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Thanks,

*Alina Schiller*
Project Manager
Office of Nuclear Reactor Regulation
Vogtle Project Office
O-13 C10
301-415-8177

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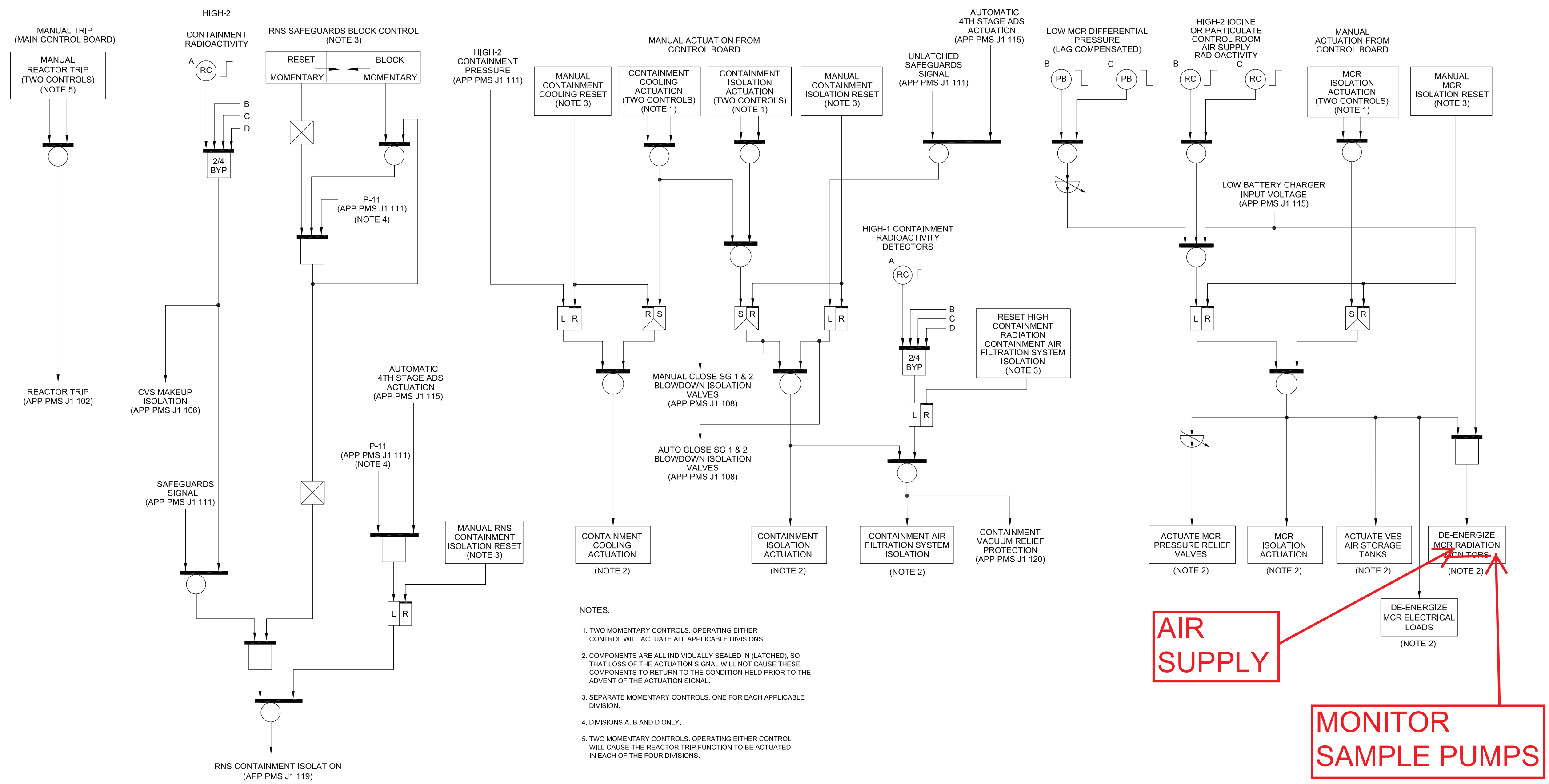


NOTES:

1. TWO MOMENTARY CONTROLS. OPERATING EITHER CONTROL WILL ACTUATE ALL APPLICABLE DIVISIONS.
2. COMPONENTS ARE ALL INDIVIDUALLY SEALED IN (LATCHED), SO THAT LOSS OF THE ACTUATION SIGNAL WILL NOT CAUSE THESE COMPONENTS TO RETURN TO THE CONDITION HELD PRIOR TO THE ADVENT OF THE ACTUATION SIGNAL.
3. SEPARATE MOMENTARY CONTROLS, ONE FOR EACH APPLICABLE DIVISION.
4. DIVISIONS A, B AND D ONLY.
5. TWO MOMENTARY CONTROLS. OPERATING EITHER CONTROL WILL CAUSE THE REACTOR TRIP FUNCTION TO BE ACTUATED IN EACH OF THE FOUR DIVISIONS.

**Figure 7.2-1 (Sheet 13 of 21)**
**Functional Diagram**
**Containment and Other Protection**

### 7.3.1.2.16 Steam Dump Block

Signals to block steam dump (turbine bypass) are generated from either of the following conditions:

1. Low-2 reactor coolant system average temperature
2. Manual initiation

Condition 1 results from a coincidence of two of the four divisions of reactor loop average temperature ($T_{avg}$) below the Low-2 setpoint. This blocks the opening of the steam dump valves. This signal also becomes an input to the steam dump interlock selector switch for unblocking the steam dump valves used for plant cooldown.

Condition 2 consists of three sets of controls. The first set of two controls selects whether the steam dump system has its normal manual and automatic operating modes available or is turned off. The second set of two controls enables or disables the operations of the Stage 1 cooldown steam dump valves if the reactor coolant average temperature ($T_{avg}$) is below the Low-2 setpoint. The third set of two controls enables or disables the operation of the Stage 2 cooldown steam dump valves.

The functional logic relating to the steam dump block is illustrated in Figure 7.2-1, sheet 10.

### 7.3.1.2.17 Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization

Signals to initiate isolation of the main control room, to initiate the air supply, to open the main control room pressure relief isolation valves, and to de-energize nonessential main control room electrical loads are generated from any of the following conditions:

1. High-2 main control room air supply radioactivity level
2. Loss of ac power sources (low Class 1E battery charger input voltage)
3. "Low" main control room differential pressure
4. Manual initiation

Condition 1 is the occurrence one of two main control room air supply radioactivity monitors detecting the iodine or particulate radioactivity level above the High-2 setpoint.

Condition 2 results from the loss of normal control room ventilation due to a loss of all ac power sources. A preset time delay is provided to permit the restoration of ventilation and ac power from the offsite sources or from the onsite diesel generators before initiation. The loss of all ac power is detected by undervoltage sensors that are connected to the input of each of the four Class 1E battery chargers. Two sensors are connected to each of the four battery charger inputs. The loss of ac power signal is based on the detection of an undervoltage condition by each of the two sensors connected to two of the four battery chargers. The ~~two-out-of-four~~ logic is based on an undervoltage to the battery chargers for divisions A or C coincident with an undervoltage to the battery chargers for divisions B or D.

air supply

Condition 3 results from the loss of main control room differential pressure as detected by the pressure boundary differential sensors. One out of two logic is based on main control room differential pressure below the "Low" setpoint for greater than 10 minutes.

sample pumps

In addition, the loss of all ac power sources coincident with main control room isolation will de-energize the main control room radiation monitors in order to conserve the battery capacity.

Condition 4 consists of two momentary controls. Manual actuation of either of the two controls will result in main control room isolation, air supply initiation, and electrical load de-energization.

, maintain room temperature below the equipment qualification limitation, and to ensure an adequate heat sink for MCR habitability.

**Table 7.3-1 (Sheet 6 of 9)**
**Engineered Safety Features Actuation Signals**

| Actuation Signal | No. of Divisions/ Controls | Actuation Logic | Permissives and Interlocks |
|---|---|---|---|
| **14. Chemical and Volume Control System Makeup Isolation** (See Figure 7.2-1, Sheets 3, 6, and 11) | | | |
| a. High-2 pressurizer water level | 4 | 2/4-BYP[1] | Automatically unblocked above P-19<br>Manual block permitted below P-19 |
| b. High-3 steam generator narrow range level | 4/steam generator | 2/4-BYP[1] in either steam generator | Manual block permitted below P-9<br>Automatically unblocked above P-9 |
| c. Automatic or manual safeguards actuation signal coincident with | (See items 1a through 1e) | | |
| High[10] pressurizer water level | 4 | 2/4-BYP[1] | None |
| d. High-2 containment radioactivity | 4 | 2/4-BYP[1] | None |
| e. Manual initiation | 2 controls | 1/2 controls | None |
| f. Flux doubling calculation | 4 | 2/4-BYP[1] | Manual block permitted above P-8<br>Automatically unblocked below P-6 or below P-8<br>Manual block permitted below P-8; demineralized water system isolation valves signaled closed when blocked below P-8 |
| g. High[10] steam generator narrow range level coincident with | 4/steam generator | 2/4-BYP[1] in either steam generator | Manual block permitted below P-9<br>Automatically unblocked above P-9 |
| Reactor trip (P-4) | 1/division | 2/4 | None |
| **15. Steam Dump Block** (Figure 7.2-1, Sheet 10)[8] | | | |
| a. Low reactor coolant temperature (Low-2 $T_{avg}$) | 2/loop | 2/4-BYP[1] | None |
| b. Mode control | 2 controls | 1/division | None |
| c. Manual stage 1 cooldown control | 2 controls | 1/division | None |
| d. Manual stage 2 cooldown control | 2 controls | 1/division | None |
| **16. Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization** (Figure 7.2-1, Sheet 13) (13) | | | |
| a. High-2 main control room ~~supply air~~ iodine or particulate radiation | 2 | 1/2[1] | None |
| b. Extended undervoltage to Class 1E battery chargers[8] | 2/charger | 2/2 per charger and 2/4 chargers[5] | None |
| c. Extended Low main control room differential pressure | 2 | 1/2[1] | None |
| d. Manual initiation[8] | 2 controls | 1/2 controls | None |

air supply

(13)

24-hour

**Table 7.3-1 (Sheet 9 of 9)**
**Engineered Safety Features Actuation Signals**

| Actuation Signal | No. of Divisions/ Controls | Actuation Logic | Permissives and Interlocks |
|---|---|---|---|
| **28. Containment Vacuum Relief** (Figure 7.2-1, Sheet 19) | | | |
| a. Low-2 containment pressure | 4 | 2/4-BYP[1] | None |
| b. Manual initiation coincident with the following condition: | 2 controls | 1/2 controls | None |
| Low containment pressure | 4 | 2/4-BYP[1] | None |

