DONALD C. COOK NUCLEAR PLANT, UNIT 2 TECHNICAL REQUIREMENTS MANUAL
AND TECHNICAL REQUIREMENTS MANUAL BASES
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# 6.0 USE AND APPLICATION

## 6.1 Definitions

----------NOTES----------

1. Definitions in Section 1.1 of the Technical Specifications (TS) are applicable throughout the Technical Requirements Manual (TRM) and Bases. Only definitions specific to the TRM will be defined in this section.

2. The defined terms of this section and the TS appear in capitalized type and are applicable throughout the TRM and TRM Bases.

3. When a term is defined in both the TS and the TRM, TRM definition takes precedence within the TRM and TRM Bases.

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| Term | Definition |
|---|---|
| ACTIONS | ACTIONS shall be that part of a Requirement that prescribes Required Actions to be taken under designated Conditions within specified Completion Times. |
| OPERABLE — OPERABILITY | A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its required function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its required function(s) are also capable of performing their related support function(s). |

6.0 USE AND APPLICATION

6.2 Logical Connectors

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Logical Connectors are discussed in Section 1.2 of the Technical Specifications and are applicable throughout the Technical Requirements Manual and Bases.

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6.0 USE AND APPLICATION

6.3 Completion Times

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Completion Times are discussed in Section 1.3 of the Technical Specifications and are applicable throughout the Technical Requirements Manual and Bases.

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6.0 USE AND APPLICATION

6.4 Frequency

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Frequency is discussed in Section 1.4 of the Technical Specifications and is applicable throughout the Technical Requirements Manual and Bases.

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# 8.0 TECHNICAL REQUIREMENTS FOR OPERATION (TRO) APPLICABILITY

TRO 8.0.1 TROs shall be met during the MODES or other specified conditions in the Applicability, except as provided in TRO 8.0.2.

TRO 8.0.2 Upon discovery of a failure to meet a TRO, the Required Actions of the associated Conditions shall be met, except as provided in TRO 8.0.5. In addition, the allowances for a supported system LCO in LCO 3.0.6 may be applied to a supported system TRO.

If the TRO is met or is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required unless otherwise stated.

TRO 8.0.3 When a TRO is not met and the associated ACTIONS are not met, an associated ACTION is not provided, or if directed by the associated ACTIONS, action shall be initiated immediately to:

a. Verify that the plant is not in an unanalyzed condition; and

b. Verify, in accordance with the Safety Function Determination Program (TS 5.5.13), that a required safety function is not compromised by the inoperabilities.

Within 12 hours, obtain Operations Manager approval of the appropriate compensatory actions and the plan for exiting TRO 8.0.3.

Exceptions to this TRO are stated in the individual TROs.

Where corrective measures are completed that permit operation in accordance with the TRO or ACTIONS, completion of the actions required by TRO 8.0.3 is not required.

TRO 8.0.4 When a TRO is not met, entry into a MODE or other specified condition in the Applicability shall only be made:

a. When the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time;

## 8.0 TRO APPLICABILITY

TRO 8.0.4 (continued)

b. After performance of a risk assessment addressing the inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability and establishment of risk management actions, if appropriate; exceptions to this TRO are stated in the individual TROs; or

c. When an allowance is stated in the individual value, parameter, or other TRO.

This TRO shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with TS or TRM ACTIONS or that are part of a shutdown of the unit.

TRO 8.0.5 Equipment removed from service or declared inoperable to comply with ACTIONS may be returned to service under administrative control solely to perform testing required to demonstrate its OPERABILITY or the OPERABILITY of other equipment. This is an exception to TRO 8.0.2 for the system returned to service under administrative control to perform the testing required to demonstrate OPERABILITY.

# 8.0 TECHNICAL REQUIREMENTS SURVEILLANCE (TRS) APPLICABILITY

| | |
|---|---|
| TRS 8.0.1 | TRSs shall be met during the MODES or other specified conditions in the Applicability for individual TROs, unless otherwise stated in the TRS. Failure to meet a TRS, whether such failure is experienced during the performance of the TRS or between performances of the TRS, shall be failure to meet the TRO. Failure to perform a TRS within the specified Frequency shall be failure to meet the TRO except as provided in TRS 8.0.3. TRSs do not have to be performed on inoperable equipment or variables outside specified limits. |
| TRS 8.0.2 | The specified Frequency for each TRS is met if the TRS is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met.<br><br>For Frequencies specified as “once,” the above interval extension does not apply.<br><br>If a Completion Time requires periodic performance on a “once per . . .” basis, the above Frequency extension applies to each performance after the initial performance.<br><br>Exceptions to this TRS are stated in the individual TRSs. |
| TRS 8.0.3 | If it is discovered that a TRS was not performed within its specified Frequency, then compliance with the requirement to declare the TRO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, whichever is greater. This delay period is permitted to allow performance of the TRS. A risk evaluation shall be performed for any TRS delayed greater than 24 hours and the risk impact shall be managed.<br><br>If the TRS is not performed within the delay period, the TRO must immediately be declared not met, and the applicable Condition(s) must be entered.<br><br>When the TRS is performed within the delay period and the TRS is not met, the TRO must immediately be declared not met, and the applicable Condition(s) must be entered. |

## 8.0 TRS APPLICABILITY

| | |
|---|---|
| TRS 8.0.4 | Entry into a MODE or other specified condition in the Applicability of a TRO shall only be made when the TRO's TRSs have been met within their specified Frequency, except as provided by TRS 8.0.3. When a TRO is not met due to TRSs not having been met, entry into a MODE or other specified condition in the Applicability shall only be made in accordance with TRO 8.0.4. This provision shall not prevent entry into MODES or other specified conditions in the Applicability that are required to comply with TS or TRM ACTIONS or that are part of a shutdown of the unit. |

# 8.1 REACTIVITY CONTROL SYSTEMS

## 8.1.1 Boration System - Operating

TRO 8.1.1 Each of the following boron injection subsystems shall be OPERABLE:

a. A flow path from an OPERABLE boric acid tank via a boric acid transfer pump and a charging pump to the Reactor Coolant System; and

b. A flow path from an OPERABLE refueling water storage tank (RWST) via a charging pump to the Reactor Coolant System.

----------NOTE----------
The charging pump in the RWST flow path must not be the charging pump in the boric acid tank flow path.
---

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One boron injection subsystem inoperable. | A.1 Restore subsystem to OPERABLE status. | 72 hours |
| B. Both boron injection subsystems inoperable.<br><br>OR<br><br>Required Action and associated Completion Time not met. | B.1 Enter TRO 8.0.3. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.1.1.1 | Not Used | NA |
| TRS 8.1.1.2 | Verify the temperature of the area containing the flow path components from the boric acid tank to the blending tee are ≥ 63°F. | 7 days |
| TRS 8.1.1.3 | Verify the boron concentration as follows:<br><br>a. Required boric acid tank ≥ 6,550 ppm and ≤ 6,990 ppm.<br><br>b. RWST ≥ 2,400 ppm and ≤ 2,600 ppm. | 7 days |
| TRS 8.1.1.4 | ----------NOTE----------<br>The boric acid tanks usable water volume limit is not required to be met in MODES 3 and 4 when or after it is injected into the Reactor Coolant System to meet the SDM requirements of LCO 3.1.1.<br>----------<br><br>Verify usable water volume of each water source as follows:<br><br>a. Required boric acid tank ≥ 8,500 gallons.<br><br>b. RWST ≥ 100,000 gallons. | 7 days |
| TRS 8.1.1.5 | Verify required boric acid storage tank solution temperature is ≥ 63°F. | 7 days |
| TRS 8.1.1.6 | Verify each manual, power operated, and automatic valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position. | 31 days |
| TRS 8.1.1.7 | Verify each automatic valve in the flow path actuates to its correct position on an actual or simulated actuation signal. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.1.1.8 | Verify the boron injection flow path from the boric acid tanks via a boric acid transfer pump and a charging pump delivers ≥ 34 gpm to the Reactor Coolant System. | 24 months |
| TRS 8.1.1.9 | Verify each charging pump's developed head at the test flow point is greater than or equal to the required developed head. | In accordance with the INSERVICE TESTING PROGRAM |
| TRS 8.1.1.10 | Perform testing required by the INSERVICE TESTING PROGRAM for required boric acid transfer pump. | In accordance with the INSERVICE TESTING PROGRAM |

8.1 REACTIVITY CONTROL SYSTEMS

8.1.2 Boration System - Shutdown

TRO 8.1.2 One of the following boron injection subsystems shall be OPERABLE:

a. A flow path from an OPERABLE boric acid tank via a boric acid transfer pump and a charging pump to the Reactor Coolant System; or

b. A flow path from an OPERABLE refueling water storage tank (RWST) via a charging pump to the Reactor Coolant System.

