Intake Train 3, but FSAR Tier 1, Figure 2.6.1-1 shows only one motorized damper in trains 2 and 3 as does FSAR Tier 2, Figure 9.4.1-2.

CONCERNS:

(1) Figure numbers and titles in Tier 2 FSAR Figures 9.4.1-1 and 9.4.1-2 should be corrected.

(2) Statements regarding the seismic classification of CRACS components shown in Tier 2 FSAR Figures 9.4.1-1, 9.4.1-2 and 9.4.1-3 and Tables 3.2.2-1 and 3.2.11-1 with Tier 2 FSAR Section 9.4.1.1 should be reconciled.

(3) Reconcile the equipment listed in Tier 2 FSAR Tables 3.2.2-1 and 3.11-1 with Figures 9.4.1-1 through 9.4.1-3.

**Response to Question 09.04.05-1 (#1):**

***Concern 1***

The titles for U.S. EPR FSAR Tier 2, Figures 9.4.1-1 and 9.4.1-2, will be corrected.

***Concern 2***

Statements regarding the seismic classification of control room air conditioning system (CRACS) fire dampers, ductwork and electric heaters have been reconciled and will be revised in U.S. EPR FSAR Tier 1, Figures 2.6.1-1, 2.6.1-2, and 2.6.1-3, U.S. EPR FSAR Tier 2, Figures 9.4.1-1, 9.4.1-2, and 9.4.1-3, and also U.S. EPR FSAR Tier 2, Tables 3.2.2-1, 3.10-1, and 3.11-1 and U.S. EPR FSAR Tier 2, Section 9.4.1.1.

***Concern 3***

The train 2 and train 3 outside air intakes have been removed. The train 2 and 3 intakes are not required for either normal or emergency operation of the CRACS. The train 1 and 4 intakes (each with a filtered and unfiltered inlet) will provide fresh outside air and pressurization for the control room envelope (CRE) during both normal and emergency operation.

Inconsistencies concerning the number of motor-operated dampers in train 2 and train 3 outside air intakes have been resolved. Revisions will be made to U.S. EPR FSAR Tier 1, Figures 2.6.1-1, 2.6.1-2, and 2.6.1-3, U.S. EPR FSAR Tier 2, Figures 9.4.1-1, 9.4.1-2, and 9.4.1-3, U.S. EPR FSAR Tier 2, Tables 3.2.2-1, 3.10-1, and 3.11-1 and U.S. EPR FSAR Tier 2, Section 9.4.1.1.

***Reply to Other Design Concerns / Resolutions***

As a result of this RAI, other modifications were made to the CRACS design, as follows:

- The pressure control dampers (30SAB 01/04 AA012) originally were located at the discharge of the CRACS air handling unit. To improve the ability of the pressure control dampers to effectively control pressure in the CRE, the pressure control dampers have been placed in a duct that is located close to the outside air inlet. The pressure control dampers for train 2 and 3 have been removed because they are not required due to removal of outside air intake for trains 2 and 3. Refer to U.S. EPR FSAR Tier 1, Figures 2.6.1-1, 2.6.1-2, and 2.6.1-3, and U.S. EPR FSAR Tier 2, Figures 9.4.1-1, 9.4.1-2, and 9.4.1-3, as well as U.S. EPR FSAR Tier 2, Tables 3.2.2-1 and 3.11-1.

- The unfiltered outside air inlet preheater was located upstream from the prefilter. Airborne particulate and debris pulled in with the unfiltered outside air could collect on the electric heater element while out of service in the summer months. When the heater is operated in the winter there is the potential that the hot heater element could ignite combustible debris that collected on the element. A similar concern was discovered with the CREF electric heating coils located upstream of the CREF prefilters. Installation of these heaters upstream of the filters does not meet the guidelines of ASME AG-1. To resolve these concerns, the unfiltered outside air inlet prefilter has been relocated upstream of the outside air preheater. In addition, the CREF prefilter has been relocated upstream of the CREF electric heating coil.

- The CRACS air handling unit humidifiers (30SAB 01/02/03/04 AH002) have been removed. The humidifiers were non-safety and are not required for operation of equipment or personnel within the CRE rooms.

- The CRE recirculation duct to the CREF filtration unit has been rerouted to provide redundant damper isolation between the outside and the CRE pressure boundary

- Isolation dampers on ducts that exhaust from the kitchen/restrooms were located adjacent to each other and have been upgraded to safety related to provide redundant closure of this exhaust during emergency operation and to correct inconsistent classification of ducting between U.S. EPR FSAR Tier 1, Figure 2.6.1-3, U.S. EPR FSAR Tier 2, Figure 9.4.1-3 and U.S. EPR FSAR Tier 2, Table 3.11-1.

The preceding changes will be made to U.S. EPR FSAR Tier 1, Section 2.6.1, Table 2.6.1-2 and Figures 2.6.1-1, 2.6.1-2, and 2.6.1-3, and to U.S. EPR FSAR Tier 2, Figures 9.4.1-1, 9.4.1-2, and 9.4.1-3, and Tables 3.2.2-1, 3.10-1, and 3.11-1 and Sections 6.4.2.2, 9.4.1.1, 9.4.1.2.1, 9.4.1.2.2, 9.4.1.2.3, and 14.2.12 (Test #082).

U.S. EPR FSAR Tier 2, Chapter 16 Technical Specifications Sections 3.7.10, Bases Section B3.7.10 and 3.7.11, Bases Section B3.7.11 will also be changed to reflect these modifications (see the response to RAI Questions 09.04.05-1.3 and 09.04.05-1.4).

The CRACS will continue to meet 10 CFR 50, GDC 4 and GDC 19 requirements for habitability and pressurization of the CRE.

**FSAR Impact:**

U.S. EPR FSAR Tier 1, Figures 2.6.1-1 and 2.6.1-2, and U.S. EPR FSAR Tier 2, Figures 9.4.1-1, 9.4.1-2 and 9.4.1-3 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR FSAR Tier 1, Tables 2.6.1-1 and 2.6.1-2, and U.S. EPR FSAR Tier 2, Tables 3.2.2-1, 3.10-1, and 3.11-1 will be revised as described in the response and indicated on the enclosed markup.

In addition, U.S. EPR FSAR Tier 1, Section 2.6.1 and U.S. EPR FSAR Tier 2, Sections 6.4.2.2, 9.4.1.1, 9.4.1.2.1, 9.4.1.2.2, 9.4.1.2.3, 14.2.12 (Test #082) and Chapter 16 Technical Specifications Section B3.7.10 and B3.7.11 will be revised as described in the response and indicated on the enclosed markup.

**Question 09.04.05-1:**

2. CRACS capacity

GDC-4 requires the CRACS to be appropriately protected against dynamic effects of missiles and pipe break and be designed to accommodate the effects of, and to be compatible with, the environmental conditions of normal operation, maintenance, testing, and postulated accidents.

FSAR Tier 2 Section 9.4.1.1 states that the CRACS components are appropriately protected against dynamic effects and designed to accommodate the effects of, and be compatible with, the environmental conditions of normal operation, maintenance, testing, and postulated accidents.

In regard to physical separation of system trains, FSAR Tier 2 Section 9.4.1.2.1 provides the following:

- The air intake subsystem consists of two identical fresh air intake trains for each division which are physically separated.
- The two iodine filtration trains located separately in the SB divisions two and three (one train in each division) are in parallel with the associated air intake trains.
- The four recirculation air handling units are located in the SB divisions two and three (two trains in each division).

From the description, it is not clear if the two individual trains in a division are physically separated.

FSAR Tier 2 Section 9.4.1.2.3 indicates that during normal operation two of the four trains are in operation. This would seem to indicate that each train has a capacity of 50%; however, FSAR Tier 2 Section 16 Technical Specification B3.7.10 indicates the capacity of each train is 75%.

The applicant states in Tier 2 FSAR Section 16, Technical specification B 3.7.11, with one division out of service for maintenance and second lost to single failure, the two operable CRACS trains maintain the MCR temperature. However, if both trains in a division are lost, the P&ID (Tier 2 FSAR Figure 9.4.1-3) shows no supply air flow to half the CRE areas.

In view of the above, please respond to the following:

1) Confirm that the recirculation air handling units in each division are physically separated.
2) Confirm that the iodine filtration train are physically separated from the parallel associated intake train.
3) Include the capacity of the individual air recirculation trains in to FSAR Tier 2 Section 9.4.1.
4) Verify that the design temperature is maintained through out the MCR with both trains in a division out of service.

**Response to Question 09.04.05-1 (#2):**

***Item 1***

The recirculation air handling unit in each division (train) is physically separated. Each air handling unit has an interconnecting duct to pull air from a common recirculation plenum and supply air to a common supply plenum. Each recirculation air handling unit has a check damper at the fan exhaust to isolate the air handling unit when not in operation. The recirculation air handling unit also has an inlet damper (manually operated) to isolate the unit when in maintenance.

U.S. EPR FSAR Tier 2, Figures 9.4.1-1, 9.4.1-2, and 9.4.1-3 and U.S. EPR FSAR Tier 1, Figures 2.6.1-1, 2.6.1-2, and 2.6.1-3 will be revised to clarify the common supply and recirculation air plenum interconnection to the control room air conditioning system (CRACS) (refer to the response to Question 09.04.05-1.1).

U.S. EPR FSAR Tier 2, Section 9.4.1.2.1 (General Description -Recirculation Air Handling Subsystem and the Air Supply and Recirculation Subsystem) will be revised for clarity to indicate that the recirculation supply plenums are open between all four CRACS units. In addition, the CRACS air handling unit humidifiers have been removed.

***Item 2***

The control room emergency filtration (CREF) iodine filtration units in both trains 1 and 4 are physically separated. During emergency operation, each CREF iodine filtration unit operates in a filtered alignment (outside air travels through the CREF filtration unit) with the unfiltered (bypass) motor-operated dampers closed. During normal operation, the CREF filtration units in both trains 1 and 4 operate in an unfiltered (bypass) alignment. In the unfiltered (bypass) alignment, unfiltered outside air bypasses the CREF iodine filtration unit.

In the unfiltered (bypass) alignment, the CREF inlet, outlet and control room envelope (CRE) recirculation dampers close to isolate the CREF filtration unit. These dampers provide redundant isolation. Additionally, each CREF filtration unit has a check damper to isolate the CREF filtration unit when not in operation.

In the filtered alignment, two motor-operated isolation dampers (located in the unfiltered bypass duct) provide redundant single-failure protection to prevent outside air from bypassing the CREF filtration unit. The design has been revised to add both a second unfiltered bypass motor-operated damper and to remove unfiltered outside air inlets for trains 2 and 3 because these inlets are not required for either normal or emergency operation.

U.S. EPR FSAR Tier 2, Figures 9.4.1-1, 9.4.1-2, and 9.4.1-3 and U.S. EPR FSAR Tier 1, Figures 2.6.1-1, 2.6.1-2, and 2.6.1-3 will also be revised (refer to the response to Question 09.04.05-1.1).

The system description in U.S. EPR FSAR Tier 2, Section 9.4.1.2.1 (Iodine Filtration Train Subsystem) will be revised based on the design changes described and for improved clarity.

The description of normal and abnormal operation in U.S. EPR FSAR Tier 2, Section 9.4.1.2.3 will also be revised (refer to the response to Question 09.04.05-1.1).

***Item 3***

During normal and emergency operation, each CRACS cooling unit provides 50 percent of the cooling for the rooms within the CRE, but each CRACS air handling unit is capable of cooling up to 75 percent of the normal and emergency cooling load. The total cooling capacity of each CRACS air handling unit has been increased from 50 percent to 75 percent to allow a single CRACS air handling unit to cool the CRE rooms during a station blackout (SBO) event. During an SBO, the single CRACS air handling unit will prevent the CRE room temperature from exceeding 104°F.

The description in U.S. EPR FSAR Tier 2, Section 9.4.1.2.1 (General Description - Recirculation Air Handling Subsystems) will be revised for clarity.

***Item 4***

The design has been modified so that the supply plenum located in Safeguard Building 2 is interconnected and open to the supply plenum located in Safeguard Building 3. Likewise, the recirculation plenum located in Safeguard Building 2 is interconnected and open to the recirculation plenum located in Safeguard Building 3. CRACS air handling units for trains 1 and 2 are located in Safeguard Building 2, while CRACS air handling units for trains 3 and 4 are located in Safeguard Building 3. Each air handling unit has a duct that connects to both the common supply and recirculation plenums. Any two of the four CRACS air handling units can operate while the other two CRACS air handling units are isolated by a check damper at the discharge of the air handling unit fan. The supply air of the operating units intermixes in the supply plenum and in a single supply duct as the air flows to the supply distribution duct and registers that supply air to each room within the CRE. Air pulled from the CRE rooms is also mixed in the common recirculation plenum. The mixing of the air in the supply and recirculation plenums and the supply duct will allow cool air to be supplied to all of the CRE rooms with any two of the four CRACS air handling units in operation.

Revisions to U.S. EPR FSAR Tier 1, Figures 2.6.1-2, and 2.6.1-3 and to U.S. EPR FSAR Tier 2 Figures 9.4.1-2, and 9.4.1-3 are provided in the markups associated with the response to Question 09.04.05-1.1.

**FSAR Impact:**

U.S. EPR FSAR Tier 2, Section 9.4.1.2.1 will be revised as described in the response and indicated on the enclosed markup.

**Question 09.04.05-1:**

3. Abnormal conditions in CRM

GDC 19 requires adequate protection to permit access to and occupancy of the control room under accident conditions. GDC 60 requires capability to suitably control release of gaseous radioactive effluents to the environment.

Tier 2 FSAR Section 9.4.1.1 states the CRACS outside air intake is capable of detecting radiation, smoke, and toxic chemicals; however, no smoke detectors are identified in the P&IDs.

Tier 2 FSAR Section 9.4.1.2 states in the event of an external fire, external toxic gas release, smoke, or excessive concentration of CO and CO2, outside air to the CRACS is isolated manually or automatically and the system operates in full recirculation mode without fresh air. The stated method of isolation is not clear.

The applicant states in Tier 2 FSAR Section 16 Technical Specification B 3.7.10 that one CREF operating at a flow rate of < 4000 cfm will pressurize the CRE to ≥ 0.125 inches water gauge relative to all external areas adjacent to the CRE boundary. This statement is misleading in several aspects: 1) in order to maintain the CRE pressurized some amount of outside air must be supplied, and 2) the total flow rate has little to do with the ability to pressurize the CRE.

With respect to SRP 9.4.1, a failure modes and effects analysis (FMEA) of the U.S. EPR Main Control Room Air Conditioning System was performed to determine if the safety-related portion of the system is capable of functioning in spite of the loss of any active component. The FMEA reviewed Tier 2 FSAR Figures 9.4.1-1 through 9.4.1-3. The review identified that the loss of a fan in either of the Division 2 or 3 iodine filter trains following a design basis accident will severely limit the ability to clean up any airborne contamination that occurs in the rooms serviced by that train. Although the opposite train is assumed to function, the airflows in and out of each room are balanced, thereby minimizing any mixing between rooms.

The review also identified that there is only a single exhaust path from each of the rooms within the Control Room Envelope (CRE), except the Computer Room. Assuming a single active failure causes an exhaust damper to fail closed, that room would experience a significant reduction of supplied conditioned air. After some period, it would be expected the room design temperature would be exceeded.

The review identified that there is only a single isolation damper between the potentially contaminated inlet air and the recirculation train. When the CRACS system realigns for high radiation in the air inlet, a single failure of damper 30SAB01AA003 or 30SAB04AA003 to close provides a potential path for airborne contamination around the iodine filtration train.

In view of the above, please respond to the following:

a. Identify the locations of smoke detectors on the P&IDs (Tier 2 FSAR Figures 9.4.1-1 through 9.4.1-3).
b. Clarify the reaction of the system to each of the following: external fire, external toxic gas release, smoke, or excessive concentration of CO and CO2.

c. Clarify the Tier 2 Section 16 Technical Specification B 3.7.10 statement regarding pressurization of the CRE by the CREF.

d. Demonstrate that adequate atmospheric cleanup of all CRE rooms when one iodine filtration train is out of service.

e. Demonstrate that there is adequate temperature and humidity control in the CRE rooms when an exhaust path is out of service.

f. Assure that the system does not require modification to eliminate the potential bypass of the iodine filtration train.

**Response to Question 09.04.05-1 (#3):**

**Item (a)**

U.S. EPR FSAR Tier 2, Figures 9.4.1-1, and 9.4.1-2 will be revised to add smoke detectors (See the response to Question 09.04.05-1.1).

***Item (b)***

The discussion in U.S. EPR FSAR Tier 2, Section 9.4.1.2.3, will be revised to clarify the reaction of the system to the receipt of external fire, external toxic gas release, smoke or excessive concentrations of CO and $CO_2$. The CO and $CO_2$ monitoring has been added to the function of the toxic gas monitor. The toxic gas monitor automatically closes the outside air intake at the inlet location where the toxic gas is detected. This prevents a failure of a single toxic gas monitor from closing both outside air intakes. Closure of the outside air damper at the site of the toxic gas event continues to allow the control room envelope (CRE) area to meet environmental habitability requirements.

The title within one subsection of U.S. EPR FSAR Tier 2, Section 9.4.1.2.3 will be changed from "Operation during External Fire, Smoke or Toxic Gas Release" to "Operation during External Fire or Smoke Release". The title is being changed to remove "Toxic Gas Release" because a toxic gas event is discussed in a separate paragraph in this FSAR section.

***Item (c)***

U.S. EPR FSAR Tier 2, Chapter 16 Technical Specifications Bases Section B3.7.10 will be revised to clarify that the CRE is pressurized by the outside intake air.

***Item (d)***

Tier 1 FSAR Figures 2.6.1-2, 2.6.1-3 and Tier 2 FSAR Figures 9.4.1-2 and 9.4.1-3 (see response to Question 09.04.05-1.1) will be revised to show that the outside inlet air from either train 1 or 4 inlet (operating in filtered or unfiltered bypass) will go into a common recirculation plenum. Any two of the four CRACS air handling units can pull air from the common recirculation plenum. The revision will also show that any two of the four operating CRACS air handling units will supply air into a common supply plenum. This common supply duct goes to a duct distribution system that supplies the CRE rooms.

With a failure of either of the CREF iodine filtration units, the remaining iodine filter train continues to clean up airborne contamination in both the outside air and the recirculation air from the CRE. The CREF filtration unit booster fan supplies this clean outside air to a common recirculation plenum where the air mixes with air from the CRE. The operation of any two of the CRACS air handling units pulls air from this common recirculation plenum through the CRACS air handling units, then supplies this to a common supply duct where it intermixes in a common supply duct. The clean supply air is then distributed to all of the CRE rooms.

***Item (e)***

All components in the CRE return air ducting are passive components and are not subject to a single active failure. The return air dampers are manually operated. The fire dampers in the return air ducting were incorrectly shown as having motor operators. This will be corrected in Tier 2 FSAR Figure 9.4.1-3 (see response to Question 09.04.05-1.1).

***Item (f)***

Due to the identified single failure concern, the design was changed to add a second CREF unfiltered bypass duct motor operated isolation damper (30SAB01AA003 or 30SAB04AA003) for each of the CREF iodine filter units.

Tier 2 FSAR Figure 9.4.1-1 and Tier 1 FSAR Figure 2.6.1-1 will be revised (see response to Question 09.04.05-1.1) to show a second motor operated isolation damper in the CREF unfiltered bypass ducting.

**FSAR Impact:**

U.S. EPR FSAR Tier 2, Section 9.4.1.2.3 will be revised as described in the response and indicated on the enclosed markup.

**Question 09.04.05-1:**

4. Two CRACS air conditioning trains fail in the same SB division

There are two CRACS trains in SB division 2, and another two CRACS trains in SB division 3. If both CRACS trains in the same SB division fail, no supply air flow to half the CRE areas. The air flows in and out of each Control Room area are prebalanced, thereby minimizing any mixing between areas.

Tech. Spec. B 3.7.11 Control Room Air Conditioning System, Applicable Safety Analysis: ……During emergency operation, one train is assumed to be out for maintenance and a second train is assumed lost to single failure. The two OPEABLE CRACS trains maintain the MCR temperature between 65$^{o}$F to 75$^{o}$ F.

Tech. Spec. 3.7.11 Control Room Air Conditioning System, ACTIONS:

One or two CRACS trains inoperable – Restore the inoperable CRACS train(s) to OPERABLE status in 30 days;

Three or more CRACS trains inoperable in MODE 5 or 6 or during movement of irradiated fuel assemblies – Suspend movement of irradiated fuel assemblies;

Three or more CRACS trains inoperable – Enter LCO 3.0.3.

Justify not addressing in the Tech. Spec. the situation of two CRACS trains in the same SB division are inoperable.

Propose Tech. Spec. as appropriate, or justify that Tech. Spec. are not required.

**Response to Question 09.04.05-1 (#4):**

The control room air conditioning system (CRACS) air handling units have ducts that interconnect with a common supply plenum. Any two of the four CRACS air handling units operate during both normal and emergency operation. The supply air from the operating air handling units flows into a common plenum and through a single supply duct. The common supply plenum and the single supply duct allow air from any two operating CRACS units to mix and supply cool air to all rooms within the control room envelope (CRE).

U.S. EPR FSAR Tier 1, Figures 2.6.1-2 and 2.6.1-3 and U.S. EPR FSAR Tier 2, Figures 9.4.1-2 and 9.4.1-3 will be revised to show the common supply plenum, the common recirculation plenum, and to show a single supply duct (refer to the response to Question 09.04.05-1.1).

U.S. EPR FSAR Tier 2, Chapter 16 Technical Specifications Section 3.7.11 and Bases Section B3.7.11 will be revised to address both a single train and two trains INOPERABLE separately.

**FSAR Impact:**

U.S. EPR FSAR Tier 2, Chapter 16 Technical Specifications Section 3.7.11 and corresponding bases will be revised as described in the response and indicated on the enclosed markup.

**Question 09.04.05-1:**

5. FBVS drawing discrepancies

1. There are discrepancies in equipment listed in FSAR Tier 1, Table 2.6.4-1 and FSAR Tier 2, Table 3.2.2-1 as follows:

   FSAR Tier 1, Table 2.6.4-1 (on 3rd sheet) lists the following equipment tag numbers as Seismic I and ASME AG-1, but they are not in FSAR Tier 2, Table 3.2.2-1;

   - Air Cooling Coils; 30KLL61/64AC001-003
   - Moisture Separators; 30KLL61/64AT001-002

2. There are drawing discrepancies between Tier 1 FSAR Figure 2.6.4.1 and Tier 2 FSAR Figure 9.4.2-1.

   a. In Tier 1 FSAR Figure 2.6.4-1, the Recirculation Cooling Units, Extra Borated Pump Room Cell 4 (lower right of drawing), and Cell 5 (lower left of drawing) indicate SCW as the cooling water interface. For the same equipment depicted in Tier 2 FSAR Figure 9.4.2-1, it indicates QKF as cooling water interface.

   b. Tier 1 FSAR Figure 2.6.4-1, the Recirculation Cooling Units, Fuel Pool Pump Room Cell 4 (lower right of drawing) indicates CCW as the cooling water interface. For the same equipment depicted in Tier 2 FSAR Figure 9.4.2-1, it indicates KAB as cooling water interface.

   c. For the exhaust ductwork connected to SBVS (vertical run on drawings) Tier 1 FSAR Figure 2.6.4-1 indicates ductwork between valve group 30KLL21/24AA004 as seismic class N/A, but Tier 2 FSAR Figure 9.4.2-1 indicates this same ductwork as seismic class I.

Justify or correct these discrepancies.

**Response to Question 09.04.05-1 (#5):**

1. The safety classification, quality group classification, and seismic category of the components in U.S. EPR FSAR Tier 2, Table 3.2.2-1 will be revised. In addition, the KKS System or Component Code column for the recirculation cooling units in FAK and JDH pump rooms will be revised. The recirculation cooling units are comprised of a cooling coil (AC), moisture separator (AT), and fan (AN). The component codes column for the recirculation cooling units for the fuel pool cooling system (FAK) pump rooms are listed as 30KLL61/64 AC/AT/AN 002-003 and for the extra borating system (JDH) pump rooms as 30KLL61/64 AC/AT/AN 001.

   U.S. EPR FSAR Tier 1, Table 2.6.4-1 will be revised to include moisture separators (30KLL61AT002, 30KLL61AT002, 30KLL61AT002, and 30KLL61AT002) for the Recirculation Cooling Units in the Fuel Pool Cooling System Pump Rooms.

   This resolves discrepancies in equipment listing between U.S. EPR FSAR Tier 1, Table 2.6.4-1, and U.S. EPR FSAR Tier 2, Table 3.2.2-1.

2. The design area, quality group, and seismic class in U.S. EPR FSAR Tier 1, Figure 2.6.4-1 and U.S. EPR FSAR Tier 2, Figure 9.4.2-1 will be revised. In addition the water supply to the recirculation cooling units in the fuel pool pump rooms will be changed from component cooling water (CCW or KAB) to the safety chilled water (SCW or QKF). The moisture separator symbols are also shown for the recirculation cooling units in the fuel pool pump rooms.

   U.S. EPR FSAR Tier 2, Section 9.4.2.1 (Design Basis)will be updated to clarify the safety-related and seismic category requirements.

   These changes resolve the drawing discrepancies between U.S. EPR FSAR Tier 1. Figure 2.6.4-1 and U.S. EPR FSAR Tier 2, Figure 9.4.2-1.

**FSAR Impact:**

U.S. EPR FSAR Tier 1, Table 2.6.4-1 and Figure 2.6.4-1will be revised as described in the response and indicated on the enclosed markup. U.S. EPR FSAR Tier 2, Table 3.2.2-1, Figure 9.4.2-1, and Section 9.4.2.1 will also be revised as described in the response and indicated on the enclosed markup.

**Question 09.04.05-1:**

6. <u>FBVS pool boiling</u>

RG 1.13, Rev 2, Position C.4, Confinement and Filtering Systems recommends that a controlled-leakage building should enclose the fuel to limit the potential release of radioactive iodine and other radioactive materials. If necessary to limit offsite dose consequences from a fuel handling accident or spent fuel pool boiling, the building should include an engineered safety feature filtration system that meets the guidelines outlined in Regulatory Guide 1.52. Additionally, this guide presents the conditions necessary to allow coolant boiling, including the ability of the pool structure and liner to withstand coolant boiling and the ability of the ventilation system to keep safety-related components safe from the effects of high temperatures and moisture.

There is no statement in Tier 1 FSAR or Tier 2 FSAR that FBVS is designed for pool boiling. Provide the impact of pool boiling on the FBVS.

Moisture Removal: There was no evidence of the capability to remove moisture in the ESF Filter Systems as required by RG 1.52. For example, HVAC diagrams do not show moisture removal components such demisters or moisture separators and drains. This is especially important for the FBVS supply to the ESF filters in the Safeguard Building Ventilation System (SBVS) diagrams (e.g., Tier 2 FSAR Figure 9.4.5-2). The FBVS is the ventilation system for the area of the spent fuel pool which is designed for bulk pool boiling. Justify no showing the moisture removal components for the ESF Filters in the SBVS that support FBVS (and the capability for bulk pool boiling) show.

**Response to Question 09.04.05-1 (#6):**

***FBVS pool boiling***

Spent fuel pool (SFP) boiling need not be considered in the design of U.S. EPR fuel building ventilation system (FBVS) based on the following justification:

- The U.S. EPR fuel pool cooling system (FPCS) is designated as safety related and Seismic Category I. The FPCS is also capable of removing the maximum spent fuel pool (SFP) heat load following a single failure. Therefore, per SRP 9.1.3, Spent Fuel Pool Cooling and Cleanup System (Revision 2 – March 2007), the FBVS need not be designed for SFP boiling conditions.

***Moisture Removal:***

The engineered safety feature (ESF) filters in the safeguard building ventilation system (SBVS) that support FBVS do not have to be designed for bulk pool boiling. The response to RAI 135, Question 09.04.05-1.13 addresses moisture removal for the SBVS during other operational events.

**FSAR Impact:**

The U.S. EPR FSAR will not be changed as a result of this question.

**Question 09.04.05-1:**

7. NABVS & RWBVS clean up system design

Tier 2 FSAR Sections 9.4.3.1 and 9.4.8 did not include the air-flow rates for the cleanup units and system leakage rates. This information is recommended in Regulatory Guide 1.140.

Provide the maximum air flow rates for the cleanup units (NABVS & RWBVS).

Regulatory Guide 1.140 recommends the monitoring of pertinent pressure drops and flow rates. The P&ID's do show differential pressure measurements across filters for the NABVS and RWBVS. There is very little instrumentation shown with regards to measuring flow rates. Also, there appears to be no system pressure monitoring for the NABVS. Confirm that the pressure and flow indication currently shown on the P&ID's for the NABVS and RWBVS is correct. If this indication is correct, justify that you meet RG 1.140, Position C3.3.