**Notes:**

1. Capable of bypass (examples: The 2 out of 4 logic becomes 2 out of 3, the 2 out of 3 logic becomes 2 out of 2, and the 1 out of 2 logic is 1 out of 1 with one bypass. Note that 2 out of 2 logic becomes 2 out of 1 which renders the function inoperable). 2/4-BYP, where identified, indicates bypass logic specifically for 2/4 coincidence logic functions.
2. Any two channels from either tank not in same division.
3. Two associated controls must be actuated simultaneously.
4. Also, closes power-operated relief block valve of respective steam generator.
5. The two-out-of-four logic is based on undervoltage to the battery chargers for divisions A or C coincident with an undervoltage to the battery chargers for divisions B or D.
6. Any two channels from either loop not in same division.
7. Any two channels from either line not in same division.
8. This function does not meet the 10 CFR 50.36(c)(2)(ii) criteria and is not included in the Technical Specifications.
9. Spurious ADS and IRWST injection actuations, both automatic and manual, are blocked as described in Subsection 7.3.1.2.4.1.
10. Low and Low-1 are considered to be equivalent terms when referring to the first low setpoint designator. High and High-1 are considered to be equivalent terms when referring to the first high setpoint designator.
11. Applies to only the Zinc/Hydrogen Addition Isolation.
12. Applies to only the Auxiliary Spray Isolation.
13. De-energization of Main Control Room air supply radiation monitor sample pumps occurs on an extended undervoltage to Class 1E 24-hour battery chargers coincident with Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization actuation signal.

3.3 INSTRUMENTATION

3.3.13 Engineered Safety Feature Actuation System (ESFAS) Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization

LCO 3.3.13 ~~Two channels of each of the following Functions shall be OPERABLE:~~

~~a. Main Control Room Air Supply Iodine or Particulate Radiation – High 2; and~~

~~b. Main Control Room Differential Pressure – Low.~~

The ESFAS Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization instrumentation channels for each Function in Table 3.3.13-1 shall be OPERABLE.

See Insert 2

APPLICABILITY: ~~MODES 1, 2, 3, and 4,~~
~~During movement of irradiated fuel assemblies.~~
According to Table 3.3.13-1.

ACTIONS

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**- NOTE -**
Separate condition entry is allowed for each Function.

---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more Functions with one or more channel(s) inoperable. | A.1 Enter the Condition referenced in Table 3.3.13-1 for the channel(s). | Immediately |
| ~~A.~~ B. ~~One or more Functions with one channel inoperable in MODE 1, 2, 3, or 4.~~ As required by Required Action A.1 and referenced in Table 3.3.13-1. | B.1 Verify one channel OPERABLE.<br>AND | Immediately |
| | ~~A.1~~ B.2 ---------- **- NOTE -** Not applicable to an inoperable Main Control Room Differential Pressure – Low channel. ---------- Verify alternate radiation monitors are OPERABLE. | 72 hours |
| | AND | |

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| ~~A.~~ (continued) | ~~A.2~~ B.3 Verify main control room isolation, air supply initiation, and electrical load de-energization manual controls are OPERABLE. | 72 hours |
| ~~B.~~ C. As required by Required Action A.1 and referenced in Table 3.3.13-1. ~~One or more Functions with one channel inoperable during movement of irradiated fuel assemblies.~~ | C.1 Verify one channel OPERABLE<br>AND<br>~~B.1~~ C.2 Restore channel to OPERABLE status. | Immediately<br><br>72 hours |
| ~~C.~~ D. Required Action and associated Completion Time of Condition ~~A~~ B not met.<br><br>~~OR~~<br><br>~~One or more Functions with two channels inoperable in MODE 1, 2, 3, or 4.~~ | ~~C.1~~ D.1 Be in MODE 3.<br><br>AND<br><br>~~C.2~~ D.2 Be in MODE 5. | 6 hours<br><br><br><br>36 hours |
| ~~D.~~ E. Required Action and associated Completion Time of Condition ~~B~~ C not met.<br><br>~~OR~~<br><br>~~One or more Functions with two channels inoperable during movement of irradiated fuel assemblies.~~ | ~~D.1~~ E.1 Suspend movement of irradiated fuel assemblies. | Immediately |

Insert 1

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.3.13.1 | -------------------------------------------------------------------- **- NOTE -** This surveillance shall include verification that the time constants are adjusted to within limits. -------------------------------------------------------------------- Perform CHANNEL CALIBRATION in accordance with Setpoint Program. | 24 months |
| SR 3.3.13.2 | Verify ESF RESPONSE TIME is within limit. | 24 months on a STAGGERED TEST BASIS |

Insert 2

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## INSERT 1

| | | |
|---|---|---|
| F.<br>-----------------------------------------------<br>-NOTE-<br>Separate Condition entry is allowed for each channel.<br>----------------------------------------------<br><br>As required by Required Action A.1 and referenced in Table 3.3.13-1. | F.1 Place inoperable channel in trip.<br><br>OR<br><br>F.2.1 Verify actuation capability is maintained.<br><br>AND<br><br>F.2.2 Restore channel to OPERABLE status. | 6 hours<br><br><br><br>6 hours<br><br><br><br>7 days |
| G. Required Action and associated Completion Time of Condition F not met. | G.1 De-energize both MCR air supply radiation monitor sample pumps. | 6 hours |

## INSERT 2

Table 3.3.13-1 (page 1 of 1)
ESFAS Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization Instrumentation

| FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS | CONDITIONS | SURVEIILANCE REQUIREMENTS |
|---|---|---|---|---|
| 1. Main Control Room Air Supply Iodine or Particulate Radiation – High 2 | 1[(a)],2[(a)],3[(a)],4[(a)] | 2 | B | SR 3.3.13.1<br>SR 3.3.13.2 |
| | (b)[(a)] | 2 | C | SR 3.3.13.1<br>SR 3.3.13.2 |
| 2. Main Control Room Differential Pressure – Low | 1,2,3,4 | 2 | B | SR 3.3.13.1<br>SR 3.3.13.2 |
| | (b) | 2 | C | SR 3.3.13.1<br>SR 3.3.13.2 |
| 3. Class 1E 24- Hour Battery Charger Undervoltage | 1, 2, 3, 4, 5, 6, (b) | 2 /24-hour battery charger | F | SR 3.3.13.1 |

Change 2:

(a) Not applicable for the Main Control Room Air Supply Iodine or Particulate Radiation - High 2 function when the Main Control Room Envelope is isolated and the Main Control Room Emergency Habitability System is in operation.

(b) During movement of irradiated fuel assemblies.

## 3.6 CONTAINMENT SYSTEMS

### 3.6.3 Containment Isolation Valves

LCO 3.6.3 Each containment isolation valve shall be OPERABLE, except for ~~the~~ containment isolation valves associated with closed systems.

and for vacuum relief valves.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

---

**- NOTES -**

1. Penetration flow path(s) may be unisolated intermittently under administrative controls.

2. Separate Condition entry is allowed for each penetration flow path.

3. Enter applicable Conditions and Required Actions for systems made inoperable by containment isolation valves.

4. Enter applicable Conditions and Required Actions of LCO 3.6.1, “Containment,” when isolation valve leakage results in exceeding the overall containment leakage rate acceptance criteria.

---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more penetration flow paths with one containment isolation valve inoperable. | A.1 | Isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured. | 4 hours |
| | <u>AND</u> | | |

3.6 CONTAINMENT SYSTEMS

3.6.9 Vacuum Relief Valves

LCO 3.6.9 Two vacuum relief ~~flow paths~~ check valves and two vacuum relief isolation valves shall be OPERABLE.

AND

Containment inside to outside differential air temperature shall be ≤ 90°F.

APPLICABILITY: MODES 1, 2, 3, and 4.
MODES 5 and 6 without an open containment air flow path ≥ 6 inches in diameter.

-NOTE-
Vacuum relief valve OPERABILITY for closing is only required in MODES 1, 2, 3, and 4.

Insert 3

ACTIONS

Insert 4

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One vacuum relief check valve inoperable for opening ~~flow path inoperable~~. | A.1 Restore vacuum relief ~~flow path~~ check valve to OPERABLE status. | 72 hours |
| ~~B.~~ E. Containment inside to outside differential air temperature > 90°F. | ~~B.1~~ E.1 Restore containment inside to outside differential air temperature to within limit.<br><br>OR<br><br>~~B.2~~ E.2 Reduce containment average temperature ≤ 80°F. | 8 hours<br><br><br><br>8 hours |
| ~~C.~~ F. Required Action and associated Completion Time of Condition ~~A or B~~ A, B, C, D, or E not met in MODE 1, 2, 3, or 4.<br><br>OR<br><br>~~Both vacuum relief flow paths inoperable~~ Two vacuum relief check valves inoperable for opening in MODE 1, 2, 3, or 4.<br><br>OR<br>Two vacuum relief isolation valves inoperable for opening in MODE 1, 2, 3, or 4. | ~~C.1~~ F.1 Be in MODE 3.<br><br>AND<br><br>~~C.2~~ F.2 Be in MODE 5. | 6 hours<br><br><br><br>36 hours |

**INSERT 3**

-----------------------------------------------------------------------------------------------------------------------------

**-NOTE-**

Enter applicable Conditions and Required Actions of LCO 3.6.1, “Containment,” when vacuum relief valve leakage results in exceeding the overall containment leakage rate acceptance criteria.