APPLICABILITY: MODES 5 and 6.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Required boron injection subsystem inoperable. | A.1 | Suspend CORE ALTERATIONS. | Immediately |
| | AND | | |
| | A.2 | Suspend operations involving positive reactivity additions that could result in loss of required SDM (TS 3.1.1) or boron concentration (TS 3.9.1). | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.1.2.1 | Not Used | NA |
| TRS 8.1.2.2 | Verify the temperatures of the areas containing the flow path components from the required boric acid tank to the blending tee are ≥ 63°F. | 7 days |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.1.2.3 | Verify required boron concentration as follows:<br><br>a. Required boric acid tank ≥ 6,550 ppm and ≤ 6,990 ppm.<br><br>b. RWST ≥ 2,400 ppm. | 7 days |
| TRS 8.1.2.4 | Verify required usable water volume as follows:<br><br>a. Required boric acid tank ≥ 900 gallons.<br><br>b. RWST ≥ 5,000 gallons. | 7 days |
| TRS 8.1.2.5 | Verify required boric acid storage tank solution temperature is ≥ 63°F. | 7 days |
| TRS 8.1.2.6 | Verify each required manual, power operated, and automatic valve in the flow path, that is not locked sealed or otherwise secured in position, is in the correct position. | 31 days |
| TRS 8.1.2.7 | Verify the required charging pump's developed head at the test flow point is greater than or equal to the required developed head. | In accordance with the INSERVICE TESTING PROGRAM |
| TRS 8.1.2.8 | Perform testing required by the INSERVICE TESTING PROGRAM for required boric acid transfer pump. | In accordance with the INSERVICE TESTING PROGRAM |

8.1 REACTIVITY CONTROL SYSTEMS

8.1.3 Boration System – Hot Shutdown

TRO 8.1.3 One of the following boron injection subsystems shall be OPERABLE:

a. A flow path from an OPERABLE boric acid storage tank (BAST) via a boric acid transfer pump and a charging pump to the Reactor Coolant System; or

b. A flow path from an OPERABLE refueling water storage tank (RWST) via a charging pump to the Reactor Coolant System.

APPLICABILITY: MODE 4.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Required boron injection subsystem inoperable. | A.1 | Enter TRO 8.0.3. | Immediately |
| | AND | | |
| | A.2 | Suspend operations involving positive reactivity additions that could result in loss of required SDM (TS 3.1.1). | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.1.3.1 | For the boron injection subsystem required to be OPERABLE, the TRSs of TRM 8.1.1, “Boration System – Operating,” are applicable. | In accordance with applicable TRSs |

## 8.2 POWER DISTRIBUTION LIMITS

### 8.2.1 Heat Flux Hot Channel Factor ($F_Q(Z)$)

TRO 8.2.1 $F_Q(Z)$, as approximated by $F_Q^W(Z)$, shall be within the limits specified in the COLR.

APPLICABILITY: MODE 1.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. $F_Q^W(Z)$ not within limit. | A.1 Enter TS 3.2.1 Condition B. | Immediately |
| B. Required Action and associated Completion Time not met. | B.1 Be in MODE 2. | 6 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.2.1.1 | Not Used. | N/A |
| TRS 8.2.1.2 | ----------NOTES----------<br>1. Not required to be performed during power escalation at the beginning of each cycle until 24 hours after equilibrium conditions at a power level for extended operation are achieved.<br><br>2. If measurements indicate that the maximum over z ($F_Q^C(Z)/K(Z)$) or maximum over Z [$F_Q^C(Z)*W(Z)/K(Z)$] has increased since the previous evaluation of $F_Q^C(Z)$ or if $F_Q^W$ is expected to increase prior to the next evaluation of $F_Q^C(Z)$.<br>For this evaluation $F_Q^W$ is expected to increase if:<br>max [$F_Q^C(Z, B_n)*W(Z, B_{n+1})/K(Z)$] > max [$F_Q^C(Z, B_n)*W(Z, B_n)/K(Z)$];<br>Where $B_n$ is the burnup when the Surveillance is performed, and $B_{n+1}$ is the burnup when the next Surveillance is performed,<br>either:<br><br>a. Increase $F_Q^W(Z)$ by the greater of a factor of 1.02 or by an appropriate factor specified in the COLR and reverify $F_Q^W(Z)$ is within limits; or<br><br>b. Repeat TRS 8.2.1.2 once per 7 EFPD until either a. above is met or two successive flux maps indicate that the maximum over z ($F_Q^C(Z)/K(Z)$) and maximum over Z [$F_Q^C(Z)*W(Z)/K(Z)$] and $F_Q^W$ prior to the next evaluation of $F_Q^C(Z)$ have not increased.<br>----------<br><br>Verify $F_Q^W(Z)$ is within limit. | Once within 24 hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified<br><br>AND<br><br>31 EFPD thereafter |

8.3 INSTRUMENTATION

8.3.1 Movable Incore Detectors

TRO 8.3.1 The Movable Incore Detection System shall be OPERABLE with:

a. ≥ 75% of the detector thimbles;

b. ≥ 2 detector thimbles per core quadrant; and

c. Sufficient movable detectors, drive, and readout equipment to map these thimbles.

APPLICABILITY: When the Movable Incore Detection System is used for:

a. Recalibration of the axial flux difference detection system;

b. Monitoring the QUADRANT POWER TILT RATIO; or

c. Measurement of $F_{\Delta H}^{N}$ and $F_{Q}(Z)$.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Movable Incore Detection System inoperable. | A.1 Suspend use of the Movable Incore Detection System for monitoring and calibration functions listed in the Applicability. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.3.1.1 | Normalize each detector output to be used. | During each use for recalibration of the excore axial flux difference detection system<br><br>AND<br><br>During each use for monitoring the QUADRANT POWER TILT RATIO<br><br>AND<br><br>During each use for measurement of $F^N_{\Delta H}$ and $F_Q(Z)$ |

8.3 INSTRUMENTATION

8.3.2 Seismic Instrumentation

TRO 8.3.2 The seismic monitoring instrumentation channels for each Function in Table 8.3.2-1 shall be OPERABLE.

APPLICABILITY: At all times.

ACTIONS

----------NOTES----------
Separate Condition entry is allowed for each channel.
---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more seismic monitoring instrumentation channels inoperable. | A.1 Restore channel to OPERABLE status. | 30 days |
| B. Required Action and associated Completion Time of Condition A not met. | B.1 Prepare an evaluation in accordance with the Corrective Action Program, outlining the cause of the malfunction and the plans for restoring the channel to OPERABLE status. | In accordance with the Corrective Action Program |

SURVEILLANCE REQUIREMENTS

----------NOTE----------

Refer to Table 8.3.2-1 to determine which TRSs apply for each seismic monitoring instrumentation Function.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.3.2.1 | Perform CHANNEL CHECK. | 31 days |
| TRS 8.3.2.2 | Perform COT. | 184 days |
| TRS 8.3.2.3 | Perform CHANNEL CALIBRATION. | 18 months |

Table 8.3.2-1 (page 1 of 1)
Seismic Monitoring Instrumentation

| FUNCTION | REQUIRED CHANNELS | SURVEILLANCE REQUIREMENT | MEASUREMENT RANGE |
|---|---|---|---|
| 1. Strong Motion Triaxial Accelerographs | | | |
| a. Reactor Pit Floor | | | |
| 1. Time History Recorder[(a)] | 1 | TRS 8.3.2.1<br>TRS 8.3.2.2<br>TRS 8.3.2.3 | 0-1 g |
| b. Top of Crane Wall | | | |
| 1. Time History Recorder[(a)] | 1 | TRS 8.3.2.1<br>TRS 8.3.2.2<br>TRS 8.3.2.3 | 0-1 g |
| c. Free Field | | | |
| 1. Time History Recorder[(a)] | 1 | TRS 8.3.2.1<br>TRS 8.3.2.2<br>TRS 8.3.2.3 | 0-1 g |
| d. Auxiliary Building El 587’ | | | |
| 1. Time History Recorder[(a)] | 1 | TRS 8.3.2.1<br>TRS 8.3.2.2<br>TRS 8.3.2.3 | 0-1 g |
| e. Auxiliary Building El 633’ | | | |
| 1. Time History Recorder[(a)] | 1 | TRS 8.3.2.1<br>TRS 8.3.2.2<br>TRS 8.3.2.3 | 0-1 g |
| f. Primary Shield Wall | | | |
| 1. Time History Recorder[(a)] | 1 | TRS 8.3.2.1<br>TRS 8.3.2.2<br>TRS 8.3.2.3 | 0-1 g |

(a) Shared with Unit 1.

| FUNCTION | REQUIRED CHANNELS | SURVEILLANCE REQUIREMENT | MEASUREMENT RANGE |
|---|---|---|---|
| 2. Peak Recording Accelerographs | | | |
| a. Containment Spring Line | 1 | TRS 8.3.2.3 | 0-2 g |
| b. Diesel Generator Room Floor | 1 | TRS 8.3.2.3 | 0-2 g |
| c. Spent Fuel Pool | 1 | TRS 8.3.2.3 | 0-2 g |

8.3 INSTRUMENTATION

8.3.3 Meteorological Instrumentation

TRO 8.3.3 The meteorological monitoring instrumentation channels for each Function shown in Table 8.3.3-1 shall be OPERABLE.