To maintain the radiation exposure to operating and maintenance personnel as low as is reasonably achievable (ALARA), normal atmosphere cleanup systems and components should be designed to control leakage and facilitate maintenance, inspection and testing, RG 1.140, Position C3.4. This information was not provided for the NABVS and RWBVS; therefore, compliance with RG 1.140, Position C3.4 can not be determined. Provide the information required to meet Regulatory Guide 1.140, Position C3.4.

Tier 2 FSAR Section 9.4.8.2.1 on the Radioactive Waste Building Ventilation System did not provide evidence that protective devices such as louvers, grills and screens are used to minimize the infiltration of contaminants from outdoor air intake openings. Provide the information required to meet Regulatory Guide 1.140, Position C3.5.

**Response to Question 09.04.05-1 (#7):**

***Air Flow Rates and System Leakage Rates***

The air flow rate of a single filtration train will be limited to approximately 30,000 cfm maximum as recommended in RG 1.140, Position C.3.2. U.S. EPR FSAR Tier 2, Sections 9.4.3.1 and 9.4.8.1, already include a reference to GDC 60 and RG 1.140. However, these sections will be revised to include a statement that the air flow rate of a single cleanup filtration unit will not exceed 30,000 cfm.

The system leakage rates are included as a part of the "Inspection and Testing Requirements" in U.S. EPR FSAR Tier 2, Section 9.4.3.4 for the nuclear auxiliary building ventilation system (NABVS) and Section 9.4.8.4 for the radioactive waste building ventilation system (RWBVS). These sections state that the initial in-place acceptance testing will be performed in accordance with ASME AG-1-2003 and ASME N510-1989.

The leak-tightness requirements of the high efficiency particulate air (HEPA) filters and adsorbers are included in the "Component Description" in U.S. EPR FSAR Tier 2, Sections 9.4.3.2.2 (NABVS) and 9.4.8.2.2 (RWBVS), which state that the periodic in-place testing of HEPA filters or adsorbers to determine the leak-tightness is performed per ASME N510-1989. The activated carbon total bed depth requirement for both the NABVS and RWBVS will be 2 inches with a maximum assigned activated carbon decontamination efficiencies of 95 percent as listed in Table 1 of RG 1.140. U.S. EPR FSAR Tier 2, Sections 9.4.3.2.2 (NABVS) and 9.4.8.2.2 (RWBVS) will be revised to include this statement.

***Pressure Drop and Flow Rates***

RG 1.140, Position C.3.3 requires that the atmosphere cleanup systems should be instrumented to monitor and alarm pressure drops and flow rates.

The differential pressure monitoring instruments are already installed on HEPA filters and iodine filters (adsorbers). Overall pressure drop across the filter units is shown in U.S. EPR FSAR Tier 2, Figures 9.4.3-3 and 9.4.3-4 (NABVS), and Figure 9.4.8-2 (RWBVS).

A statement is already included in U.S. EPR FSAR Tier 2, Section 9.4.8.5 for the RWBVS that all instrumentation provided with the filtration units is as required by RG 1.140. U.S. EPR FSAR Tier 2, Section 9.4.3.5 will be revised to add a similar statement for the NABVS.

U.S. EPR FSAR Tier 2, Figures 9.4.3-3 and 9.4.3-4 (NABVS) and Figure 9.4.8-2 (RWBVS) will be revised to add flow rate element sensors.

***ALARA Concerns***

RG 1.140, Position C.3.4 addresses the as low as reasonably achievable (ALARA) concept for the normal atmosphere cleanup systems and components. This requirement is already addressed in several sections of U.S. EPR FSAR Tier 2, Chapter 12.

*From Section 12.3.1.9.2 – Particulate Filters:*

> “The ventilation system is designed to minimize dose resulting from service, testing, inspection, decontamination, and replacement of components. The components have sufficient space around them to provide ready access and to expedite work on these units.”

*From Section 12.3.3.3 – Protective Design Features:*

> “Access and service of ventilation systems in potentially radioactive areas is controlled by component location to minimize personnel exposure during maintenance, inspection, and testing. The air cleaning system design, maintenance, and testing criteria are designed in accordance with the regulatory criteria contained in RG 1.52 (post-accident engineered safety features atmosphere cleanup systems) and RG 1.140 (normal atmosphere cleanup systems).”

*From Section 12.3.3.3 – Protective Design Features:*

> “The facility layout provides dedicated rooms for HVAC filter housings and provides sufficient space for conducting HVAC maintenance activities, such as filter change-outs and bagging of filters.”

The ALARA concept addressed in U.S. EPR FSAR Tier 2, Chapter 12, as described above, meets the ALARA requirements for the NABVS and RWBVS atmospheric cleanup systems, as required by RG 1.140, Position C.3.4.

***Outdoor Air Intake Openings***

To meet the requirements of RG 1.140, Position C.3.5, U.S. EPR FSAR Tier 2, Section 9.4.8.2.1 will be revised to include the statement:

> "The outside air is provided through intake mesh grilles and louver dampers. The outside air intake openings are equipped with electrically heated and weather-protected grilles to prevent ice formation and ingress of insects and debris."

**FSAR Impact:**

U.S. EPR FSAR Tier 2, Sections 9.4.3 and 9.4.8 and Figures 9.4.3-3, 9.4.3-4 and 9.4.8-2 will be revised as described in the response and indicated on the enclosed markup.

**Question 09.04.05-1:**

10. TBVS design information

NUREG 0800 identifies general design criteria applicable to safety related portions of the turbine building ventilation system (such as GDC-60 on controlled release of radioactive material to the environment). However, the FSAR does not provide sufficient detail to make an independent judgment that the system is not safety related.

Regulatory Guide 1.206, page C.IV.1-3, Item 2, with respect to Chapter 9, Auxiliary Systems, states that it is expected that reactors will reflect through their design, construction, and operation an extremely low probability for accidents that could result in the release of significant quantities of radioactive fission products. The descriptions shall be sufficient to permit understanding of the system designs and their relationship to safety evaluations.

Tier 2 FSAR Section 9.4.4, Turbine Building Ventilation System provides a single paragraph description of the TBVS stating what the system does. However, no design information (e.g., number of fans, use of filters or charcoal) or design criteria (redundancy, diverse power supplies, design temperatures of the building equipment) is provided. This section concludes that the TBVS is classified as a non-safety related system, and it does not provide accident response nor radioactive effluent control functions for the U.S. EPR. Sufficient information to confirm this statement is not provided. Also, no interface requirements have been provided to assure an acceptable TBVS will be designed to meet minimum building and component requirements.

Provide the basis for concluding the TBVS is not safety related. For example, reference evaluations that have been performed to conclude that the system is not needed to filter radioactive materials following a steam generator tube rupture. Also, provide the interface requirements for the COL applicants to assure that Turbine Building temperatures will adequately support equipment operations to preclude challenges to reactor safety systems (such as caused by trips of main feedwater pumps on high turbine building temperatures). Interface requirements are also needed to assure that COL applicants submit sufficient design information to confirm minimum TBVS capabilities.

**Response to Question 09.04.05-1 (#10):**

The turbine building ventilation system (TBVS) provides heating and ventilation in the Turbine Building (UMA) and heating, ventilation and cooling in the Electrical Switchgear Building (UBA) for normal operating modes as well as during refueling outages. The heating, ventilation and air conditioning for these buildings is achieved by various systems to satisfy the varying requirements of the equipment heat loads, personnel comfort, process extraction and so forth. This system provides a source of ventilation, heating and cooling to the U.S. EPR systems located in the Turbine Building. The systems are sized to provide the heating and cooling requirements for all conditions of operation, including shutdown conditions. These systems are generally interdependent in order to maintain a balanced supply and exhaust air volume at a required temperature and to maintain a slight positive pressure.

The TBVS is not required to provide accident response or radioactive effluent control functions for the U.S. EPR. In the event of a steam generator tube rupture (SGTR), potentially contaminated air/steam is discharged to the condensers. Air and other non-condensable gases from the Low Pressure (LP), Intermediate Pressure (IP), and High Pressure (HP) condensers are removed by the condenser evacuation system (MAJ) (refer to U.S. EPR FSAR Tier 2, Section 15.0.3.6). Thus, filtration of the Turbine Building atmosphere is not required for an SGTR and the TBVS is not safety-related. On this basis, a COL interface requirement is not required for the TBVS.

**FSAR Impact:**

The U.S. EPR FSAR will not be changed as a result of this question.

**Question 09.04.05-1:**

13. SBVS moisture separator

GDC 60 requires the Engineered Safety Function Ventilation System (ESFVS) to be capable of suitably controlling release of gaseous radioactive effluents to the environment.

FSAR Tier 2 Section 9.4.5.1 states that the release of radioactive materials to the environment is controlled by meeting the guidance of RG 1.52 (position C.3). RG 1.52 paragraph C3.1 recommends the installation of a moisture separator prior to the heater to remove entrained water droplets from the inlet air stream, thereby protecting HEPA filters and iodine absorbers from water damage and plugging.

FSAR Tier 2 Chapter 16 Section B 3.7.12 states the pre-filters remove any large particles in the air and any entrained water droplets present to prevent excessive loading of the HEPA filters and carbon absorbers. Installing the heaters upstream of the pre-filters essentially negates the moisture removal function of the pre-filters.

a. Justify the omission of a moisture separator in the SBVS accident exhaust iodine filtration trains.
b. Justify installing a heater upstream of the SBVS pre-filter with the intent to remove entrained moisture.

**Response to Question 09.04.05-1 (#13):**

The design has been revised to replace the safeguard building ventilation system (SBVS) iodine filtration unit prefilter with a moisture separator and to relocate the preheater downstream of the moisture separator.

The moisture separator is a combination of moisture separator and prefilter. The moisture separator must meet the requirements of RG 1.52, ASME N509 and ASME AG-1. The moisture separator is located upstream of the filter air heater and also upstream of the high efficiency particulate air (HEPA) filter. The moisture separator is qualified by testing in accordance with the procedures described in ASME N509. Moisture separators must be capable of removing at least 99 percent by weight of entrained moisture in an air stream containing approximately 1.5 to 2 lb of entrained water per 1000 cubic feet. Fiberglass knitted media within the moisture separator remove airborne particulates, which prevents the HEPA filters from becoming overloaded during radiological release events. The filters are equipped with local differential pressure measurement which indicates the degree of particulate loading and the need for filter change. The description of the engineered safety feature (ESF) filter systems will be revised in U.S. EPR FSAR Tier 2, Section 6.5.1.2.2 to add information describing the moisture separator. The description of the SBVS in Tier 2, Section 9.4.5 will also be revised similarly. In addition, editorial changes will be made to the equipment names in Tier 1, Table 2.6.6-1, Tier 2, Table 3.2.2-1, and Tier 2, Table 3.10-1 to change the SBVS iodine filtration unit prefilter to a combined prefilter/moisture separator.

The drawings of the safeguard building exhaust air system in both Tier 1 and Tier 2 will be revised to reflect this design change. The symbol legends in Tier 1 and Tier 2 of the U.S. EPR FSAR also will be revised to add a symbol for the moisture separator prefilter. In addition, the

U.S. EPR FSAR Tier 2, Chapter 16 Technical Specifications Bases Section B3.7.12 will be revised to add the moisture separator.

**FSAR Impact:**

U.S. EPR FSAR Tier 1, Table 2.6.6-1, Tier 2, Table 3.2.2-1, and Tier 2, Table 3.10-1 will be revised as described in the response and indicated on the enclosed markup. The text in Tier 2, Sections 6.5.1.2.2, 6.5.4, 9.4.5.2.1, 9.4.5.2.2, 9.4.5.6 and Chapter 16 Technical Specifications Bases Section B3.7.12 will also be revised as described in the response and indicated on the enclosed markup.

U.S. EPR FSAR Tier 1, Figures 1.3-1 and 2.6.6-2, and U.S. EPR FSAR Tier 2, Figures 1.7-1 and 9.4.5-2, will be revised as described in the response and indicated on the enclosed markup.

# U.S. EPR Final Safety Analysis Report Markups

# 2.6 HVAC Systems

## 2.6.1 Main Control Room Air Conditioning System

### 1.0 Description

09.04.05-1.1

The main control room air conditioning system (CRACS) supplies air to the control room envelope (CRE) area which includes the main control room (MCR) and associated rooms.

The CRACS controls the CRE area temperature~~, humidity~~ and air change rate for personnel comfort, personnel safety, and equipment protection during normal plant operation. The CRACS provides cooling, heating, and ventilation for the CRE area to remove equipment heat, and heat generated from other sources. The CRACS also provides heat to maintain a minimum temperature in the CRE area. The CRACS provides a minimal air change rate for the CRE area and controls building pressurization to reduce spreading of contamination.

The CRACS maintains habitability of the CRE areas in case of radioactive or toxic gas contamination of the environment. The CRACS also maintains a positive pressure in the CRE area to prevent infiltration of contaminated outside air. The CRACS operates in recirculation mode with fresh air makeup.

The CRACS provides the following safety-related functions:

- Maintains ambient temperature conditions inside the CRE area during design basis conditions, including a radiological contamination event, or toxic gas contamination of the environment.
- Maintains a positive pressure in the CRE area relative to the adjacent areas to prevent unfiltered in-leakage.

09.04.05-1.1

~~The CRACS provides the following non-safety-related functions:~~

- ~~Maintains acceptable humidity conditions in the CRE area during normal plant operation and plant maintenance.~~

### 2.0 Arrangement

2.1 The functional arrangement of the CRACS is as shown in the following figures:

- Figure 2.6.1-1—Control Room Air Intake and Iodine Filtration Train Subsystem Functional Arrangement.
- Figure 2.6.1-2—Control Room Air Conditioning and Recirculation Air Subsystem Functional Arrangement.
- Figure 2.6.1-3—CRE Air Supply and Recirculation Air Subsystem Functional Arrangement.

2.2 The location of the CRACS equipment is as listed in Table 2.6.1-1—Main Control Room Air Conditioning System Equipment Mechanical Design.

09.04.05-1.1

| Table 2.6.1-1—Main Control Room Air Conditioning System Equipment Mechanical Design (9 Sheets) | | | | | |
|---|---|---|---|---|---|
| **Equipment Description** | **Equipment Tag Number (1)** | **Equipment Location** | **ASME AG-1 Code** | **Function** | **Seismic Category** |
| **Fresh Air Intake Trains 30SAB01 and 30SAB04** | | | | | |
| Motor Operated Dampers | 30SAB01AA002<br>30SAB04AA002 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | Open / Close (“Open for high radiation signal, and “Close” for toxic gas signal) | I |
| Electric Heaters | 30SAB01AH001<br>30SAB04AH001 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | On / Off (based on ambient conditions) | I |
| Motor Operated Dampers | 30SAB01AA003<br>30SAB04AA003 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | Close | I |
| Prefilters | 30SAB01AT001<br>30SAB04AT001 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | N/A | I |
| Manual Dampers | 30SAB01AA006<br>30SAB04AA006 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | N/A | I |
| Motor Operated Dampers | 30SAB01AA012 | Safeguard Building Division 2. | Yes | Open | I |

09.04.05-1.1

Table 2.6.1-1—Main Control Room Air Conditioning System Equipment Mechanical Design (9 Sheets)

| Equipment Description | Equipment Tag Number (1) | Equipment Location | ASME AG-1 Code | Function | Seismic Category |
|---|---|---|---|---|---|
| | 30SAB04AA012 | Safeguard Building Division 3 | | | |
| Fresh Air Intake Trains 30SAB02and 30SAB03 | | | | | |
| Motor Operated Dampers | 30SAB02AA002<br>30SAB03AA002 | Safeguard Building Division 2.<br>Safeguard Building Division 3. | Yes | Close | I |
| Electric Heaters | 30SAB02AH001<br>30SAB03AH001 | Safeguard Building Division 2.<br>Safeguard Building Division 3. | Yes | Off | I |
| Motor Operated Dampers | 30SAB02AA003<br>30SAB03-AA003 | Safeguard Building Division 2.<br>Safeguard Building Division 3. | Yes | Close | I |
| Prefilters | 30SAB02AT001<br>30SAB03AT001 | Safeguard Building Division 2.<br>Safeguard Building Division 3. | Yes | N/A | I |
| Manual Dampers | 30SAB02AA006<br>30SAB03AA006 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | N/A | I |
| **Iodine Filtration Trains 30SAB11 and 30SAB14** | | | | | |

**Table 2.6.1-1—Main Control Room Air Conditioning System Equipment Mechanical Design (9 Sheets)**

| Equipment Description | Equipment Tag Number (1) | Equipment Location | ASME AG-1 Code | Function | Seismic Category |
|---|---|---|---|---|---|
| | | Division 3 | | | |
| Air Cooling Coils | 30SAB01AC001<br>30SAB04AC001 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | N/A | I |
| Moisture Separators | 30SAB01AT004<br>30SAB04AT004 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | N/A | I |
| Supply Air Fans<br>09.04.05-1.1 | 30SAB01AN001<br>30SAB04AN001 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | Run | I |
| HEPA Filters | 30SAB01AT005<br>30SAB04AT005 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | N/A | I |
| ~~Humidifiers~~ | ~~30SAB01AH002~~<br>~~30SAB04AH002~~ | ~~Safeguard Building Division 2.~~<br>~~Safeguard Building Division 3~~ | ~~Yes~~ | ~~N/A~~ | ~~I~~ |
| Back draft Dampers | 30SAB01AA011<br>30SAB04AA011 | Safeguard Building Division 2.<br>Safeguard Building | Yes | N/A | I |

09.04.05-1.1

| Table 2.6.1-1—Main Control Room Air Conditioning System Equipment Mechanical Design (9 Sheets) | | | | | |
|---|---|---|---|---|---|
| Equipment Description | Equipment Tag Number (1) | Equipment Location | ASME AG-1 Code | Function | Seismic Category |
| | | Division 3 | | | |
| Motor Operated Dampers | 30SAB01AA012<br>30SAB04AA012 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | Open | I |
| Recirculation and Air Conditioning Trains 30SAB02 and 30SAB03 | | | | | |
| Manual Dampers (recirculation from CRE) | 30SAB02AA009<br>30SAB03AA009 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | N/A | I |
| Manual Dampers (recirculation from CRE) | 30SAB02AA010<br>30SAB03AA010 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | N/A | I |
| Air Cooling Coils | 30SAB02AC001<br>30SAB03AC001 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | N/A | I |
| Moisture Separators | 30SAB02AT004<br>30SAB03AT004 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | N/A | I |
| Supply Air Fans | 30SAB02AN001 | Safeguard Building Division 2. | Yes | Stop | I |

**Table 2.6.1-1—Main Control Room Air Conditioning System Equipment Mechanical Design (9 Sheets)**

09.04.05-1.1

09.04.05-1.1

| Equipment Description | Equipment Tag Number (1) | Equipment Location | ASME AG-1 Code | Function | Seismic Category |
|---|---|---|---|---|---|
| | 30SAB03AN001 | Safeguard Building Division 3 | | | |
| HEPA Filters | 30SAB02AT005<br>30SAB03AT005 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | N/A | I |
| ~~Humidifiers~~ | ~~30SAB02AH002~~<br>~~30SAB03AH002~~ | ~~Safeguard Building Division 2.~~<br>~~Safeguard Building Division 3~~ | ~~Yes~~ | ~~N/A~~ | ~~I~~ |
| Backdraft Dampers | 30SAB02AA011<br>30SAB03AA011 | Safeguard Building Division 2.<br>Safeguard Building Division 3 | Yes | N/A | I |
| ~~Motor Operated Dampers~~ | ~~30SAB02AA012~~<br>~~30SAB03AA012~~ | ~~Safeguard Building Division 2.~~<br>~~Safeguard Building Division 3~~ | ~~Yes~~ | ~~Close~~ | ~~I~~ |
| **Kitchen and Sanitary Exhaust 30SAB45** | | | | | |
| Motor Operated Damper | 30SAB45AA003 | Safeguard Building Division 2 | Yes | Close | I |
| Silencer | 30SAB45BS001 | Safeguard Building Division 2 | Yes | N/A | I |
| Manual damper | 30SAB45AA005 | Safeguard Building | Yes | N/A | I |

09.04.05-1.1

Table 2.6.1-2—Main Control Room Air Conditioning System Equipment I&C and Electrical Design (7 Sheets)

| Equipment Description | Equipment Tag Number (1) | Equipment Location | IEEE Class 1E Source (2) | Failure Position | PACS | MCR / RSS Displays | MCR / RSS Controls |
|---|---|---|---|---|---|---|---|
| **Fresh Air Intake Train 30SAB01** | | | | | | | |
| Motor Operated Damper | 30SAB01AA002 | Safeguard Building Division 2 | Division 41[N] Division 32[A] | Close | Yes | Position / Position | Open-Close / Open-Close |
| Electric Heater | 30SAB01AH001 | Safeguard Building Division 2 | Division 1[N] | N/A | Yes | On-Off / On-Off | Start-Stop / Start-Stop |
| Motor Operated Damper | 30SAB01AA003 | Safeguard Building Division 2 | Division 12[N] Division 21[A] | Close | Yes | Position / Position | Open-Close / Open-Close |
| Motor Operated Damper | 30SAB01AA012 | Safeguard Building Division 2 | Division 1[N] Division 2[A] | Open | Yes | Position / Position | Open-Close / Open-Close |
| Motor Operated Damper | 30SAB01AA004 | Safeguard Building Division 2 | Division 3[N] Division 4[A] | Close | Yes | Position / Position | Open-Close/ Open-Close |
| **Fresh Air Intake Train 30SAB02** | | | | | | | |
| Motor Operated Damper | 30SAB02AA002 | Safeguard Building Division 2 | Division 2[N] Division 1[A] | Close | Yes | Position / Position | Open-Close / Open-Close |
| Electric Heater | 30SAB02AH001 | Safeguard Building Division 2 | Division 2[N] | N/A | Yes | On-Off / On-Off | Start-Stop / Start-Stop |
| Motor Operated Damper | 30SAB02AA003 | Safeguard Building Division 2 | Division 1[N] Division 2[A] | Close | Yes | Position / Position | Open-Close / Open-Close |
| **Fresh Air Intake Train 30SAB03** | | | | | | | |

09.04.05-1.1

Table 2.6.1-2—Main Control Room Air Conditioning System Equipment I&C and Electrical Design (7 Sheets)

| Equipment Description | Equipment Tag Number (1) | Equipment Location | IEEE Class 1E Source (2) | Failure Position | PACS | MCR / RSS Displays | MCR / RSS Controls |
|---|---|---|---|---|---|---|---|
| ~~Motor Operated Damper~~ | ~~30SAB03AA002~~ | ~~Safeguard Building Division 3~~ | ~~Division 3[N]~~<br>~~Division 4[A]~~ | ~~Close~~ | ~~Yes~~ | ~~Position / Position~~ | ~~Open-Close / Open-Close~~ |
| ~~Electric Heater~~ | ~~30SAB03AH001~~ | ~~Safeguard Building Division 3~~ | ~~Division 3[N]~~ | ~~N/A~~ | ~~Yes~~ | ~~On-Off / On-Off~~ | ~~Start-Stop / Start-Stop~~ |
| ~~Motor Operated Damper~~ | ~~30SAB03AA003~~ | ~~Safeguard Building Division 3~~ | ~~Division 4[N]~~<br>~~Division 3[A]~~ | ~~Close~~ | ~~Yes~~ | ~~Position / Position~~ | ~~Open-Close / Open-Close~~ |
| **Fresh Air Intake Train 30SAB04** | | | | | | | |
| Motor Operated Damper | 30SAB04AA002 | Safeguard Building Division 3 | Division 1~~4~~[N]<br>Division 2~~3~~[A] | Close | Yes | Position / Position | Open-Close / Open-Close |
| Electric Heater | 30SAB04AH001 | Safeguard Building Division 3 | Division 4[N] | N/A | Yes | On-Off / On-Off | Start-Stop / Start-Stop |
| Motor Operated Damper | 30SAB04AA003 | Safeguard Building Division 2 | Division 4~~3~~[N]<br>Division 3~~4~~[A] | Close | Yes | Position / Position | Open-Close / Open-Close |
| Motor Operated Damper | 30SAB04AA012 | Safeguard Building Division 3 | Division 4[N]<br>Division 3[A] | Open | Yes | Position / Position | Open-Close / Open-Close |
| Motor Operated Damper | 30SAB04AA004 | Safeguard Building Division 3 | Division 2[N]<br>Division 1[A] | Close | Yes | Position / Position | Open-Close / Open-Close |
| **Iodine Filtration Train 30SAB11** | | | | | | | |
| Motor Operated Damper (Recirculation | 30SAB11AA004 | Safeguard Building Division 2 | Division 1[N]<br>Division 2[A] | Open | Yes | Position / Position | Open-Close / Open-Close |

09.04.05-1.1

Table 2.6.1-2—Main Control Room Air Conditioning System Equipment I&C and Electrical Design (7 Sheets)

| Equipment Description | Equipment Tag Number (1) | Equipment Location | IEEE Class 1E Source (2) | Failure Position | PACS | MCR / RSS Displays | MCR / RSS Controls |
|---|---|---|---|---|---|---|---|
| Supply Air Fan | 30SAB14AN001 | Safeguard Building Division 3 | Division 4[N] Division 3[A] | N/A | Yes | On-Off / On-Off | Run-Stop / Run-Stop |
| **Recirculation and Air Conditioning Train 30SAB01** | | | | | | | |
| Supply Air Fan | 30SAB01AN001 | Safeguard Building Division 2 | Division 1[N] Division 2[A] | N/A | Yes | On-Off / On-Off | Run-Stop / Run-Stop |
| Motor Operated Damper | 30SAB01AA012 | Safeguard Building Division 2 | Division 1[N] Division 2[A] | Open | Yes | Position / Position | Open-Close / Open-Close |
| **Recirculation and Air Conditioning Train 30SAB02** | | | | | | | |
| Supply Air Fan | 30SAB02AN001 | Safeguard Building Division 2 | Division 2[N] | N/A | Yes | On-Off / On-Off | Run-Stop / Run-Stop |
| Motor Operated Damper | 30SAB02AA012 | Safeguard Building Division 2 | Division 2[N] Division 1[A] | Close | Yes | Position / Position | Open-Close / Open-Close |
| **Recirculation and Air Conditioning Train 30SAB03** | | | | | | | |
| Supply Air Fan | 30SAB03AN001 | Safeguard Building Division 3 | Division 3[N] | N/A | Yes | On-Off / On-Off | Run-Stop / Run-Stop |
| Motor Operated Damper | 30SAB03AA012 | Safeguard Building Division 3 | Division 3[N] Division 4[A] | Close | Yes | Position / Position | Open-Close / Open-Close |
| **Recirculation and Air Conditioning Train 30SAB04** | | | | | | | |

09.04.05-1.1

**Table 2.6.1-2—Main Control Room Air Conditioning System Equipment I&C and Electrical Design (7 Sheets)**

| Equipment Description | Equipment Tag Number [1] | Equipment Location | IEEE Class 1E Source [2] | Failure Position | PACS | MCR / RSS Displays | MCR / RSS Controls |
|---|---|---|---|---|---|---|---|
| Supply Air Fan | 30SAB04AN001 | Safeguard Building Division 3 | Division 4[N]<br>Division 3[A] | N/A | Yes | On-Off / On-Off | Run-Stop / Run-Stop |
| ~~Motor Operated Damper~~ | ~~30SAB04AA012~~ | ~~Safeguard Building Division 3~~ | ~~Division 4[N]~~<br>~~Division 3[A]~~ | ~~Open~~ | ~~Yes~~ | ~~Position / Position~~ | ~~Open-Close / Open-Close~~ |
| **Kitchen and Sanitary Exhaust 30SAB45** | | | | | | | |
| Motor Operated Damper | 30SAB45AA003 | Safeguard Building Division 2 | Division 1[N]<br>Division 2[A] | Close | Yes | Position / Position | Open-Close / Open-Close |
| Motor Operated Damper | 30SAB45AA004 | Safeguard Building Division 2 | Division ~~2~~4[N]<br>Division ~~1~~3[A] | Close | Yes | Position / Position | Open-Close / Open-Close |
| **MCR Air Exhaust 30SAB42** | | | | | | | |
| Motor Operated Damper | 30SAB42AA001 | Safeguard Building Division 2 | Division 1[N]<br>Division 2[A] | Open | Yes | Position / Position | Open-Close / Open-Close |
| Motor Operated Damper | 30SAB42AA002 | Safeguard Building Division 2 | Division ~~2~~4[N]<br>Division ~~1~~3[A] | Open | Yes | Position / Position | Open-Close / Open-Close |
| **Pressure Sensors** | | | | | | | |
| Differential pressure across 30SAB11 iodine train filters | 30SAB11CP001 | Safeguard Building Division 2 | N/A | N/A | N/A | Press / Press | N/A |
| Differential pressure across 30SAB14 iodine | 30SAB14CP001 | Safeguard Building Division 3 | N/A | N/A | N/A | Press / Press | N/A |

**Table 2.6.1-2—Main Control Room Air Conditioning System Equipment I&C and Electrical Design (7 Sheets)**

| Equipment Description | Equipment Tag Number [(1)] | Equipment Location | IEEE Class 1E Source [(2)] | Failure Position | PACS | MCR / RSS Displays | MCR / RSS Controls |
|---|---|---|---|---|---|---|---|
| train filters | | | | | | | |
| Differential pressure between Main Control Room and reference rooms | 30SAB32CP001<br>30SAB32CP002<br>30SAB32CP003 | Safeguard Building Division 2<br>09.04.05-1.1 | N/A | N/A | N/A | Press / Press | N/A |
| **Temperature Sensors** | | | | | | | |
| Outside Air temperature sensors for trains 30SAB 01/~~02/03/~~04 | 30SAB01CT001<br>~~30SAB02CT001~~<br>~~30SAB03CT001~~<br>30SAB04CT001 | Safeguard Building Division 2<br>Safeguard Building Division 3 | N/A | N/A | N/A | Temp / Temp | N/A |
| Protective switch-off temperature for heaters | 30SAB01CT002<br>~~30SAB02CT002~~<br>~~30SAB03CT002~~<br>30SAB04CT002 | Safeguard Building Division 2<br>Safeguard Building Division 3 | N/A<br>09.04.05-1.1 | N/A | N/A | Temp / Temp | N/A |
| Temperature downstream of electric heaters | 30SAB01CT003 /004<br>~~30SAB02CT003 /004~~<br>~~30SAB03CT003 /004~~<br>30SAB04CT003 /004 | Safeguard Building Division 2<br>Safeguard Building Division 3 | N/A | N/A | N/A | Temp / Temp | N/A |

09.04.05-1.1

**Table 2.6.1-2—Main Control Room Air Conditioning System Equipment I&C and Electrical Design (7 Sheets)**

| Equipment Description | Equipment Tag Number (1) | Equipment Location | IEEE Class 1E Source (2) | Failure Position | PACS | MCR / RSS Displays | MCR / RSS Controls |
|---|---|---|---|---|---|---|---|
| ~~Supply air temperature~~ | ~~30SAB01CT005~~ ~~30SAB02CT005~~ ~~30SAB03CT005~~ ~~30SAB04CT005~~ | ~~Safeguard Building Division 2~~ ~~Safeguard Building Division 3~~ | ~~N/A~~ | ~~N/A~~ | ~~N/A~~ | ~~Temp / Temp~~ | ~~N/A~~ |
| Main Control Room temperature | 30SAB32CT002 30SAB32CT003 | Safeguard Building Division 2 | N/A | N/A | N/A | Temp / Temp | N/A |

1) Equipment tag numbers are provided for information only and are not part of the certified design.