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**INSERT 4**

| | | |
|---|---|---|
| B. One vacuum relief isolation valve inoperable for opening | B.1 Restore vacuum relief valve to isolation valve to OPERABLE status. | 72 hours |
| ---------------------------------------------<br>- **NOTE**-<br>Separate Condition entry is allowed for each valve.<br>---------------------------------------------<br><br>C. One or more vacuum relief valves inoperable for closing. | --------------------------------------<br>**-NOTES-**<br>1. Required Actions C.1 and C.2 are not required for vacuum relief valves open during Surveillances.<br>2. Required Actions C.1 and C.2 are not required for vacuum relief valves open when performing their vacuum relief function.<br>-------------------------------------------<br><br>C.1 Close each vacuum relief isolation valve.<br><br><u>AND</u><br><br>C.2 Verify each vacuum relief isolation valve is closed.<br><br><u>AND</u><br><br>C.3 Restore affected valve to OPERABLE for closing. | 4 hours<br><br>Once per 7 days<br><br>30 days for inoperable vacuum relief isolation valves<br><br><u>AND</u><br><br>Prior to entering MODE 4 following next MODE 6 entry for inoperable vacuum relief check valves. |
| D. One or more vacuum relief isolation valves inoperable for closing.<br><br><u>AND</u><br><br>One or more vacuum relief check valves inoperable for closing. | --------------------------------------<br>**-NOTES-**<br><u>1. Not required for vacuum relief valves open during Surveillances.</u><br><u>2. Not required for vacuum relief valves open when performing their vacuum relief function.</u><br>-------------------------------------------<br><br>D.1 Close each vacuum relief isolation valve. | 1 hour |

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| ~~D.~~ G. Required Action and associated Completion Time of Condition ~~A or B~~ A, B, or E not met in MODE 5 or 6.<br><br>OR<br><br>~~Both vacuum relief flow paths inoperable~~ Two vacuum relief check valves inoperable for opening in MODE 5 or 6.<br><br>OR<br>Two vacuum relief isolation valves inoperable for opening in MODE 5 or 6. | ~~D.1~~ G.1 Open a containment air flow path ≥ 6 inches in diameter. | 8 hours |

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.6.9.1 | Verify containment inside to outside differential air temperature is ≤ 90°F. | 12 hours |
| SR 3.6.9.2 | -----NOTE-----<br>1. Not required to be met for vacuum relief valves open during Surveillances.<br>2. Not required to be met for vacuum relief valves open when performing their vacuum relief function.<br>----------<br>Verify each vacuum relief isolation valve is closed. | 31 days |
| SR 3.6.9.~~2~~3 | Verify each vacuum relief ~~flow path~~ valve is OPERABLE in accordance with the Inservice Testing Program. | In accordance with the Inservice Testing Program |
| SR 3.6.9.~~3~~4 | Verify each vacuum relief isolation valve actuates ~~to relieve vacuum~~ on ~~an~~ actual or simulated ~~signal~~ signals. | 24 months |

SURVEILLANCE REQUIREMENTS (continued)

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.8.1.2 | Verify each battery charger supplies ≥ 150 amps at greater than or equal to the minimum established float voltage for ≥ 8 hours.<br><br>OR<br><br>Verify each battery charger can recharge the battery to the fully charged state within 24 hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state. | 24 months |
| SR 3.8.1.3 | ------------------------------------------------------------------<br>**- NOTE -**<br>The modified performance discharge test in SR 3.8.7.6 may be performed in lieu of SR 3.8.1.3.<br>------------------------------------------------------------------<br><br>Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test. | 24 months |

| | | |
|---|---|---|
| SR 3.8.1.4 | -----------------------------------------------<br>NOTE<br>Only required to be met when the main control room air supply radiation monitor sample pumps are energized.<br>-----------------------------------------------<br><br>Verify main control room air supply radiation monitor sample pump de-energizes on an actual or simulated actuation signal. | 24 months |

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| SR 3.8.2.1 | -------------------- **- NOTE -** The following SRs are not required to be performed: SR 3.8.1.2 and SR 3.8.1.3. -------------------- <br><br> The ~~For DC sources required to be OPERABLE, the~~ following SRs are applicable: <br><br> SR 3.8.1.1 <br> SR 3.8.1.2 <br> SR 3.8.1.3 <br> SR 3.8.1.4 | In accordance with applicable SRs |

APPLICABLE SAFETY ANALYSES, LCOs, and APPLICABILITY (continued)

Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization

Isolation of the main control room and initiation of the VES air supply provides a breathable air supply for the operators following an uncontrolled release of radiation. De-energizing non-essential main control room electrical loads maintains the room temperature within habitable limits. Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization is actuated ~~on a Control Room Air Supply Radiation – High 2 signal or a Main Control Room Differential Pressure - Low signal.~~

Refueling Cavity and Spent Fuel Pool Cooling System (SFS) Isolation

The SFS can be connected to the spent fuel pool, the fuel transfer canal, the refueling cavity, and the IRWST to clarify and purify the water. It can also connect the IRWST and refueling cavity to transfer water in preparation for refueling activities, and to return to normal operations from refueling activities. In the event of a leak in the nonsafety-related SFS, Refueling Cavity and SFS Isolation is actuated on the following signals:

- Spent Fuel Pool Level - Low 2; and
- IRWST Wide Range Level - Low.

ESF Logic

LCO 3.3.15 and LCO 3.3.16 require four sets of ESF coincidence logic, each set with one battery backed logic group OPERABLE to support automatic actuation. These logic groups are implemented as processor based actuation subsystems. The ESF coincidence logic provides the system level logic interfaces for the divisions.

ESF Actuation

on the following signals:
- Main Control Room Air Supply Iodine or Particulate Radiation - High 2
- Main Control Room Differential Pressure - Low
- Class 1E 24-hour Battery Charger Undervoltage
- Manual initiation

The main control room air supply radiation monitor sample pumps are de-energized by PMS on Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization signal coincident with Class 1E 24-hour battery charger undervoltage signal. The main control room radiation monitor sample pumps are de-energized to conserve battery capacity, maintain room temperature below the equipment qualification limitation, and provide an adequate heat sink for Main Control Room habitability.

B 3.3 INSTRUMENTATION

B 3.3.13 Engineered Safety Feature Actuation System (ESFAS) Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization

BASES

BACKGROUND

A description of the ESFAS Instrumentation is provided in the Bases for LCO 3.3.8, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation."

APPLICABLE SAFETY ANALYSES, LCOs, and APPLICABILITY

A description of the Main Control Room (MCR) Isolation, Air Supply Initiation, and Electrical Load De-energization is also provided in the Bases for LCO 3.3.8. ESFAS protective functions include:

A Note is included in the Applicability to state that the MCR Air Supply Iodine or Particulate Radiation High 2 channels are not required to be OPERABLE if the Main Control Room Envelope (MCRE) is isolated and the Main Control Room Emergency Habitability System (VES) is in operation. In the event of a Class 1E 24-hour battery charger undervoltage signal, the MCRE is isolated, the VES is initiated, and the MCR air supply radiation monitor sample pumps are de-energized to conserve battery capacity. With the MCR air supply radiation monitor sample pumps de-energized, the MCR Air Supply Iodine or Particulate Radiation High 2 function cannot be OPERABLE. Whenever both the MCRE has been isolated (VBS cannot supply air flow to the MCR) and the VES is providing pressurization and breathing air to the MCRE, the safety function of the MCR Air Supply Iodine or Particulate Radiation High - 2 channels is not required.

1. ~~a.~~ Main Control Room Air Supply Iodine or Particulate Radiation – High 2

Two radiation monitoring channels are provided on the main control room (MCR) air intake. Each MCR Air Supply Iodine or Particulate Radiation monitoring channel requires both the iodine radiation monitor and the particulate radiation monitor to be OPERABLE for the MCR Air Supply Iodine or Particulate Radiation channel to be OPERABLE. If either MCR Air Supply Iodine or Particulate Radiation channel exceeds the High 2 setpoint, main control room isolation, air supply initiation, and electrical load de-energization are actuated. Two channels of the Main Control Room Air Supply Iodine or Particulate Radiation - High 2 Function (each with both the iodine and particulate monitors) are required to be OPERABLE in MODES 1, 2, 3, and 4, and during movement of irradiated fuel because of the potential for a fission product release following a fuel handling accident, or other DBA.

2. ~~b.~~ Main Control Room Differential Pressure – Low

Two differential pressure sensor monitors are provided for the MCR pressure boundary. If either sensor exceeds the Low setpoint for greater than 10 minutes, main control room isolation, air supply initiation, and electrical load deenergization are actuated. Two channels of the Main Control Room Differential Pressure – Low Function are required to be OPERABLE in MODES 1, 2, 3, and 4, and during movement of irradiated fuel because of the potential for a fission product release following a fuel handling accident, or other DBA.

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3. Class 1E 24- hour Battery Charger Undervoltage

Two undervoltage sensors are provided on the input to each of the four 24-hour battery charger inputs. The main control room isolation, air supply isolation, and electrical load de-energization is actuated by an undervoltage condition on the Class 1E 24-hour battery chargers. The logic is based on a two-out-of-two undervoltage to the 24-hour battery charger for divisions A or C coincident with an undervoltage to the 24-hour battery chargers for divisions B or D. When the undervoltage to Class 1E 24-hour battery chargers signal is present coincident with the main control room isolation, air supply initiation, and electrical load de-energization signal, the main control room air supply radiation monitor sample pumps are de-energized.

Two channels per Class 1E 24-hour battery charger are required to be OPERABLE in MODES 1, 2, 3, 4, 5, and 6 and during movement of irradiated fuel because in the result of a loss of all ac power event, the main control room air supply radiation monitor sample pumps are required to be de-energized to conserve battery capacity, maintain room temperature below the equipment qualification limitation, and provide an adequate heat sink for Main Control Room habitability.

BASES

APPLICABLE SAFETY ANALYSES, LCOs, and APPLICABILITY (continued)

ESFAS Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

ACTIONS

In the event a channel's as-found condition is outside the as-found tolerance described in the SP, or the channel is not functioning as required, or the transmitter, or the Protection and Safety Monitoring System Division, associated with a specific Function is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the LCO Condition(s) entered for the particular protection Function(s) affected.

,

, and Class 1E 24-hour Battery Charger Undervoltage

A Note has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this specification may be entered independently for each Function (i.e., Main Control Room Air Supply Iodine or Particulate Radiation – High 2 ~~and~~ Main Control Room Differential Pressure – Low). The Completion Time(s) of the inoperable Function will be tracked separately for each Function starting from the time the Condition was entered for that Function.

A.1

Condition A addresses one or more Functions with one or more channels(s) inoperable. In this case, the Required Action is to enter the Condition referenced in Table 3.3.13-1 immediately.

~~A.1 and A.2~~ B.1, B.2, and B.3

Required Action B.1 verifies that one channel in the affected Function is OPERABLE. The Completion Time for Required Action B.1 is immediately because if two channels are inoperable then the Required Actions of Condition D are applicable.