APPLICABILITY: At all times.

ACTIONS

----------NOTES----------
Separate Condition entry is allowed for each function.
---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required meteorological monitoring instrumentation channels inoperable. | A.1 | Suspend release of gaseous radioactive material from the radwaste gas decay tanks. | Immediately |
| | AND | | |
| | A.2 | Restore channels to OPERABLE status. | 7 days |
| B. Required Action and associated Completion Time not met. | B.1 | Prepare an evaluation in accordance with the Corrective Action Program, outlining the cause of the malfunction and the plans for restoring the channel to OPERABLE status. | In accordance with the Corrective Action Program |

SURVEILLANCE REQUIREMENTS

----------NOTE----------
These TRSs apply for each Function in Table 8.3.3-1.
---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.3.3.1 | Perform CHANNEL CHECK of each required channel. | 24 hours |
| TRS 8.3.3.2 | Perform CHANNEL CALIBRATION of each required channel. | 184 days |

Table 8.3.3-1 (page 1 of 1)
Meteorological Monitoring Instrumentation

| | FUNCTION | REQUIRED CHANNELS | INSTRUMENT MINIMUM ACCURACY |
|---|---|---|---|
| 1. | Wind Speed (Primary or Backup Meteorological Tower, Nominal Elevation 10 m; Primary Meteorological Tower, Nominal Elevation 60 m)[(c)] | 1 | ± 1% or 0.5 mph, whichever is greater[(a)] |
| 2. | Wind Direction (Primary or Backup Meteorological Tower, Nominal Elevation 10 m; Primary Meteorological Tower, Nominal Elevation 60 m)[(c)] | 1 | ± 5° |
| 3. | Air Temperature (for 60 m to 10 m delta T)[(b)(c)] | | |
| | a. Primary Meteorological Tower, Nominal Elevation 10 m | NA | ± 0.15°C |
| | b. Primary Meteorological Tower, Nominal Elevation 60 m | NA | ± 0.15°C |

(a) Starting speed of anemometer shall be ≤ 1 mph.

(b) With delta T information unavailable, sigma theta (standard deviation of the horizontal wind direction as determined from emergency procedures) is to be used for the determination of stability class.

(c) Shared with Unit 1.

8.3 INSTRUMENTATION

8.3.4 NFPA 805 Remote Shutdown Instrumentation

TRO 8.3.4 The NFPA 805 remote shutdown instrumentation channels shown in Table 8.3.4-1 shall be OPERABLE with an opposite unit power supply available and with read out capability at the LSI panels.

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

ACTIONS

----------NOTES----------
Separate Condition entry is allowed for each channel.
---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required channels inoperable. | A.1 | Restore channel to OPERABLE status. | 30 days |
| B. Opposite unit power supply not available. | B.1 | Provide fire watches in the affected areas. | 7 days |
| | AND | | |
| | B.2 | Restore opposite unit power supply to available status. | 60 days |
| C. Required Action and associated Completion Time not met. | C.1 | Enter TRO 8.0.3. | Immediately |

SURVEILLANCE REQUIREMENTS

----------NOTE----------

Refer to Table 8.3.4-1 to determine which TRSs apply for each Function.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.3.4.1 | Perform CHANNEL CHECK. | 31 days |
| TRS 8.3.4.2 | PERFORM CHANNEL CALIBRATION. | 24 months |

Table 8.3.4-1 (page 1 of 1)
NFPA 805 Instrumentation

| | FUNCTION | READOUT LOCATION | REQUIRED CHANNELS | SURVEILLANCE REQUIREMENTS | MEAUSUREMENT RANGE |
|---|---|---|---|---|---|
| 1. | Steam Generators 1 and 4 Level | LSI Cabinet 1 and LSI Cabinet 4 | 1/SG on each LSI cabinet | TRS 8.3.4.1<br>TRS 8.3.4.2 | 0 - 100% wide range instrument span |
| 2. | Steam Generators 2 and 3 Level | LSI Cabinet 2 and LSI Cabinet 4 | 1/SG on each LSI cabinet | TRS 8.3.4.1<br>TRS 8.3.4.2 | 0 - 100% wide range instrument span |
| 3. | Steam Generators 1 and 4 Pressure | LSI Cabinet 4 and LSI Cabinet 5 | 1/SG on each LSI cabinet | TRS 8.3.4.1<br>TRS 8.3.4.2 | 0 - 1500 psig |
| 4. | Steam Generators 2 and 3 Pressure | LSI Cabinet 4 and LSI Cabinet 6 | 1/SG on each LSI cabinet | TRS 8.3.4.1<br>TRS 8.3.4.2 | 0 - 1500 psig |
| 5. | Reactor Coolant Loop 4 Temperature (Cold) | LSI Cabinet 4 and LSI Cabinet 5 | 1 on each LSI cabinet | TRS 8.3.4.1<br>TRS 8.3.4.2 | 0 - 700°F |
| 6. | Reactor Coolant Loop 4 Temperature (Hot) | LSI Cabinet 4 and LSI Cabinet 5 | 1 on each LSI cabinet | TRS 8.3.4.1<br>TRS 8.3.4.2 | 0 - 700°F |
| 7. | Reactor Coolant Loop 2 Temperature (Cold) | LSI Cabinet 4 and LSI Cabinet 6 | 1 on each LSI cabinet | TRS 8.3.4.1<br>TRS 8.3.4.2 | 0 - 700°F |
| 8. | Reactor Coolant Loop 2 Temperature (Hot) | LSI Cabinet 4 and LSI Cabinet 6 | 1 on each LSI cabinet | TRS 8.3.4.1<br>TRS 8.3.4.2 | 0 - 700°F |
| 9. | Pressurizer Level | LSI Cabinet 3 | 1 | TRS 8.3.4.1<br>TRS 8.3.4.2 | 0 - 100% of instrument span |
| 10. | Reactor Coolant System Pressure | LSI Cabinet 3 | 1 | TRS 8.3.4.1<br>TRS 8.3.4.2 | 0 - 3000 psig |
| 11. | DELETED | | | | |
| 12. | Source Range Neutron Detector (N-23) | LSI Cabinet 4 | 1 | TRS 8.3.4.2 | $1 \times 10^0$ - $1 \times 10^6$ cps |

(a) Instrument common to both Units.

8.3 INSTRUMENTATION

8.3.5 Explosive Gas Monitoring Instrumentation

TRO 8.3.5 Explosive gas monitoring instrumentation channels shown in Table 8.3.5-1 shall be OPERABLE with their alarm/trip setpoints set to ensure that the concentration of oxygen in the waste gas holdup system is limited to ≤ 3% by volume if the hydrogen in the system is ≥ 4% by volume.

APPLICABILITY: During waste gas holdup system operation.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Required hydrogen channel inoperable. | A.1 | Take and analyze grab sample. | Once per 12 hours |
| | AND | | |
| | A.2 | Restore hydrogen channel to OPERABLE status. | 14 days |
| B. One oxygen channel inoperable. | B.1 | Restore oxygen channel to OPERABLE status. | 30 days |
| C. Two oxygen channels inoperable. | C.1 | Take and analyze grab sample. | Once per 12 hours |
| D. Required Action and associated Completion Time of Conditions A, B, or C not met. | D.1 | Prepare an evaluation in accordance with the Corrective Action Program explaining why this inoperability was not corrected in a timely manner. | In accordance with the Corrective Action Program |

SURVEILLANCE REQUIREMENTS

----------NOTE----------

Refer to Table 8.3.5-1 to determine which TRSs apply for each Explosive Gas Monitoring Instrumentation Function.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.3.5.1 | Perform CHANNEL CHECK. | 24 hours |
| TRS 8.3.5.2 | Perform COT. | 31 days |
| TRS 8.3.5.3 | Perform CHANNEL CALIBRATION using standard gas samples containing a nominal:<br>a. 1 volume % hydrogen, balance nitrogen; and<br>b. 4 volume % hydrogen, balance nitrogen. | 92 days |
| TRS 8.3.5.4 | Perform CHANNEL CALIBRATION using standard gas samples containing a nominal:<br>a. 1 volume % oxygen, balance nitrogen; and<br>b. 4 volume % oxygen, balance nitrogen. | 92 days |

Table 8.3.5-1 (page 1 of 1)
Explosive Gas Monitoring Instrumentation

| FUNCTION | REQUIRED CHANNELS | SURVEILLANCE REQUIREMENTS |
|---|---|---|
| 1. Waste Gas Holdup System Explosive Gas Monitoring System | | |
| a. Hydrogen Monitor (QC-1400) | 1 | TRS 8.3.5.1<br>TRS 8.3.5.2<br>TRS 8.3.5.3 |
| b. Oxygen Monitor (QC-1400, QC-370) | 2 | TRS 8.3.5.1<br>TRS 8.3.5.2<br>TRS 8.3.5.4 |

8.3 INSTRUMENTATION

8.3.6 ATWS Mitigation System Actuation Circuitry (AMSAC)

TRO 8.3.6 AMSAC shall be OPERABLE.