2) N denotes division the component is normally powered from, while A denotes division the component is powered from when alternate feed is implemented.

**Table 2.6.4-1—Fuel Building Ventilation System Equipment Mechanical Design (3 Sheets)**

| Equipment Description | Equipment Tag Number [1] | Equipment Location | ASME AG-1 Code | Function | Seismic Category |
|---|---|---|---|---|---|
| Recirculation Fan | 30KLL61AN001 | Fuel Building | Yes | Run | I |
| Air Cooling Coil | 30KLL64AC001 | Fuel Building | Yes | N/A | I |
| Moisture Separator | 30KLL64AT001 | Fuel Building | Yes | N/A | I |
| Recirculation Fan | 30KLL64AN001 | Fuel Building | Yes | Run | I |
| **Recirculation Cooling Units for the Fuel Pool Cooling System Pump Rooms** | | | | | |
| Air Cooling Coil | 30KLL61AC002 | Fuel Building | Yes | N/A | I |
| Recirculation Fan | 30KLL61AN002 | Fuel Building | Yes | Run | I |
| Air Cooling Coil | 30KLL61AC003 | Fuel Building | Yes | N/A | I |
| Recirculation Fan | 30KLL61AN003 | Fuel Building | Yes | Run | I |
| Air Cooling Coil | 30KLL64AC002 | Fuel Building | Yes | N/A | I |
| Recirculation Fan | 30KLL64AN002 | Fuel Building | Yes | Run | I |
| Air Cooling Coil | 30KLL64AC003 | Fuel Building | Yes | N/A | I |
| Recirculation Fan | 30KLL64AN003 | Fuel Building | Yes | Run | I |
| Moisture Separator | 30KLL61AT002 | Fuel Building | Yes | N/A | I |
| Moisture Separator | 30KLL61AT003 | Fuel Building | Yes | N/A | I |
| Moisture Separator | 30KLL64AT002 | Fuel Building | Yes | N/A | I |
| Moisture Separator | 30KLL64AT003 | Fuel Building | Yes | N/A | I |

1) Equipment tag numbers are provided for information only and are not part of the certified design.

09.04.05-1.5

**Table 2.6.6-1—Safeguard Building Controlled-Area Ventilation System Equipment Mechanical Design (~~5~~ 6 Sheets)**

| Equipment Description | Equipment Tag Number (1) | Equipment Location | ASME AG-1 Code | Function | Seismic Category |
|---|---|---|---|---|---|
| | 30KLC33 AA001<br>30KLC34 AA001 | Safeguard Building 3<br>Safeguard Building 4 | | | |
| Motor Operated dampers | 30KLC45 AA001<br>30KLC45 AA002<br>30KLC45 AA003<br>30KLC45 AA004<br>30KLC45 AA005<br>30KLC45 AA006 | Fuel Building<br>Fuel Building<br>Fuel Building<br>Fuel Building<br>Fuel Building<br>Fuel Building | Yes | Open | I |
| **Personnel Air Lock Area** | | | | | |
| Motor Operated damper | 30KLC12 AA009<br>30KLC12 AA010 | Safeguard Building 2<br>Safeguard Building 2 | Yes | Close | I |
| Motor Operated damper | 30KLC22 AA010 | Safeguard Building 2 | Yes | Close | I |
| 09.04.05-1.13 **Iodine Filtration Trains 30KLC41/42** | | | | | |
| Motor Operated dampers | 30KLC41 AA001<br>30KLC42 AA001 | Fuel Building<br>Fuel Building | Yes | Open | I |
| Electric Heaters | 30KLC41 AH001<br>30KLC42 AH001 | Fuel Building<br>Fuel Building | Yes | On / Off (based on ambient conditions) | I |
| Pre filter~~s~~/Moisture Separators | 30KLC41 AT001<br>30KLC42 AT001 | Fuel Building<br>Fuel Building | Yes | N/A | I |
| Upstream HEPA Filters | 30KLC41 AT002 | Fuel Building | Yes | N/A | I |

**Figure 1.3-1—Functional Arrangement Symbol Legend**

**Figure 2.6.1-1—Control Room Air Intake and Iodine Filtration Train Subsystem Functional Arrangement**

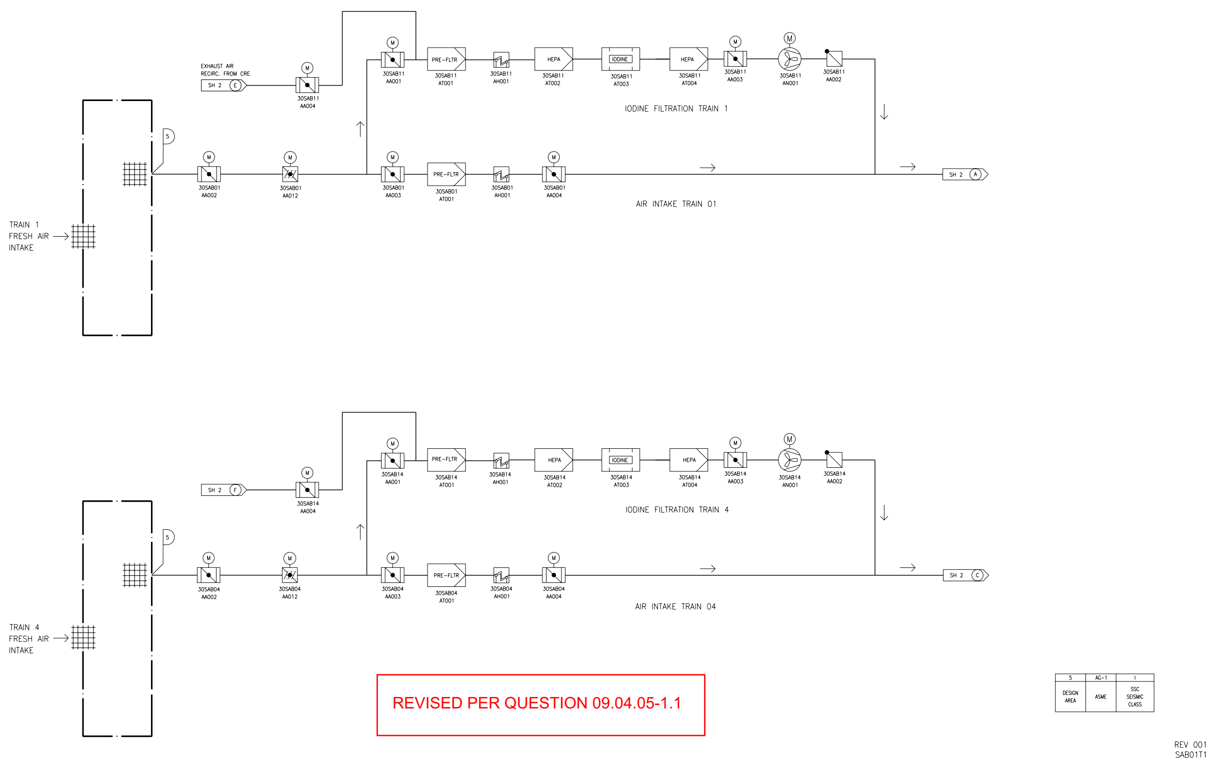
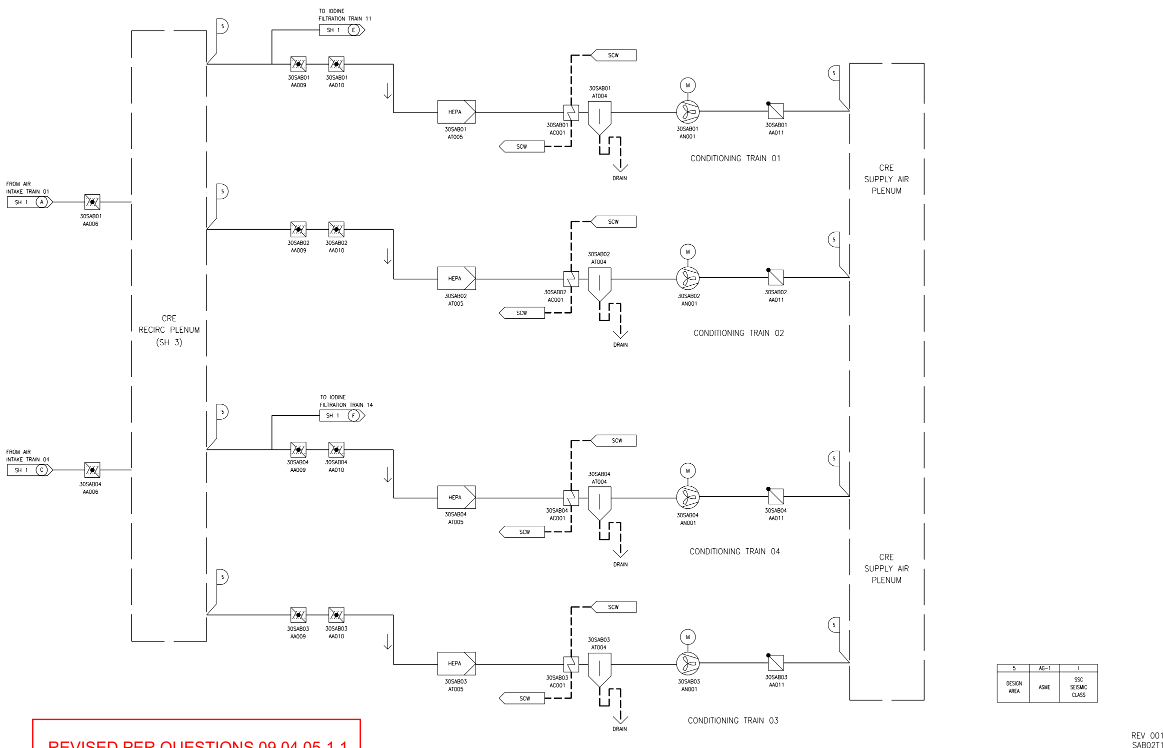


**Figure 2.6.1-2—Control Room Air Conditioning and Recirculation Air Subsystem Functional Arrangement**




REVISED PER QUESTIONS 09.04.05-1.1 & 1.4

**Figure 2.6.1-3—CRE Air Supply and Recirculation Air Subsystem Functional Arrangement**

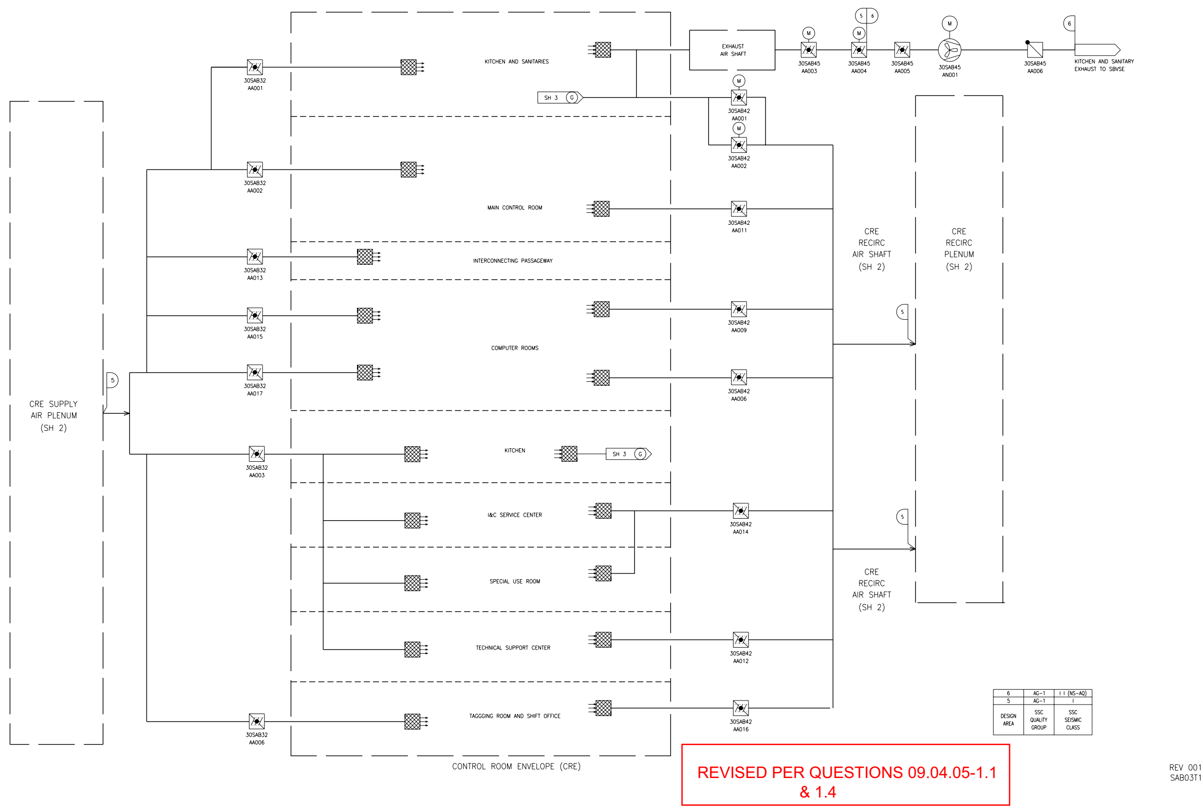



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**Figure 2.6.4-1—Fuel Building Ventilation System Functional Arrangement**

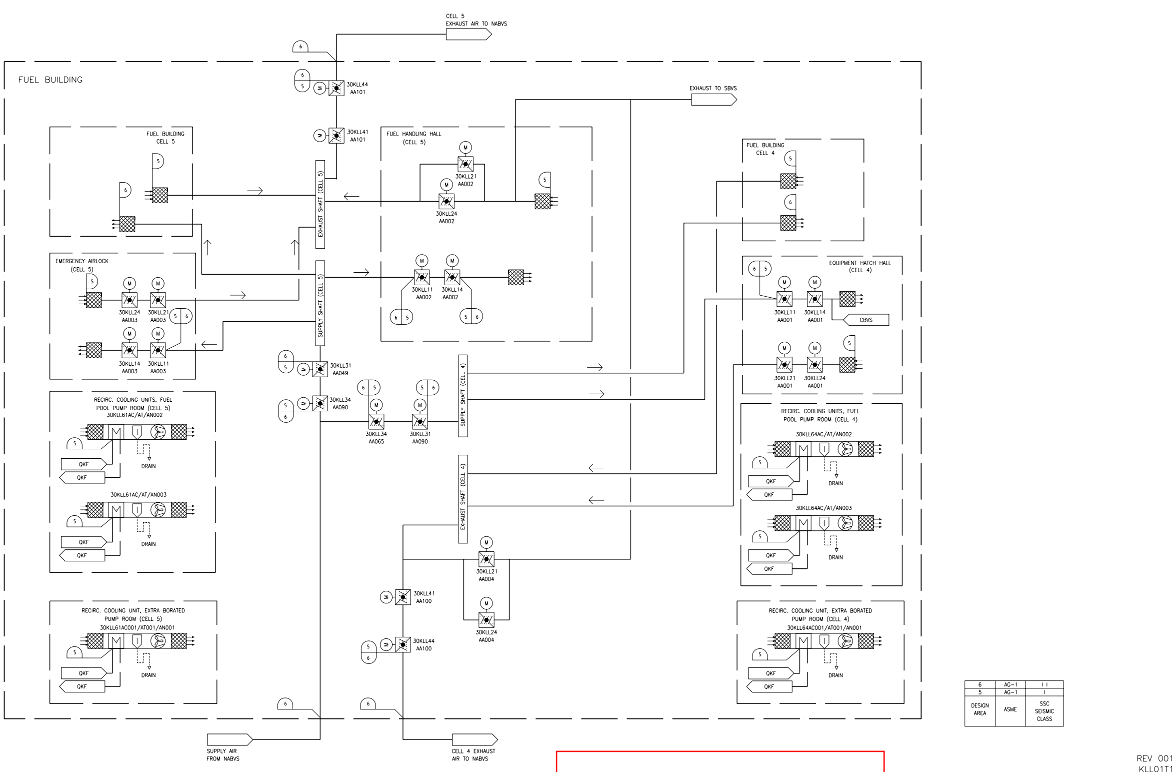


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**Figure 2.6.6-2—Safeguard Building Controlled-Area Ventilation System Exhaust Air Functional Arrangement**

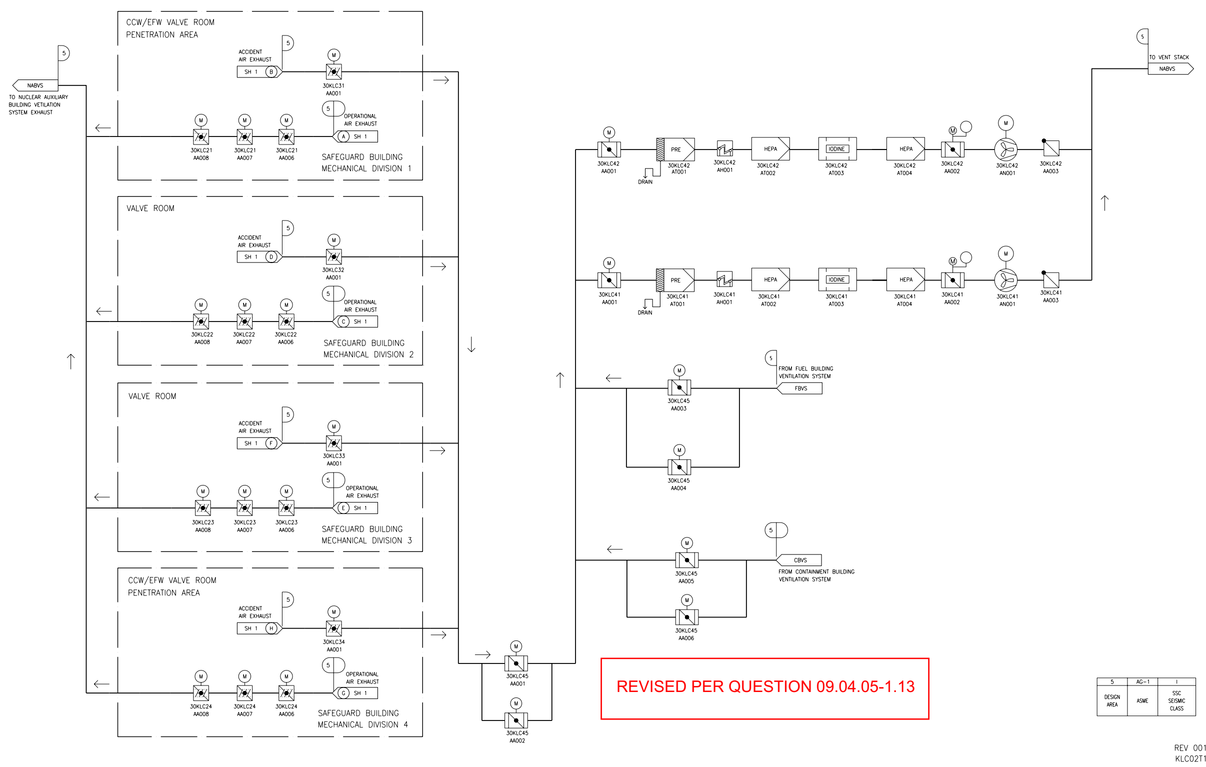


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**Table 3.10-1 List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment**

(Sheet 129 of 162)

09.04.05-1.13

| Name Tag (Equipment Description) | Tag Number | Local Area KKS ID (Room Location) | EQ Environment (Note 1) | Radiation Environment Zone (Note 2) | EQ Designated Function (Note 3) | Safety Class (Note 4) | | EQ Program Designation (Note 5) | |
|---|---|---|---|---|---|---|---|---|---|
| sup fire dmpr 2, ICP, SG4 | 30KLC24AA001 | 34UJH10011 | M | H | SII | NS-AQ | C/NM | Y (3) | Y (5) |
| sup iso dmpr, JMU rm, SG4 | 30KLC24AA002 | 34UJH10004 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| sup iso dmpr, anteroom, div 4 | 30KLC24AA003 | 34UJH05006 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| sup iso dmpr, anteroom, div 4 | 30KLC24AA004 | 34UJH01011 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| exh iso dmpr, div 4 | 30KLC24AA005 | 34UJH10004 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| oper ex vol cntrl dmpr, div 4 | 30KLC24AA006 | 34UJH10010 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| oper ex iso dmpr 1, div 4 | 30KLC24AA007 | 34UJH10010 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| oper ex iso dmpr 2, div 4 | 30KLC24AA008 | 34UJH10010 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| oper ex fire dmpr, div 4 | 30KLC24AA009 | 34UJH10004 | M | H | SII | NS-AQ | C/NM | Y (3) | Y (5) |
| acc ex iso dmpr vlv rm, div 1 | 30KLC31AA001 | 31UJH10004 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| acc ex fire dmpr vlv rm, div 1 | 30KLC31AA002 | 31UJH10004 | M | H | SII | NS-AQ | C/NM | Y (3) | Y (5) |
| acc ex iso dmpr vlv rm, div 2 | 30KLC32AA001 | 32UJH10002 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| acc ex fire dmpr vlv rm, div 2 | 30KLC32AA002 | 32UJH10002 | M | H | SII | NS-AQ | C/NM | Y (3) | Y (5) |
| acc ex iso dmpr vlv rm, div 3 | 30KLC33AA001 | 33UJH10002 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| acc ex fire dmpr vlv rm, div 3 | 30KLC33AA002 | 33UJH10002 | M | H | SII | NS-AQ | C/NM | Y (3) | Y (5) |
| acc ex iso dmpr vlv rm, div 4 | 30KLC34AA001 | 34UJH10004 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| acc ex fire dmpr vlv rm, div 4 | 30KLC34AA002 | 34UJH10004 | M | H | SII | NS-AQ | C/NM | Y (3) | Y (5) |
| iso dmpr 1, acc ex tr 1 | 30KLC41AA001 | 30UFA21082 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| iso dmpr 2, acc ex tr 1 | 30KLC41AA002 | 30UFA21082 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| check dmpr, acc ex tr 1 | 30KLC41AA003 | 30UFA21083 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| elec air preheater, accident filt tr 1 | 30KLC41AH001 | 30UFA21082 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| exhaust fan, accident filtr tr 1 | 30KLC41AN001 | 30UFA21083 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| prefilter/moisture separator, accident filtr tr 1 | 30KLC41AT001 | 30UFA21082 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| HEPA prefilter, accident filtr tr 1 | 30KLC41AT002 | 30UFA21082 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| iodine filter, accident filtr tr 1 | 30KLC41AT003 | 30UFA21082 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| HEPA postfilter, accident filtr tr 1 | 30KLC41AT004 | 30UFA21082 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| iso dmpr 1, acc ex tr 2 | 30KLC42AA001 | 30UFA21084 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| iso dmpr 2, acc ex tr 2 | 30KLC42AA002 | 30UFA21084 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| check dmpr, acc ex tr 2 | 30KLC42AA003 | 30UFA21083 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| elec air preheater, accident filt tr 2 | 30KLC42AH001 | 30UFA21084 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| exhaust fan, accident filtr tr 2 | 30KLC42AN001 | 30UFA21081 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| prefilter/moisture separator, accident filtr tr 2 | 30KLC42AT001 | 30UFA21084 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| HEPA prefilter, accident filtr tr 2 | 30KLC42AT002 | 30UFA21084 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| iodine filter, accident filtr tr 2 | 30KLC42AT003 | 30UFA21084 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| HEPA postfilter, accident filtr tr 2 | 30KLC42AT004 | 30UFA21084 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| acc ex sw iso dmpr 1 | 30KLC45AA001 | 30UFA21095 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| acc ex sw iso dmpr 2 | 30KLC45AA002 | 30UFA21095 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| acc ex sw iso dmpr 3 | 30KLC45AA003 | 30UFA29045 | M | H | SI | S | C/NM | Y (3) | Y (5) |
| acc ex sw iso dmpr 4 | 30KLC45AA004 | 30UFA29045 | M | H | SI | S | C/NM | Y (3) | Y (5) |