~~Condition A addresses the situation where one or more Functions with one channel are inoperable in MODE 1, 2, 3, or 4.~~ With one channel inoperable in either or both Functions in MODE 1, 2, 3, or 4, the logic becomes one-out-of-one in the affected Function and is unable to meet single failure criterion. ~~Restoring all channels to OPERABLE status ensures that a single failure will not prevent the protective Function.~~

Required Action ~~A.1~~ B.2 assures that with one Main Control Room Air Supply Iodine or Particulate Radiation - High 2 channel inoperable, the redundant radiation monitor(s), which provide equivalent information, must be verified to be OPERABLE within 72 hours. Required Action ~~A.1~~ B.2 is modified with a Note stating ~~the~~ that it is not applicable to an inoperable Main Control Room Differential Pressure – Low channel. These provisions for operator action can replace one channel of radiation detection and system actuation. Required Action ~~A.2~~ B.3 requires that the main control room isolation, air supply initiation, and electrical load de-energization manual controls must be verified to be OPERABLE within 72 hours. The 72 hour Completion Times are reasonable considering that there is one remaining channel OPERABLE and the low probability of an event occurring during this interval.

BASES

ACTIONS (continued)

~~B.1~~ C.1 and C.2

~~Condition B addresses the situation where one or more Functions with one channel are inoperable during movement of irradiated fuel assemblies.~~ With one channel inoperable during movement of irradiated fuel assemblies, the system level initiation capability is reduced below that required to meet single failure criterion. ~~Therefore, the~~ The required channel must be returned to OPERABLE status within 72 hours. The specified Completion Time is reasonable considering the remaining channel is capable of performing the initiation.

Required Action C.1 verifies that one channel in the affected Function is OPERABLE. The Completion Time for Required Action C.1 is immediately because if two channels are inoperable then the Required Actions of Condition D are applicable.

~~C.1 and C.2~~ D.1 and D.2

If the Required Action and associated Completion Time ~~Condition A~~ of Condition B is not met, ~~or one or more Functions with two channels are inoperable in MODE 1, 2, 3, or 4,~~ the plant must be placed in a MODE in which the LCO does not apply. This is accomplished by placing the plant in 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 plant conditions from full power conditions in an orderly manner without challenging plant systems.

~~D.1~~ E.1

If the Required Action and associated Completion Time ~~Condition B~~ of Condition C is not met, ~~or one or more Functions with two channels are inoperable during movement of irradiated fuel assemblies,~~ the plant must be placed in a MODE in which the LCO does not apply. This is accomplished by immediately suspending movement of irradiated fuel assemblies. The required action suspends activities with potential for releasing radioactivity that might enter the Main Control Room. This action does not preclude the movement of fuel to a safe position.

Insert 6

**INSERT 6**

F.1, F.2.1, and F.2.2

Required Action F.1 allows the inoperable channel to be placed in a trip condition within 6 hours. The Completion Time of 6 hours to place the inoperable channel in trip is reasonable considering the time required to complete this action. Once an inoperable channel is placed in trip, single failure capability of the action is restored and no additional action is required for the inoperable channel. If more than one channel is inoperable at a time, the configuration of inoperable channels in the trip condition may generate an undesirable Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization and de-energize the MCR air supply radiation monitor sample pumps. Therefore, one or more inoperable channels may be left untripped by optionally complying with Required Actions F.2.1 and F.2.2.

In place of Required Action F.1, the Required Actions F.2.1 and F.2.2 may be performed. Required Action F.2.1 is to verify that actuation capability is maintained. In order to verify actuation capability is maintained, the combination of channels either in trip or OPERABLE must be able to maintain the actuation capability with an undervoltage to the 24-hour battery chargers for divisions A or C coincident with an undervoltage to the 24-hour battery chargers for divisions B or D. Perfoming the Required Action F.2.1 within the 6 hour Completion Time is a reasonable time to verify that actuation capability is maintained. Required Action F.2.2. also requires restoring the channel to OPERABLE status within 7 days. This reflects a reasonable time to effect restoration of the single failure capability of the undervoltage actuation function.

G.1

If the Required Action and Completion Time of Condition F cannot be met, the plant must be placed in a Condition in which the likelihood and consequences of an event are minimized. This is accomplished by de-energizing both main control room air supply radiation monitor sample pumps within 6 hours. This allowed Completion Time is reasonable considering the time required to complete this action.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.3 Containment Isolation Valves

No changes on this page

BASES

BACKGROUND

The containment isolation valves form part of the containment pressure boundary and provide a means for fluid penetrations not serving accident consequence limiting systems to be provided with two isolation barriers. These isolation devices are either passive or active (automatic). Manual valves, de-activated automatic valves secured in their closed position (including check valves with flow through the valve secured), blind flanges, and closed systems are considered passive devices. Check valves, or other automatic valves designed to close without operator action following an accident, are considered active devices. Two barriers in series are provided for each penetration so that no single credible failure or malfunction of an active component can result in a loss of isolation or leakage that exceeds limits assumed in the safety analyses. One of these barriers may be a closed system. These barriers (typically containment isolation valves) make up the Containment Isolation System.

Automatic isolation signals are produced during accident conditions. FSAR Section 6.2 (Ref. 1) identifies parameters which initiate isolation signal generation for containment isolation valves. The containment isolation valves (and blind flanges) help ensure that the containment atmosphere will be isolated from the environment in the event of a release of fission product radioactivity to the containment atmosphere as a result of a Design Basis Accident (DBA).

The OPERABILITY requirements for containment isolation valves help ensure that containment is isolated within the time limits assumed in the safety analysis. Therefore, the OPERABILITY requirements provide assurance that containment function assumed in the safety analysis will be maintained.

Containment Air Filtration System 16-inch purge valves

The Containment Air Filtration System operates to:

a. Supply outside air into the containment for ventilation and cooling or heating,

b. Reduce the concentration of noble gases within containment prior to and during personnel access, and

c. Equalize internal and external pressures.

DRAFT

No changes on this page

BASES

BACKGROUND (continued)

Since the valves used in the Containment Air Filtration System are designed to meet the requirements for automatic containment isolation valves, these valves may be opened as needed in MODES 1, 2, 3 and 4.

APPLICABLE SAFETY ANALYSES

The containment isolation valve LCO was derived from the assumptions related to minimizing the loss of reactor coolant inventory and establishing the containment boundary during major accidents. As part of the containment boundary, containment isolation valve OPERABILITY supports leak tightness of the containment. Therefore, the safety analysis of any event requiring isolation of containment is applicable to this LCO.

The DBAs that result in a release of radioactive material within containment are a loss of coolant accident (LOCA) and a rod ejection accident (Ref. 2). In the analyses for each of the accidents, it is assumed that containment isolation valves are either closed or function to close within the required isolation time following event initiation. This ensures that potential paths to the environment through containment isolation valves (including containment purge valves) are minimized.

The DBA dose analysis assumes that, following containment isolation signal generation, the containment purge isolation valves are closed within 10 seconds. The remainder of the automatic isolation valves are assumed closed and the containment leakage is terminated except for the design leakage rate, $L_a$. Since the containment isolation valves are powered from the 1E division batteries no diesel generator startup time is applied.

The single failure criterion required to be imposed in the conduct of plant safety analyses was considered in the design of the containment purge isolation valves. Two valves in series on each purge line provide assurance that both the supply and exhaust lines could be isolated even if a single failure occurred. The inboard and outboard isolation valves on each line are pneumatically operated, spring closed valves that fail in the closed position and are provided with power via independent sources.

The containment isolation valves satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Containment isolation valves form a part of the containment boundary. The containment isolation valves' safety function is related to minimizing the loss of reactor coolant inventory and establishing the containment boundary during a DBA.

LCO (continued)

and vacuum relief valves

The automatic power operated isolation valves are required to have isolation times within limits and to actuate on an automatic isolation signal. The valves covered by this LCO are listed along with their associated stroke times in the FSAR Section 6.2 (Ref. 1).

The normally closed isolation valves are considered OPERABLE when manual valves are closed, automatic valves are de-activated and secured in their closed position, or blind flanges are in place. These passive isolation valves/devices are those listed in Reference 1.

This LCO provides assurance that the containment isolation valves, except for the closed system valves, and purge valves will perform their designed safety functions to minimize the loss of reactor coolant inventory and establish the containment boundary during accidents. The containment isolation valves associated with closed systems are not included in this LCO since they are covered in LCO 3.7.1, "Main Steam Safety Valves (MSSVs)," LCO 3.7.2, “Main Steam Line Flow Path Isolation Valves,” LCO 3.7.3, “Main Feedwater Isolation Valves (MFIVs) and Main Feedwater Control Valves (MFCVs),” LCO 3.7.7, “Startup Feedwater Isolation and Control Valves,” and LCO 3.7.10, “Steam Generator (SG) Isolation Valves.”

The containment system vacuum relief valves provide containment isolation but are also required to open to mitigate a negative pressure event within containment. Therefore, the vacuum relief valves are not included in this LCO since they are covered in LCO 3.6.9, “Vacuum Relief Valves.”

APPLICABILITY

In MODES 1, 2, 3, and 4 a DBA could cause a release of radioactive material to containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, containment isolation valves are not required to be OPERABLE in MODES 5 and 6 to prevent leakage of radioactive material from containment. However, containment closure capability is required in MODES 5 and 6. The requirements for containment isolation valves during MODES 5 and 6 are addressed in LCO 3.6.7, “Containment Penetrations.”

ACTIONS

The ACTIONS are modified by a Note allowing containment penetration flow paths to be unisolated intermittently under administrative control. These administrative controls consist of stationing a dedicated operator at the valve controls, who is in continuous communication with the control room. In this way, the penetration can be rapidly isolated when a need for containment isolation is indicated.

A second Note has been added to provide clarification that, for this LCO, separate Condition entry is allowed for each penetration flow path. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable containment

## B 3.6 CONTAINMENT SYSTEMS

### B 3.6.9 Vacuum Relief Valves

BASES

BACKGROUND

The purpose of the vacuum relief lines is to protect the containment vessel from damage due to a negative pressure (that is, a lower pressure inside than outside). Excessive negative pressure inside containment can occur, if there is a loss of ac power (containment recirculation cooling system (VCS) containment heating not available, reactor trip decay heating only) with a differential (inside to outside) ambient temperature > 90°F. In this case, the relative low outside ambient temperature may cool containment faster than the available heat sources (primarily, reactor decay heat) can heat containment, resulting in a reduction of the containment temperature and pressure below the negative pressure design limit since normal non-safety-related pressure control means are not available due to loss of ac power. In addition, excessive negative pressure inside containment can occur, in the event of malfunction of the Containment Fan Coolers (containment air filtration system (VFS)) control, in combination with low outside ambient temperature, which reduces containment temperature.