APPLICABILITY: MODE 1 with reactor power ≥ 40%.

ACTIONS

None

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.3.6.1 | Perform an end-to-end test, including the AMSAC outputs through to the final actuation device. | 24 months |
| TRS 8.3.6.2 | Perform a configuration verification in accordance with plant procedures. | Once following each unexpected or unanticipated AMSAC actuation |

8.3 INSTRUMENTATION

8.3.7 Post Accident Monitoring (PAM) Instrumentation

TRO 8.3.7 The PAM instrumentation for each Function in Table 8.3.7-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function.
---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more Functions with one required channel inoperable. | A.1 Restore required channel to OPERABLE status. | 30 days |
| B. Required Action and associated Completion Time of Condition A not met. | B.1 Enter TRO 8.0.3. | Immediately |
| C. Two hydrogen monitor channels inoperable. | C.1 Restore one hydrogen monitor channel to OPERABLE status. | 7 days |
| D. Required Action and associated Completion Time of Condition C not met. | B.1 Enter TRO 8.0.3. | Immediately |

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 8.3.7-1 to determine which TRSs apply for each PAM instrumentation Function
---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.3.7.1 | Perform CHANNEL CHECK for each required instrument channel that is normally energized. | 31 days |
| TRS 8.3.7.2 | Perform CHANNEL CALIBRATION. | 18 months |
| TRS 8.3.7.3 | Perform CHANNEL CALIBRATION. | 24 months |
| TRS 8.3.7.4 | Perform CHANNEL CALIBRATION. | 92 days |

Table 8.3.7-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

| | FUNCTION | REQUIRED CHANNELS | SURVEILLANCE REQUIREMENTS |
|---|---|---|---|
| 1. | DELETED | - | - |
| 2. | PORV Position Indicator – Limit Switch | 1 per valve[(a)] | TRS 8.3.7.1<br>TRS 8.3.7.2 |
| 3. | DELETED | - | - |
| 4. | Safety Valve Position Indicator – Acoustic Monitor | 2 out of 3 total | TRS 8.3.7.1<br>TRS 8.3.7.2 |
| 5. | Containment Sump Level | 1 | TRS 8.3.7.1<br>TRS 8.3.7.3 |
| 6. | Hydrogen Monitor | 2 | TRS 8.3.7.4 |

(a) Acoustic monitoring of PORV position (1 channel per three valves – headered discharge) can be used as a substitute for the PORV Indicator – Limit Switch instruments.

8.3 INSTRUMENTATION

8.3.8 Radiation Monitoring Instrumentation

TRO 8.3.8 The radiation monitoring instrumentation for each Function in Table 8.3.8-1 shall be OPERABLE.

APPLICABILITY: According to Table 8.3.8-1.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Function.
---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required channel(s) inoperable. | A.1 | Enter Condition referenced in Table 8.3.8-1 for the channel. | Immediately |
| B. As required by Required Action A.1 and referenced in Table 8.3.8-1. | B.1 | Perform area surveys of the monitored area. | Once per 24 hours |
| C. As required by Required Action A.1 and referenced in Table 8.3.8-1. | C.1 | Restore channel to OPERABLE status. | 7 days |
| D. Required Action and associated Completion Time of Condition C not met. | D.1 | Prepare an evaluation in accordance with the Corrective Action Program outlining the action taken, the cause of the inoperability, and the plans and schedule for restoring the system to OPERABLE status. | In accordance with the Corrective Action Program |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| E. Required Function 2 from Table 8.3.8-1 channel inoperable and accident involving radiological release. | E.1 Initiate the preplanned alternate method of monitoring the appropriate parameter(s). | As soon as practical but within 72 hours. |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.3.8.1 | Perform CHANNEL CHECK. | 12 hours |
| TRS 8.3.8.2 | Perform COT. | 92 days |
| TRS 8.3.8.3 | Perform COT. | 92 days |
| TRS 8.3.8.4 | Perform CHANNEL CALIBRATION. | 24 months |

Table 8.3.8-1 (page 1 of 1)
Radiation Monitoring Instrumentation

| | FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS | CONDITIONS | SURVEILLANCE REQUIREMENTS |
|---|---|---|---|---|---|
| 1. | Area Monitor - Upper Containment | 1[(a)], 2[(a)], 3[(a)], and 4[(a)] | 1 | B | TRS 8.3.8.1<br>TRS 8.3.8.3<br>TRS 8.3.8.4 |
| 2. | Noble Gas Effluent Monitors | | | | |
| | a. Unit Vent Effluent Monitors | | | | |
| | (1) Mid Range | 1, 2, 3, 4 | 1 | C | TRS 8.3.8.1<br>TRS 8.3.8.4 |
| | (2) High Range | 1, 2, 3, 4 | 1 | C | TRS 8.3.8.1<br>TRS 8.3.8.4 |
| | b. Steam Generator PORV | 1, 2, 3, 4 | 1 per loop | C | TRS 8.3.8.1<br>TRS 8.3.8.2<br>TRS 8.3.8.4 |
| | c. Steam Jet Air Ejector Vent Monitors | | | | |
| | (1) Mid Range | 1, 2, 3, 4 | 1 | C | TRS 8.3.8.1<br>TRS 8.3.8.2<br>TRS 8.3.8.4 |
| | (2) High Range | 1, 2, 3, 4 | 1 | C | TRS 8.3.8.1<br>TRS 8.3.8.4 |
| 3. | Spent Fuel Storage | With fuel in the storage pool or building | 1 | B | TRS 8.3.8.1<br>TRS 8.3.8.2<br>TRS 8.3.8.4 |

(a) When any Containment Purge Supply and Exhaust System penetration flow path is open.

8.4 REACTOR COOLANT SYSTEM (RCS)

8.4.1 Chemistry

TRO 8.4.1 The Reactor Coolant System (RCS) chemistry shall be maintained within the steady state limits specified in Table 8.4.1-1.

APPLICABILITY: At all times, except the dissolved oxygen limit is only applicable when $T_{avg}$ is > 250°F.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more chemistry parameters in excess of Steady State Limit but within the Transient Limit in MODES 1, 2, 3, and 4. | A.1 Restore chemistry parameter(s) to within Steady State Limit. | 24 hours |
| B. One or more chemistry parameters in excess of Transient Limit in MODES 1, 2, 3, and 4.<br><br>OR<br><br>Required Action and associated Completion Time of Condition A not met. | B.1 Be in MODE 3.<br><br>AND<br><br>B.2 Be in MODE 5. | 6 hours<br><br><br><br>36 hours |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. Chloride or fluoride concentration in excess of Steady State Limit for more than 24 hours in other than MODES 1, 2, 3, and 4.<br><br>OR<br><br>Cholride or fluoride concentration in excess of Transient Limit in other than MODES 1, 2, 3, and 4. | C.1 Reduce pressurizer pressure to ≤ 500 psig.<br><br>AND<br><br>C.2 Determine by analysis the effects of the out-of-limit conditions on the structural integrity of the RCS and that the RCS remains acceptable for continued operation. | Immediately<br><br>Prior to increasing pressurizer pressure > 500 psig<br><br>AND<br><br>Prior to entering MODE 4 |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.4.1.1 | ----------NOTE----------<br>1. Not required to be performed when the reactor is defueled with no forced circulation.<br><br>2. Not required to be performed until 72 hours after establishing forced circulation.<br>----------<br><br>Verify the RCS chemistry parameters are within the limits specified in Table 8.4.1-1. | 72 hours |

Table 8.4.1-1 (page 1 of 1)
Chemistry

| PARAMETER | STEADY STATE LIMIT | TRANSIENT LIMIT |
|---|---|---|
| Dissolved Oxygen | ≤ 0.10 ppm | ≤ 1.00 ppm |
| Chloride | ≤ 0.15 ppm | ≤ 1.50 ppm |
| Fluoride | ≤ 0.15 ppm | ≤ 1.50 ppm |

8.4 REACTOR COOLANT SYSTEM (RCS)

8.4.2 Pressurizer

TRO 8.4.2 The pressurizer temperature shall be limited to:

a. Heatup ≤ 100°F in any one hour period;

b. Cooldown ≤ 200°F in any one hour period; and

c. Spray water temperature differential ≤ 320°F.