**Table 3.10-1 List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment**

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| Name Tag (Equipment Description) | Tag Number | Local Area KKS ID (Room Location) | EQ Environment (Note 1) | Radiation Environment Zone (Note 2) | EQ Designated Function (Note 3) | Safety Class (Note 4) | EQ Program Designation (Note 5) |
|---|---|---|---|---|---|---|---|
| ~~Makeup Air Heater - Div 2~~ | ~~30SAB02AH001~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S~~ | ~~Y (5)~~ - |
| Recirc. Fan Motor Heater - Div 2 | 30SAB02AH501 | 32UJK31035 | M | M | SI | S | Y (5) |
| Recirc. Fan - Div 2 | 30SAB02AN001 | 32UJK31035 | M | M | SI | S C/NM | Y (5) |
| ~~Makeup Air Pre-filter - Div 2~~ | ~~30SAB02AT001~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S~~ ~~C/NM~~ | ~~Y (5)~~ - |
| Moisture / Condensate Separator - Div 2 | 30SAB02AT004 | 32UJK31035 | M | M | SI | S | Y (5) |
| Recirc. HEPA Filter - Div 2 | 30SAB02AT005 | 32UJK31035 | M | M | SI | S C/NM | Y (5) |
| Recirc. Return Silencer - Div 2 | 30SAB02BS001 | 32UJK31035 | M | M | SI | S | Y (5) |
| Recirc. Fan Inlet Silencer - Div 2 | 30SAB02BS002 | 32UJK31035 | M | M | SI | S | Y (5) |
| Recirc. Fan Outlet Silencer - Div 2 | 30SAB02BS003 | 32UJK31035 | M | M | SI | S | Y (5) |
| ~~Makeup Air Heaters - Div 3~~ | ~~30SAB03AH001~~ | ~~33UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S~~ | ~~Y (5)~~ - |
| Recirc. Fan Motor Heater- Div 3 | 30SAB03AH501 | 33UJK31035 | M | M | SI | S | Y (5) |
| Recirc. Fan - Div 3 | 30SAB03AN001 | 33UJK31035 | M | M | SI | S C/NM | Y (5) |
| ~~Makeup Air Pre-filters - Div 3~~ | ~~30SAB03AT001~~ | ~~33UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S~~ ~~C/NM~~ | ~~Y (5)~~ - |
| Moisture / Condensate Separator - Div 3 | 30SAB03AT004 | 33UJK31035 | M | M | SI | S | Y (5) |
| Recirc. HEPA Filter - Div 3 | 30SAB03AT005 | 33UJK31035 | M | M | SI | S C/NM | Y (5) |
| Recirc. Return Silencer - Div 3 | 30SAB03BS001 | 33UJK31035 | M | M | SI | S | Y (5) |
| Recirc. Fan Inlet Silencer - Div 3 | 30SAB03BS002 | 33UJK31035 | M | M | SI | S | Y (5) |
| Recirc. Fan Outlet Silencer - Div 3 | 30SAB03BS003 | 33UJK31035 | M | M | SI | S | Y (5) |
| Recirc. Cooling Coil - Div 4 | 30SAB04AC001 | 33UJK31034 | M | M | SI | S | Y (5) |
| Makeup Air Heaters - Div 4 | 30SAB04AH001 | 33UJK31034 | M | M | SI | S | Y (5) |
| Recirc. Fan Motor Heater - Div 4 | 30SAB04AH501 | 33UJK31034 | M | M | SI | S | Y (5) |
| ~~Air Humidifier~~ | ~~30SAB01AH002~~ | ~~32UJK31034~~ | ~~M~~ | ~~M~~ | ~~SII~~ | ~~NS-AQ~~ | ~~Y (5)~~ - |
| ~~Air Humidifier~~ | ~~30SAB02AH002~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SII~~ | ~~NS-AQ~~ | ~~Y (5)~~ - |
| ~~Air Humidifier~~ | ~~30SAB03AH002~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SII~~ | ~~NS-AQ~~ | ~~Y (5)~~ - |
| ~~Air Humidifier~~ | ~~30SAB04AH002~~ | ~~33UJK31035~~ | ~~M~~ | ~~M~~ | ~~SII~~ | ~~NS-AQ~~ | ~~Y (5)~~ - |
| Exhaust Air Recirc. Vol Contr Damper A | 30SAB42AA001 | 32UJK26031 | M | M | SI | S C/NM | Y (5) |
| SICS2/Computer Rm2 Exhaust Balanc Damp | 30SAB42AA006 | 33UJK26002 | M | M | SI | S C/NM | Y (5) |
| SICS1/Computer Rm1 Exhaust Balanc Damp | 30SAB42AA009 | 32UJK26002 | M | M | SI | S C/NM | Y (5) |
| MCR Exhaust Balancing Damper | 30SAB42AA011 | 32UJK26031 | M | M | SI | S C/NM | Y (5) |
| TechSupport Exhaust Balancing Damp | 30SAB42AA012 | 33UJK26006 | M | M | SI | S C/NM | Y (5) |
| I&CServ/SpecialUse Exhaust Balanc Damp | 30SAB42AA014 | 33UJK26044 | M | M | SI | S C/NM | Y (5) |
| Tag/ShiftOffice Exhaust Balancing Damp | 30SAB42AA016 | 32UJK26029 | M | M | SI | S C/NM | Y (5) |
| Exhaust Air Isolation Damper - A | 30SAB45AA003 | 32UJK31020 | M | M | SI | S C/NM | Y (5) |
| Exhaust Air Isolation Damper - B | 30SAB45AA004 | 32UJK31020 | M | M | SI | S C/NM | Y (5) |
| Exhaust Air Balancing Damper | 30SAB45AA005 | 32UJK31020 | M | M | SI | S C/NM | Y (5) |
| Exhaust Air Back-flow Damper | 30SAB45AA006 | 32UJK31020 | M | M | SI | S C/NM | Y (5) |
| Bathrooms Back-draft Damper | 30SAB45AA007 | 32UJK26015 | M | M | SI | S C/NM | Y (5) |
| Inlet Isolation Damper - Div 1 | 30SAB01AA002 | 32UJK31034 | M | M | SI | S C/NM | Y (5) |
| Makeup Air Isolation Damper - Div 1 | 30SAB01AA003 | 32UJK31034 | M | M | SI | S C/NM | Y (5) |

**Table 3.10-1 List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment**

(Sheet 148 of 162)

09.04.05-1.13

| Name Tag (Equipment Description) | Tag Number | Local Area KKS ID (Room Location) | EQ Environment (Note 1) | Radiation Environment Zone (Note 2) | EQ Designated Function (Note 3) | Safety Class (Note 4) | EQ Program Designation (Note 5) |
|---|---|---|---|---|---|---|---|
| MCRAirCond. Rm Return Balancing - Div1 | 30SAB01AA005 | 32UJK31034 | M | M | SI | S C/NM | Y (5) |
| Makeup Air Balancing Damper - Div 1 | 30SAB01AA006 | 32UJK31034 | M | M | SI | S C/NM | Y (5) |
| Recirc. Return Air Isolation Damper-Div1 | 30SAB01AA009 | 32UJK31034 | M | M | SI | S C/NM | Y (5) |
| Recirc. Return Air Balancing Damper-Div1 | 30SAB01AA010 | 32UJK31034 | M | M | SI | S C/NM | Y (5) |
| Recirc. Air Back-flow Damper - Div 1 | 30SAB01AA011 | 32UJK31034 | M | M | SI | S C/NM | Y (5) |
| Recirc. Air Vol Control Damper - Div 1 | 30SAB01AA012 | 32UJK31034 | M | M | SI | S C/NM | Y (5) |
| ~~Inlet Isolation Damper - Div 2~~ | ~~30SAB02AA002~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S C/NM~~ | ~~Y (5)~~ |
| MCRAirCond. Rm Return Balanc Damp - Div2 | 30SAB02AA005 | 32UJK31035 | M | M | SI | S C/NM | Y (5) |
| ~~Makeup Air Balancing Damper - Div 2~~ | ~~30SAB02AA006~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S C/NM~~ | ~~Y (5)~~ |
| Recirc. Return Air Isolation Damper - Di | 30SAB02AA009 | 32UJK31035 | M | M | SI | S C/NM | Y (5) |
| Recirc. Return Air Balancing Damp - Div2 | 30SAB02AA010 | 32UJK31035 | M | M | SI | S C/NM | Y (5) |
| Recirc. Air Back-flow Damper - Div 2 | 30SAB02AA011 | 32UJK31035 | M | M | SI | S C/NM | Y (5) |
| ~~Recirc. Air Volume Control Damp - Div 2~~ | ~~30SAB02AA012~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S C/NM~~ | ~~Y (5)~~ |
| MCRAirCond Rm Return Balanc Damp - Div 3 | 30SAB03AA005 | 33UJK31034 | M | M | SI | S C/NM | Y (5) |
| ~~Makeup Air Balancing Damper - Div 3~~ | ~~30SAB03AA006~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S C/NM~~ | ~~Y (5)~~ |
| Recirc. Return Air Iso Damper - Div 3 | 30SAB03AA009 | 33UJK31034 | M | M | SI | S C/NM | Y (5) |
| Recirc. Return Air Balancing Damp - Div | 30SAB03AA010 | 33UJK31034 | M | M | SI | S C/NM | Y (5) |
| Recirc. Air Back-flow Damper - Div 3 | 30SAB03AA011 | 33UJK31034 | M | M | SI | S C/NM | Y (5) |
| ~~Recirc. Air Volume Control Damper - Div~~ | ~~30SAB03AA012~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S C/NM~~ | ~~Y (5)~~ |
| ~~Makeup Air Isolation Damper - Div 4~~ | ~~30SAB04AA003~~ | ~~33UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S C/NM~~ | ~~Y (5)~~ |
| MCRAirCond Rm Return Balanc Damp - Div 4 | 30SAB04AA005 | 33UJK31035 | M | M | SI | S C/NM | Y (5) |
| ~~Makeup Air Balancing Damper - Div 4~~ | ~~30SAB04AA006~~ | ~~33UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S C/NM~~ | ~~Y (5)~~ |
| Recirc. Return Air Isolation Damper - D | 30SAB04AA009 | 33UJK31035 | M | M | SI | S C/NM | Y (5) |
| Recirc. Return Air Balancing Damper - Di | 30SAB04AA010 | 33UJK31035 | M | M | SI | S C/NM | Y (5) |
| Recirc. Air Back-flow Damper - Div 4 | 30SAB04AA011 | 33UJK31035 | M | M | SI | S C/NM | Y (5) |
| Recirc. Air Volume Control Damper - Div | 30SAB04AA012 | 33UJK31035 | M | M | SI | S C/NM | Y (5) |
| Iodine Filtr. Inlet Isol. Damper - Div 1 | 30SAB11AA001 | 32UJK31034 | M | M | SI | S C/NM | Y (5) |
| Iodine Filtr. Outlet Isol Damp - Div 1 | 30SAB11AA002 | 32UJK31034 | M | M | SI | S C/NM | Y (5) |
| Iodine Filtr. Inlet Iso. Damper - Div 4 | 30SAB14AA001 | 33UJK31034 | M | M | SI | S C/NM | Y (5) |
| WC & Kitchen Supply Balancing Damper | 30SAB32AA001 | 32UJK26029 | M | M | SI | S C/NM | Y (5) |
| TechSupp/SpecUse Supply Balanc Damp | 30SAB32AA003 | 32UJK26029 | M | M | SI | S C/NM | Y (5) |
| Tag/Shift Office Supply Balancing Damp | 30SAB32AA006 | 32UJK26029 | M | M | SI | S C/NM | Y (5) |
| Interconnect Passage Supply Balanc Damp | 30SAB32AA013 | 32UJK26020 | M | M | SI | S C/NM | Y (5) |
| SICS1/Computer Rm1 Supply Balancing Damp | 30SAB32AA015 | 32UJK26002 | M | M | SI | S C/NM | Y (5) |
| SICS2/Computer Rm2 Supply Balancing Damp | 30SAB32AA017 | 33UJK26002 | M | M | SI | S C/NM | Y (5) |
| MCR, WC & Kitchen Supply Fire Damp C | 30SAB32AA022 | 32UJK31019 | M | M | SI | S C/NM | Y (5) |
| Recirc Gastight Iso Dmpr Div 2 | 30SAB11AA004 | 32UJK31034 | M | M | SI | S C/NM | Y (5) |
| Recirc Damper Div 3 | 30SAB14AA004 | 33UJK31034 | M | M | SI | S C/NM | Y (5) |
| Inlet Fire Damper - Div 1 | 30SAB01AA001 | 32UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |

**Table 3.10-1 List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment**

(Sheet 149 of 162)

09.04.05-1.13

| Name Tag (Equipment Description) | Tag Number | Local Area KKS ID (Room Location) | EQ Environment (Note 1) | Radiation Environment Zone (Note 2) | EQ Designated Function (Note 3) | Safety Class (Note 4) | EQ Program Designation (Note 5) |
|---|---|---|---|---|---|---|---|
| Inlet Fire Damper - Div 3 | 30SAB03AA001 | 33UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Inlet Fire Damper - Div 2 | 30SAB02AA001 | 32UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Inlet Fire Damper - Div 4 | 30SAB04AA001 | 33UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Return Air Fire Damper - Div 1 A | 30SAB01AA007 | 32UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Return Air Fire Damper - Div 1 B | 30SAB01AA008 | 32UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Supply Air Fire Damper - Div 1 A | 30SAB01AA014 | 32UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Supply Air Fire Damper - Div 1 B | 30SAB01AA015 | 32UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Return Air Fire Damper - Div 2 A | 30SAB02AA007 | 32UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Return Air Fire Damper - Div 2 B | 30SAB02AA008 | 32UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Supply Air Fire Damper - Div 2 A | 30SAB02AA014 | 32UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Supply Air Fire Damper - Div 2 B | 30SAB02AA015 | 32UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Return Air Fire Damper - Div 3 A | 30SAB03AA007 | 33UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Return Air Fire Damper - Div 3 B | 30SAB03AA008 | 33UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Supply Air Fire Damper - Div 3 A | 30SAB03AA014 | 33UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Supply Air Fire Damper - Div 3 B | 30SAB03AA015 | 33UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Return Air Fire Damper - Div 4 A | 30SAB04AA007 | 33UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Return Air Fire Damper - Div 4 B | 30SAB04AA008 | 33UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Supply Air Fire Damper - Div 4 A | 30SAB04AA014 | 33UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Recirc. Supply Air Fire Damper - Div 4 B | 30SAB04AA015 | 33UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| MCRAirCond. Rm Supply Fire Damp-Div 1 | 30SAB31AA030 | 32UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| TechSupport Supply Fire Damper A | 30SAB32AA004 | 33UJK26033 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| TechSupport Supply Fire Damper B | 30SAB32AA005 | 33UJK26033 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Interconnec Passage Supply Fire Damper | 30SAB32AA010 | 32UJK26020 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| SICS1 / Computer Rm1 Supply Fire Damper | 30SAB32AA011 | 32UJK26002 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| SICS2 / Computer Rm2 Supply Fire Damper | 30SAB32AA012 | 33UJK26002 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| MCR, WC, & Kitchen Supply Fire Damp A | 30SAB32AA020 | 32UJK31019 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| MCR, WC, & Kitchen Supply Fire Damp B | 30SAB32AA021 | 32UJK31019 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| MCRAirCond. Rm Supply Fire Damp-Div 2 | 30SAB32AA030 | 32UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| MCRAirCond Rm Supply Fire Damper - Div 3 | 30SAB33AA030 | 33UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| MCRAirCond Rm Supply Fire Damper- Div 4 | 30SAB34AA030 | 33UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Exhaust Air Recirc. Fire Damper | 30SAB42AA003 | 32UJK26031 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Interconnect Passage Exhaust Fire Damp-A | 30SAB42AA004 | 33UJK26020 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| SICS2/Computer Rm2 Exhaust Fire Damp | 30SAB42AA005 | 33UJK26002 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Interconnect Passage Exhaust Fire Damp-B | 30SAB42AA007 | 32UJK26020 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| SICS1/Computer Rm1 Exhaust Air Fire Damp | 30SAB42AA008 | 32UJK26002 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| MCR Exhaust Fire Damper | 30SAB42AA010 | 32UJK26031 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| TechSupport Exhaust Fire Damper | 30SAB42AA013 | 33UJK26006 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| I&CServ/SpecialUse Exhaust Fire Damp | 30SAB42AA015 | 33UJK26044 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Tag/ShiftOffice Exhaust Fire Damper | 30SAB42AA017 | 32UJK26029 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |

**Table 3.10-1 List of Seismically and Dynamically Qualified Mechanical and Electrical Equipment**

(Sheet 150 of 162)

09.04.05-1.13

| Name Tag (Equipment Description) | Tag Number | Local Area KKS ID (Room Location) | EQ Environment (Note 1) | Radiation Environment Zone (Note 2) | EQ Designated Function (Note 3) | Safety Class (Note 4) | EQ Program Designation (Note 5) |
|---|---|---|---|---|---|---|---|
| Exhaust Air Fire Damper | 30SAB45AA001 | 32UJK31020 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Bathrooms Exhaust Air Fire Damper | 30SAB45AA008 | 32UJK26020 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| Kitchen Exhaust Fire Damper | 30SAB45AA009 | 33UJK26033 | M | M | SI~~I~~ | S~~NS-AQ~~ C/NM | Y (5) |
| SAB11 Filtr Train Iso dmpr dwnstrm | 30SAB11AA003 | 32UJK31034 | M | M | SI | S C/NM | Y (5) |
| SAB11 Filtration Trn Elec Preheater | 30SAB11AH001 | 32UJK31034 | M | M | SI | S | Y (5) |
| SAB14 Iodine Filtration Train Check Dmpr | 30SAB14AA002 | 33UJK31034 | M | M | SI | S C/NM | Y (5) |
| SAB14 Filtr Train Iso Dmpr Dwnstrm | 30SAB14AA003 | 33UJK31034 | M | M | SI | S C/NM | Y (5) |
| SAB14 Iodine filtration train preheater | 30SAB14AH001 | 33UJK31034 | M | M | SI | S | Y (5) |
| **Essential Service Water Pump Building Ventilation System (ESWPBVS)** | | | | | | | |
| Recirc Chiller Bldg 1 | 30SAQ01AC001 | 31UQB02001 | M | M | SI | S C/NM | Y (5) |
| Elec Heater Bldg 1 | 30SAQ01AH001 | 31UQB02001 | M | M | SI | S C/NM | Y (5) |
| Recirc Fan Bldg 1 | 30SAQ01AN001 | 31UQB02001 | M | M | SI | S C/NM | Y (5) |
| Impact Sep Bldg 1 | 30SAQ01AT001 | 31UQB02001 | M | M | SI | S C/NM | Y (5) |
| Recirc Chiller Bldg 2 | 30SAQ02AC001 | 32UQB02001 | M | M | SI | S C/NM | Y (5) |
| Elec Heater Bldg 2 | 30SAQ02AH001 | 32UQB02001 | M | M | SI | S C/NM | Y (5) |
| Recirc Fan Bldg 2 | 30SAQ02AN001 | 32UQB02001 | M | M | SI | S C/NM | Y (5) |
| Impact Sep Bldg 2 | 30SAQ02AT001 | 32UQB02001 | M | M | SI | S C/NM | Y (5) |
| Recirc Chiller Bldg 3 | 30SAQ03AC001 | 33UQB02001 | M | M | SI | S C/NM | Y (5) |
| Elec Heater Bldg 3 | 30SAQ03AH001 | 33UQB02001 | M | M | SI | S C/NM | Y (5) |
| Recirc Fan Bldg 3 | 30SAQ03AN001 | 33UQB02001 | M | M | SI | S C/NM | Y (5) |
| Impact Sep Bldg 3 | 30SAQ03AT001 | 33UQB02001 | M | M | SI | S C/NM | Y (5) |
| Recirc Chiller Bldg 4 | 30SAQ04AC001 | 34UQB02001 | M | M | SI | S C/NM | Y (5) |
| Elec Heater Bldg 4 | 30SAQ04AH001 | 34UQB02001 | M | M | SI | S C/NM | Y (5) |
| Recirc Fan Bldg 4 | 30SAQ04AN001 | 34UQB02001 | M | M | SI | S C/NM | Y (5) |
| Impact Sep Bldg 4 | 30SAQ04AT001 | 34UQB02001 | M | M | SI | S C/NM | Y (5) |
| Elec Eq Area Sup Damper Bldg 1 | 30SAQ01AA001 | 31UQB02001 | M | M | SI | S C/NM | Y (5) |
| ESW Pump Area Sup Dmpr Bldg 1 | 30SAQ01AA002 | 31UQB02001 | M | M | SI | S C/NM | Y (5) |
| Plug Valve Chiller Cold Leg Bldg 1 | 30SAQ01AA003 | 31UQB02001 | M | M | SI | S C/NM | Y (5) |
| Plug Valve Chiller Hot Leg Bldg 1 | 30SAQ01AA004 | 31UQB02001 | M | M | SI | S C/NM | Y (5) |
| Elec Eq Area Sup Damper Bldg 2 | 30SAQ02AA001 | 32UQB02001 | M | M | SI | S C/NM | Y (5) |
| ESW Pump Area Sup Dmpr Bldg 2 | 30SAQ02AA002 | 32UQB02001 | M | M | SI | S C/NM | Y (5) |
| Plug Valve Chiller Cold Leg Bldg 2 | 30SAQ02AA003 | 32UQB02001 | M | M | SI | S C/NM | Y (5) |
| Plug Valve Chiller Hot Leg Bldg 2 | 30SAQ02AA004 | 32UQB02001 | M | M | SI | S C/NM | Y (5) |
| Elec Eq Area Sup Damper Bldg 3 | 30SAQ03AA001 | 33UQB02001 | M | M | SI | S C/NM | Y (5) |
| ESW Pump Area Sup Dmpr Bldg 3 | 30SAQ03AA002 | 33UQB02001 | M | M | SI | S C/NM | Y (5) |
| Plug Valve Chiller Cold Leg Bldg 3 | 30SAQ03AA003 | 33UQB02001 | M | M | SI | S C/NM | Y (5) |

**Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment**
(Sheet 93 of 102)

| Name Tag (Equipment Description) | Tag Number | Local Area KKS ID (Room Location) | EQ Environment (Note 1) | Radiation Environment Zone (Note 2) | EQ Designated Function (Note 3) | Safety Class (Note 4) | EQ Program Designation (Note 5) |
|---|---|---|---|---|---|---|---|
| TEMP ROOM UFA10089 | 30KLL64CT097 | 30UFA10089 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA10095 | 30KLL64CT098 | 30UFA10095 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA01082 | 30KLL64CT101 | 30UFA01082 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA01088 | 30KLL64CT103 | 30UFA01088 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA10071 | 30KLL64CT104 | 30UFA10071 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| 1 TEMP ROOM UFA03057 | 30KLL64CT106 | 30UFA03057 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| 2 TEMP ROOM UFA03057 | 30KLL64CT109 | 30UFA03057 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA05076 | 30KLL64CT111 | 30UFA05076 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA06082 | 30KLL64CT113 | 30UFA06082 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA06084 | 30KLL64CT114 | 30UFA06084 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA06085 | 30KLL64CT115 | 30UFA06085 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA06086 | 30KLL64CT116 | 30UFA06086 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA06095 | 30KLL64CT117 | 30UFA06095 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA10070 | 30KLL64CT119 | 30UFA10070 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA10082 | 30KLL64CT120 | 30UFA10082 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA10089 | 30KLL64CT121 | 30UFA10089 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA10095 | 30KLL64CT122 | 30UFA10095 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA13025 | 30KLL64CT124 | 30UFA13025 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA13070 | 30KLL64CT129 | 30UFA13070 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA17025 | 30KLL64CT130 | 30UFA17025 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA17057 | 30KLL64CT132 | 30UFA17057 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA17056 | 30KLL64CT134 | 30UFA17056 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA17072 | 30KLL64CT136 | 30UFA17072 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| 1 TEMP ROOM UFA21057 | 30KLL64CT138 | 30UFA21057 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| 2 TEMP ROOM UFA21057 | 30KLL64CT140 | 30UFA21057 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA21072 | 30KLL64CT142 | 30UFA21072 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA21095 | 30KLL64CT144 | 30UFA21095 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA24070 | 30KLL64CT149 | 30UFA24070 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA24072 | 30KLL64CT150 | 30UFA24072 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA24080 | 30KLL64CT152 | 30UFA24080 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA24095 | 30KLL64CT154 | 30UFA24095 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA01083 | 30KLL64CT162 | 30UFA01083 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA01085 | 30KLL64CT165 | 30UFA01085 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA05054 | 30KLL64CT169 | 30UFA05054 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA24081 | 30KLL64CT178 | 30UFA24081 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA01076 | 30KLL64CT198 | 30UFA01076 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| TEMP ROOM UFA01077 | 30KLL64CT199 | 30UFA01077 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| 3 PRESS FP RM | 30KLL81CP020 | 30UFA29015 | M | H | SI | S 1E EMC | Y (2) Y (5) Y (6) |
| | | | | | | | |
| **Main Control Room Air Conditioning System (CRACS)** | | | | | | | |
| Inlet Fire Damper - Div 1 | 30SAB01AA001 | 32UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Inlet Isolation Damper - Div 1 | 30SAB01AA002 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Makeup Air Isolation Damper - Div 1 | 30SAB01AA003 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc. Return Air Fire Damper - Div 1 A | 30SAB01AA007 | 32UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Recirc. Return Air Fire Damper - Div 1 B | 30SAB01AA008 | 32UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |

09.04.05-1.1

**Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment**
(Sheet 94 of 102)

| Name Tag (Equipment Description) | Tag Number | Local Area KKS ID (Room Location) | EQ Environment (Note 1) | Radiation Environment Zone (Note 2) | EQ Designated Function (Note 3) | Safety Class (Note 4) | EQ Program Designation (Note 5) |
|---|---|---|---|---|---|---|---|
| Recirc. Air Vol Control Damper - Div 1 | 30SAB01AA012 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc. Supply Air Fire Damper - Div 1 A | 30SAB01AA014 | 32UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Recirc. Supply Air Fire Damper - Div 1 B | 30SAB01AA015 | 32UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Recirc. Vol. Cont. Posit. Indic. - Div1 | 30SAB01CG012 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| ~~Recirc. Humidifier Outlet RH - Div 1 A~~ | ~~30SAB01CM001~~ | ~~32UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Recirc. Humidifier Outlet RH - Div 1 B~~ | ~~30SAB01CM002~~ | ~~32UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~MCR Air Cond. Rm (32UJK31 034) RH - A~~ | ~~30SAB01CM003~~ | ~~32UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~MCR Air Cond. Rm (32UJK31 034) RH - B~~ | ~~30SAB01CM004~~ | ~~32UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| Recirc. HEPA DP - Div 1 | 30SAB01CP002 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Makeup Air Pre-Filter DP - Div 1 | 30SAB01CP501 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc. HEPA DP (Local) - Div 1 | 30SAB01CP504 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Makeup Air Inlet Temp - Div 1 | 30SAB01CT001 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Makeup Air Heater Outlet Temp - Div 1 A | 30SAB01CT002 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Makeup Air Heater Outlet Temp - Div 1 B | 30SAB01CT003 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Makeup Air Heater Outlet Temp - Div 1 C | 30SAB01CT004 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| ~~Recirc. Humidifier Outlet Temp - Div 1~~ | ~~30SAB01CT005~~ | ~~32UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| Recirc. CoolCoil Inlet Temp (Local)-Div1 | 30SAB01CT501 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc. CoolCoil Exit Temp (Local)-Div1 | 30SAB01CT502 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| ~~Inlet Fire Damper - Div 2~~ | ~~30SAB02AA001~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SII~~ | ~~NS-AQ~~ - ~~EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Inlet Isolation Damper - Div 2~~ | ~~30SAB02AA002~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Makeup Air Isolation Damper - Div 2~~ | ~~30SAB02AA003~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| Recirc. Return Air Fire Damper - Div 2 A | 30SAB02AA007 | 32UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Recirc. Return Air Fire Damper - Div 2 B | 30SAB02AA008 | 32UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| ~~Recirc. Air Volume Control Damp - Div 2~~ | ~~30SAB02AA012~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| Recirc. Supply Air Fire Damper - Div 2 A | 30SAB02AA014 | 32UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Recirc. Supply Air Fire Damper - Div 2 B | 30SAB02AA015 | 32UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| ~~Recirc. Vol. Cont. Posit. Indic. - Div2~~ | ~~30SAB02CG012~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Recirc. Humidifier Outlet RH - Div 2 A~~ | ~~30SAB02CM001~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Recirc. Humidifier Outlet RH - Div 2 B~~ | ~~30SAB02CM002~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~MCR Air Cond. Rm (32UJK31 035) RH - A~~ | ~~30SAB02CM003~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~MCR Air Cond. Rm (32UJK31 035) RH - B~~ | ~~30SAB02CM004~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| Recirc. HEPA DP - Div 2 | 30SAB02CP002 | 32UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| ~~Makeup Air Pre-Filter DP - Div 2~~ | ~~30SAB02CP501~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| Recirc. HEPA DP (Local) - Div 2 | 30SAB02CP504 | 32UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| ~~Makeup Air Inlet Temp - Div 2~~ | ~~30SAB02CT001~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Makeup Air Heater Outlet Temp - Div 2 A~~ | ~~30SAB02CT002~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Makeup Air Heater Outlet Temp - Div 2 B~~ | ~~30SAB02CT003~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Makeup Air Heater Outlet Temp - Div 2 C~~ | ~~30SAB02CT004~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Recirc. Humidifier Outlet Temp - Div 2~~ | ~~30SAB02CT005~~ | ~~32UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| Recirc. CoolCoil Inlet Temp (Local)-Div2 | 30SAB02CT501 | 32UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc. CCoil Outlet Temp (Local) - Div2 | 30SAB02CT502 | 32UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| ~~Inlet Fire Damper - Div 3~~ | ~~30SAB03AA001~~ | ~~33UJK31035~~ | ~~M~~ | ~~M~~ | ~~SII~~ | ~~NS-AQ~~ - ~~EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Makeup Air Isolation Damper - Div 3~~ | ~~30SAB03AA003~~ | ~~33UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| Recirc. Return Air Fire Damper - Div 3 A | 30SAB03AA007 | 33UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Recirc. Return Air Fire Damper - Div 3 B | 30SAB03AA008 | 33UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| ~~Recirc. Air Volume Control Damper - Div~~ | ~~30SAB03AA012~~ | ~~33UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |

**Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment**

(Sheet 95 of 102)

| Name Tag (Equipment Description) | Tag Number | Local Area KKS ID (Room Location) | EQ Environment (Note 1) | Radiation Environment Zone (Note 2) | EQ Designated Function (Note 3) | Safety Class (Note 4) | EQ Program Designation (Note 5) |
|---|---|---|---|---|---|---|---|
| Recirc. Supply Air Fire Damper - Div 3 A | 30SAB03AA014 | 33UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Recirc. Supply Air Fire Damper - Div 3 B | 30SAB03AA015 | 33UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| ~~Recirc. Vol Cont Damp Posit Indic - Div3~~ | ~~30SAB03CG012~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Recirc. Humidifier Outlet RH - Div 3 A~~ | ~~30SAB03CM001~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Recirc. Humidifier Outlet RH - Div 3 B~~ | ~~30SAB03CM002~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~MCR Air Condition Rm RH - A~~ | ~~30SAB03CM003~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~MCRAirCondition Rm RH - B~~ | ~~30SAB03CM004~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Makeup Air Toxic Gas Filters DP - Div 3~~ | ~~30SAB03CP001~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| Recirc. HEPA DP - Div 3 | 30SAB03CP002 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| ~~Makeup Air Pre-Filter DP - Div 3~~ | ~~30SAB03CP501~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Makeup Air Toxic Gas Filter DP - Div 3 A~~ | ~~30SAB03CP502~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Makeup Air Toxic Gas Filter DP - Div 3 B~~ | ~~30SAB03CP503~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| Recirc. HEPA DP (Local) - Div 3 | 30SAB03CP504 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| ~~Makeup Air Inlet Temp - Div 3~~ | ~~30SAB03CT001~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Makeup Air Heater Outlet Temp - Div 3 A~~ | ~~30SAB03CT002~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Makeup Air Heater Outlet Temp - Div 3 B~~ | ~~30SAB03CT003~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Makeup Air Heater Outlet Temp - Div 3 C~~ | ~~30SAB03CT004~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Recirc. Humidifier Outlet Temp - Div 3~~ | ~~30SAB03CT005~~ | ~~33UJK31034~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| Recirc CoolCoil Inlet Temp (Local)-Div3 | 30SAB03CT501 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc. Cool Coil Exit Temp (Local)-Div3 | 30SAB03CT502 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Inlet Fire Damper - Div 4 | 30SAB04AA001 | 33UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Makeup Air Isolation Damper - Div 4 | 30SAB04AA003 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc. Return Air Fire Damper - Div 4 A | 30SAB04AA007 | 33UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Recirc. Return Air Fire Damper - Div 4 B | 30SAB04AA008 | 33UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Recirc. Air Volume Control Damper - Div | 30SAB04AA012 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc. Supply Air Fire Damper - Div 4 A | 30SAB04AA014 | 33UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Recirc. Supply Air Fire Damper - Div 4 B | 30SAB04AA015 | 33UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Recirc Vol Cont Damp Position Indic-Div4 | 30SAB04CG012 | 33UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| ~~Recirc. Humidifier Outlet RH - Div 4 A~~ | ~~30SAB04CM001~~ | ~~33UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~Recirc. Humidifier Outlet RH - Div 4 B~~ | ~~30SAB04CM002~~ | ~~33UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~MCRAirCond Rm (33UJK31 034) RH - A~~ | ~~30SAB04CM003~~ | ~~33UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| ~~MCRAirCond Rm (33UJK31 034) RH - B~~ | ~~30SAB04CM004~~ | ~~33UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| Makeup Air Toxic Gas Filters DP - Div 4 | 30SAB04CP001 | 33UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc. HEPA DP - Div 4 | 30SAB04CP002 | 33UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Makeup Air Pre-Filter DP - Div 4 | 30SAB04CP501 | 33UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Makeup Air Toxic Gas Filter DP - Div 4 A | 30SAB04CP502 | 33UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Makeup Air Toxic Gas Filter DP - Div 4 B | 30SAB04CP503 | 33UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc. HEPA DP (Local) - Div 4 | 30SAB04CP504 | 33UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Makeup Air Inlet Temp - Div 4 | 30SAB04CT001 | 33UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Makeup Air Heater Outlet Temp - Div 4 A | 30SAB04CT002 | 33UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Makeup Air Heater Outlet Temp - Div 4 B | 30SAB04CT003 | 33UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Makeup Air Heater Outlet Temp - Div 4 C | 30SAB04CT004 | 33UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| ~~Recirc. Humidifier Outlet Temp - Div 4~~ | ~~30SAB04CT005~~ | ~~33UJK31035~~ | ~~M~~ | ~~M~~ | ~~SI~~ | ~~S 1E EMC~~ | ~~Y (5) Y (6)~~ - |
| Recirc CoolCoil Inlet Temp (Local)-Div 4 | 30SAB04CT501 | 33UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc. CoolCoil Exit Temp (Local)-Div 4 | 30SAB04CT502 | 33UJK31035 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Iodine Filtr. Inlet Isol. Damper - Div 1 | 30SAB11AA001 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |

**Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment**
(Sheet 96 of 102)

| Name Tag (Equipment Description) | Tag Number | Local Area KKS ID (Room Location) | EQ Environment (Note 1) | Radiation Environment Zone (Note 2) | EQ Designated Function (Note 3) | Safety Class (Note 4) | EQ Program Designation (Note 5) |
|---|---|---|---|---|---|---|---|
| Iodine Filtr. Filter DP - Div 1 | 30SAB11CP001 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Iodine Filtration Pre-Filter DP - Div 1 | 30SAB11CP501 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Iodine Filtr. Inlet HEPA DP - Div1 | 30SAB11CP502 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Iodine Filtration Charcoal DP - Div 1 | 30SAB11CP503 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Iodine Filtration Outlet HEPA DP - Div 1 | 30SAB11CP504 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Iodine Filtr. Inlet Iso. Damper - Div 4 | 30SAB14AA001 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Iodine Filtration Filter DP - Div 4 | 30SAB14CP001 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Iodine Filtration Pre-Filter DP - Div 4 | 30SAB14CP501 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Iodine Filtration Inlet HEPA DP - Div 4 | 30SAB14CP502 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Iodine Filtration Charcoal DP - Div 4 | 30SAB14CP503 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Iodine Filtration Outlet HEPA DP - Div 4 | 30SAB14CP504 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| MCRAirCond. Rm Supply Fire Damp-Div 1 | 30SAB31AA030 | 32UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| TechSupport Supply Fire Damper A | 30SAB32AA004 | 33UJK26033 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| TechSupport Supply Fire Damper B | 30SAB32AA005 | 33UJK26033 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Interconnec Passage Supply Fire Damper | 30SAB32AA010 | 32UJK26020 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| SICS1 / Computer Rm1 Supply Fire Damper | 30SAB32AA011 | 32UJK26002 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| SICS2 / Computer Rm2 Supply Fire Damper | 30SAB32AA012 | 33UJK26002 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| MCR, WC, & Kitchen Supply Fire Damp A | 30SAB32AA020 | 32UJK31019 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| MCR, WC, & Kitchen Supply Fire Damp B | 30SAB32AA021 | 32UJK31019 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| MCR, WC & Kitchen Supply Fire Damp C | 30SAB32AA022 | 32UJK31019 | M | M | SI | S ~~1E~~ EMC | Y (5) Y (6) |
| MCRAirCond. Rm Supply Fire Damp-Div 2 | 30SAB32AA030 | 32UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| MCR Supply Duct Heater Oultet Air Flow | 30SAB32CF001 | 32UJK26030 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Tag/ShiftOff Supply Duct Heat Exit Flow | 30SAB32CF002 | 33UJK26030 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| WC & Kitchen Supply Duct Heat Exit Flow | 30SAB32CF003 | 32UJK26015 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Kitchen Supply Duct Heater Exit Flow | 30SAB32CF004 | 33UJK26044 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| I&CService Supply Duct Heat Exit Flow | 30SAB32CF005 | 33UJK26034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Special Use Supply Duct Heater Exit Flow | 30SAB32CF006 | 33UJK26032 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| TechSupport Supply Duct Heater Exit Flow | 30SAB32CF007 | 33UJK26030 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| ~~MCR Relative Humidity A~~ | ~~30SAB32CM001~~ | ~~32UJK26030~~ | ~~M~~ | ~~M~~ | ~~SII~~ | ~~NS-AQ~~ ~~EMC~~ | ~~Y (5)~~ ~~Y (6)~~ - |
| ~~MCR Relative Humidity A~~ | ~~30SAB32CM002~~ | ~~32UJK26030~~ | ~~M~~ | ~~M~~ | ~~SII~~ | ~~NS-AQ~~ ~~EMC~~ | ~~Y (5)~~ ~~Y (6)~~ - |
| DP between MCR and Anteroom A | 30SAB32CP001 | 32UJK26030 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| DP between MCR and Anteroom B | 30SAB32CP002 | 32UJK26030 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| DP between MCR and Anteroom C | 30SAB32CP003 | 32UJK26030 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| DP between MCR and Anteroom (Local) | 30SAB32CP501 | 32UJK26030 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| MCR Supply Duct Heater Oultet Air Temp | 30SAB32CT001 | 32UJK26030 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| MCR Temp A | 30SAB32CT002 | 32UJK26030 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| MCR Temp B | 30SAB32CT003 | 32UJK26030 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Tagging/ShiftOffice Heater Exit Temp | 30SAB32CT004 | 33UJK26030 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Tagging Rm Temp | 30SAB32CT005 | 33UJK26030 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| I&C Service Center Rm Temp A | 30SAB32CT006 | 33UJK26034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| SICS1 / Computer Rm 1 Temp | 30SAB32CT007 | 32UJK26002 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| SICS2 / Computer Rm 2 Temp | 30SAB32CT008 | 33UJK26002 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| WC & Kitchen Supply Duct Heat Exit Temp | 30SAB32CT009 | 32UJK26015 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Kitchen (MCR Staff) Temp | 30SAB32CT010 | 32UJK26031 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Kitchen Supply Duct Heater Outlet Temp | 30SAB32CT011 | 33UJK26044 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Kitchen Temp | 30SAB32CT012 | 33UJK26044 | M | M | SI | S 1E EMC | Y (5) Y (6) |

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**Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment**
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| Name Tag (Equipment Description) | Tag Number | Local Area KKS ID (Room Location) | EQ Environment (Note 1) | Radiation Environment Zone (Note 2) | EQ Designated Function (Note 3) | Safety Class (Note 4) | EQ Program Designation (Note 5) |
|---|---|---|---|---|---|---|---|
| I&CService Supply Duct Heater Exit Temp | 30SAB32CT013 | 33UJK26034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| I&C Service Center Rm Temp B | 30SAB32CT014 | 33UJK26034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| SpecialUse Supply Duct Heat Exit Temp | 30SAB32CT015 | 33UJK26032 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Special Use Temp | 30SAB32CT016 | 33UJK26032 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| TechSupp Supply Duct Heat Exit Temp | 30SAB32CT017 | 33UJK26030 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Tech Support Center Temp | 30SAB32CT018 | 33UJK26006 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| MCRAirCond Rm Supply Fire Damper - Div 3 | 30SAB33AA030 | 33UJK31035 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| MCRAirCond Rm Supply Fire Damper- Div 4 | 30SAB34AA030 | 33UJK31034 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Exhaust Air Recirc. Vol Contr Damper A | 30SAB42AA001 | 32UJK26031 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Exhaust Air Recirc. Fire Damper | 30SAB42AA003 | 32UJK26031 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Interconnect Passage Exhaust Fire Damp-A | 30SAB42AA004 | 33UJK26020 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| SICS2/Computer Rm2 Exhaust Fire Damp | 30SAB42AA005 | 33UJK26002 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Interconnect Passage Exhaust Fire Damp-B | 30SAB42AA007 | 32UJK26020 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| SICS1/Computer Rm1 Exhaust Air Fire Damp | 30SAB42AA008 | 32UJK26002 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| MCR Exhaust Fire Damper | 30SAB42AA010 | 32UJK26031 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| TechSupport Exhaust Fire Damper | 30SAB42AA013 | 33UJK26006 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| I&CServ/SpecialUse Exhaust Fire Damp | 30SAB42AA015 | 33UJK26044 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Tag/ShiftOffice Exhaust Fire Damper | 30SAB42AA017 | 32UJK26029 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Exhaust Air Fire Damper | 30SAB45AA001 | 32UJK31020 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Exhaust Air Isolation Damper - A | 30SAB45AA003 | 32UJK31020 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Exhaust Air Isolation Damper - B | 30SAB45AA004 | 32UJK31020 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Bathrooms Exhaust Air Fire Damper | 30SAB45AA008 | 32UJK26020 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| Kitchen Exhaust Fire Damper | 30SAB45AA009 | 33UJK26033 | M | M | SI~~I~~ | S~~NS-AQ~~ EMC | Y (5) Y (6) |
| SAB11 Filtr Train Iso Dmpr Dwnstrm | 30SAB11AA003 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| SAB11 Filtr Train recirc iso dmpr | 30SAB11AA004 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| SAB11 Filtr Train Temp Sens 1 | 30SAB11CT001 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| SAB11 Filtr Train Temp Sens 2 | 30SAB11CT002 | 32UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| SAB14 Filtr Train Iso Dmpr Dwnstrm | 30SAB14AA003 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| SAB14 Filtr Train recirc iso dmpr | 30SAB14AA004 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| SAB14 Filtr Train Temp Sens 1 | 30SAB14CT001 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| SAB14 Filtr Train Temp Sens 2 | 30SAB14CT002 | 33UJK31034 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| **Essential Service Water Pump Building Ventilation System (ESWPBVS)** | | | | | | | |
| Elec Heater Bldg 1 | 30SAQ01AH001 | 31UQB02001 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc Fan Bldg 1 | 30SAQ01AN001 | 31UQB02001 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Room Temp Sensor Bldg 1 | 30SAQ01CT001 | 31UQB02001 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Elec Heater Bldg 2 | 30SAQ02AH001 | 32UQB02001 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc Fan Bldg 2 | 30SAQ02AN001 | 32UQB02001 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Room Temp Sensor Bldg 2 | 30SAQ02CT001 | 32UQB02001 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Elec Heater Bldg 3 | 30SAQ03AH001 | 33UQB02001 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc Fan Bldg 3 | 30SAQ03AN001 | 33UQB02001 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Room Temp Sensor Bldg 3 | 30SAQ03CT001 | 33UQB02001 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Elec Heater Bldg 4 | 30SAQ04AH001 | 34UQB02001 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Recirc Fan Bldg 4 | 30SAQ04AN001 | 34UQB02001 | M | M | SI | S 1E EMC | Y (5) Y (6) |
| Room Temp Sensor Bldg 4 | 30SAQ04CT001 | 34UQB02001 | M | M | SI | S 1E EMC | Y (5) Y (6) |

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**Table 3.2.2-1—Classification Summary**
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| KKS System or Component Code | ~~System or Component~~ SSC Description | Safety Classification (Note 15) | Quality Group Classification | Seismic Category (Note 16) | 10 CFR 50 Appendix B Program | Location (Note 17) | Comments/ Commercial Code |
|---|---|---|---|---|---|---|---|
| 30SAB45 AA004 | Downstream Exhaust Air Isolation Damper | S | C | I | Yes | UJK | ~~Local Building Codes~~ ASME AG-1(14) |
| 30SAB32 AH001-007 | Electric Air Heaters | NS-AQ | ~~E~~D | ~~NSC~~II | No | UJK | Local Bldg. Code |
| SAB | Safety-Related Fire Dampers | S | C | I | Yes | UJK | NFPA 90A |
| 30SAB11/14 AH001 | Electric Heater for Carbon Filter | S | C | I | Yes | UJK | ASME AG-1(14) |
| 30SAB11/14 AA002 | ESF Filter Train Backdraft Damper | S | C | I | Yes | UJK | ASME AG-1(14) |
| 30SAB11/14 AA005 | ESF Recirc Backdraft Damper | S | C | I | Yes | UJK | ASME AG-1 (14) |
| 30SAB11/14 AN001 | ESF Filter Train Fans | S | C | I | Yes | UJK | ASME AG-1(14) |
| 30SAB11/14 AA003 | ESF Filter Train Isolation Dampers, Electric Operated | S | C | I | Yes | UJK | ASME AG-1(14) |
| 30SAB45 AN001 | Exhaust Fan | S | C | I | Yes | UJK | ~~Local Building Codes~~ ASME AG-1(14) |
| 30SAB01/02/03/04 AT005 | HEPA Filters | S | C | I | Yes | UJK | ASME AG-1(14) |

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Table 3.2.2-1—Classification Summary
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| KKS System or Component Code | ~~System or Component~~ SSC Description | Safety Classification (Note 15) | Quality Group Classification | Seismic Category (Note 16) | 10 CFR 50 Appendix B Program | Location (Note 17) | Comments/ Commercial Code |
|---|---|---|---|---|---|---|---|
| 30SAB01/02/03/04 AA009 | Recirculation Unit Isolation Dampers | S | C | I | Yes | UJK | ASME AG-1(14) |
| 30SAB01/02/03/04 BS003 | Silencers on Fan Discharge Side | S | C | I | Yes | UJK | ASME AG-1(14) |
| 30SAB01/02/03/04 BS002 | Silencers on Fan Suctions | S | C | I | Yes | UJK | ASME AG-1(14) |
| ~~30SAB01/02/03/04 AH002~~ | ~~Steam Humidifiers~~ | ~~NS~~ | ~~E~~ | ~~NSC~~ | ~~No~~ | ~~UJK~~ | ~~Local Building Codes~~ |
| 30SAB01/04 SD001 | Smoke Detector | NS-AQ | D | II | No | UJK | Local Bldg. Code |
| 30SAB 01/02/03/04 SD002 | Smoke Detector | NS-AQ | D | II | No | UJK | Local Bldg. Code |
| 30SAB01/02/03/04 AN001 | Supply Air Fans | S | C | I | Yes | UJK | ASME AG-1(14) |
| 30SAB45 AA003 | Upstream Exhaust Air Isolation Damper | S | C | I | Yes | UJK | ~~Local Building Codes~~ ASME AG-1(14) |
| 30SAB01/02/03/04 AA010/012 | Volume Control Dampers, Manually Adjusted for Recirc Unit | S | C | I | Yes | UJK | ASME AG-1(14) |

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**Table 3.2.2-1—Classification Summary**
**Sheet 165 of 179**

| KKS System or Component Code | ~~System or Component~~ SSC Description | Safety Classification (Note 15) | Quality Group Classification | Seismic Category (Note 16) | 10 CFR 50 Appendix B Program | Location (Note 17) | Comments/ Commercial Code |
|---|---|---|---|---|---|---|---|
| 30KLC41/42 AH001 | Heaters | S | C | I | Yes | UFA | ASME AG-1(14) |
| 30KLC41/42 AT002 | HEPA Filters | S | C | I | Yes | UFA | ASME AG-1(14) |
| 30KLC41/42 AT004 | HEPA Filters | S | C | I | Yes | UFA | ASME AG-1(14) |
| 30KLC41/42 AA001 | Inlet Tight Isolation Dampers with Electric actuator | S | C | I | Yes | UJH | ASME AG-1(14) |
| 30KLC51/54 AT003 | Moisture Separator | S | C | I | Yes | UJH | ASME AG-1(14) |
| 30KLC51/52/53/54 AT001 | Moisture Separators | S | C | I | Yes | UJH | ASME AG-1(14) |
| 30KLC51/52/53/54 AT002 | Moisture Separators | S | C | I | Yes | UJH | ASME AG-1(14) |
| 30KLC41/42 AA003 | Non-Return Dampers | S | C | I | Yes | UJH | ASME AG-1(14) |
| 30KLC41/42 AT001 | Pre-Filter~~s~~/Moisture Separators | S | C | I | Yes | UFA | ASME AG-1(14) |
| 30KLC51/52/53/54 AC001 | Recirculation Cooling Units | S | C | I | Yes | UJH | ASME AG-1(14) |
| 30KLC51/52/53/54 AC002 | Recirculation Cooling Units | S | C | I | Yes | UJH | ASME AG-1(14) |
| 30KLC51/54 AC003 | Recirculation Cooling Units | S | C | I | Yes | UJH | ASME AG-1(14) |

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**Table 3.2.2-1—Classification Summary**
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| KKS System or Component Code | ~~System or Component~~ SSC Description | Safety Classification (Note 15) | Quality Group Classification | Seismic Category (Note 16) | 10 CFR 50 Appendix B Program | Location (Note 17) | Comments/ Commercial Code |
|---|---|---|---|---|---|---|---|
| KLL | Non-Safety Related Electric Heating Units ~~(33)~~ | NS-AQ | ~~E~~D | ~~NSC~~II | ~~No~~Yes | UFA | ~~Commercial~~ ASME AG-1(14) |
| 30KLL61/64 ~~AN002-003~~AC/AT/AN002-003 | Recirculation Cooling Units in FAK Pump Rooms | S | C | I | Yes | UFA | ASME AG-1(14) |
| 30KLL61/64 ~~AN001~~AC/AT/AN001 | Recirculation Cooling Units in JDH Pump Rooms | S | ~~B~~C | I | Yes | UFA | ASME AG-1(14) |
| KLL | Safety Related Electric Heating Units ~~(115)~~ | S | ~~B~~C | I | Yes | UFA | ASME AG-1(14) |
| 30KLL11/14 AA001-003 | Supply Isolation Dampers | S | C | I | Yes | UFA | ASME AG-1(14) |
| 30KLL11 AA010 | Supply Pressure Control Damper | NS-AQ | ~~E~~D | ~~NSC~~II | ~~No~~Yes | UFA | ASME AG-1(14) |
| KLL | Balance of KLL System | NS-AQ | ~~E~~D | ~~NSC~~II | ~~No~~Yes | UFA | ASME AG-1(14) |
| KLL | Exhaust Air Duct | S | C | I | Yes | UFA | ASME AG-1(14) |

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The main features related to control room habitability of the CRACS design are:

- Under normal operating conditions:
  - The ventilation system operates in the recycling mode with fresh air makeup.
  - The air makeup rate corresponds to the exhausts from the kitchen and sanitary rooms and leakage out of the area due to the controlled overpressure.
- The ventilation system maintains an ambient condition for comfort and safety of control room occupants and to support operability of the MCR components during normal operation, anticipated operational occurrences (AOO), and design basedds accidents (DBA).
- The ventilation system maintains a positive pressure of 0.125 inches water gauge as a minimum within the CRE areas with respect to adjacent environmental zones to prevent uncontrolled, unfiltered in-leakage during normal and accident conditions. The filtered outside air supply rate during accident conditions corresponds to 0.3 volume changes per hour.
- During a site radiological contamination event, the air intake is redirected through the ESF filter system trains.
- [[Control room operators are protected from chlorine releases and other toxic gases in accordance with RG 1.52, RG 1.78, and ASME AG-1 (Reference 2).]]
- The ventilation system can be operated in full recirculation mode without outside air makeup during DBAs [[or events involving toxic gas releases]]. The recirculated airflow rate is 17,000 cfm.
- The ventilation system provides adequate capacity for proper temperature and humidity within the CRE.
  - Redundancy for air cooling, filtration, and toxic gas protection is provided by having two independent trains for critical functions.
  - Redundancy is provided for proper operation of the system when one active component is out of service.
  - Power supplies of the active components are backed up with emergency power so that they function in case of a loss of offsite power.

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### 6.4.2.3 Leak-tightness

The CRACS is maintained in a manner that minimizes the unfiltered in-leakage across the CRE boundary. Adequate leak-tightness for air sealing components supports operator habitability within the CRE boundary during normal operation, AOOs and DBAs.

Leak-tightness provisions for pressure boundary components are:

ASHRAE Standard 52 (Reference 4). The filters are equipped with local differential pressure measurement, which indicates the degree of particulate loading and the need for filter change.

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#### Moisture Separator

The moisture separator is a combination of moisture separator and prefilter. The moisture separator must meet the requirements of RG 1.52 (Reference 10), ASME N509 (Reference 1), and ASME AG-1 (Reference 3). The moisture separator is located upstream of the filter air heater and the HEPA prefilter. The moisture separator shall be a design that has been qualified by testing in accordance with the procedures described in Reference 1. Moisture separators must be capable of removing at least 99 percent by weight of entrained moisture in an air stream containing approximately 1.5–2 lb of entrained water per 1000 cubic feet, per Reference 1. Fiberglass knitted media within the moisture separator removes airborne particulates, which prevents the HEPA filters from becoming overloaded during radiological release events. The filters are equipped with local differential pressure measurement, which indicates the degree of particulate loading and the need for filter change.

#### HEPA Filters

HEPA filters are located upstream and downstream of the carbon adsorbers to prevent contamination of the carbon adsorbers and charcoal loss. The filters are equipped with local differential pressure measurements that indicate the degree of load and the need for a filter change. HEPA filters are designed, constructed, qualified, and factory tested in accordance with ASME AG-1 (Reference 3). Each HEPA filter cell is manufacturer tested to achieve an efficiency of at least 99.97 percent and, once installed, is tested periodically according to ASME N510 (Reference 2) to confirm an efficiency of at least 99.95 percent.

#### Carbon Adsorbers

The radiological filters use activated charcoal to adsorb airborne radioiodine from the air. Carbon filters are designed to meet the requirements of RG 1.52. Each of the ESF carbon adsorbers contains a four-inch-deep carbon bed with a laboratory decontamination efficiency of 99 percent, as tested per ASTM D3803 (Reference 5). Downstream of the carbon adsorbers, a HEPA filter removes entrained charcoal. Charcoal trays and screens are fabricated using all-welded construction to preclude potential loss of charcoal. The carbon adsorbers are equipped with differential pressure measurement to indicate the need for filter replacement. Carbon adsorbers are constructed, qualified, and tested in accordance with ASME AG-1 (Reference 3).

doses from fission product releases to within the criteria of 10 CFR 52.47(a)(2)(iv) and GDC 19, respectively, through the use of the ESF filter systems.

Following a DBA, the AVS controls and removes fission products that leak from the primary containment. The AVS maintains the annulus at a slightly negative pressure to prevent leakage from the annulus through the Shield Building. A containment isolation actuation signal automatically aligns the discharge of the AVS through its ESF filter trains.

The SBVS services the SB and FB, including areas containing containment penetration piping. Pipes that penetrate the RB have the potential to create a bypass path for radioactive fission products through the annulus. Leakage from the safety injection pumps may also release radioactive fission products. The SB and FB capture bypass leakage from the RB and process it through SBVS, described in Section 9.4.5. ESF signals automatically align the discharge of SBVS through its ESF filter trains.

## 6.5.4 References


1. ANSI/ASME N509, "Nuclear Power Plant Air-Cleaning Units and Components," American National Standards Institute/The American Society of Mechanical Engineers, ~~2003~~2002.

2. ANSI/ASME N510, "Testing of Nuclear Air Treatment Systems," American National Standards Institute/The American Society of Mechanical Engineers, 1989.

3. ASME AG-1, "Code on Nuclear Air and Gas Treatment Systems," The American Society of Mechanical Engineers, 2003.

4. ASHRAE Standard 52, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size (ANSI approved)," American Society of Heating, Refrigerating and Air Conditioning Engineers, 1999.

5. ASTM D3803, "Standard Test Method for Nuclear-Grade Activated Carbon," American Society for Testing and Materials, 1989.

6. ANSI/AMCA-210, "Laboratory Methods for Testing Fans for Rating," American National Standards Institute/American Movement and Control Association, 1999,

7. ANSI/AMCA-211, "Certified Ratings Program Air Performance," American National Standards Institute/American Movement and Control Association, 1987.

8. ANSI/AMCA-500, "Test Methods for Louvers, Dampers, and Shutters," American National Standards Institute/American Movement and Control Association, 1989.

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9. UL-555, "Fire Dampers and Ceiling Dampers," Underwriters Laboratories Inc., 1999.

10. Regulatory Guide 1.52, Revision 3, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature

Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," U.S. Nuclear Regulatory Commission, June 2001.

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## 9.4 Air Conditioning, Heating, Cooling and Ventilation Systems

The heating, ventilation, and air-conditioning (HVAC) system for each major building or area is provided in the following subsections.

### 9.4.1 Main Control Room Air Conditioning System

The main control room air conditioning system (CRACS) is designed to maintain a controlled environment in the control room envelope (CRE) area for the comfort and safety of control room personnel and to support operability of the control room components during normal operation, anticipated operational occurrences and design basis accidents. CRACS is also relied upon to cope with and recover from a station blackout (SBO) event.

The air conditioning system for the CRE area operates in the recirculation mode with fresh air makeup. The fresh outside air intake and recirculated air are filtered and conditioned through the filtration trains. The conditioned air is then supplied to the CRE area. During a site radiological contamination event, the fresh air intake is redirected through the iodine filtration trains.

The main control room (MCR) habitability system, including the definition of the CRE area, is addressed in Section 6.4.

Under emergency conditions, when the iodine filtration train subsystem of CRACS is utilized, the subsystem function is designated as control room emergency filtration (CREF). See Technical Specification 3.7.10 in Chapter 16.

09.04.05-1.1

#### 9.4.1.1 Design Bases

All components of the CRACS except the restroom/kitchen exhaust fan, smoke detectors, and electric heaters to CRE rooms are safety related and designed to Seismic Category I requirements.

- The CRACS components are located inside the Safeguard Building (SB) divisions two and three. These buildings are designed to withstand the effect of natural phenomena, such as earthquake, tornados, hurricanes, floods and external missiles (GDC 2).
- The quality group classification (Section 3.2) meets the requirements of RG 1.26. The seismic design of the system meets the guidance of RG 1.29 (Position C.1 for the safety-related portion and Position C.2 for the non-safety-related portion).
- The CRACS components are appropriately protected against dynamic effects and designed to accommodate the effects of, and be compatible with the environmental conditions of normal operation, maintenance, testing, and postulated accidents (GDC 4). Consideration of the environmental and dynamic

The CRACS is capable of isolating all non-safety-related system penetrations of the CRE boundary so that occupation and habitability of the control room is not compromised. 09.04.05-1.1

- The CRACS maintains the following temperature ~~and humidity~~ ranges for the areas serviced:
  - Main Control Room: 65°F to 76°F ~~(40 to 60 percent humidity)~~.
  - Other areas of CRE: 68°F to 79°F ~~(30 to 60 percent humidity)~~.