The vacuum relief valves have an additional function to provide containment isolation to establish a containment boundary during accidents.

vacuum relief isolation valve, which is a

isolation valves

There are two

The containment pressure vessel contains two 100% capacity vacuum relief flow paths with a shared containment penetration that protect the containment from excessive external pressure loading. Each flow path outside containment contains a normally closed~~,~~ motor-operated valve (MOV). The ~~MOVs~~ receive an engineered safety features (ESF) “open” signal on Containment Pressure–Low 2. The ~~MOVs~~ close on an ESF containment isolation signal, as well as on High containment radioactivity. ~~Each flow path contains a~~ normally closed, self-actuated check ~~valve~~ inside containment that open~~s~~ on a negative differential pressure of 0.2 psi. A vacuum relief flow path consists of one ~~MOV~~ and one check valve, and the shared containment penetration.

valves

isolation valves

The parallel vacuum relief ~~MOVs~~ are interlocked with the 16 inch containment purge discharge isolation valve inside containment, VFS-PL-V009, which shares the containment penetration. The vacuum relief ~~MOVs~~ are blocked from opening if VFS-PL-V009 is not closed. If VFS-PL-V009 is not closed, then the vacuum relief ~~MOVs~~ will automatically close to direct VFS purge exhaust through the normal VFS discharge flow path. However, if vacuum relief actuation is required, the vacuum relief ~~MOV~~ actuation signal overrides the closing interlock with VFS-PL-V009 to allow the vacuum relief ~~MOVs~~ to open ensuring that the vacuum relief protection actuates (Ref. 3).

isolation valves

APPLICABLE SAFETY ANALYSES

Design of the vacuum relief system involves calculating the effect of loss of ac power and a low outside ambient air temperature in combination with limited containment heating that reduces the atmospheric temperature (and hence pressure) inside containment (Ref. 1). Conservative assumptions are used for relevant parameters in the calculation; for example, maximum inside containment temperature, minimum outside air temperature, maximum humidity, and maximum heat transfer coefficients (Ref. 1). The resulting containment pressure versus time is calculated, including the effect of the opening of the vacuum relief valves when their negative pressure setpoint is reached. It is also assumed that one valve fails to open.

The containment was designed for an external pressure load equivalent to 1.7 psid. The excessive containment cooling events were analyzed to determine the resulting reduction in containment pressure. The initial pressure condition used in this analysis was -0.2 psig. This resulted in a minimum pressure inside the containment less than the design load.

The applicable safety analyses results for the loss of ac power event bounds the analyses for the other external pressure load events described in the Bases for LCO 3.6.4, "Containment Pressure."

The vacuum relief valves must also perform the containment isolation function ~~(as required by LCO 3.6.3, "Containment Isolation Valves")~~ during a containment high pressure event. For this reason, the system is designed to take the full containment positive design pressure and the environmental conditions (temperature, pressure, humidity, radiation, chemical attack, and the like) associated with the containment DBA.

The vacuum relief valves satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO establishes the maximum containment temperature initial condition and the minimum equipment required to accomplish the vacuum relief function following excessive containment cooling events (Ref. 1). ~~Two 100% vacuum relief flow paths are required to be OPERABLE to ensure that at least one is available, assuming one or both valves in the other flow path fail to open. A vacuum relief flow path is OPERABLE if the MOV opens on an ESF open signal and the self-actuated check valves open on a negative differential pressure of 0.2 psi.~~

Insert 7

The containment inside to outside differential air temperature limit of ≤ 90°F ensures that the initial condition for the excessive cooling analysis is met. If the differential air temperature exceeds the limit, the containment vacuum relief capacity of one flow path may not be adequate to ensure the containment pressure meets the negative pressure design limit.

APPLICABILITY

In MODES 1 through 6, the potential exists for excessive containment cooling events to produce a negative containment pressure below the design limit. However, in MODE 5 or 6, a containment air flow path may be opened (LCO 3.6.7, "Containment Penetrations"), providing a vacuum relief path that is sufficient to preclude a negative containment pressure below the design limit.

valves

for opening

Therefore, the vacuum relief ~~flow paths~~ are required to be OPERABLE in MODES 1 through 4 and in MODES 5 and 6 without an open containment air flow path ≥ 6 inches in diameter. With a 6 inch diameter or equivalent containment air flow path, the vacuum relief function is not needed to mitigate a low pressure event.

Insert 8

ACTIONS

Insert 9

A.1

check valves

for opening

When one of the ~~required~~ vacuum relief ~~flow paths~~ is inoperable, the inoperable ~~flow path~~ must be restored to OPERABLE status within 72 hours. The specified ~~time period~~ is consistent with other LCOs for the loss of one train of a system required to mitigate the consequences of a LOCA or other DBA.

valve

Completion Time

It is acceptable to enter Condition A and B concurrently. The vacuum relief function is maintained with at least one isolation valve and one check valve OPERABLE, which is assured provided Condition F or G is not entered for two vacuum relief isolation valves or two vacuum relief check valves inoperable for opening.

Insert 10

~~B.1 and B.2~~ E.1 and E. 2

If the containment inside to outside differential air temperature is > 90°F, then the differential air temperature shall be restored to within the limit within 8 hours. The 8-hour Completion Time is reasonable, considering that limit is based on a worst case condition and the time needed to reduce the containment temperature while controlling pressure within limits of LCO 3.6.4, Containment Pressure.

If the differential temperature cannot be restored, Required Action B.2 provides an alternate requirement. Reduction of the containment average temperature to ≤ 80°F provides an initial condition for excessive cooling events that ensures the vacuum relief system capacity is sufficient (Ref. 1).

~~C.1, C.2, and D.1~~ F.1 and F.2

A, B, C, D, or E

If the Required Action and associated Completion Time of Conditions ~~A or B~~ are not met in MODE 1, 2, 3, or 4, or ~~both vacuum relief flow paths are inoperable~~ in MODE 1, 2, 3, or 4, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

two vacuum relief check valves are inoperable for opening in MODE 1, 2, 3, or 4, or two vacuum relief isolation valves are inoperable for opening

BASES

ACTIONS (continued)

G.1

G.1

Once in MODE 5 or 6, Required Action ~~D.1~~ G.1 requires that a containment air flow path ≥ 6 inches in diameter shall be opened within 8 hours. Any flow path (or paths) with an area equivalent to 6 inches in diameter is adequate to provide the necessary air flow.

if the Required Action and associated Completion Time of Condition A, B, or E is not met, or it two vacuum relief check valves are inoperable for opening, or if two vacuum relief isolation valves are inoperable for opening.

for containment vacuum relief.

The primary means of opening a containment air flow path is by establishing a VFS air flow path into containment. Manual actuation and maintenance as necessary to open a purge supply, purge exhaust, or vacuum relief flow path are available means to open a containment air flow path. In addition, opening of a spare penetration is an acceptable means to provide the necessary flow path. Opening of an equipment hatch or a containment airlock is acceptable. Containment air flow paths opened must comply with LCO 3.6.7, Containment Penetrations.

The 8 hour Completion Time is reasonable for opening a containment air flow path in an orderly manner.

SURVEILLANCE REQUIREMENTS

SR 3.6.9.1

Verification that the containment inside to outside differential air temperature is ≤ 90°F is required every 12 hours. The containment inside to outside differential air temperature is the difference between the outside ambient air temperature (measured by the site meteorological instrumentation or equivalent) and the inside containment average air temperature (measured using the same instrumentation as used for SR 3.6.5.1).

The Frequency is based on the normally stable containment average air temperature and the relatively small outside ambient air temperature changes within this time.

Insert 11

SR 3.6.9.~~2~~ 3

This SR cites the Inservice Testing Program, which establishes the requirement that inservice testing of the ASME Code Class 1, 2, and 3 valves shall be performed in accordance with the ASME OM Code (Ref. 2). Therefore, SR Frequency is governed by the Inservice Testing Program.

Vacuum relief valves are tested to be OPERABLE for opening and OPERABLE for closing.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.9.~~3~~ 4

This SR ensures that each vacuum relief ~~motor operated~~ isolation valve will actuate to the open position on an actual or simulated actuation signal and will actuate to the closed position on an actual or simulated actuation signal. The actual or simulated signal is processed through the component interface module to verify the continuity between the output of the component interface module and the valves. The Frequency of 24 months is based on the need to perform this surveillance during periods in which the plant is shutdown for refueling to prevent any upsets of plant operations.

REFERENCES

1. FSAR subsection 6.2.1.1.4, "External Pressure Analysis."
2. ASME OM Code, "Code for Operation and Maintenance of Nuclear Power Plants."
3. FSAR subsection 9.4.7, "Containment Air Filtration System."

**INSERT 7**

This LCO also addresses the minimum equipment required to perform the containment isolation function of the vacuum relief valves. The vacuum relief isolation valves are located in independent parallel paths outside containment and the vacuum relief check valves are located in independent parallel paths inside containment; they are connected by a common containment penetration. For one open vacuum relief path to be available, one of the isolation valves must open and one of the check valves must open. For isolation of the containment penetration flow path by a single barrier, either both of the isolation valves must be closed or both check valves must be closed. Therefore, two vacuum relief isolation valves and two vacuum relief check valves are required to be OPERABLE to ensure that at least one vacuum relief path is available with the failure to open of one isolation valve and/or one check valve and to ensure that there are two barriers for containment isolation. For vacuum relief valves to be OPERABLE, the valves must be OPERABLE for opening and OPERABLE for closing. A vacuum relief isolation valve is OPERABLE for opening if the isolation valve opens on an ESF open signal and is OPERABLE for closing if the isolation valve closes on an ESF closure signal. The self-actuated check valves are OPERABLE for opening if they open on a negative differential pressure of 0.2 psi and are OPERABLE for closing if they close with zero differential pressure across the valve.

**INSERT 8**

The Applicability is modified by a Note that the vacuum relief valve OPERABILITY for closing is only required in MODES 1, 2, 3, and 4. In MODES 1, 2, 3, and 4, a DBA could cause a release of radioactive material to containment. In MODES 5 and 6, the probability and consequences of these events are reduced due to the pressure and temperature limitations of these MODES. Therefore, the vacuum relief valve OPERABILITY for closing is only required in MODES 1, 2, 3, and 4 to prevent leakage of radioactive material from containment. However, containment closure capability is required in MODES 5 and 6. The requirements for containment isolation valves, including the vacuum relief valves, during MODES 5 and 6 are addressed in LCO 3.6.7, “Containment Penetrations.”

**INSERT 9**

The Actions are modified by a Note that directs entry into the applicable Conditions and Required Actions of LCO 3.6.1, “Containment,” in the event that vacuum relief valve leakage results in exceeding the overall containment leakage rate acceptance criteria.