APPLICABILITY: At all times.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. ----------NOTE---------- Required Action A.2 shall be completed whenever this Condition is entered. ---------- One or more pressurizer temperature limits not met. | A.1 | Restore temperature to within limits. | 30 minutes |
| | AND | | |
| | A.2 | Determine pressurizer is acceptable for continued operation. | 72 hours |
| B. Required Action and associated Completion Time not met. | B.1 | Be in MODE 3. | 6 hours |
| | AND | | |
| | B.2 | Be in MODE 5 with pressurizer pressure < 500 psig. | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.4.2.1 | ----------NOTE----------<br>Only required to be performed during pressurizer heatup and cooldown operations.<br>----------<br>Verify pressurizer heatup and cooldown temperatures are within limits. | 30 minutes |
| TRS 8.4.2.2 | ----------NOTE----------<br>Only required to be performed during auxiliary spray operation OR when RCS temperature <140°F with an RCP in operation.<br>----------<br>Verify spray water differential temperature is within limit. | 12 hours |

8.4 REACTOR COOLANT SYSTEM (RCS)

8.4.3 ASME Code Class 1, 2, and 3 Components

TRO 8.4.3 The structural integrity of ASME Code Class 1, 2, and 3 components shall be maintained in accordance with the Inservice Inspection Program.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Structural integrity of Class 1 components not conforming as required. | A.1 | Restore the structural integrity of the affected component to within its limits. | Prior to increasing the RCS temperature to >50°F above the minimum temperature required by Nil-Ductility Transition temperature considerations. |
| | OR | | |
| | A.2 | Isolate the affected component. | Prior to increasing the RCS temperature to >50°F above the minimum temperature required by Nil-Ductility Transition temperature considerations. |
| B. Structural integrity of Class 2 components not conforming as required. | B.1 | Restore the structural integrity of the affected component to within its limits. | Prior to increasing RCS temperature to >200°F. |
| | OR | | |
| | B.2 | Isolate the affected component. | Prior to increasing RCS temperature to >200°F. |

| ACTION (cont'd) | | | |
|---|---|---|---|
| C. Structural integrity of Class 3 components not conforming as required. | C.1 | Initiate actions to restore the structural integrity of the affected component to within its limits. | Immediately. |
| | OR | | |
| | C.2 | Initiate actions to isolate the affected component. | Immediately. |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.4.3.1 | Verify the structural integrity of ASME Code Class 1, 2, and 3 components. | In accordance with the Inservice Inspection Program |

8.4 REACTOR COOLANT SYSTEM (RCS)

8.4.4 Reactor Vessel Head and Pressurizer Steam Space Vents

TRO 8.4.4 All reactor vessel head vent paths, consisting of two remotely operated valves in series that are powered from Class 1E DC buses, shall be OPERABLE and closed.

AND

All pressurizer steam space vent paths, consisting of two remotely operated valves in series that are powered from Class 1E DC buses, shall be OPERABLE and closed.

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

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. ----------NOTE---------- Separate condition entry allowed for each vent path. ---------- One or more reactor vessel head vent paths or pressurizer steam space vent paths inoperable. | A.1 | Verify associated vent paths are isolated with power removed from the associated valves. | 1 hour |
| B. Both reactor vessel head vent paths inoperable. | B.1 | Restore one reactor vessel head vent path to OPERABLE status. | 30 days |
| C. Both pressurizer steam space vent paths inoperable. | C.1 | Restore one pressurizer steam space vent path to OPERABLE status. | 30 days |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. Both reactor vessel head vent path inoperable.<br><br>AND<br><br>Both pressurizer steam space vent path inoperable. | D.1 Restore one reactor vessel head vent path to OPERABLE status.<br><br>OR<br><br>D.2 Restore one pressurizer steam space vent path to OPERABLE status. | 72 hours<br><br><br><br>72 hours |
| E. Required Action and associated Completion Time not met. | E.1 Enter TRO 8.0.3. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.4.4.1 | Verify the common manual isolation valve in the reactor vessel head vent paths is sealed in the open position. | 24 months |
| TRS 8.4.4.2 | Cycle each remotely operated valve in each reactor vessel head vent path through at least one complete cycle of full travel from the Control Room. | 24 months |
| TRS 8.4.4.3 | Verify flow through each reactor vessel head vent path. | 24 months |
| TRS 8.4.4.4 | Verify the common manual isolation valve in the pressurizer steam space vent paths is sealed in the open position. | 24 months |
| TRS 8.4.4.5 | Cycle each remotely operated valve in each pressurizer steam vent path through at least one complete cycle of full travel from the Control Room. | 24 months |
| TRS 8.4.4.6 | Verify flow through each pressurizer steam space vent path. | 24 months |

8.4 REACTOR COOLANT SYSTEM (RCS)

8.4.5 Reactor Coolant System (RCS) Total Flow Rate

TRO 8.4.5 Surveillance Requirement TRS 8.4.5.1 shall be met.

APPLICABILITY: MODE 1

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.4.5.1 | Perform CHANNEL CALIBRATION on indicators used to determine RCS total flow rate. | 24 months |

8.4 REACTOR COOLANT SYSTEM (RCS)

8.4.6 Power Operated Relief Valve (PORV) Emergency Air Tank Low Pressure Alarm

TRO 8.4.6 The following Surveillance Requirements shall be met:

a. TRS 8.4.6.1; and

b. TRS 8.4.6.2.

APPLICABILITY: Whenever the associated PORV is required to be OPERABLE by LCO 3.4.12, "Low Pressure Overpressure Protection (LTOP) System."

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| TRS 8.4.6.1 | ----------NOTE----------<br>Not required to be performed until 12 hours after decreasing RCS cold leg temperature to ≤ 299°F.<br>----------<br><br>Perform COT on each required PORV emergency air tank low pressure alarm channel. | 31 days |
| TRS 8.4.6.2 | Perform CHANNEL CALIBRATION on each required PORV emergency air tank low pressure alarm channel. The low pressure alarm setpoint shall be ≥ 900 psig. | 24 months |

8.4 REACTOR COOLANT SYSTEM

8.4.7 DELETED

8.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

8.5.1 Emergency Core Cooling System (ECCS)

TRO 8.5.1 The following Surveillance Requirements shall be met:

a. TRS 8.5.1.1; and

b. TRS 8.5.1.2.

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

SURVEILLANCE REQUIREMENTS

| | SURVEILLANCE | FREQUENCY |
|---|---|---|
| TRS 8.5.1.1 | ----------NOTE----------<br>Not required to be performed if controls have been established that ensure containment cleanliness since performance of the previous surveillance.<br>----------<br><br>Perform a visual inspection of the accessible areas of the containment to verify that no loose debris is present that could be transported to the containment sump and cause restriction of the pump suctions during LOCA conditions. | Prior to entering MODE 4 from MODE 5 |
| TRS 8.5.1.2 | Perform a visual inspection of the affected areas of the containment to verify that no loose debris is present that could be transported to the containment sump and cause restriction of the pump suctions during LOCA conditions. | After each containment entry |

8.6 CONTAINMENT SYSTEMS

8.6.1 Ice Bed Temperature Monitoring System

TRO 8.6.1 Ice Bed Temperature Monitoring System shall be OPERABLE with ≥ 2 OPERABLE RTD channels in the ice bed at elevations 652'-2 ¼", 672'-5 ¼" and 696'-2 ¼" for each one third of the ice condenser.

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

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Ice Bed Temperature Monitoring System inoperable. | A.1 | Verify the ice compartment lower inlet doors, intermediate deck doors, and top deck doors are closed. | Immediately |
| | AND | | |
| | A.2 | Verify the last recorded mean ice bed temperature is ≤ 20°F and steady. | Immediately |
| | AND | | |
| | A.3 | Initiate action to determine an alternate method for performing SR 3.6.11.1. | Immediately |
| | AND | | |
| | A.4 | Restore Ice Bed Temperature Monitoring System to OPERABLE status. | 30 days |
| B. Required Action and associated Completion Time not met. | B.1 | Enter TRO 8.0.3. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.6.1.1 | Perform CHANNEL CHECK. | 12 hours |

8.6 CONTAINMENT SYSTEMS

8.6.2 Inlet Door Position Monitoring System

TRO 8.6.2 Inlet Door Position Monitoring System shall be OPERABLE.