### 9.4.1.2 System Description

### 9.4.1.2.1 General Description

The CRACS is designed to maintain acceptable ambient conditions inside the CRE areas to provide for proper operation of equipment and for personnel access to conduct inspection, testing and maintenance. The CRE area is shown in Figures 6.4-1 through 6.4-3.

The CRACS consists of following subsystems:

- Air intake.
- Iodine filtration train.
- Recirculation air handling.
- Air supply and recirculation.
- Kitchen and sanitary rooms exhaust.

#### Air Intake Subsystem

09.04.05-1.2

The air intake subsystem is illustrated in Figure 9.4.1-1—Control Room Air Intake and Iodine Filtration Train Subsystems.

~~Fresh air is supplied by an outside air intake through a wire mesh grille, one intake for SB division two and another for SB division three. Sensors on the outside air inlet protect against toxic gas (refer to Section 6.4.2.4) and radiological intrusion. Each outside air intake is equipped with an electrically heated, weather protected grille to prevent ice formation. Outside air is diverted into two fresh air intake trains for each division (total of four trains).~~The control room air conditioning system has two outside air intakes. The train 1 intake is located in Safeguard Building 2 and the train 4 intake is located in Safeguard Building 3. Outside air is supplied by each outside air intake through a wire mesh grille. Each outside air intake is equipped with an electrically heated, weather protected grille to prevent ice formation. A sensor is installed in each outside air intake to protect against toxic gas (refer to Section 6.4.2.4), while smoke and radiation monitors are installed in the outside air intake ducting.

~~Two identical fresh air intake trains for each division are physically separated. In each train, air is directed through motorized dampers, an electric heater, and a prefilter. Fresh air is then mixed with the recirculated air from the CRE area prior to conditioning by the air handling units.~~The outside air intake on each train is interconnected through ducting to allow the outside inlet air to travel through a CREF carbon filtration unit (filtered alignment), or the outside air can bypass the CREF filtration unit (unfiltered bypass alignment).

09.04.05-1.2

Trains 1 and 4 outside air intakes each are equipped with a motor-operated isolation damper. These isolation dampers are normally open but they can be manually closed as necessary to isolate the outside air intake from the control room.

**Iodine Filtration Train Subsystem**

09.04.05-1.2

The iodine filtration train subsystem is illustrated in Figure 9.4.1-1.

~~There are two iodine filtration trains located separately in the SB divisions two and three (one train in each division) in parallel with the associated intake trains. These trains provide an alternate path for fresh air intake and CRE recirculated air when site contamination is detected. Each train consists of an inlet motorized isolation damper, an electric heater, a prefilter, an upstream high efficiency particulate air (HEPA) filter, an iodine filter with activated carbon, a downstream HEPA filter, an outlet motorized isolation damper, a supply air fan, and a backdraft damper. The motorized dampers operate automatically to isolate or align the iodine filtration trains.~~The train 1 outside air inlet duct and train 1 CREF filtration unit is located in Safeguard Building 2. The train 4 outside air inlet duct and train 4 CREF filtration unit is located in Safeguard Building 3. Each CREF filtration train pulls air from its respective outside air inlet. The outside inlet air for each CREF is ducted to allow the CREF filtration units to operate in the filtered or the unfiltered (bypass) alignment.

In the CREF filtered alignment, a maximum of 1000 cfm of outside air mixes with 3000 cfm of CRE recirc air and is pulled through the CREF filtration unit by the CREF booster fan. In the filtered alignment, the filter bypass duct has two motor-operated isolation dampers in series to provide redundancy and single-failure protection. The filtered outside air then flows through a duct to the CRE common recirculation plenum.

In the CREF unfiltered (bypass) alignment, the CREF filtration unit inlet, outlet and CRE recirc dampers are all closed and both bypass dampers are open. The outside unfiltered air bypasses the CREF carbon filtration unit. In the unfiltered (bypass) alignment, the outside air flows through a prefilter and a preheater that is temperature controlled. The outside air then flows through ducting and is pulled into the common recirculation plenum. In this unfiltered (bypass) alignment, the CREF booster fan does not operate and outside air is pulled into the common recirculation plenum by the CRACS air handling units.

09.04.05-1.2

### Recirculation Air Handling Subsystem

The recirculation air handling subsystem is illustrated in Figure 9.4.1-2—Control Room Recirculation Air Handling Subsystem.

There are four recirculation air handling units located in the SB divisions two and threeSafeguard Buildings 2 and 3 (two trains in each divisionbuilding). Recirculated and fresh air is processed through these air handling units and supplied to a common supply air plenum in divisions two and three. Each train includes an isolation damper, a volume control manual damper, a cooling coil, a moisture separator, fan suction and discharge silencers, a supply air fan, a HEPA filter, anda steam humidifier, a non-return damper, and a volume control electric damper. The cooling coil is supplied with chilled water from the safety chilled water system (SCWS). The humidifier is supplied with water from the potable and sanitary water system (PSWS). The relative humidity in the rooms is controlled by modulation of the humidifiers.

During normal and emergency operation, each CRACS cooling unit provides 50 percent of the cooling for the rooms within the CRE. However, each CRACS air handling unit is capable of cooling up to 75 percent of the normal and emergency cooling load to allow a single CRACS air handling unit to cool the CRE rooms during a station blackout (SBO) event. During an SBO, the single CRACS air handling unit prevents the CRE room temperature from exceeding 104°F.

The air conditioning system for the CRE area operates in the recirculation mode with fresh air makeup. The fresh air flow rate corresponds to the exhaust of kitchens and sanitary rooms and the leakage rate in the CRE area due to controlled overpressure. The exhaust from the kitchen and sanitary rooms is directed to the electrical division of the SB ventilation system (SBVSE) air outlet duct (refer to Section 9.4.6).

### Air Supply and Recirculation Subsystem

09.04.05-1.2

The air supply and recirculation subsystem is illustrated in Figure 9.4.1-3—CRE Air Supply and Recirculation SubsystemFigure 9.4.1-3—Control Room Envelope Air Supply and Recirculation Subsystem.

The common supply air plenum (one in the SB division two and one in the SB division three) provides conditioned air to the CRE areas through the ductwork distribution network. Electric air heaters are installed in the supply air ducts to maintain individual room temperatures. The exhaust air from the CRE area, except the exhaust from kitchen and sanitary rooms, is recirculated through the recirculation air handling units. The exhaust from kitchen and sanitary rooms is separated from the recirculated

09.04.05-1.2

~~return air and is processed separately through the SBVSE.~~The common supply air plenum receives air from the operating CRACS air handling units and provides conditioned air to the CRE areas through the duct distribution network. Electric air heaters are installed in the supply air ducts to maintain individual room temperatures. The exhaust air from the CRE area, except from the kitchen and sanitary rooms, flows through the recirculation air handling units. The exhaust from kitchen and sanitary rooms is separated from the recirculated return air and is processed separately through the SBVSE.

### 9.4.1.2.2 Component Description

The major components of the CRACS are listed below, along with the applicable codes and standards. Refer to Section 3.2 for the seismic and system quality group classification of these components.

#### Ductwork and Accessories

The main supply and exhaust air shafts are constructed of concrete with painted surfaces. The air supply and exhaust duct branches for each area are fed from the main supply and exhaust air shafts. These ducts are constructed of galvanized sheet steel and are structurally designed for fan shutoff pressures. The ductwork meets the design, testing and construction requirements per ASME AG-1-2003 (Reference 1).

#### Electric Heaters

The electric heaters are installed in the supply duct to maintain room ambient conditions. These are controlled by local room temperature sensors and control circuits. The heaters meet the requirements of Reference 1.

#### Filter Air Heaters

Filter air heaters are located upstream of iodine filtration units to prevent excessive moisture accumulation in the carbon filter beds. The heaters meet the requirements of Reference 1.

#### Prefilters

The prefilters are located upstream of the HEPA filters and collect large particles to increase the useful life of the high efficiency filters. The prefilters meet the requirements of ANSI/ASHRAE Standard 52.2-1999 (Reference 2).

#### HEPA Filters

HEPA filters are constructed, qualified and tested in accordance with Reference 1. The periodic inplace testing of HEPA filters to determine the leak tightness is performed per ASME N510-1989 (Reference 3).

### Adsorbers

Carbon filters are used to remove radioactive iodine from the supply of fresh and recirculated air. The efficiency of removal of methyl iodine is based on the decontamination efficiency assigned during the laboratory tests. The periodic inplace testing of adsorbers to determine the leak tightness is performed per Reference 3.

### Fans

The supply and exhaust fans are centrifugal or axial type with electric motor drivers. Fan performance is rated in accordance with ANSI/AMCA-210-99 (Reference 4), ANSI/AMCA-211-1987 (Reference 5) and ANSI/AMCA-300-1985 (Reference 6).

### Isolation dampers

Manual dampers are adjusted during initial plant startup testing to establish accurate air flow balance between the rooms. The motor-operated dampers will fail to “close” or “open” position in case of power loss, depending on the safety function of the damper. The performance and testing requirements of the dampers are per Reference 1.

### Fire Dampers

Fire dampers are installed where ductwork penetrates a fire barrier. Fire damper design meets the requirements of UL 555 (Reference 7) and the damper fire rating is commensurate with the fire rating of the barrier penetrated.

### Cooling Coils and Moisture Separator

The cooling coils are of the finned tube, coil type and are connected to the safety chilled water system (SCWS). The cooling coils are designed in accordance with Reference 1. The moisture separator collects condensate which is directed to the drain system.

09.04.05-1.1

### ~~Humidifier~~

~~Humidifiers are installed to restore ambient humidity conditions as required for each area. Humidity levels are maintained in all areas within the acceptable range defined in the design basis. The humidifier is supplied with water from the PSWS. The relative humidity in the rooms is controlled by modulation of the humidifiers.~~

## 9.4.1.2.3 System Operation

09.04.05-1.1

### Normal Plant Operation

During normal plant operation, fresh air is admitted via ~~two of four~~ air intake trains 1 and 4. The fresh air passes through the unfiltered bypass duct and bypass dampers. ~~two~~

09.04.05-1.1

auto-opened isolation dampers and is heated by electric heaters depending on the fresh air temperature. The fresh air passes through a prefilter, electric heaters, and then mixes with the recirculated air from the CRE area.

The fresh and recirculated air is admitted through two of four air handling units which provide heating and, cooling and humidity control of the supply air. The conditioned air is then distributed through a ductwork distribution network to the CRE area. The room air conditioning is provided by the supply and exhaust air flows based on minimum air renewal rate, equipment and personnel heat loads and heat balance between the rooms.

Heating of air streams is provided by electric heaters located in the supply air ducts. The operation of heaters is automatically controlled by the temperature sensors located in the corresponding rooms.

The CRE area is maintained at a pressure above atmospheric pressure to provide habitability in the event of radioactive or toxic contamination of the environment.

Both iodine filtration trains are secured and fully bypassed with the motorized inlet, outlet and CRE recirc dampers in the auto-closed position during normal plant operation.

09.04.05-1.1

The air conditioning system for the CRE area operates in the recirculation mode with fresh air makeup. During the recirculation mode, the fresh air supply rate is equal to the rate of exhaust air from the kitchens and sanitary rooms plus accounting for the leakage rate in the area due to controlled overpressure. The four fresh air intake trains are not cross-connected; therefore, the air intake in operation corresponds to the recirculation train in operation.

Exhaust air from the kitchen and sanitary rooms is not recirculated. The exhaust air is directed by a separate exhaust duct and exhaust fans to the SBVSE air outlet duct. During normal operation, air is exhausted from the sanitary rooms and the kitchen area to the SBVSE air outlet. The CRACS has design features which will allow it to continue to maintain a minimum positive pressure of 0.125 inch water gauge in the CRE. Approximately twice as much outside air is supplied to the CRE during normal operation compared to operation during accident conditions. Each train of the CRACS is equipped with a pressure control damper. This damper will open and close as required to increase or decrease the amount of outside air that enters the control room. During normal operation, air is exhausted from the sanitary rooms and the kitchen area through a small throttle damper that minimizes the open CRE boundary area.

### Abnormal Operating Conditions

Redundancy of air supply and air conditioning trains is provided. A loss of function or power to any single train or component does not affect overall system operation. The train separation and independent power source limit common mode failure of active multiple trains and abnormal operating conditions.

Loss of a single cooling train will not result in a loss of system functional capability because four cooling trains are provided. The iodine filtration trains do not operate during normal plant operation, but loss of a single iodine filtration train during any design basis accident will not result in a loss of iodine filtration capability because two iodine filtration trains are provided.

09.04.05-1.1

During a toxic gas accident event, the CREF outside air inlet where toxic gas is detected~~CRACS~~ is placed in full recirculation mode without any outside air makeup (refer to Section 6.4.2.2).

*Loss of Offsite Power*

09.04.05-1.1

During loss of offsite power (LOOP), the air intake and recirculation air handling electrical components located inside SB division two receive power for one train from the emergency diesel generators (EDG) of division two, and for the other train from the EDGs of division one. The electrical components located inside the SB division three receive power on one train from the EDGs of division three, and for the other train from the EDGs of division four. ~~The humidity is not controlled during this event.~~

During LOOP, the iodine filtration train electrical components located inside the SB division two receive power from the EDGs of division one. The electrical components located inside the SB division three receive power from the EDGs of division four.

*Station Blackout*

- In the event of station blackout (SBO), the electrical components which receive power from the EDG of division one are backed-up by alternate AC (AAC) power from the SBO diesel generators (SBODG) of division one. The electrical components which receive power from the EDG of division four are backed up by the AAC power from the SBODGs of division four.

- In the event of a simultaneous SBO and site radiological event, the CRE area is isolated and CRACS is maintained in a full recirculation mode through the iodine filtration train until site power is restored or EDGs are started. Power restoration is assumed to occur within eight hours following the occurrence of a SBO event.

*Loss of Ultimate Heat Sink*

The conditioned air supply is cooled by chilled water provided by the SCWS. Two water-cooled chillers are located in SB divisions two and three, and two air-cooled chillers are located in SB divisions one and four. In case of loss of ultimate heat sink (LUHS), the water-cooled chillers are not available. The safety chilled water is then supplied by air-cooled chillers which provide the cooling function for the filtration trains located in divisions one and four, which also include both iodine filtration trains. The cooling function for the filtration trains in divisions two and three is not available.

*Operation During Radiological Site Contamination*

During a site radiological contamination event, the fresh air supply is automatically redirected through the iodine filtration trains, instead of the normal intake air supply, by closing and opening the associated dampers. When one iodine filtration train operates, the outside fresh airflow rate of 1000 cfm and CRE recirculation airflow rate of 3000 cfm (a total flow rate of 4000 cfm) provides an unlimited stay by the CRE personnel.

Exhaust from the kitchen and sanitary rooms is stopped and all other exhaust air is recirculated.

The operation of CRACS creates an overpressure of 0.125 inches water gauge as a minimum inside the CRE area with respect to the surrounding area, which limits unfiltered incoming air leakage into these areas.

09.04.05-1.3

*Operation During a Toxic Gas Event*

~~Outside air is continuously monitored for toxic gas by the toxic gas sensors located at the air intakes. Upon detection of a toxic gas condition, audible and visual alarms are actuated in the MCR.~~Outside air is continuously monitored for toxic gas (including CO and $CO_2$) by the toxic gas sensors located at the outside air intakes. Upon detection of a toxic gas condition, audible and visual alarms are actuated in the MCR. The CREF filtration units on both intakes are automatically placed in the filtered alignment. The outside air intake (at the inlet location where the toxic gas is detected) automatically closes.

*Operation ~~d~~During External Fire~~,~~ or Smoke ~~or Toxic Gas~~ Release*

In the event of ~~an~~ external fire or~~, external toxic gas release,~~ smoke, the outside inlet isolation damper (at the inlet location where smoke is detected) is closed manually from the control room. The CREF iodine adsorption units are placed in the filtered alignment manually from the control room.~~or excessive concentration of CO and $CO_2$,~~

~~outside air to the CRACS is isolated manually or automatically and the system operates in full recirculation mode without fresh air.~~

09.04.05-1.3

### 9.4.1.3 Safety Evaluation

The CRACS is designed to maintain ambient conditions inside the CRE area for personnel comfort and to allow safe operation of the equipment during normal plant operation, outages, and under all anticipated occurrences including postulated accidental events (refer to Section 15.0.3 for a discussion of radiological consequences).

The CRACS keeps the CRE area at a positive pressure of 0.125 inches water gauge at a minimum with respect to the surrounding area to provide habitability in the event of radioactive contamination of the environment, and to prevent uncontrolled incoming air leakage.

During a site radiological contamination event, the fresh air intake is redirected through the iodine filtration trains. The CRACS also can be operated in full recirculation mode without fresh air during abnormal operation or postulated accident events.

Redundancy for air cooling and iodine filtration is provided by multiple independent trains for critical functions. Sufficient redundancy is provided for proper operation of the system when one active component is out of service.

In case of fire in any room within the CRE area, the room air supply and exhaust are isolated by fire dampers and, if necessary, the plant is controlled by the remote shutdown station (RSS). The four air conditioning trains are installed in four different fire zones. Two of these zones contain the two iodine filtration trains.

Capability for withstanding or coping with an SBO event is met by the design of the AAC power source satisfying the ten minutes criteria; that is, the AAC power source can be started from the MCR within ten minutes after the onset of an SBO event. The AAC diesel generators are designed to operate for a minimum of twenty-four hours with available onsite fuel supplies.

### 9.4.1.4 Inspection and Testing Requirements

Refer to Section 14.2 (test abstracts #082 and #203) for initial plant testing. Initial inplace acceptance testing of the CRACS components is performed in accordance with Reference 1 and Reference 3.

Periodic testing will be performed to verify the unfiltered in-leakage into the CRE area per RG 1.197.

Refer to Section 16 (SR 3.7.10 and SR 3.7.11) for surveillance requirements.

## 9.4.2 Fuel Building Ventilation System

The fuel building ventilation system (FBVS) is designed to maintain acceptable ambient conditions in the Fuel Building (FB), to permit personnel access, and to control airborne radioactivity in the area during normal operation, anticipated occurrences, and following fuel handling accidents.

The conditioned air supply to the FB is provided by the nuclear auxiliary building ventilation system (NABVS) (refer to Section 9.4.3). The exhaust from the building is also processed by the NABVS through a filtration train, and the exhaust air is directed to the plant stack (refer to Section 9.4.3).

### 9.4.2.1 Design Bases

The following components are safety-related and designed to Seismic Category I requirements:

- Fuel handling hall isolation dampers.
- Isolation dampers for the fuel handling hall located in front of the equipment hatch.
- Isolation dampers for the room located in front of the emergency airlock.
- NABVS supply and exhaust isolation dampers to and from FBVS.
- FB isolation dampers to safeguard building ventilation system (SBVS).
- Electric heaters for heating of rooms which have safety-related systems, structures, or components containing borated fluid, and the rooms surrounding the extra borating system tanks.
- Recirculation cooling units in the extra borating system pump rooms, and fuel pool cooling system pump rooms.

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- FBVS exhaust duct.

The FBVS air supply duct and other components of the FBVS are designated as Supplemental Grade (NS-AQ) safety class and Seismic Category II. All other components of the FBVS are non-safety related and Non Seismic category.

The FBVS components are located inside the FB structure, which is designed to withstand the effects of natural phenomena, such as earthquake, tornados, hurricanes, floods and external missiles (GDC-2).

The safety functions of the FB ventilation system can be performed assuming a single active component failure coincident with the loss of offsite power (LOOP).

## 9.4.3 Nuclear Auxiliary Building Ventilation System

The nuclear auxiliary building ventilation system (NABVS) provides conditioned air to the Nuclear Auxiliary Building (NAB) to maintain acceptable ambient conditions, to permit personnel access, and to control the concentration of airborne radioactive material during normal operations and anticipated occupational occurrences. The system also provides conditioned air to the Fuel Building (FB), Containment Building, and the annulus area between the Containment Building and the Shield Building.

The exhaust air from the NAB, FB, Safeguard Building (SB), Containment Building, and the annulus is processed through the NABVS filtration trains prior to release to the environment via the plant stack.

### 9.4.3.1 Design Basis

All components of the NABVS are non-safety related and Non-Seismic, as specified in Section 3.2.

- The NABVS meets GDC-2 for all components as it relates to meeting the seismic design criteria based on the guidance of RG 1.29 Position C.2 (GDC-2).
- The NABVS has no shared systems or components with other nuclear power units (GDC-5).
- 09.04.05-1.7 The NABVS meets GDC-60, as it relates to the ability of the system to limit release of gaseous radioactive effluents to the environment. The NABVS exhaust iodine filtration trains meet the guidance of RG 1.140 Positions C.2 and C.3. RG 1.52 is not applicable because the NABVS is not required to operate during post-accident engineered safety features (ESF) atmospheric cleanup. The air flow rate of a single cleanup filtration unit will not exceed 30,000 cfm.

The NABVS performs no safety-related functions and the system is not required to operate during a design basis accident.

The NABVS performs the following important non-safety-related system functions:

- Controls and maintains a negative pressure within the NAB relative to the outside environment.
- Maintains the following temperature and humidity ranges for the areas serviced:

  A. Minimum temperature 50°F.

  B. Maximum temperature 113°F.

  C. Humidity 25 to 70 percent.

### Prefilters

The prefilters are located upstream of HEPA filters and collect large particles to increase the useful life of the high efficiency filters. The prefilters will meet the requirements of ANSI/ASHRAE Standard 52.2-1999 (Reference 2).

### HEPA Filters

HEPA filters are constructed, qualified and tested in accordance with Reference 1. The periodic in-place testing of HEPA filters to determine the leak-tightness is performed per ASME N510-1989 (Reference 3).

### Adsorbers

09.04.05-1.7

Carbon filters are used to remove radioactive iodine from the exhaust air. The efficiency for removal of methyl iodine is based on the decontamination efficiency assigned during the laboratory tests. The periodic in-place testing of the adsorbers to determine the leak-tightness is performed per Reference 3. The activated carbon total bed depth requirement will be 2 inches with a maximum assigned activated carbon decontamination efficiency of 95 percent.

### Fans

The supply and exhaust fans are centrifugal or vane-axial design with electrical motor drivers. Fan performance is rated in accordance with ANSI/AMCA-210-99 (Reference 4), ANSI/AMCA-211-1987 (Reference 5) and ANSI/AMCA-300-1985 (Reference 6).

### Isolation Dampers

The isolation dampers are located upstream and downstream of each filtration train. The motor-operated dampers will fail to "close" or "open" position in case of loss of power, depending on the safety function of the dampers. The performance and testing requirements of the dampers are per Reference 1.

### Fire Dampers

Fire dampers are installed where ductwork penetrates a fire barrier. Fire damper design meets the requirements of UL 555 (Reference 7) and the damper fire rating is commensurate with the fire rating of the barrier penetrated.

### Recirculation Units

The recirculation units are comprised of chilled water cooling coils and fans, which are designed to process and supply cool air for the compressor, switchgear and transformer rooms.

Section 9.4.5). The remainder of the FB is ventilated by the NABVS. During and after the fuel handling accident, proper NABVS supply and exhaust flow rates are maintained by adjusting the control dampers.

*Fuel Handling Accident in the Containment Building*

In the event of a fuel handling accident in the Containment Building, the containment isolation valves close (refer to Section 9.4.7). Exhaust from the Containment Building is routed to the iodine filtration trains of the SB ventilation system. Excess air supply from the NABVS is redirected by adjusting the supply air control dampers.

*Operation of Safety Injection System during LOCA*

In the event of a loss of coolant accident (LOCA), leakages in the safety injection system (SIS) can lead to iodine activity levels that are above the limits of the NABVS iodine filtration trains. In such a case, the SB exhaust is routed through the SB ventilation system (refer to Section 9.4.5). Excess air supply from NABVS is redirected by adjusting the supply air control damper. The NABVS supply and exhaust to the FB are isolated (refer to Section 9.4.2).

*Loss of Offsite Power (LOOP)*

Upon loss of offsite power, the isolation dampers fail to the closed position, preventing any pathway for potentially contaminated air to leak out to the environment.

*Station Blackout (SBO)*

In the event of SBO, there will be no power to any of the electrical components of the NABVS. Isolation dampers with spring return will fail to the closed position. Other isolation dampers will fail "as-is".

### 9.4.3.3 Safety Evaluation

None of the components of the NABVS perform a nuclear safety-related function. The NABVS components are not required to operate during a design basis accident (DBA). In case of a DBA, the NABVS is isolated from the HVAC systems of other buildings by isolation dampers.

The NABVS provides adequate capacity and redundant trains to maintain proper temperature levels in the NAB, FB, Containment Building, and annulus.

### 9.4.3.4 Inspection and Testing Requirements

Refer to Section 14.2 (test abstracts #079 and #203) for initial plant startup test program. Initial in-place acceptance testing of NABVS components will be performed in accordance with Reference 1 and Reference 3.

09.04.05-1.7

### 9.4.3.5 Instrumentation Requirements

Indication of the operational status of the equipment, position of dampers, instrument indications and alarms are provided in the MCR. Fans, motor-operated dampers, heaters, and cooling units are operable from the MCR. Local instruments are provided to measure differential pressure across filters, flow, temperature and pressure.

09.04.05-1.7

The fire detection and sensors information is delivered to the fire detection system.

All instrumentation provided with the filtration units is as required by RG 1.140.

### 9.4.3.6 References


1. ASME AG-1-2003, “Code on Nuclear Air and Gas Treatment,” The American Society of Mechanical Engineers, 2003 (including the AG-1a, 2004 Addenda).

2. ANSI/ASHRAE Standard 52.2-1999, “Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size,” ANSI/American Society of Heating, Refrigerating and Air Conditioning Engineers, 1999.

3. ASME N510-1989 (R1995), “Testing of Nuclear Air-Treatment Systems,” The American Society of Mechanical Engineers, 1989.

4. ANSI/AMCA-210-99, “Laboratory Methods of Testing Fans for Aerodynamic Performance Rating,” American National Standards Institute/~~AMCA~~Air Movement and Control Association International, December 1999.

5. ANSI/AMCA-211-1987, “Certified Ratings Program–Air Performance,” American National Standards Institute/~~AMCA~~Air Movement and Control Association International, 1987.

6. ANSI/AMCA-300-1985, “Reverberant Room Method of Testing Fans for Rating Purposes,” American National Standards Institute/~~AMCA~~Air Movement and Control Association International, 1985.

7. UL 555, “Standard for Fire Dampers,” Underwriter’s Laboratories, Sixth Edition, June 1999.


Next File

The SBVS air supply and exhaust flows are designed to prevent the spread of airborne contamination and to maintain a negative pressure in the SBs with respect to the outside environment.

The SBVS has two separate modes of exhaust:

- Operational Air Exhaust Mode–The exhaust air (normal exhaust) from all four divisions of the SBs (hot mechanical areas) connects to a single concrete duct in the annulus, which then runs via the FB and connects to the exhaust duct of the NABVS. The exhaust duct of each SB division is equipped with two isolation dampers and one volume control damper. The exhaust air is processed by the NABVS through a filtration train prior to release through the plant stack (refer to Section 9.4.3).

- Accident Air Exhaust Mode–If airborne contamination is detected in any of the four hot mechanical areas of the SBs or there is a containment isolation signal, the SBVS will automatically direct the exhaust air (accident exhaust) via four separate exhaust air ducts and isolation dampers to one common concrete duct in the annulus. This exhaust duct connects to two accident iodine exhaust filtration trains located in the FB. The exhaust air is processed through one of two redundant and independent iodine filtration trains prior to release through the plant stack. Each iodine filtration train includes inlet and outlet dampers, moisture separator, electric ~~pre~~heater, ~~prefilter,~~ inlet and outlet high efficiency particulate air (HEPA) filters, ~~iodine~~carbon adsorber ~~using activated carbon~~, exhaust fan, and backdraft damper. The fans direct the exhaust air to the plant stack.

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As a backup, during the accident mode, the contaminated air also can be processed through the iodine filtration units of NABVS (refer to Section 9.4.3).

In case of a fuel handling accident in the FB, or a fuel handling accident in the RB, the accident exhaust air from these buildings is directed and filtered through the SBVS iodine exhaust filtration trains located in the FB, and released through the plant stack.

In case of containment isolation signal or high radiation signal in the RB, the SBVS maintains a negative pressure in the FB and filters all areas of the FB in addition to performing the SBVS accident air exhaust filtration function.

The supply and exhaust duct network of the hot mechanical area in the SBs is equipped with isolation dampers to isolate the following areas from the other rooms:

- Rooms where safety injection and residual heat removal system components in divisions one and four are installed.

- Rooms where severe accident heat removal system components in division four are installed.

- Personnel air lock area in division two.

Recirculation cooling units are provided for the following rooms where high heat load equipment is located:

- Rooms in the SB, divisions one through four, where safety injection and residual heat removal system components are installed.
- Valve rooms in the SB, divisions one through four, where component cooling water system and emergency feedwater system components are installed.
- Rooms where hydrogen and containment atmosphere monitoring system (divisions one and four), and severe accident sampling system (division four) components are installed.