**INSERT 10**

B.1

When one of the vacuum relief isolation valves is inoperable for opening, the inoperable valve must be restored to OPERABLE status within 72 hours. Provided Condition F or G is not entered for two vacuum relief isolation valves or two vacuum relief check valves inoperable for opening, then the vacuum relief function is maintained with at least one isolation valve and one check valve (i.e., it is acceptable to enter Conditions A and B concurrently). The Completion Time is consistent with other LCOs for the loss of one train of a system required to mitigate the consequences of a LOCA or other DBA.

C.1, C.2, and C.3

With one or more vacuum relief valve(s) inoperable for closing (including either two vacuum relief isolation valves inoperable for closing or two vacuum relief check valves inoperable for closing), provided Condition D is not applicable, the penetration has not lost isolation capability. Consistent with LCO 3.6.3 Action A, the penetration flow path is to be isolated by the closure of the vacuum relief isolation valves within 4 hours. Requiring both isolation valves to be closed assures a containment isolation barrier. The 4 hour Completion Time for Required Action C.1. is reasonable considering the time required to isolate the penetration, the relative importance of supporting containment OPERABILITY during MODES 1, 2, 3, 4, and the availability of a second barrier.

The periodic verification performed by Required Action C.2 ensures that the vacuum relief isolation valves remain closed to isolate containment. The vacuum relief isolation valves are normally closed and will only be automatically opened due to an ESF signal on Containment Pressure Low-2. The Completion Time of once per 7 days for verifying the vacuum relief isolation valves are in the closed position is appropriate considering the probability of the valve misalignment is low.

For the vacuum relief isolation valves, the affected valves are to be restored to OPERABLE for closing within 30 days. For the check valves, which are located inside containment, the affected valves are to be restored to OPERABLE for closing following the next MODE 6 entry prior to entering MODE 4. The Completion Times are acceptable since the vacuum relief isolation valves will be confirmed closed, maintaining isolation of the containment penetration flow path, once per 7 days in accordance with Required Action C.2 and the low probability of the valves being opened during this time period. If the valves were opened for vacuum relief, air flows into containment from the atmosphere due to the negative pressure inside containment, and prevents radiological release from containment. Based on engineering judgement, there would be a reasonable time to monitor the containment pressure and manually close the isolation valves before failure to isolate containment would be a significant impact to safety.

Condition C is modified by a Note to provide clarification that separate Condition entry is allowed for each valve. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each vacuum relief valve inoperable for closing.

DRAFT

Complying with the Required Actions may allow for continued operation, and subsequent vacuum relief valves inoperable for closing are governed by subsequent Condition entry and application of the associated Required Actions.

The Required Actions are modified by two Notes. Note 1 states that Required Actions C.1 and C.2 are not required for vacuum relief valves that are open during Surveillances. Surveillances which open the vacuum relief isolation valves are performed infrequently and the valves will only be open for a limited period of time. Note 2 states that Required Actions C.1 and C.2 are not required for vacuum relief valves performing their vacuum relief function. If vacuum relief is required, the valves need to be open to perform their safety function to maintain the integrity of the containment vessel. Air will flow into containment from the atmosphere due to the negative pressure inside containment which will prevent radiological release from containment during vacuum relief.

D.1

With one or more vacuum relief isolation valves and one or more vacuum relief check valves inoperable for closing, the penetration flow path is to be isolated by closing the isolation valves within 1 hour to restore the containment boundary. With one isolation valve and one check valve inoperable for closing, the containment isolation capability is lost and a release path remains open. To address this, both vacuum relief isolation valves need to be closed to provide a containment isolation barrier. Therefore, Required Action D.1 requires the vacuum relief isolation valves to be closed within 1 hour. The 1 hour Completion Time is consistent with the Action B of LCO 3.6.1.

In the event the vacuum relief isolation valves are closed in accordance with Required Action D.1, the vacuum relief isolation valves must be verified to be closed on a periodic basis per Required Action C.2 which also remains in effect. This periodic verification is necessary to ensure leak tightness of containment and that penetrations requiring isolation following an accident are isolated. The Completion Time of once per 7 days for verifying the vacuum relief isolation valves are in the closed position is appropriate considering the probability of the valve misalignment is low.

Required Action C.3 would also remain in effect. The Completion Times are acceptable since the vacuum relief isolation valves will be confirmed closed, maintaining isolation of the containment penetration flow path, once per 7 days in accordance with Required Action C.2 and the low probability of the valves being opened during this time period. If the valves were opened for vacuum relief, air flows into containment from the atmosphere due to the negative pressure inside containment, and prevents radiological release from containment. Based on engineering judgement, there would be a reasonable time to monitor the containment pressure and manually close the isolation valves before failure to isolate containment would be a significant impact to safety.

Required Action D.1 is modified by two Notes. Note 1 states that Required Action D.1 is not required for vacuum relief valves that are open during Surveillances. Surveillances which open the vacuum relief isolation valves are performed infrequently and the valves will only be open for a limited period of time. Note 2 states that Required Action D.1 is not required for vacuum relief valves performing their vacuum relief function. If vacuum relief is required, the valves need to be open to perform their safety function to maintain the integrity of the containment vessel. Air will flow into containment from the atmosphere due to the negative pressure inside containment which will prevent radiological release from containment during vacuum relief.

**INSERT 11**

SR 3.6.9.2

Each vacuum relief isolation valve must be verified to be closed every 31 days. This SR ensures that the vacuum relief isolation valves are closed as required, or if open, the valves are open for an allowable reason. The vacuum relief isolation valves are normally closed. The frequency of 31 days is appropriate considering the valves should only be opened to relieve vacuum or manually opened to perform Surveillances and the probability of the valve misalignment is low.

SR 3.6.9.2 is modified by two Notes. Note 1 states that SR 3.6.9.2 is not required to be met for vacuum relief valves that are open during Surveillances. Surveillances which open the vacuum relief isolation valves are performed infrequently and the valves will only be open for a limited period of time. Note 2 states that SR 3.6.9.2 is not required to be met for vacuum relief valves performing their vacuum relief function. If vacuum relief is required, the valves need to be open to perform their safety function to maintain the integrity of the containment vessel. Air will flow into containment from the atmosphere due to the negative pressure inside containment which will prevent radiological release from containment during vacuum relief.

BACKGROUND (continued)

the charger is substituted for one of the preferred battery banks or chargers, then the requirements of independence and redundancy between subsystems are maintained and the division is OPERABLE.

During normal operation, the 250 VDC load is powered from the battery chargers with the batteries floating on the system. In case of loss of normal power to the battery charger, the DC load is automatically powered from the station batteries.

Each battery bank provides power to an inverter, which in turn powers an AC instrumentation and control bus. The AC instrumentation and control bus loads are connected to inverters according to the battery bank type, 24 hour or 72 hour.

The Class 1E DC power distribution system is described in more detail in Bases for LCO 3.8.5, “Distribution Systems – Operating,” and LCO 3.8.6, “Distribution Systems – Shutdown.”

Each battery has adequate storage capacity to carry the required load for the required duration as discussed in Reference 4.

Each 250 VDC battery bank, including the spare battery bank, is separately housed in a ventilated room apart from its charger and distribution centers. Each subsystem is located in an area separated physically and electrically from the other subsystems to ensure that a single failure in one subsystem does not cause a failure in a separate subsystem. There is no sharing between separate Class 1E subsystems such as batteries, battery chargers, or distribution panels.

The batteries for each Class 1E electrical power subsystem are based on 125% of required capacity. The voltage limit is 2.13 V per cell, which corresponds to a total minimum voltage output of 256 V per battery discussed in Reference 4. The criteria for sizing large lead storage batteries are defined in IEEE-485 (Ref. 5).

Each electrical power subsystem has ample power output capacity for the steady state operation of connected loads required during normal operation, while at the same time maintaining its battery bank fully charged. Each battery charger has sufficient capacity to restore the battery bank from the design minimum charge to its fully charged state within 24 hours while supplying normal steady state loads (Ref. 4).

The main control room air supply radiation monitor sample pumps are de-energized by the Protection and Safety Monitoring System (PMS) on a "Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization" signal coincident with a "Class 1E 24-hour Battery Charger Undervoltage" signal (refer to LCO 3.3.13,"ESFAS Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization," Bases) to remove non-essential loads from the batteries.

APPLICABLE SAFETY ANALYSES

The initial conditions of DBA and transient analyses in the FSAR Chapter 6 (Ref. 6) and FSAR Chapter 15, (Ref. 7), assume that engineered safety features are OPERABLE. The Class 1E DC electrical power system provides 250 volts power for safety related and vital control instrumentation loads including monitoring and main control room emergency lighting during all MODES of operation. It also provides power for safe shutdown when all the onsite and offsite AC power sources are lost.

The OPERABILITY of the Class 1E DC sources is consistent with the initial assumptions of the accident analyses. This includes maintaining at least three of the four divisions of DC sources OPERABLE during accident conditions in the event of:

a. An assumed loss of all offsite and onsite AC power sources; and

b. A worst case single failure.

The DC Sources satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Class 1E DC electrical power subsystems are required to be OPERABLE to ensure the availability of the required power to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated DBA. Loss of Class 1E DC electrical power from one division does not prevent the minimum safety function from being performed (Ref. 4).

An OPERABLE Class 1E DC electrical power subsystem requires all required batteries and respective chargers to be operating and connected to the associated DC bus(es). The spare battery and/or charger may be used by one subsystem for OPERABILITY.

De-energization of the main control room air supply radiation monitor sample pumps on a valid PMS signal is also required to be OPERABLE to support the Class 1E 24-hour battery OPERABILITY based on the assumed battery load profile and to maintain equipment temperature limits.

APPLICABILITY

The Class 1E DC electrical power sources are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure safe unit operation and to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

b. Adequate core cooling is provided, and containment integrity and other vital functions are maintained in the event of a postulated DBA.

Class 1E DC electrical power requirements for MODES 5 and 6 are addressed in the Bases for LCO 3.8.2, “DC Sources – Shutdown.”

SURVEILLANCE REQUIREMENTS (continued)

The battery terminal voltage for the modified performance discharge test is required to remain above the minimum battery terminal voltage specified in the battery service test for the the duration of the service test portion of the test. Initial conditions for the modified performance discharge test are identical to those specified for a service test.

SR 3.8.1.4

Verification that the main control room air supply radiation monitor sample pumps de-energize on an actual or simulated signal from PMS is required every 24 months to assure that the non-essential Class 1E 24-hour battery loads are shed to maintain the assumed battery load profile.