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

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Inlet Door Position Monitoring System inoperable. | A.1 | Verify Ice Bed Temperature Monitoring System is OPERABLE. | Immediately |
| | AND | | |
| | A.2 | Initiate action to determine an alternate method for performing SR 3.6.12.1. | Immediately |
| | AND | | |
| | A.3 | Restore Inlet Door Position Monitoring System to OPERABLE status. | 14 days |
| B. Required Action A.1 and associated Completion Time not met. | B.1 | Restore Inlet Door Position Monitoring System to OPERABLE status. | 48 hours |
| C. Required Action A.2, A.3, or B.1 and associated Completion Time not met. | C.1 | Enter TRO 8.0.3. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.6.2.1 | Perform CHANNEL CHECK. | 12 hours |
| TRS 8.6.2.2 | Perform COT. | 18 months |
| TRS 8.6.2.3 | Verify each inlet door indicates the correct status when opened and closed. | 18 months |

8.6 CONTAINMENT SYSTEMS

8.6.3 DELETED

8.6 CONTAINMENT SYSTEMS

8.6.5 DELETED

8.6 CONTAINMENT SYSTEMS

8.6.6 Accumulator Temperature

TRO 8.6.6 Accumulator temperature shall be ≥ 60°F and ≤ 115°F

APPLICABILITY: MODES 1 and 2,
MODE 3 with RCS pressure > 1000 psig

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Accumulator temperature not within limits. | A.1 Restore accumulator temperature to within limits. | 8 hours |
| B. Required Action A and associated Completion Time not met. | B.1 Verify accumulator external surface temperature within limits. | 2 hours<br>AND<br>Once per 8 hours thereafter |
| C. Required Action B and associated Completion Time not met. | C.1 Be in MODE 3.<br>AND<br>C.2 Reduce RCS pressure to ≤ 1000 psig. | 6 hours<br><br>12 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|---|
| TRS 8.6.6.1 Verify accumulator temperature is within limits. | 24 hours |

8.7 PLANT SYSTEMS

8.7.1 Steam Generator Pressure and Temperature Limit

TRO 8.7.1 The temperature of both the primary and secondary coolants in the steam generators shall be > 70°F when the pressure of either coolant in the steam generator is > 200 psig.

APPLICABILITY: At all times.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. ----------NOTE---------- Required Action A.2 shall be completed whenever this Condition is entered. ---------- Requirements of TRO not met. | A.1 Reduce the steam generator pressure of the applicable side to ≤ 200 psig. AND A.2 Determine by analysis the effects of the overpressurization on the structural integrity of the steam generator and that the steam generator remains acceptable for continued operation. | 30 minutes Prior to increasing steam generator temperature ≥ 200°F |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.7.1.1 | Verify pressure in each side of the steam generators is < 200 psig. | 1 hour from discovery of the primary or secondary temperature of any steam generator is < 70°F<br><br>AND<br><br>Once per hour thereafter |

8.7 PLANT SYSTEMS

8.7.2 Sealed Source Contamination

TRO 8.7.2 Each sealed source containing material ≥ 100 μCi of beta and/or gamma emitting material or ≥ 5 μCi of alpha emitting material, shall be free of ≥ 0.005 μCi of removable contamination.

APPLICABILITY: At all times.

ACTIONS

----------NOTES----------
Separate Condition entry is allowed for each sealed source.
---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more sealed sources with removable contamination not within limits. | A.1 | Withdraw the sealed source from use. | Immediately |
| | AND | | |
| | A.2.1 | Initiate action to decontaminate and repair the sealed source. | Immediately |
| | OR | | |
| | A.2.2 | Initiate action to dispose of the sealed source in accordance with NRC Regulations. | Immediately |
| | AND | | |
| | A.3 | Initiate an evaluation in accordance with the Corrective Action Program. | In accordance with the Corrective Action Program |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. The TRSs shall be performed by the licensee or other personnel specifically authorized by the Commission or an agreement state.

2. The test method used shall have a detection sensitivity of ≤ 0.005 μCi.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.7.2.1 | ----------NOTE----------<br>Startup sources and fission detectors previously subjected to core flux are excluded.<br>----------<br><br>Perform leakage and contamination testing on each sealed source in use containing radioactive materials with a half-life > 30 days (excluding Hydrogen 3) and in any form other than gas. | 184 days |
| TRS 8.7.2.2 | Perform leakage and contamination testing for each sealed source and fission detector not in use. | Prior to placing in use or transferring to another licensee, if not performed within the previous 184 days |
| TRS 8.7.2.3 | Perform leakage and contamination testing on each sealed source and fission detector not in use that was received without a certificate indicating the last test date. | Prior to placing in use |
| TRS 8.7.2.4 | Perform leakage and contamination testing on each sealed startup source and fission detector. | Once within 31 days prior to being subjected to core flux or installed in the core<br><br>AND<br><br>Following repair or maintenance to the sealed source |

8.7 PLANT SYSTEMS

8.7.3 DELETED

8.7 PLANT SYSTEMS

8.7.4 Fire Detection Instrumentation

TRO 8.7.4 The fire detection instrumentation for each fire detection zone shown in Table 8.7.4-1 shall be OPERABLE.

APPLICABILITY: Whenever equipment protected by the fire detection instrumentation is required to be OPERABLE.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each zone.
---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required Function A detectors inoperable. | A.1 | Verify ≥ ½ the total Function A detectors in the affected zones are OPERABLE. | Immediately |
| | AND | | |
| | A.2 | Verify no two adjacent fire detectors in the affected zones are inoperable. | Immediately |
| | AND | | |
| | A.3 | Restore the detector(s) to OPERABLE status. | 14 days |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| B. One or more Function B detectors inoperable. | B.1.1 | Verify zone(s) with inoperable detector(s) are protected by operable suppression system.<br><br>OR | 1 hour |
| | B.1.2 | Inspect the zone(s) with inoperable detector(s) using a fire watch patrol.<br><br>AND | Once per hour |
| | B.2 | Restore the detectors to OPERABLE status. | 14 days |
| C. Required Action and associated completion time of Condition A or Condition B is not met. | C.1 | Establish a continuous fire watch patrol of affected area. | 1 hour |

SURVEILLANCE REQUIREMENTS

----------NOTE----------
These TRSs apply for each Detector System Location in Table 8.7.4-1.
---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.7.4.1 | Perform COT on each detector (not applicable to pneumatic detectors). | 184 days |
| TRS 8.7.4.2 | Verify the supervised alarm circuits are OPERABLE. | 184 days |
| TRS 8.7.4.3 | Verify each pneumatic detection system provides supervisory alarm. | 24 months |

Table 8.7.4-1 (page 1 of 4)
Unit 2 and Common Area Fire Detection Systems

| DETECTOR SYSTEM LOCATION (ZONE) | TOTAL NUMBER OF DETECTORS | | |
|---|---|---|---|
| | HEAT A/B[a] | FLAME A/B[a] | SMOKE A/B[a] |
| 1. Auxiliary Building | | | |
| a. DELETED | | | |
| b. Elevation 587 (smoke detection zone 2) | | | 58/0[b] |
| c. Elevation 609 (smoke detection zone 3) | | | 42/0[b] |
| d. DELETED | | | |
| e. Elevation 587' (pneumatic system) | 0/1 [b.d] | | |
| f. Elevation 609' (pneumatic system) | 0/1 [b.d] | | |
| 2. Fire Pump House | 0/1 [b.d] | | |
| 3. DELETED | | | |
| 4. DELETED | | | |
| 5. 4kV Switchgear (AB) (smoke detection zone 7; flame detection zone 23) | | 0/3 | 0/2 |

(continued)

(a) Number of Function A (early warning fire detection and notification only) detectors / number of Function B (actuation of fire suppression systems and early warning and notification) detectors.

(b) Detectors protect area common to both Units 1 and 2.

(c) DELETED

(d) Dry Pilot Actuation is considered to be a heat actuated pneumatic type detection system.

Table 8.7.4-1 (page 2 of 4)
Unit 2 and Common Area Fire Detection Systems

| DETECTOR SYSTEM LOCATION (ZONE) | TOTAL NUMBER OF DETECTORS | | |
|---|---|---|---|
| | HEAT A/B[a] | FLAME A/B[a] | SMOKE A/B[a] |
| 6. DELETED | | | |
| 7. Engr. Safety System Switchgear and Xfmr. Rm. (smoke detection zone 8; flame detection zone 25) | | 0/5 | 0/15 |
| 8. DELETED | | | |
| 9. DELETED | | | |
| 10. DELETED | | | |
| 11. Diesel Generator Rm. 2AB | 0/2 | | |
| 12. Diesel Generator Rm. 2CD | 0/2 | | |
| 13. Diesel Generator Ramp Corridor (smoke detection zone 31-2) | | | 4/0 |
| 14. DELETED | | | |
| 15. DELETED<br>a. DELETED<br>b. DELETED | | | |
| 16. Switchgear Cable Vault (smoke detection zone10; flame detection zones 27/28) | | 0/10[f] | 0/22 |
| 17. Control Room Cable Vault and Hot Shutdown Panel Enclosure (smoke detection zones 12/13) | | | 0/76[g] |

(continued)

(a) Number of Function A (early warning fire detection and notification only) detectors / number of Function B (actuation of fire suppression systems and early warning and notification) detectors.