Electric air heating convectors are provided in the service corridors, interconnecting passageway, and stairways to maintain the minimum allowable temperatures in these areas.

The SBVS is designed to circulate sufficient air to prevent accumulation of flammable or explosive gas or fuel-vapor mixture from components such as storage batteries and stored fuel.

### 9.4.5.2.2 Component Description

The major components of the SBVS are listed below, along with the applicable code and standards. Refer to Section 3.2 for the seismic and system quality group classification of these components.

#### Ductwork and Accessories

The main supply and exhaust air shafts are constructed of concrete with painted surfaces. The air supply and exhaust duct branches for each area are fed from the main supply and exhaust air shafts. These ducts are constructed of ~~galvanized sheet~~ steel and structurally designed for fan shutoff pressures. The ductwork meets the design, testing and construction requirements per ASME AG-1-2003 (Reference 2).

#### Electric Air Heating Convectors (Area Heaters)

The electrical air heating convectors are installed to maintain room ambient conditions. The convectors are controlled by local room temperature sensors and control circuits.

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#### Moisture Separator

The moisture separator is a combination of moisture separator and prefilter. The moisture separator must meet the requirements of RG 1.52 (Reference 10), ASME N509 (Reference 9), and ASME AG-1 (Reference 2). The moisture separator is located upstream of the filter air heater and the HEPA prefilter. The moisture separator shall be a design that has been qualified by testing in accordance with the procedures described in Reference 9.

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### Filter Air Heaters

Filter air heaters are located upstream of iodine filtration units to prevent excessive moisture accumulation in the charcoal filter beds. The heaters meet the requirements of Reference 2.

### Prefilters

The prefilters are located upstream of the HEPA filters and collect large particles to increase the useful life of the high efficiency filters. The prefilters meet the requirements of ANSI/ASHRAE Standard 52.2-1999 (Reference 3).

### HEPA Filters

HEPA filters are constructed, qualified and tested in accordance with Reference 2. The periodic inplace testing of HEPA filters to determine the leak tightness is performed per ASME N510-1989 (Reference 4).

### Adsorbers

Carbon ~~filters~~adsorbers are used to remove radioactive iodine from the exhaust air. The efficiency for removal of methyl iodine is based on the decontamination efficiency assigned during the laboratory tests. The periodic inplace testing of adsorbers to determine the leak-tightness is performed per Reference 4.

### Fans

The supply and exhaust fans are centrifugal or vane-axial design with electrical motor drivers. Fan performance is rated in accordance with ANSI/AMCA-210-99 (Reference 5), ANSI/AMCA-211-1987 (Reference 6), and ANSI/AMCA-300-1985 (Reference 7).

### Isolation Dampers

Manual dampers are adjusted during initial plant startup testing to establish accurate air flow balance between the rooms. The motor-operated dampers will fail to the “close” or “open” position in case of power loss, depending on the safety function of the dampers. The performance and testing requirements of the dampers are per Reference 2.

### 9.4.5.6 References


1. NUREG-CR/0660, Boner, G.L. and Hanners, H.W., "Enhancement of Onsite Emergency Diesel Generator Reliability," (subsection A–item 2, and subsection C-item 1), University of Dayton Research Institute UDR-TR-79-07 for U.S. Nuclear Regulatory Commission, January 1979.

2. ASME AG-1-2003, "Code on Nuclear Air and Gas Treatment," "The American Society of Mechanical Engineers, 2003 (including the AG-1a, 2004 Addenda).

3. ANSI/ASHRAE Standard 52.2-1999, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size," ANSIAmerican National Standards Institute/American Society of Heating, Refrigerating and Air Conditioning Engineers, 1999.

4. ASME N510-1989 (R1995), "Testing of Nuclear Air-Treatment Systems," The American Society of Mechanical Engineers, 1989.

5. ANSI/AMCA-210-99, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating," American National Standards Institute/AMCAAir Movement and Control Association International, December 1999.

6. ANSI/AMCA-211-1987, "Certified Ratings Program–Air Performance," American National Standards Institute/AMCAAir Movement and Control Association International, 1987.

7. ANSI/AMCA-300-1985, "Reverberant Room Method of Testing Fans for Rating Purposes," American National Standards Institute/AMCAAir Movement and Control Association International, 1985.

8. UL 555, "Standard for Fire Dampers," Underwriter's Laboratories, Sixth Edition, June 1999.

9. ASME N509, "Nuclear Power Plant Air-Cleaning Units and Components," American National Standards Institute/The American Society of Mechanical Engineers, 2002.

10. Regulatory Guide 1.52, Revision 3, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," U.S. Nuclear Regulatory Commission, June 2001.


09.04.05-1.13

Next File

### 9.4.8 Radioactive Waste Building Ventilation System

The radioactive waste building ventilation system (RWBVS) provides fresh conditioned air to the Radioactive Waste Building (RWB) to maintain acceptable ambient conditions within the building. The RWBVS provides filtration of exhaust from the rooms of the RWB to limit the release of airborne contaminants exhausted from the plant stack. Additionally, the RWBVS maintains sub-atmospheric pressure in the RWB, to prevent the release of airborne contaminants into the outside atmosphere. The RWBVS functions during normal plant operation.

#### 9.4.8.1 Design Bases

The RWBVS is non-safety-related and is located in a building that is not Seismic Category I. The U.S. EPR meets:

- GDC 2, as it relates to meeting the guidance of RG 1.29 for radioactive waste management systems to be designed in accordance with RG 1.143.
- GDC 5, as it relates to the RWBVS because there are no safety-related components that are shared with any other nuclear power units.
- GDC 60, as it relates to the ability of the system to limit the release of gaseous radioactive effluents to the environment. The RWBVS exhaust filtration units are designed, tested, and maintained in accordance with RG 1.140. The air flow rate of a single cleanup filtration unit will not exceed 30,000 cfm.

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The RWBVS performs no safety-related function and is Non-Seismic. Refer to Section 3.2 for the seismic and system quality group classification of the RWBVS. Failure of the system does not affect the reactor coolant system (RCS) pressure boundary or the safe shutdown of the plant; nor is the system required to mitigate the consequences of a 10 CFR Part 100 release.

The RWBVS performs the following important non-safety-related system functions:

- Maintains the RWB at sub-atmospheric pressure. Maintaining the building sub-atmospheric is accomplished by flow balancing of the intake and exhaust air flow with air dampers.
- Maintains adequate building temperatures for personnel in the working areas and removes waste heat from the equipment located in the building. The RWBVS maintains the following temperature and humidity values in the RWB permanent working areas based on normal outdoor temperatures specified in Table 2.1-1:

  A. Temperature from 68° to 91°F.

  B. Humidity from 30 to 70 percent.

- Removes radioactivity from the system exhaust air by the use of high efficiency particulate air (HEPA) filters and iodine adsorption charcoal filtration units.

### 9.4.8.2 System Description

#### 9.4.8.2.1 General Description

The RWBVS supplies conditioned outside air and processes and removes the exhaust from the RWB. This once-through ventilation system has no air recirculation capability except for the evaporator, instrumentation and controls (I&C), and the vehicle access rooms. A simplified sketch of the RWBVS is shown in Figure 9.4.8-1 and Figure 9.4.8-2.

09.04.05-1.7

The outside air is provided through intake mesh grilles and louver dampers. The outside air intake openings are equipped with electrically heated and weather protected grilles to prevent ice formation and ingress of insects and debris.

Depending on outdoor conditions, the supply air to the RWB is filtered, cooled and dehumidified or filtered, heated and humidified by the supply air system. A humidifier, which provides minimum air humidity, is installed in the common air supply duct of the RWB to treat the supply air. The humidifier is supplied steam from the air humidification system (AHS) to perform its function. If required, electrical air heaters installed in the supply air ductwork provide additional heating of the supply air.

The supply air system shown in Figure 9.4.8-1 consists of two air handling units; both units supply air to two supply fans. Each air handling unit consists of a preheater, prefilter, cooling coil, system heater, fan, and back draft damper. The back draft damper prevents short cycling supply air through the non-operating supply fan. Downstream of the air handling units in the common supply air duct is a humidifier. Downstream of the humidifier is a motor-driven supply damper that maintains the sub-atmospheric pressure in the RWB by decreasing or increasing the supply air flow as required. The air handling units, supply fans, common humidifier, and supply damper are located in the RWB at ~~the~~ elevation +36 ft ~~elevation~~.

The operational chilled water system (OCWS) supplies chilled water to the air cooling coil. The preheater and the system heater are supplied with hot water by the space heating system (SHS). The air cooling coil and system heater condition the supply air to maintain RWB temperatures. The preheater prevents freezing during cold weather conditions. In the event the preheater cannot prevent freezing, a signal is generated by a temperature sensor indicating that the air temperature leaving the preheating coils is low, the supply air fans shut down automatically and the air inlet dampers on the air intake close automatically to avoid freezing the equipment.

### Fans

The supply, exhaust, and iodine filter unit booster fans are centrifugal type fans and are directly driven by the shaft of an electric motor. The fans are designed and rated in accordance with ANSI/AMCA 210-99 (Reference 4), ANSI/AMCA 211-1987 (Reference 5), and ANSI/AMCA 300-1985 (Reference 6).

### Isolation Dampers

The isolation dampers are located upstream and downstream of each filtration train. The motor-operated dampers will fail to "close" or "open" position in case of loss of power, depending on the safety function of the dampers. The performance and testing requirements of the dampers are per ASME AG-1-2003.(Reference 1).

### Electric Heaters

Electric heaters meet the requirements of Reference 1.

### Heating and Cooling Coils

Preheating, heating, and cooling coils are of the continuous tube type, which are made of finned ~~copper~~ tubes with return bends providing continuous and uninterrupted flow of water within each tube.

### Prefilters

The prefilters are located upstream of HEPA filters and collect large particles to increase the useful life of the high efficiency filters. The prefilters meet the requirements of ANSI/ASHRAE Standard 52.2-1999 (Reference 2).

### HEPA Filters

HEPA filters are constructed, qualified and tested in accordance with Reference 1. The periodic in-place testing of HEPA filters to determine the leak-tightness is performed per ASME N510-1989 (Reference 3).

### Adsorbers

Carbon ~~filters~~adsorbers are used to remove radioactive iodine from the exhaust air. The efficiency for removal of methyl iodine is based on the decontamination efficiency assigned during the laboratory tests. The periodic inplace testing of the adsorbers to determine the leak-tightness is performed per Reference 3. The activated carbon total bed depth requirement will be 2 inches with a maximum assigned activated carbon decontamination efficiency of 95 percent.

09.04.05-1.7

2.5 Test instrumentation is available and calibrated.

3.0 TEST METHOD

3.1 Verify control logic.

3.2 Verify that operation, stroke speed and position indication of dampers meet design requirements.

3.3 Verify in manual operating mode that system rated air flow and air balance meet design requirements.

3.4 Demonstrate in automatic mode the transfer to emergency-operations as a result of the following:

3.4.1 Radiation detection in MCR HVAC air supply.

3.4.2 Smoke detection.

3.4.3 Toxic chemical detection~~, if applicable~~.

3.4.4 Safety injection actuation / primary containment isolation signal~~s (SIAS)~~.

3.5 Verify the HEPA filter efficiency, carbon absorber efficiency, and filter bank air flow capacity.

3.6 Verify that operation of protective devices, controls, interlocks, instrumentation, and alarms using actual or simulated inputs meets design requirements.

3.7 Verify that the system maintains the CRE at the required positive pressure relative to the outside atmosphere during system operation. ~~in the pressurized mode as required by the Technical Specifications.~~

3.8 Verify the isolation capability of the CRE on detection of toxic gas at the intakes meets the requirements of RG ~~1.95~~1.78~~, if applicable~~.

3.9 Demonstrate the operation of the battery room exhaust fans.

3.10 Verify the CRE air in-leakage rate when aligned in the emergency mode.

3.11 Verify that operation of CRACS in response to radiation monitors meets design requirements.

3.12 Check electrical independence and redundancy of power supplies for safety-related functions by selectively removing power and determining loss of function.

4.0 DATA REQUIRED

4.1 Air balancing verification.

09.04.05-1.1

4.2 Fan and damper operating data.

4.3 Temperature ~~and humidity~~ data in the CRE.

4.4 Response to radioactivity, toxic gas ~~(if applicable)~~, and products of combustion.

## 3.7 PLANT SYSTEMS

### 3.7.11 Control Room Air Conditioning System (CRACS)

LCO 3.7.11 Four CRACS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies.

09.04.05-1.4

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One ~~or two~~ CRACS trains inoperable. | A.1 Restore ~~the inoperable~~ CRACS train~~(s)~~ to OPERABLE status. | 120 days |
| B. Two CRACS trains inoperable. | B.1 Restore one inoperable CRACS train to OPERABLE status. | 30 days |
| ~~B~~C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4. | ~~B~~C.1 Be in MODE 3.<br>AND<br>~~B~~C.2 Be in MODE 5. | 6 hours<br><br>36 hours |
| ~~C~~D. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of irradiated fuel assemblies. | ~~C~~D.1 Place OPERABLE CRACS train in operation.<br>OR<br>~~C~~D.2 Suspend movement of irradiated fuel assemblies. | Immediately<br><br>Immediately |
| ~~D~~E. Three or more CRACS trains inoperable in MODE 5 or 6 or during movement of irradiated fuel assemblies. | ~~D~~E.1 Suspend movement of irradiated fuel assemblies. | Immediately |

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| ~~E~~F. Three or more CRACS trains inoperable in MODE 1, 2, 3, or 4. | ~~E~~F.1 Enter LCO 3.0.3. | Immediately |

09.04.05-1.4

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.7.11.1 | Verify each CRACS train has the capability to remove the design heat load. | 24 months |

B 3.7 PLANT SYSTEMS

B 3.7.10 Control Room Emergency Filtration (CREF)

BASES

BACKGROUND

The control room ventilation system consist of the control room emergency filtration (CREF) units and the control room air conditioning system (CRACS) air handling units.

The CREF provides a protected environment from which occupants can control the unit following an uncontrolled release of radioactivity, [[hazardous chemicals,]] or smoke.

The CREF consists of two independent, redundant trains that recirculate and filter air in the control room envelope (CRE) and a CRE boundary that limits the in-leakage of unfiltered air. Each CREF train consist of a prefilter, electric heating coil, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, dampers, doors, barriers, and instrumentation also form part of the system. A second bank of HEPA filters follows the adsorber section to collect carbon fines and provides backup in case of failure of the main HEPA filter bank.

The CRE is the area within the confines of the CRE Boundary that contains the spaces that control room occupants inhabit to control the unit for normal and accident conditions. This area encompasses the control room, and may encompass other non-critical areas to which frequent personnel access or continuous occupancy is not necessary in the event of an accident. The CRE is protected during normal operation, natural events and accident conditions. The CRE boundary is the combination of walls, floor, roof, ducting, doors, penetrations and equipment that physically form the CRE. The OPERABILITY of the CRE boundary must be maintained to ensure that the in-leakage of unfiltered air into the CRE will not exceed the in-leakage assumed in the licensing basis analysis of design basis accident (DBA) consequences to CRE occupants. The CRE and its boundary are defined in the Control Room Envelope Habitability Program.

09.04.05-1.1

The CREF is an emergency system, parts of which may also operate during normal unit operations in the standby mode of operation. Upon receipt of the actuating signal(s), normal air supply to the CRE is isolated, and the stream of ventilation air is recirculated through the system filter trains. The prefilters remove large particles in the air to prevent excessive loading of the HEPA filters and charcoal adsorbers. Continuous operation of each train for at least 10 hours per month, with the heaters on, reduces moisture buildup on the HEPA filters and the charcoal adsorbers.

BASES

BACKGROUND (continued)

~~The CREF consists of two 100% capacity iodine filtration trains which operate when radioactive contamination is detected at the site or inside the control room envelope (CRE) area. The iodine filtration train is a bypass path of the fresh air intake train for the Control Room Air Conditioning System (CRACS) normal air supply. The air from CRE can also be recirculated through the CREF Iodine Filtration trains. The iodine filtration trains are provided as bypass lines on two of the four normal CRACS air intake trains; other two CRACS intake trains do not have the bypass iodine filtration trains. During an emergency, the fresh outside air and recirculated air are directed through air intake motorized damper and electric heater through the CREF Iodine Filtration train. Each iodine filtration train consists of motorized damper, electric heater, prefilter, upstream HEPA filter, an activated carbon iodine filter, downstream HEPA filter, booster fan, and manual isolation damper. The filtered and clean air is then directed through one or both CRACS normal 75% capacity air conditioning train. Each air conditioning train consists of volume control manual damper, cooling coil, moisture separator, fan suction and discharge silencers, supply air fan, HEPA filter, steam humidifier, non-return damper, volume control electric damper, and fire dampers. The conditioned and clean air is then supplied to the CRE areas. Electric heaters are installed in the CRE supply air ducts to maintain individual room temperatures and relative humidity. The exhaust air from the CRE areas is directed through the recirculation air shaft and then recycled either through the iodine filtration trains or CRACS air conditioning trains. The exhaust from kitchen and sanitary areas is separated from the recycle return air and processed separately.~~

09.04.05-1.1

~~The prefilters remove any large particles in the air, and any entrained water droplets present, to prevent excessive loading of the HEPA filters and carbon adsorbers. The HEPA filter bank downstream of the carbon iodine filter collects carbon fines and provides backup in case of failure of the upstream HEPA filter bank. Continuous operation of each train for at least 10 hours per month, with the heaters on, reduces moisture buildup on the HEPA filters and carbon adsorbers.~~

~~The CRE is the area within the confines of the CRE boundary that contains the spaces that control room occupants inhabit to control the unit during normal and accident conditions. This area encompasses the control room, and may encompass other non-critical areas to which frequent personnel access or continuous occupancy is not necessary in the event of an accident. The CRE is protected during normal operation, natural events, and accident conditions. The CRE boundary is the combination of walls, floor, roof, ducting, doors, penetrations and~~

BASES

BACKGROUND (continued)

equipment that physically form the CRE. The OPERABILITY of the CRE boundary must be maintained to ensure that the inleakage of unfiltered air into the CRE will not exceed the inleakage assumed in the licensing basis analysis of design basis accident (DBA) consequences to CRE occupants. The CRE and its boundary are defined in the Control Room Envelope Habitability Program.

The CREF train is an emergency system, which may also operate during normal unit operations in the standby mode of operation. Upon receipt of the actuating signal(s), the outside fresh air supply to the CRE is isolated, and the outside air is directed through the CREF train. The CRE ventilation air is recycled through the air conditioning filter trains and/or CREF train.

Actuation of the CREF places the system in either of two separate states (emergency radiation state or toxic gas isolation state) of the emergency mode of operation, depending on the initiation signal. Actuation of the system to the emergency radiation state of the emergency mode of operation, closes the unfiltered outside air intake and unfiltered exhaust dampers, and aligns the system for recirculation of the air within the CRE through the redundantCREF trains of HEPA and charcoal filters. The emergency radiation state also maintains initiates control room pressurization and filtered ventilation of the air supply to the CRE.

Outside makeup air is mixed with supplied through the iodine filtration train and added to the air being recirculated air from the CRE. This air flows through the CREF filtration unit into a common recirculation plenum where it mixes with air pulled from the CRE rooms. Pressurization of the CRE minimizes infiltration of unfiltered air through the CRE boundary from all the surrounding areas adjacent to the CRE boundary. The actions taken in the toxic gas isolation state are the same, except that the signal switches the CREF to an isolation alignment to minimize any outside air from entering the CRE through the CRE boundary.

09.04.05-1.1

The outside air entering the CRE is continuously monitored by radiation [[and toxic gas]] detectors. One detector output above the setpoint will cause actuation of the emergency radiation state or toxic gas isolation state, as required. The actions of the toxic gas isolation state are more restrictive, and will override the actions of the emergency radiation state.

BASES

BACKGROUND (continued)

09.04.05-1.3(c)

One CREF filtration train operating in a filtered alignment at a flow rate of ≤< 4000 cfm (≤ 1000 cfm outside air and 3000 cfm of CRE recirculation air), will pressurize the CRE to ≥ 0.125 inches water gauge relative to all external areas adjacent to the CRE boundary. The CREF operation in maintaining the CRE habitability is discussed in FSAR Section 9.4.1 (Ref. 1).

09.04.05-1.1

Redundant supply and recirculation trains provide the required filtration should an excessive pressure drop develop across one of the other filter trains. Normally open iIsolation dampers are arranged in series so the failure of one damper to shut will not result in a breach of isolation. The CREF train components areis designed in accordance with Seismic Category I requirements.

The CREF is designed to maintain a habitable environment in the CRE for 30 days of continuous occupancy after a postulated design basis accident (DBA) without exceeding a 5 rem whole body dose or its equivalent to any part of the body (5 rem total effective dose equivalent (TEDE)).

APPLICABLE SAFETY ANALYSES

The CREF components are arranged in redundant, safety related ventilation trains. The location of components and ducting within the CRE ensures an adequate supply of filtered air to all areas requiring access. The CREF provides airborne radiological protection for the CRE occupants, as demonstrated by the CRE occupant dose analyses for the most limiting design basis loss of coolant accident, fission product release presented in Chapter 15 (Ref. 2).

The CREF consists of two 100% capacity iodine filtration trains. Each iodine filtration train can be aligned with one of the two 75% capacity air conditioning trains. There are only two iodine filtration trains since only slow failure modes are assumed and filtration efficiency is checked periodically. Both CREF trains with the associated air conditioning trains are required to be OPERABLE. One CREF train is assumed to be lost to a single failure. The other train provides 100% of the ventilation to the CRE.

The CREF provides protection from smoke [[and hazardous chemicals to the CRE occupants. Reference 3 discusses protection of CRE occupants following a hazardous chemical release]]. Reference 4 discusses protection of the CRE occupants and their ability to control the reactor from the control room or from the remote shutdown panels in the event of a smoke challenge.

B 3.7 PLANT SYSTEMS

B 3.7.11 Control Room Air Conditioning System (CRACS)

BASES

BACKGROUND

The CRACS provides temperature control for the control room envelope (CRE) following isolation of the control room.

09.04.05-1.4

The CRACS operates in the recycling mode with fresh outside air makeup. There are two 100%four normal system 75% capacity identical fresh air intake trains. Train 1 is located in Safeguard Building 2 and train 4 is located in Safeguard Building 3. For each intake train, the fresh air is taken from outside environment through a motor-operatedized inlet isolation damper, and a pressure control damper.electric heater, and prefilter. If operating in the unfiltered bypass alignment (intake air bypasses the carbon filtration unit), outside air flows through a prefilter and duct heater. The fresh outsidefiltered air is then goes to the recirculation plenum and mixeds with the CRE recycled air. The mixed air is then directed through twoone of the four 75% capacity associated air conditioning trains.

During normal and emergency operation each CRACS cooling unit provides 50% of the cooling for the rooms within the CRE. However, each CRACS air handling unit is capable of cooling up to 75% of the normal and emergency cooling load to allow a single CRACS air handling unit to cool the CRE rooms during a station blackout (SBO) event. During an SBO event, the single CRACS air handling unit will prevent the CRE room temperature from exceeding 104°F.

Each air conditioning train consists of a HEPA filter,volume control manual damper, cooling coil, moisture separator, fan suction and discharge silencers, supply air fan, and backdraft damper.HEPA filter, steam humidifier, non-return damper, volume control electric damper, and fire dampers. The conditioned air is supplied to the control room envelope (CRE) areas. Electric heaters are installed in the supply air ducts to maintain individual room temperatures and relative humidity. The exhaust air from the control room envelope (CRE) areas is directed through the recirculation air shaft plenum and then recycled through the air conditioning trains upstream of the cooling coils for each train. During emergency operation or if contamination, toxic gas or smoke is detected in either of the two outside air inlets, the CREF filtration unit ioperates in the filtered alignment. The eExhaust air from the CRE (includes exhaust air from the kitchen and restrooms) iscan also be recycled through the CREF Iiodine Ffiltration trains. During normal operation, the CREF filtration units operate in the bypass alignment (air bypasses the iodine filtration unit). CRE room exhaust from clean areas continues to recycle back to the recirculation plenum and CRACS air conditioning units. Exhaust air from kitchen and restooms is pulled out of these areas by an

09.04.05-1.4

BASES

BACKGROUND (continued)

exhaust fan and exhausted to the safeguard building ventilation system (SBVS) where it is exhausted to the outside environment. ~~if contamination is detected in the CRE. The exhaust from kitchen and sanitary areas is separated from the recycle return air and processed separately.~~

Two out of four ~~75%~~ CRACS Air Conditioning trains operating in the recirculation mode with fresh outside makeup air will provide the required temperature in the Main Control Room (MCR) between 65°F to 7~~5~~6°F~~, and humidity 40% to 60%~~.

The CRACS operation in maintaining the CRE temperature is discussed in FSAR Section 9.4.1 (Ref. 1).

APPLICABLE SAFETY ANALYSES

The design basis of the CRACS is to maintain the CRE for 30 days of continuous occupancy.

There are four CRACS trains with two trains normally in operation. During emergency operation, one train is assumed to be out for maintenance and a second train is assumed lost to single failure. The two OPERABLE CRACS trains maintain the MCR temperature between 65°F to 7~~5~~6°F. Redundant detectors and controls are provided for

BASES

APPLICABLE SAFETY ANALYSES (continued)

control room temperature control. The CRACS is designed in accordance with Seismic Category I requirements. The CRACS is capable of removing sensible and latent heat loads from the CRE, which include consideration of equipment heat loads and personnel occupancy requirements, to ensure equipment OPERABILITY.

The CRACS satisfies Criterion 3 of 10 CFR 50.36(~~d~~c)(2)(ii).

LCO

Four independent and redundant trains of the CRACS are required to be OPERABLE to ensure that at least two are available, assuming a single failure disabling the other train. Total system failure could result in the equipment operating temperature exceeding limits in the event of an accident.

09.04.05-1.1

The CRACS is considered to be OPERABLE when the individual components necessary to maintain the control room temperature are OPERABLE in all ~~three~~ four trains. These components include the heating and cooling coils, moisture separators, ~~humidifiers,~~ and associated temperature control instrumentation. In addition, the CRACS must be OPERABLE to the extent that air circulation can be maintained.

APPLICABILITY

In MODES 1, 2, 3, 4, 5, and 6, and during movement of irradiated fuel assemblies, the CRACS must be OPERABLE to ensure that the control room temperature will not exceed equipment operational requirements following isolation of the control room.

ACTIONS

A.1

09.04.05-1.4

With one CRACS train inoperable, the inoperable train must be returned to OPERABLE status within 120 days. The 120 day Completion Time is based on the assumption that the one CRACS train is out of service for maintenance and is consistent with the dose analysis assumptions in Chapter 15.

B.1

With ~~one or~~ two CRACS train~~(s)~~ inoperable, action must be taken to restore OPERABLE status within 30 days. In this Condition, the remaining OPERABLE CRACS trains are adequate to maintain the control room temperature within limits. However, the overall reliability is reduced because a single failure in one of the OPERABLE CRACS trains could result in loss of CRACS function. The 30 day Completion Time is based on the low probability of an event requiring control room isolation, the consideration that the remaining train can provide the required

BASES

ACTIONS (continued)

protection, and that alternate safety or non-safety related cooling means are available.

BC.1 and BC.2

If any Required Action and Associated Completion Time of Condition A or B is not met in MODE 1, 2, 3, or 4, the unit must be placed in a MODE that minimizes the risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

09.04.05-1.4

CD.1 and CD.2

In MODE 5 or 6, or during movement of irradiated fuel, if the inoperable CRACS train(s) cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE CRACS train must be placed in operation immediately. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that active failures will be readily detected.

An alternative to Required Action CD.1 is to immediately suspend activities that present a potential for releasing radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.

DE.1

In MODE 5 or 6, or during movement of irradiated fuel assemblies, with three or more CRACS trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

EF.1

If three or more CRACS trains are inoperable in MODE 1, 2, 3, or 4, the CRACS may not be capable of performing its intended function. Therefore, LCO 3.0.3 must be entered immediately.

# B 3.7 PLANT SYSTEMS

## B 3.7.12 Safeguard Building Controlled Area Ventilation System (SBVS)

BASES

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BACKGROUND

The SBVS provides a protected environment in the hot mechanical areas of Safeguards Building Divisions 1, 2, 3, and 4 and the fuel building. The SBVS also filters airborne radioactive particulates from the areas of the active Emergency Core Cooling System (ECCS) components during a Loss of Coolant Accident (LOCA).

The conditioned air supply to all four Safeguard Building Divisions is provided independently for each division by the Electrical Division of Safeguard Ventilation System (Ref. 1). The SBVS supplies the conditioned air for ventilation through a volume control damper and two isolation dampers for each division to the hot mechanical areas of the four Safeguard Building Divisions. The SBVS air supply and exhaust flows are designed to prevent spread of airborne contamination and to maintain a negative pressure in the safeguard buildings and fuel building.

Under normal plant operation, the operational air exhaust from each hot area is drawn independently through a volume control damper and two isolation dampers located on the operational exhaust duct system for each safeguard building. The main exhaust duct of each division is connected to a common concrete duct which runs inside the annulus. The operational air exhaust is then drawn through a concrete duct cell for processing by the normal filtration train of the Nuclear Auxiliary Building Ventilation System prior to release through the plant stack (Ref. 2).