The Surveillance Frequency is acceptable, given the unit conditions required to perform the test and other administrative controls existing to ensure adequate charger performance during these 24 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

This Surveillance is modified by a Note stating that it is only required to be met when the main control room air supply radiation monitor sample pumps are energized.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.

2. Regulatory Guide 1.6, “Independence Between Redundant Standby (Onsite) Power Sources and Between Their Distribution Systems,” U.S. Nuclear Regulatory Commission, March 10, 1971.

9. Regulatory Guide 1.32, “Criteria for Safety-Related Electric Power Systems for Nuclear Power Plants,” U.S. Nuclear Regulatory Commission, February 1977.

10. Not used.

11. Regulatory Guide 1.93, “Availability of Electric Power Sources,” U.S. Nuclear Regulatory Commission, December 1974.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.2 DC Sources – Shutdown

No changes to this page

BASES

| | |
|---|---|
| BACKGROUND | A description of the Class 1E DC power sources is provided in the Bases for LCO 3.8.1, “DC Sources – Operating.” |

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the FSAR Chapter 6 (Ref. 1) and FSAR Chapter 15 (Ref. 2), assume engineered safety features are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the emergency auxiliaries and control and switching during all MODES of operation.

The OPERABILITY of the DC subsystem is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems’ OPERABILITY.

The OPERABILITY of the minimum Class 1E DC power sources during MODES 5 and 6 and during movement of irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate Class 1E DC power sources are provided to mitigate events postulated during shutdown, such as an inadvertent draindown of the vessel or a fuel handling accident.

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many Design Basis Accidents (DBAs) that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. To demonstrate robust design, a single failure is assumed, consistent with the single failure assumptions in TS 3.8.1 and the shutdown evaluation in FSAR Appendix 19E (Ref. 3).

APPLICABLE SAFETY ANALYSES (continued)

These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

The shutdown Technical Specification requirements are designed to ensure that the unit has the capability to mitigate the consequences of certain postulated accidents. Worst case Design Basis Accidents which are analyzed for operating MODES are generally viewed not to be a significant concern during shutdown MODES due to the lower energies involved. The Technical specifications therefore require a lesser complement of electrical equipment to be available during shutdown than is required during operating MODES. More recent work completed on the potential risks associated with shutdown, however, have found significant risk associated with certain shutdown evolutions. As a result, in addition to the requirements established in the Technical Specifications, the industry has adopted NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management," as an Industry initiative to manage shutdown tasks and associated electrical support to maintain risk at an acceptable low level. This may require the availability of additional equipment beyond that required by the shutdown Technical Specifications.

The Class 1E DC Sources satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

De-energization of the main control room air supply radiation monitor sample pumps on a valid PMS signal is also required to be OPERABLE to support the Class 1E 24-hour battery OPERABILITY based on the assumed battery load profile and to maintain equipment temperature limits.

Class 1E DC electrical power subsystems are required to be OPERABLE to support required trains of Class 1E Distribution System divisions required to be OPERABLE by LCO 3.8.6. This ensures the availability of sufficient Class 1E DC power sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents, inadvertent reactor vessel draindown).

As described in the previous section, "Applicable Safety Analyses," in the event of an accident during shutdown, the Technical Specifications are designed to maintain the plant in such a condition that, even with a single failure, the plant will not be in immediate difficulty.

APPLICABILITY

The Class 1E DC power sources required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provide assurance that:

a. Required features to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core in case of an inadvertent draindown of the reactor vessel;

ACTIONS (continued)

ACTIONS. In many instances this option would likely involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend movement of irradiated fuel assemblies, any activities that could potentially result in inadvertent draining of the reactor vessel, and operations involving positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit) to assure continued safe operation. The Required Action to suspend positive reactivity additions does not preclude actions to maintain or increase reactor vessel inventory, provided the required SDM is maintained.

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required DC electrical power subsystems and to continue this action until restoration is accomplished in order to provide the necessary Class 1E DC electrical power to the unit safety systems.

The installed spare battery bank and charger may be used to restore an inoperable Class 1E DC power subsystem; however, all applicable surveillances must be met by the spare equipment used, prior to declaring the subsystem OPERABLE.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required Class 1E DC electrical power subsystems should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

SURVEILLANCE REQUIREMENTS

SR 3.8.2.1

3.8.1.4.

SR 3.8.2.1 requires performance of all Surveillances required by SR 3.8.1.1 through SR ~~3.8.1.3~~. Therefore, see the corresponding Bases for LCO 3.8.1 for a discussion of each SR.

This SR is modified by a Note. The reason for the Note is to preclude requiring the OPERABLE DC sources from being discharged below their capability to provide the required power supply or otherwise rendered inoperable during the performance of SRs. It is the intent that these SRs must still be capable of being met, but actual performance is not required.


**ONE TEAM. ONE VISION. ONE GOAL.**

# Building the future of nuclear power in America

Main Control Room Emergency Habitability System (VES) Undervoltage Actuation and Vacuum Relief Valve Technical Specification Changes (LAR-20-003) [LAR 232]

## Technical Exchange Meeting

**April 9, 2020**

Southern Nuclear

Georgia Power

## Main Control Room Emergency Habitability System (VES) Undervoltage Actuation and Vacuum Relief Valve Technical Specification Changes (LAR-20-003)

A. **First change**: Identify that Class 1E 24-Hour Battery Charger Undervoltage is a credited actuation of Main Control Room (MCR) Emergency Habitability System (VES) and de-energization of MCR air supply radiation monitor sample pumps.
   Impacts Updated Final Safety Analysis Report (UFSAR) and Technical Specifications (TS)

B. **Second Change**: TS 3.3.13, Engineered Safety Feature Actuation System (ESFAS) Main Control Room Isolation, Applicability to exclude operability requirements of the Main Control Room Air Supply Iodine or Particulate Radiation - High 2 function when the MCR Envelope is isolated and the Emergency Habitability System is operating. Impacts TS

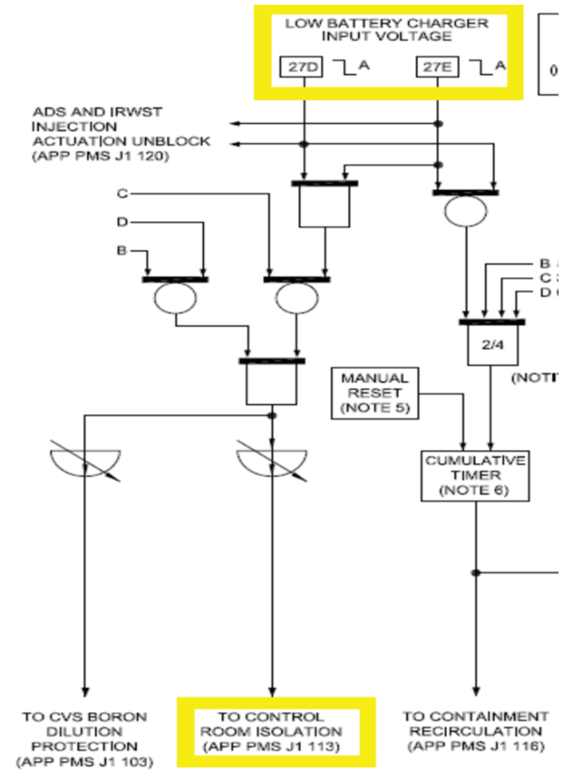
C. **Third Change**: Revise TS 3.6.3, Containment Isolation Valves, to exclude the vacuum relief containment isolation valves (i.e., “close” function), and revise TS 3.6.9, Vacuum Relief Valves, to address operability of the containment isolation function, Actions, and Surveillances. Impacts TS

## Main Control Room Emergency Habitability System (VES) Undervoltage Actuation and Vacuum Relief Valve Technical Specification Changes (LAR-20-003)

### A. First Change Background

**Extract from UFSAR Figure 7.2-1 Sheet 15**

- Shows logic requiring both UV relays in each Division then Divisional signals from A or C AND B or D to produce the Undervoltage actuation shown on UFSAR Figure 7.2-1 Sheet 13

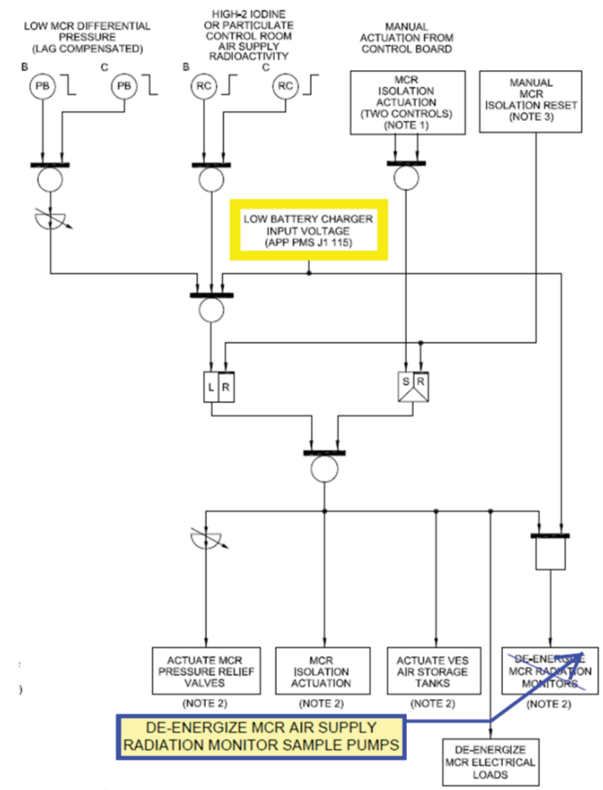


# Main Control Room Emergency Habitability System (VES) Undervoltage Actuation and Vacuum Relief Valve Technical Specification Changes (LAR-20-003)

## A. First Change Background

**Extract from UFSAR Figure 7.2-1 Sheet 13**

- Shows 3 VES Actuation Signals in the current design
- Shows Battery Charger Input Voltage Low "AND" VES Actuation Signal (any one of 3) leading to De-energize MCR Radiation Monitor (being corrected to clarify that "sample pumps" are being de-energized)
- Battery Charger Input Voltage Low (and sample pump de-energization) is already included in the design, but now being recognized as a Function credited in the Battery Load profile assumptions (meeting 10 CFR 50.36 criteria); therefore being added to Technical Specifications (TS)



## Main Control Room Emergency Habitability System (VES) Undervoltage Actuation and Vacuum Relief Valve Technical Specification Changes (LAR-20-003)

A. The first change would revise the following UFSAR and Technical Specifications (TS):

1. UFSAR Figure 7.2-1 (Sheet 13 of 21) to revise the functional block to state "DE-ENERGIZE MCR <u>AIR SUPPLY</u> RADIATION MONITOR <u>SAMPLE PUMPS</u>."
2. UFSAR subsection 7.3.1.2.17 to correct the load that is de-energized and to further describe the protection provided by undervoltage actuation signal.
3. UFSAR Table 7.3-1 Sheet 6 to correctly reflect Note (8) and add a new Note (13); and Sheet 9 adding Note (13) stating the logic: "De-energization of Main Control Room air supply radiation monitor sample pumps occurs on extended undervoltage to Class 1E 24-hour battery chargers coincident with Main Control Room Isolation, Air Supply Initiation, and Electrical Load De-energization actuation signal."
4. TS 3.3.13 to include requirements for Class 1E 24-Hour Battery Charger Input Undervoltage actuation signals for VES actuation and MCR air supply radiation monitoring sample pump de-energization.
5. TS 3.8.1 and TS 3.8.2 to include a Surveillance Requirement to verify the MCR air supply radiation monitoring sample pump de-energizes on an actual or simulated actuation signal.