(e) DELETED

(f) Two circuits of five detectors each.

(g) Two circuits of 38 detectors each.

Table 8.7.4-1 (page 3 of 4)
Unit 2 and Common Area Fire Detection Systems

| DETECTOR SYSTEM LOCATION (ZONE) | TOTAL NUMBER OF DETECTORS | | |
|---|---|---|---|
| | HEAT A/B[a] | FLAME A/B[a] | SMOKE A/B[a] |
| 18. Aux. Cable Vault (smoke detection zone 11) | | | 0/6 |
| 19. ESW Basement Area (smoke detection zone 26) | | | 4/0[b] |
| 20. DELETED | | | |
| 21. Cable Tunnels | | | |
| a. Quad 1 Cable Tunnel (smoke detection zone 1; flame detection zone 21) | | 0/3 | 0/4 |
| b. DELETED | | | |
| c. Quad 3N (smoke detection zone 3; flame detection zone 17) | | 0/3 | 0/3 |
| d. Quad 3S (smoke detection zone 5; flame detection zone 19) | | 0/3 | 0/4 |
| e. Quad 3M (smoke detection zone 4; flame detection zone 18) | | 0/3 | 0/4 |
| f. DELETED | | | |
| 22. DELETED | | | |
| a. DELETED | | | |
| b. DELETED | | | |

(continued)

(a) Number of Function A (early warning fire detection and notification only) detectors / number of Function B (actuation of fire suppression systems and early warning and notification) detectors.

(b) Detectors protect area common to both Units 1 and 2.

(h) DELETED

Table 8.7.4-1 (page 4 of 4)
Unit 2 and Common Area Fire Detection Systems

| DETECTOR SYSTEM LOCATION (ZONE) | TOTAL NUMBER OF DETECTORS | | |
|---|---|---|---|
| | HEAT A/B[a] | FLAME A/B[a] | SMOKE A/B[a] |
| 22. DELETED | | | |
| c. DELETED | | | |
| d. DELETED | | | |
| e. DELETED | | | |
| f. DELETED | | | |
| 23. DELETED | | | |
| a. DELETED | | | |
| b. DELETED | | | |
| c. DELETED | | | |
| d. DELETED | | | |
| e. DELETED | | | |
| 24. DELETED | | | |

(a) Number of Function A (early warning fire detection and notification only) detectors / number of Function B (actuation of fire suppression systems and early warning and notification) detectors..

(h) DELETED

(i) DELETED

(j) DELETED

8.7 PLANT SYSTEMS

8.7.5 Fire Suppression Water System

TRO 8.7.5 The Fire Suppression Water System shall be OPERABLE with:

a. Three Fire Suppression Water System pumps, each with a capacity of 2500 gpm, with their discharge aligned to the fire suppression header;

b. Two fire water tanks, each with a minimum usable volume of 565,000 gallons; and

c. An OPERABLE flow path capable of taking suction from either one of the fire water tanks and transferring the water through protected area distribution piping up to the yard hydrant curb control valves, to the power block hose station valves and Water Suppression System controlling valves that are required by TRM 8.7.6.

----------NOTE----------
1. The Fire Suppression Water System pumps and fire water tanks are common to both Units 1 and 2.
---

APPLICABILITY: At all times.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One Fire Suppression Water System pump inoperable. | A.1 Provide alternative backup pump. | 7 days |
| B. One fire water tank inoperable. | B.1 Establish backup water system supply. | 30 days |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. Fire Suppression Water System inoperable for reasons other than Condition A or B. | C.1 Establish backup fire suppression water system. | 24 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.7.5.1 | Verify each fire water tank volume is within limits. | 7 days |
| TRS 8.7.5.2 | Verify the electrolytic level for each fire pump diesel starting battery is above the plates. | 7 days |
| TRS 8.7.5.3 | ----------NOTE----------<br>Not required when the Diesel Driven Fire Pump is starting or running.<br>----------<br>Verify the output voltage of each fire pump diesel starting battery bank is > 24VDC and charging current of ≤ 2 amps.<br>----------NOTE----------<br>Only required to be performed when the Diesel Driven Fire Pump is not running and controller battery charger is unavailable OR controller battery indication is ≤ 24VDC.<br>----------<br>Verify the output voltage for each fire pump diesel starting battery bank is > 24.1VDC. | 7 days<br><br>1 hour |
| TRS 8.7.5.4 | Operate each Fire Suppression Water System pump for ≥ 15 minutes on recirculation flow. | 31 days |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.7.5.5 | Verify each Fire Suppression Water System valve (manual, power operated, and automatic) in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position. | 31 days |
| TRS 8.7.5.6 | Verify the fire pump diesel engine fuel storage tank contains ≥ 160 gallons of fuel. | 31 days |
| TRS 8.7.5.7 | Verify each fire pump diesel engine starts from ambient conditions and operates for ≥ 30 minutes. | 31 days |
| TRS 8.7.5.8 | Verify that a sample of diesel fuel from the fuel storage tank, obtained in accordance with ASTM-D4057-81, is within acceptable limits specified in Table 1 of ASTM-D975-81 for viscosity, water, and sediment. | 92 days |
| TRS 8.7.5.9 | Verify that the specific gravity of each fire pump diesel starting battery bank is appropriate for continued service for each battery. | 92 days |
| TRS 8.7.5.10 | Perform a system flush of above ground internal distribution headers and hydrants. | 12 months |
| TRS 8.7.5.11 | Cycle each valve in the flow path through one complete cycle of full travel. | 12 months |
| TRS 8.7.5.12 | Perform a system functional test, which includes a simulated or actual automatic actuation of the system throughout its operating sequence. | 24 months |
| TRS 8.7.5.13 | Verify that each fire pump develops sufficient flow and pressure to meet the largest fire suppression system demands. | 24 months |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.7.5.14 | Not used. | Not used |
| TRS 8.7.5.15 | Inspect each fire pump diesel in accordance with procedures prepared in conjunction with the manufacturer's recommendations. | 24 months |
| TRS 8.7.5.16 | Verify, for each fire pump diesel starting battery, the battery, cell plates, and battery packs show no visual indication of physical damage or abnormal deterioration. | 18 months |
| TRS 8.7.5.17 | Verify, for each fire pump diesel starting battery, the battery-to-battery and terminal connections are clean, tight, free of corrosion, and coated with anti-corrosion material. | 18 months |
| TRS 8.7.5.18 | DELETED | |
| TRS 8.7.5.19 | Verify each fire pump starts in its preplanned sequence to maintain the Fire Suppression Water System pressure ≥ 100 psig. | 24 months |
| TRS 8.7.5.20 | ----------NOTE----------<br>Individual supplies are excluded.<br>----------<br>Verify, by a series of full flow tests, every fire main segment to be clear of obstruction. | 36 months |

8.7 PLANT SYSTEMS

8.7.6 Water Suppression System

TRO 8.7.6 The Sprinkler Systems located in the areas shown in Table 8.7.6-1 shall be OPERABLE.