During conditions in which a release of airborne contamination from any of the four hot mechanical areas occurs, the SBVS will redirect the accident air exhaust independently via four separate exhaust lines which join into one common leak-tight exhaust duct inside the annulus. The exhaust duct then connects to an accident exhaust filtration train located in the fuel building. There are two 100% capacity accident iodine exhaust filtration trains in parallel configuration. Each train consists of inlet motor controlled damper, moisture separator, electric heater, ~~pre-filter,~~ upstream HEPA filter, iodine filter with activated carbon, downstream HEPA filter, outlet motor controlled damper, exhaust fan, and non-return damper. The accident air exhaust is processed through one or both independent iodine filtration trains prior to release through the plant stack. The downstream HEPA filter is not credited in the analysis, but serves to collect carbon particles and provides a backup in case the upstream HEPA filter bank fails. The ~~pre-filters~~moisture separator removes any large particles in the air and any entrained water droplets present to prevent excessive loading of the HEPA filters and carbon adsorbers.

09.04.05-1.13

**Figure 1.7-1—P&ID Symbol Legend**

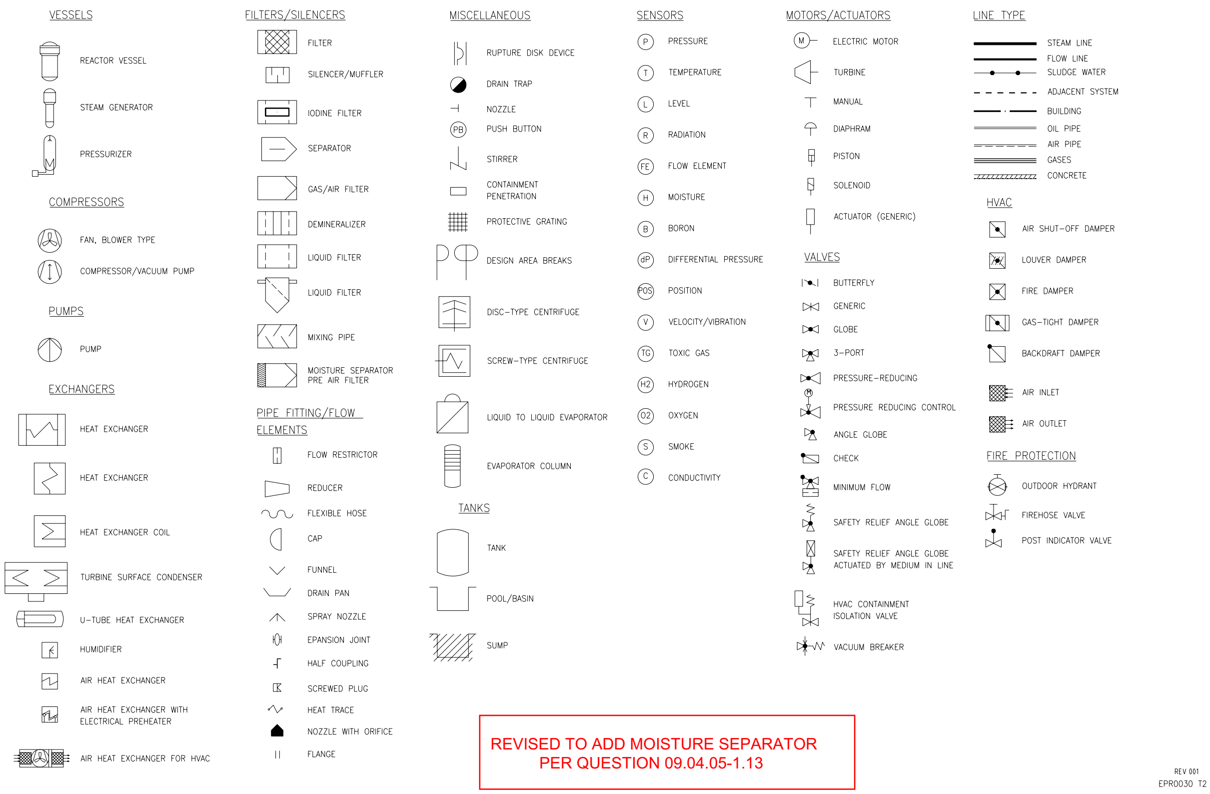


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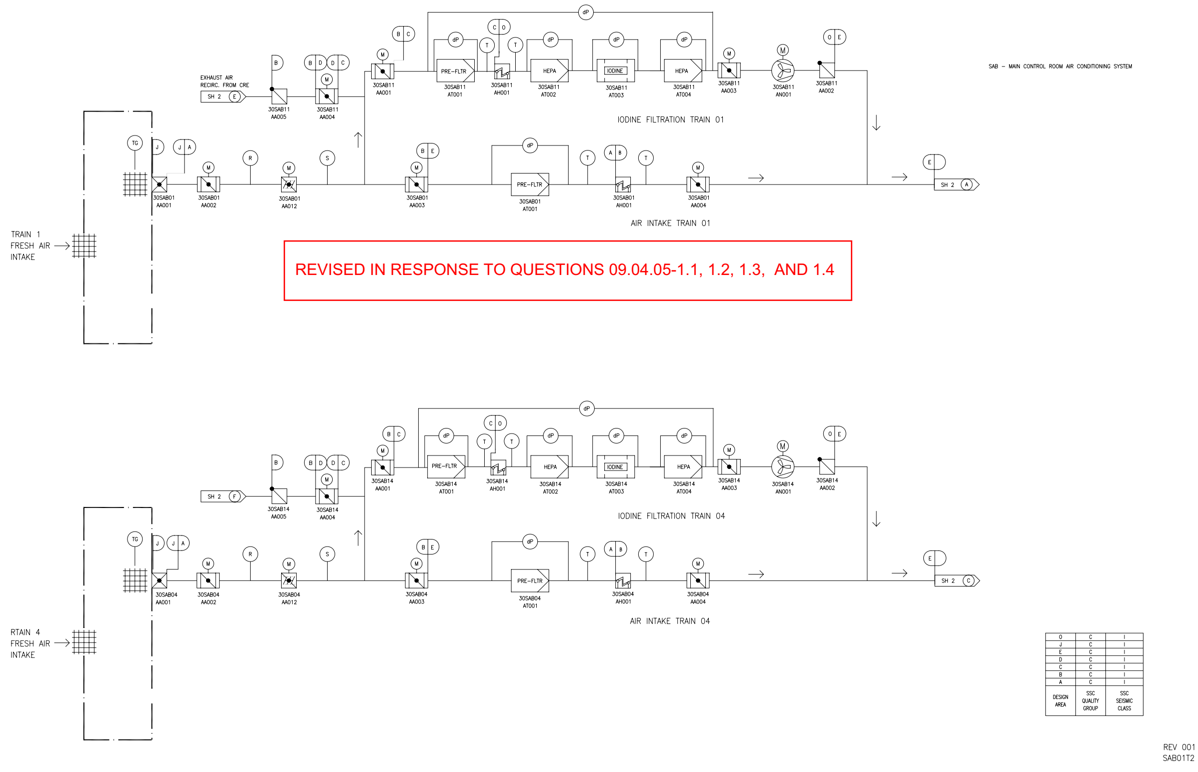
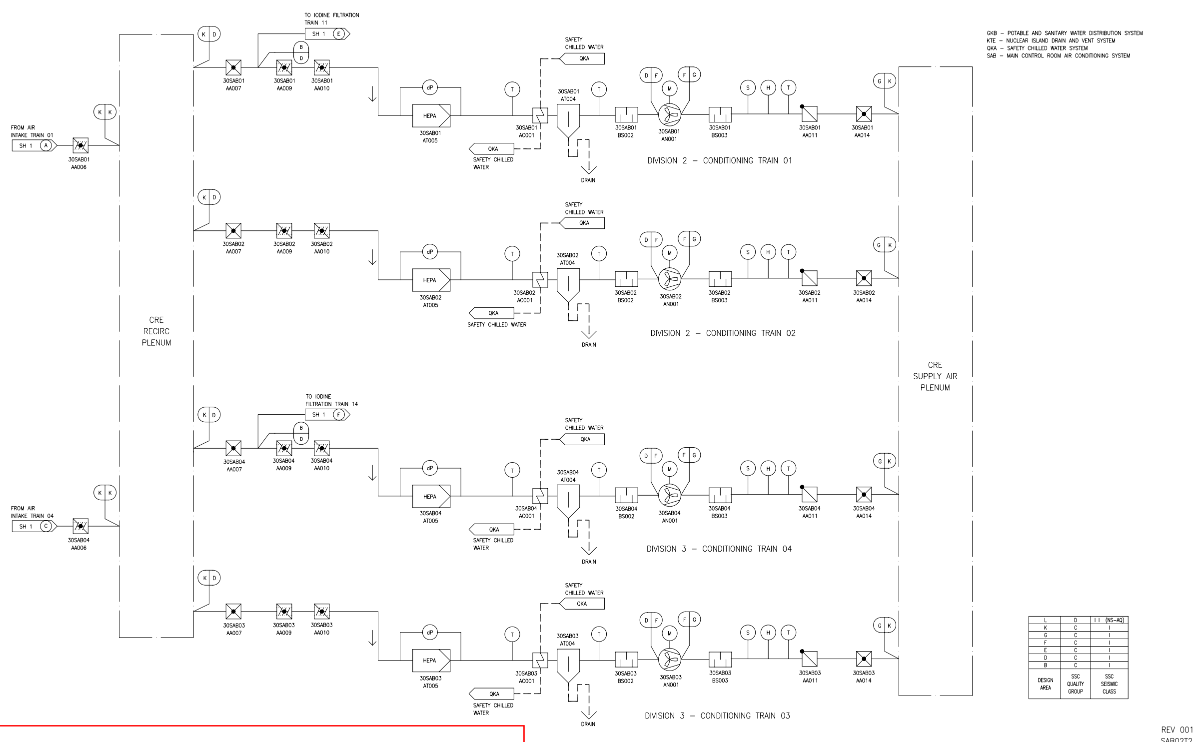
**Figure 9.4.1-1—Control Room Air Intake and Iodine Filtration Train Subsystems**



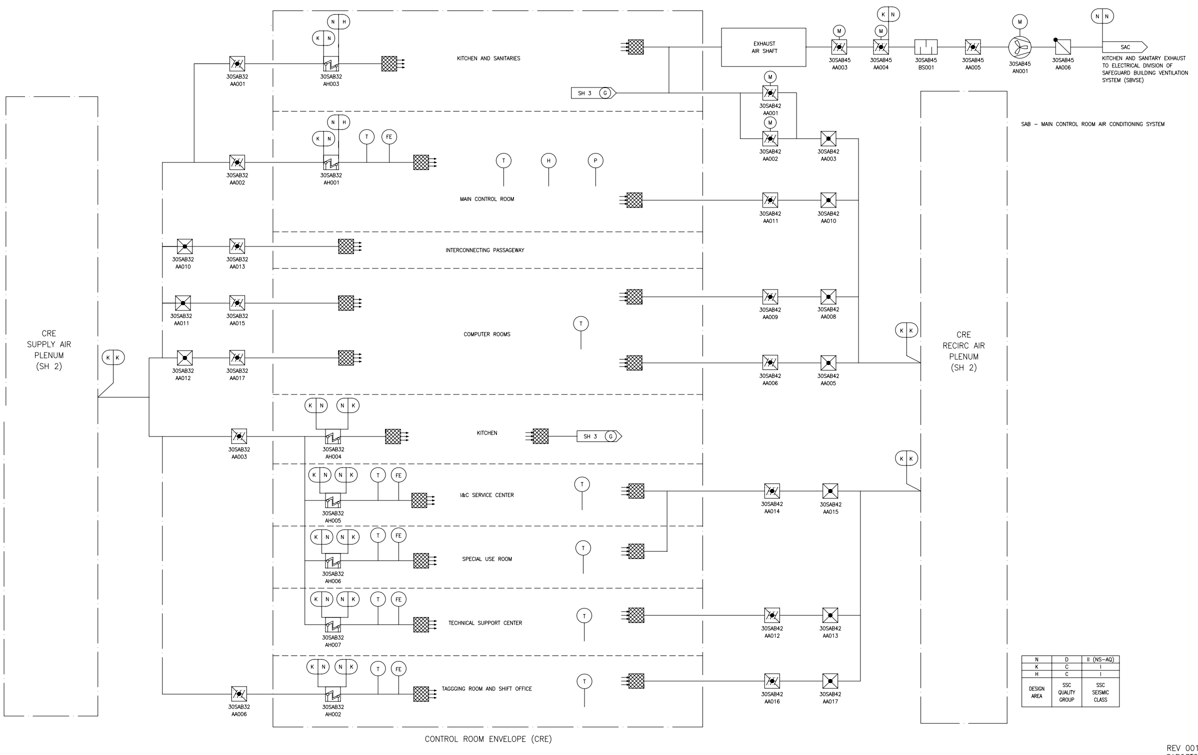

TG-Toxic Gas Sensors

**Figure 9.4.1-2—Control Room Recirculation Air Handling Subsystem**




REVISED IN RESPONSE TO QUESTIONS 09.04.05-1.1, 1.2, 1.3, AND 1.4

**Figure 9.4.1-3—Control Room Envelope Air Supply and Recirculation Subsystem**




REVISED IN RESPONSE TO QUESTION 09.04.05-1.1

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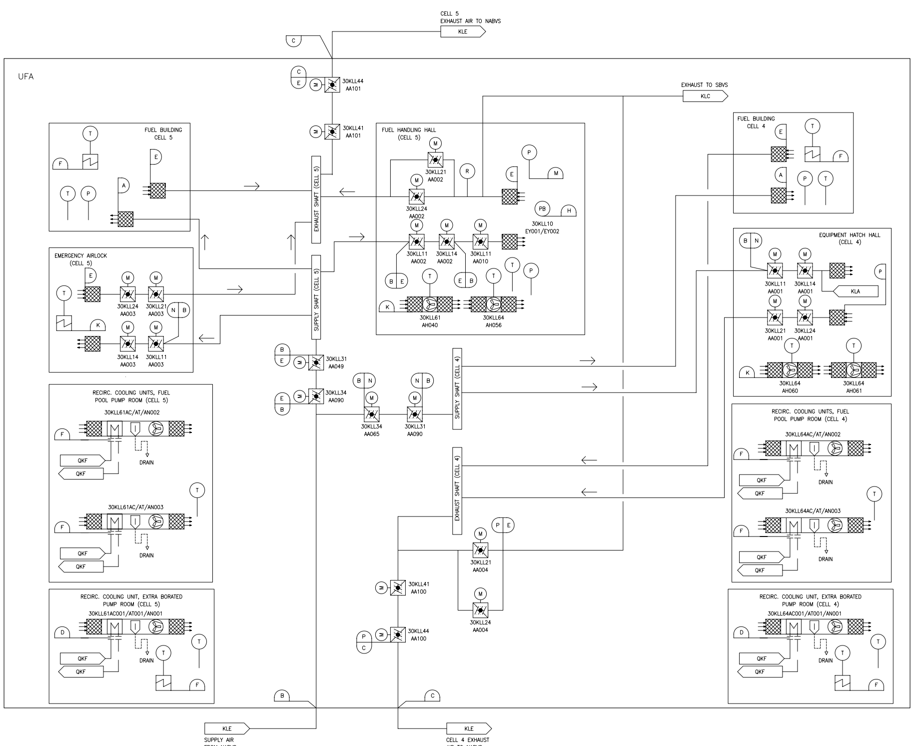
## Figure 9.4.2-1—Fuel Building Ventilation System




KLA – CONTAINMENT BUILDING VENTILATION SYSTEM
KLC – SAFEGUARD BUILDING CONTROLLED AREA VENTILATION SYSTEM
KLE – NUCLEAR AUXILIARY BUILDING VENTILATION SYSTEM
KLL – FUEL BUILDING VENTILATION SYSTEM
QKF – SAFETY CHILLED WATER SYSTEM IN FUEL BUILDING

UFA – FUEL BUILDING

| DESIGN AREA | SSC QUALITY GROUP | SSC SEISMIC CLASS |
|---|---|---|
| P | C | I |
| N | C | I |
| M | C | I |
| K | D | I I |
| H | C | I |
| F | C | I |
| E | C | I |
| D | C | I |
| C | D | I I |
| B | D | I I |
| A | D | I I |

REV 001
KLL01T2

REVISED IN RESPONSE TO QUESTION 09.04.05-1.5

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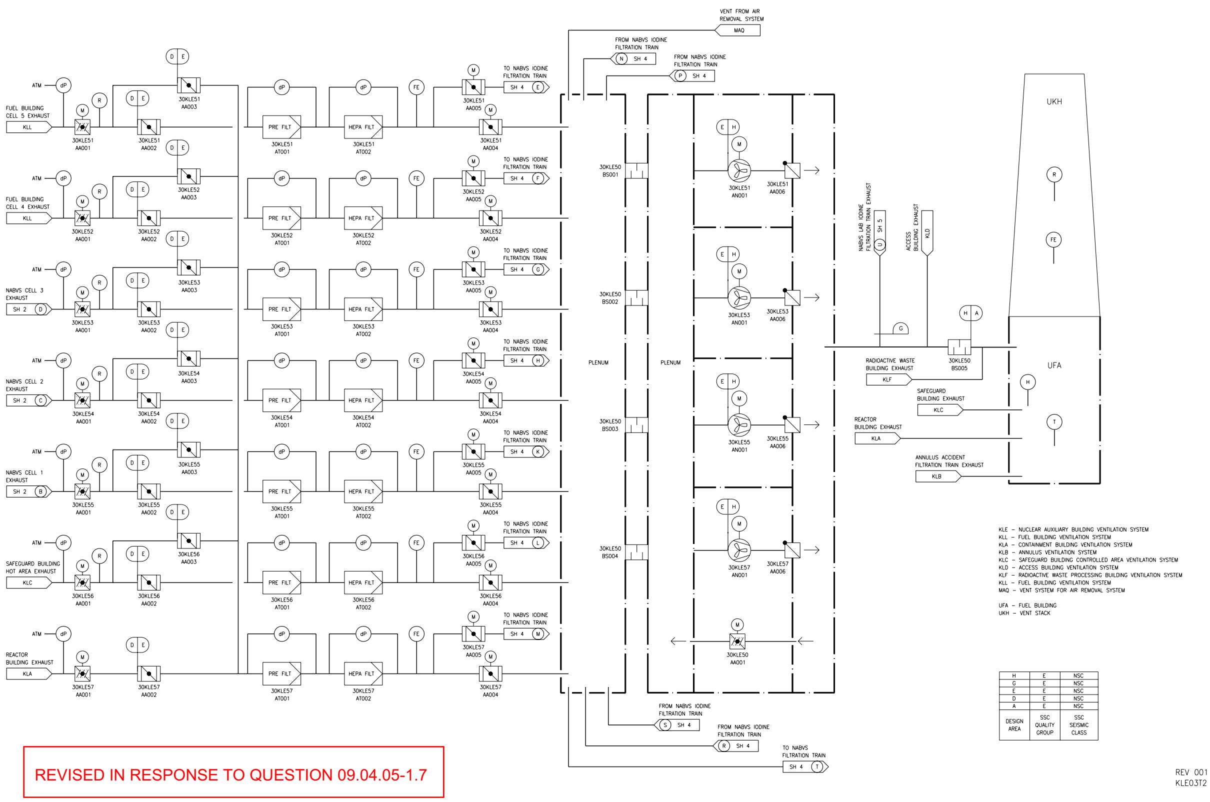
**Figure 9.4.3-3—Nuclear Auxiliary Building Exhaust Filtration Trains Subsystem**




REVISED IN RESPONSE TO QUESTION 09.04.05-1.7

**Figure 9.4.3-4—Nuclear Auxiliary Building Exhaust Iodine Filtration Train Subsystem**

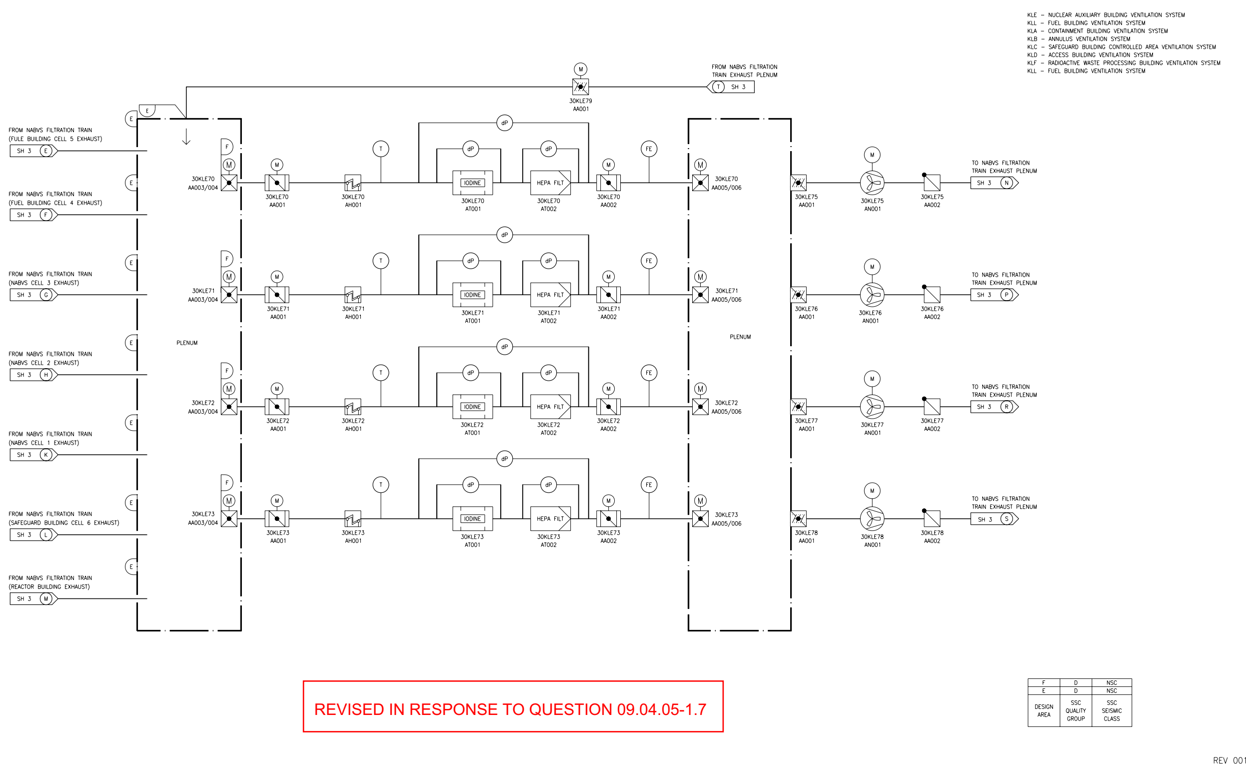


**Figure 9.4.5-2—Safeguard Buildings Exhaust Air Sub-System**

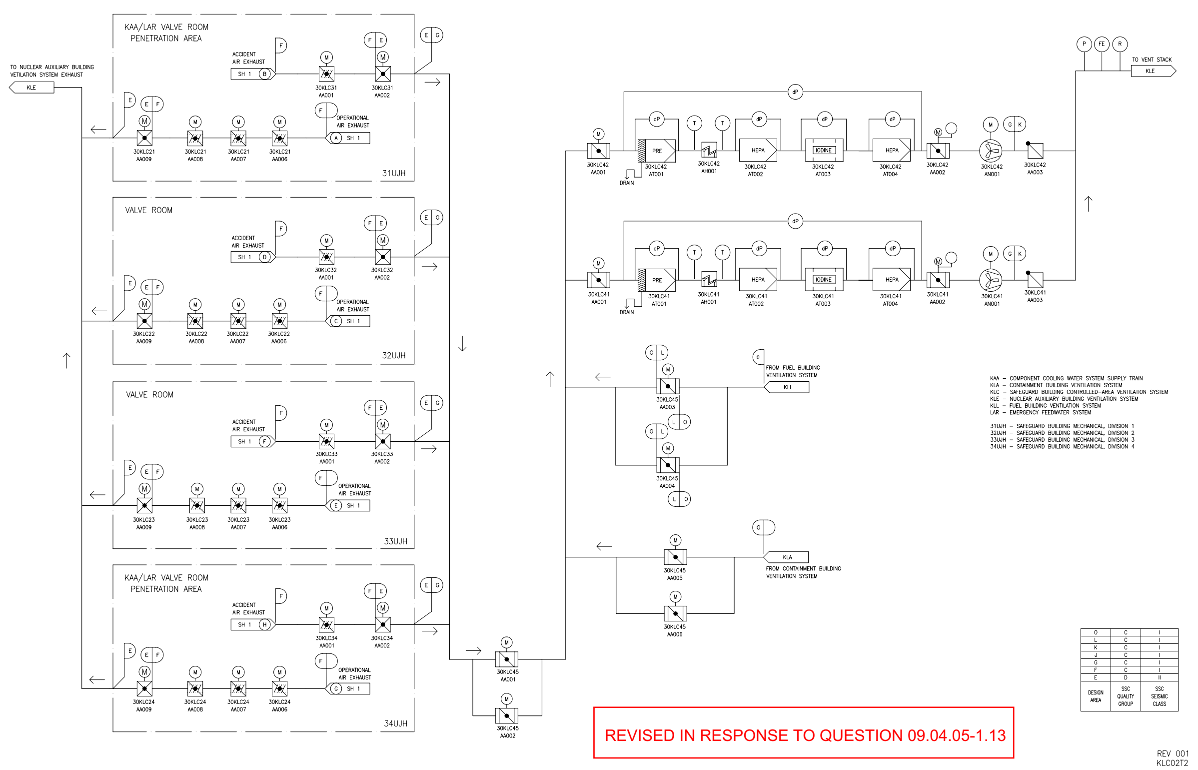



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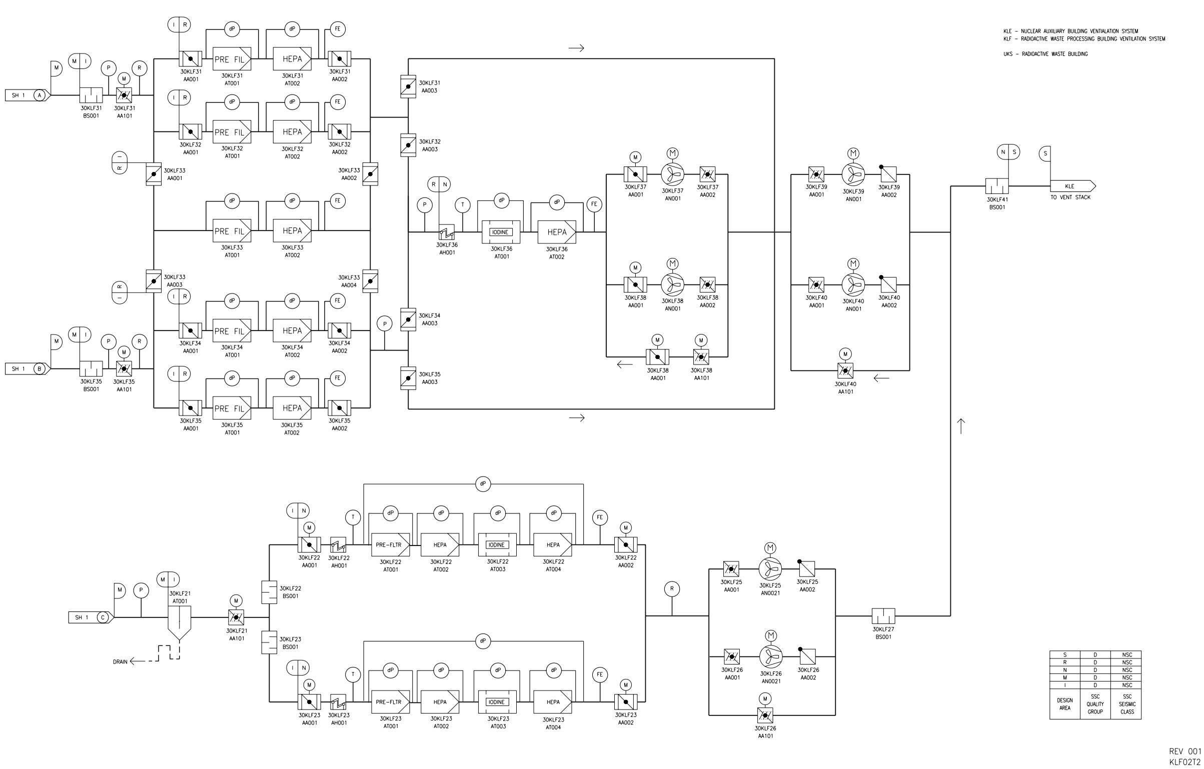
**Figure 9.4.8-2—Radioactive Waste Building Ventilation System Exhaust Air Station**




REVISED IN RESPONSE TO QUESTION 09.04.05-1.7

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