# Main Control Room Emergency Habitability System (VES) Undervoltage Actuation and Vacuum Relief Valve Technical Specification Changes (LAR-20-003)

A. First Change Technical Basis

- The design of the battery load that is de-energized is the air supply sample pump. The radiation monitor skid remains energized.
- De-energizing the sample pumps is assumed in the 24-hour battery load profile; therefore meeting 10 CFR 50.36 criteria for inclusion in Technical Specifications. The actuation signals are added to TS 3.3.13 and verification of the de-energizing of the sample pump is added to TS 3.8.1 & TS 3.8.2
- De-energizing the sample pumps also credited for maintaining I&C room temperature below equipment qualification limits and ensuring an adequate heat sink for MCR habitability during and extended loss of ac event, which is clarified in UFSAR subsection 7.3.1.2.17 changes.

## Main Control Room Emergency Habitability System (VES) Undervoltage Actuation and Vacuum Relief Valve Technical Specification Changes (LAR-20-003)

B. The second change would revise TS 3.3.13, Engineered Safety Feature Actuation System (ESFAS) Main Control Room Isolation, Applicability to exclude operability requirements of the Main Control Room Air Supply Iodine or Particulate Radiation - High 2 function when the Main Control Room Envelope is isolated and the Emergency Habitability System is operating.

Refer to proposed Table 3.3.13-1, Note (a)

# Main Control Room Emergency Habitability System (VES) Undervoltage Actuation and Vacuum Relief Valve Technical Specification Changes (LAR-20-003)

B. <u>Second Change Technical Basis</u>

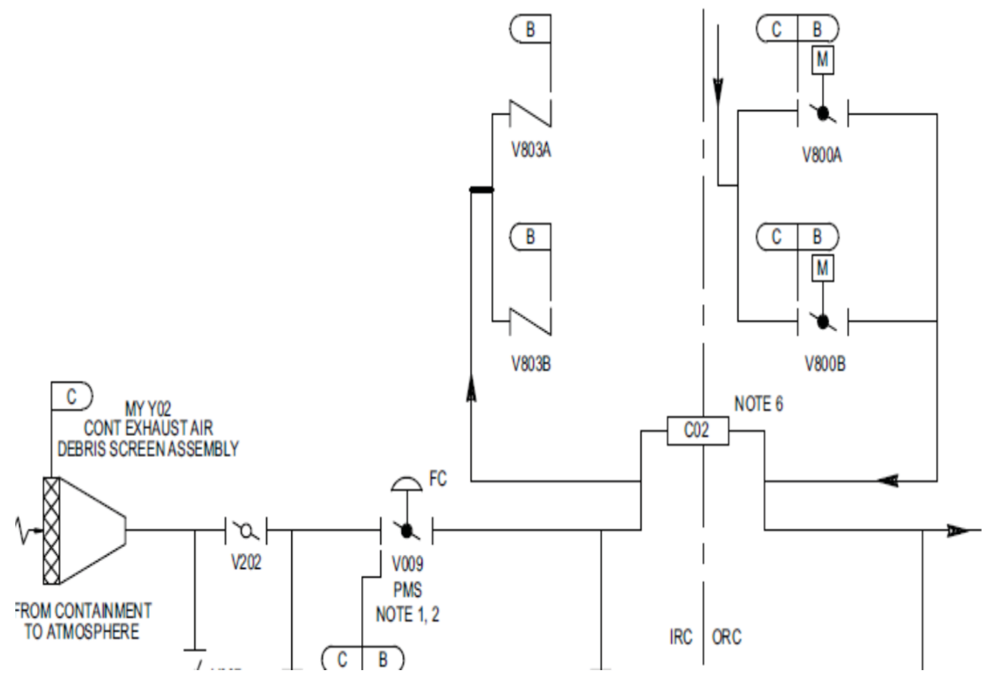
- When the MCR envelope is isolated and VES is operating the safety function of the Main Control Room Air Supply Iodine or Particulate Radiation – High 2 channels is satisfied.
- With the MCR envelope isolated and VES operating there would be no air supply for the radiation monitors to sample, and therefore they would be declared inoperable. Additionally, in the event of a Class 1E 24-hour battery charger undervoltage, the de-energized sample pumps would not provide a sample for the MCR air supply radiation channels and therefore they would be declared inoperable.
- As such, excluding the requirement for MCR air supply radiation channel operability when the MCR envelope isolated and VES operating is appropriate. This avoids having to enter current TS Action C (renumbered "D") and shutdown the plant.

# Main Control Room Emergency Habitability System (VES) Undervoltage Actuation and Vacuum Relief Valve Technical Specification Changes (LAR-20-003)

## C. Third Change Background

**Extract from UFSAR Figure 9.4.7-1 Sheet 1**

- Containment isolation can be accomplished by either closing both V803A & V803B or closing both V800A & V800B
- Vacuum Relief can be accomplished by opening either V803A or V803B AND either V800A or V800B

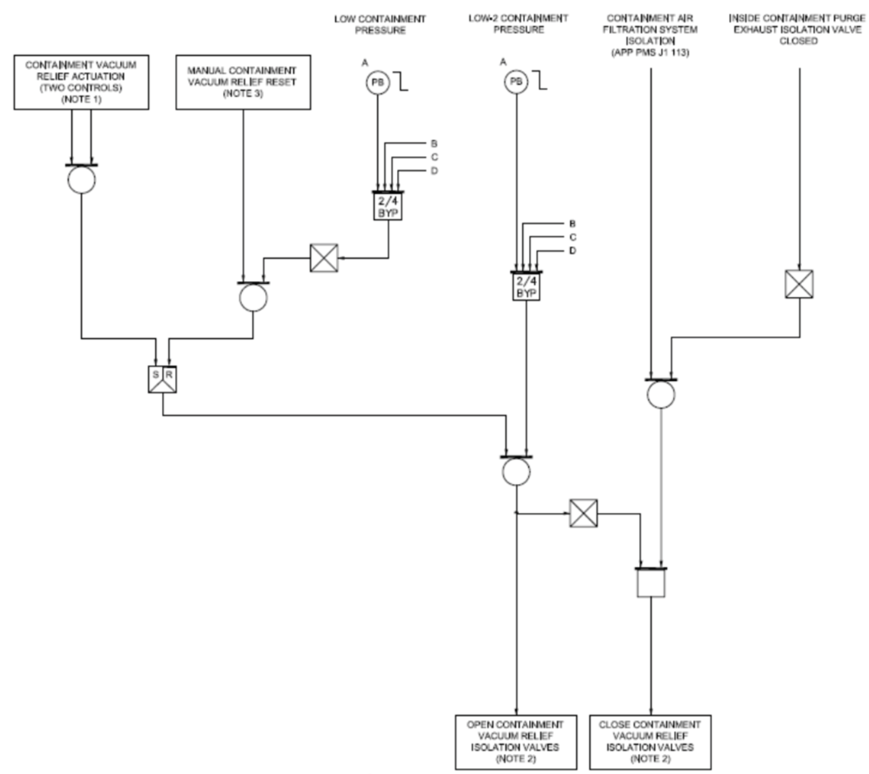


# Main Control Room Emergency Habitability System (VES) Undervoltage Actuation and Vacuum Relief Valve Technical Specification Changes (LAR-20-003)

## C. Third Change Background

### Extract from UFSAR Figure 7.2-1 Sheet 19

- The logic for normally closed V800A/B provides priority for vacuum relief over containment isolation (i.e., Containment Pressure Low-2 would override a containment isolation signal and allow the MOV to open).



## Main Control Room Emergency Habitability System (VES) Undervoltage Actuation and Vacuum Relief Valve Technical Specification Changes (LAR-20-003)

C. The third change would revise TS 3.6.3, Containment Isolation Valves, to exclude the vacuum relief containment isolation valves, and revise TS 3.6.9, Vacuum Relief Valves, to address operability of the containment isolation function, Actions, and Surveillances.

This is similar to the treatment of Closed System containment isolation valves; which are excluded from TS 3.6.3 and addressed in various other TS LCOs on these valves (this change was made in TS Upgrade LAR).

However, the Actions for a vacuum relief valve that is inoperable for closing are revised to remove the requirement for deactivating or securing the valve closed.

# Main Control Room Emergency Habitability System (VES) Undervoltage Actuation and Vacuum Relief Valve Technical Specification Changes (LAR-20-003)

## C. Third Change Technical Basis

- TS 3.6.3 Actions require closing and deactivating or securing inoperable valves. In the case of vacuum relief valves, this Action would preclude the capability for these valves to relieve a negative pressure in the containment, and TS 3.6.9 Actions would require an immediate plant shutdown.
- The vacuum relief isolation valves will only be automatically opened due to an ESF signal on Containment Pressure-Low 2. The setpoint to open the valves is at a negative pressure. With the containment under negative pressure, air flows into containment from the atmosphere, preventing radiological release from containment. The probability of the containment pressure to drop significantly below the outside atmospheric pressure and require vacuum relief is low. Therefore, in lieu of deactivating or securing inoperable vacuum relief valves closed, Actions impose a more frequent verification of closed status and a requirement to restore to operability.

## Main Control Room Emergency Habitability System (VES) Undervoltage Actuation and Vacuum Relief Valve Technical Specification Changes (LAR-20-003)

# Questions / Discussion