APPLICABILITY: According to Table 8.7.6-1.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each area.
---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more Sprinkler Systems inoperable in areas WITH fire detection (electric or pneumatic). | A.1 | Verify fire detection instrumentation (electric or pneumatic) for the affected area is OPERABLE. | 1 hour |
| | OR | | |
| | A.2 | ----------NOTE----------<br>Only applicable for high radiation areas.<br>---<br>Monitor closed circuit television of affected area and log results. | Once per hour |
| | OR | | |
| | A.3 | ----------NOTE----------<br>Only applicable for high radiation areas.<br>---<br>Patrol the affected area with a fire watch. | Once per hour |
| | AND | | |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. (continued) | A.4 | Restore the suppression system to OPERABLE status. | 28 days |
| B. One or more Sprinkler Systems inoperable in areas <u>WITH</u> other automatic suppression system(s) OPERABLE. | B.1 | Verify automatic suppression system OPERABLE for affected area. | Immediately |
| | <u>AND</u> | | |
| | B.2 | Restore the suppression system to OPERABLE status. | 28 days |
| C. Required Action and associated Completion Time of Condition A or Condition B is not met. | C.1 | Establish a continuous fire watch patrol of affected area. | 1 hour |
| | <u>OR</u> | | |
| | C.2 | ----------NOTE----------<br>Only applicable for high radiation areas.<br>---------- | |
| | | Continuously monitor closed circuit television of affected area and log results. | 1 hour |

SURVEILLANCE REQUIREMENTS

----------NOTE----------

Refer to Table 8.7.6-1 to determine which TRSs apply for each Location.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.7.6.1 | Cycle each valve in the flow path through at least one complete cycle of full travel. | 12 months |
| TRS 8.7.6.2 | Perform a system functional test, which includes simulated or actual automatic actuation of the system. Actuation of the system includes verifying each automatic valve in the flow path actuates to the correct position. | 24 months |
| TRS 8.7.6.3 | Not used. | Not used |
| TRS 8.7.6.4 | Visually inspect automatic wet pipe, manual, and preaction system piping and verify integrity. | 24 months |
| TRS 8.7.6.5 | DELETED | |
| TRS 8.7.6.6 | DELETED | |

Table 8.7.6-1 (page 1 of 3)Water Suppression Systems

| | LOCATION | APPLICABLE MODE OR OTHER SPECIFIED CONDITION | TYPE SYSTEM | ACTUATION | SURVEILLANCE REQUIREMENT |
|---|---|---|---|---|---|
| 1. | DELETED | | | | |
| 2. | DELETED | | | | |
| 3. | DELETED | | | | |
| 4. | DELETED | | | | |
| 5. | DELETED | | | | |
| 6. | DELETED | | | | |
| 7. | Auxiliary Building Elevation 587 ft (12-FP-324; Normally accessible areas, charging and safety injection pump rooms, stairways to Elevations 573 and 609)[c)(d)] | (c,e) | Sprinkler System Closed Head Preaction Sprinkler | Dry Pilot[f)] | TRS 8.7.6.1<br>TRS 8.7.6.2<br>TRS 8.7.6.4 |
| 8. | Auxiliary Building Elevation 609 ft (12-FP-371; Normally accessible areas, CCW pump area, stairways to Elevations 633 and 620 above Chem. Lab)[c)(d)] | (c,e) | Sprinkler System Closed Head Preaction Sprinkler | Dry Pilot[f)] | TRS 8.7.6.1<br>TRS 8.7.6.2<br>TRS 8.7.6.4 |
| 9. | DELETED | | | | |
| 10. | DELETED | | | | |
| 11. | DELETED | | | | |

(continued)

(a) DELETED

(b) DELETED

(c) Sprinkler System protects area common to both Units 1 and 2.

(d) Located in areas that also have an automatic detection system.

(e) When equipment protected by Sprinkler System is required to be OPERABLE.

(f) Dry Pilot Actuation is considered to be a heat actuated pneumatic type detection system.

Table 8.7.6-1 (page 2 of 3)
Water Suppression Systems

| LOCATION | APPLICABLE MODE OR OTHER SPECIFIED CONDITION | TYPE SYSTEM | ACTUATION | SURVEILLANCE REQUIREMENT |
|---|---|---|---|---|
| 12. DELETED | | | | |
| 13. DELETED | | | | |
| 14. Turbine Building 591 ft | | | | |
| a. South end and condenser pit (2-FP-186) | (e) | Sprinkler System<br>Closed Head<br>Wet Pipe | Automatic | TRS 8.7.6.1<br>TRS 8.7.6.2<br>TRS 8.7.6.4 |
| b. North end cable racks and oil piping (2-FP-201) | (e) | Sprinkler System<br>Closed Head<br>Wet Pipe | Automatic | TRS 8.7.6.1<br>TRS 8.7.6.2<br>TRS 8.7.6.4 |
| c. North end (2-FP-504) | (e) | Sprinkler System<br>Closed Head<br>Wet Pipe | Automatic | TRS 8.7.6.1<br>TRS 8.7.6.2<br>TRS 8.7.6.4 |
| d. South end cable racks and oil piping (2-FP-505) | (e) | Sprinkler System<br>Closed Head<br>Wet Pipe | Automatic | TRS 8.7.6.1<br>TRS 8.7.6.2<br>TRS 8.7.6.4 |
| 15. Turbine Building 609 ft | | | | |
| a. South end (2-FP-185) | (e) | Sprinkler System<br>Closed Head<br>Wet Pipe | Automatic | TRS 8.7.6.1<br>TRS 8.7.6.2<br>TRS 8.7.6.4 |
| b. North end racks and oil piping (2-FP-202) | (e) | Sprinkler System<br>Closed Head<br>Wet Pipe | Automatic | TRS 8.7.6.1<br>TRS 8.7.6.2<br>TRS 8.7.6.4 |
| c. North end (2-FP-506) | (e) | Sprinkler System<br>Closed Head<br>Wet Pipe | Automatic | TRS 8.7.6.1<br>TRS 8.7.6.2<br>TRS 8.7.6.4 |
| d. South end racks and oil piping (2-FP-507) | (e) | Sprinkler System<br>Closed Head<br>Wet Pipe | Automatic | TRS 8.7.6.1<br>TRS 8.7.6.2<br>TRS 8.7.6.4 |

(continued)

(e) When equipment protected by Sprinkler System is required to be OPERABLE.

Table 8.7.6-1 (page 3 of 3)
Water Suppression Systems

| LOCATION | APPLICABLE MODE OR OTHER SPECIFIED CONDITION | TYPE SYSTEM | ACTUATION | SURVEILLANCE REQUIREMENT |
|---|---|---|---|---|
| 16. DELETED | | | | |
| 17. Pump Cubicles in the Fire Pump House (12-FP-739) [c] | (e) | Sprinkler System Closed Head Preaction System | Dry Pilot [f] | TRS 8.7.6.1<br>TRS 8.7.6.2<br>TRS 8.7.6.4 |

(c) Sprinkler System protects area common to both Units 1 and 2.

(d) DELETED

(e) When equipment protected by Sprinkler System is required to be OPERABLE.

(f) Dry Pilot Actuation is considered to be a heat actuated pneumatic type detection system

8.7 PLANT SYSTEMS

8.7.7 DELETED

8.7 PLANT SYSTEMS

8.7.8 Low Pressure $CO_2$ Systems

TRO 8.7.8 The Low Pressure $CO_2$ Systems located in the areas shown in Table 8.7.8-1 shall be OPERABLE.

APPLICABILITY: Whenever equipment in the areas protected by Low Pressure $CO_2$ Systems are required to be OPERABLE.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each Low Pressure $CO_2$ System.
---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more Low Pressure $CO_2$ Systems inoperable due to being isolated from automatic operation for personnel protection. | A.1 Verify ≥ one zone of fire detection instrumentation in the affected area is OPERABLE. | Immediately |
| B. One or more Low Pressure $CO_2$ Systems inoperable for reasons other than Condition A. | B.1.1 Verify ≥ one zone of fire detection instrumentation in the affected area is OPERABLE.<br>AND<br>B.1.2 Patrol the affected area with a fire watch.<br>OR | 1 hour<br><br><br><br>Once per hour |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| B. (continued) | B.2.1 | ----------NOTE----------<br>Only applicable for Control Room Cable Vault<br>---------- | |
| | | Verify Control Room Cable Vault HALON System is OPERABLE. | 1 hour |
| | AND | | |
| | B.2.2 | Verify ≥ one zone of fire detection instrumentation in the affected area is OPERABLE. | 1 hour |
| | AND | | |
| | B.3 | Restore the $CO_2$ System to OPERABLE status. | 28 days |
| C. Required Action and associated Completion Time of Condition A or Condition B is not met. | C.1 | Establish a continuous fire watch patrol of affected area. | 1 hour |

SURVEILLANCE REQUIREMENTS

----------NOTE----------

TRS 8.7.8.2, TRS 8.7.8.3, and TRS 8.7.8.4 apply to each Location in Table 8.7.8-1.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.7.8.1 | Verify low pressure $CO_2$ storage tank level ≥ 60.4% and pressure ≥ 285 psig. | 7 days |
| TRS 8.7.8.2 | Verify each Low Pressure $CO_2$ System manual valve in the flow path is in the correct position. | 31 days |
| TRS 8.7.8.3 | Verify the Low Pressure $CO_2$ System valves, associated ventilation dampers and fans, and self-closing fire doors operate automatically upon receipt of a simulated or actual actuation signal. | 24 months |
| TRS 8.7.8.4 | Verify Low Pressure $CO_2$ System actuation methods are tested to verify proper actuation of the system. | 24 months |

Table 8.7.8-1 (page 1 of 1)
Low Pressure Carbon Dioxide Systems
(17-Ton Capacity)

| | LOCATION | ACTUATION PERIOD |
|---|---|---|
| 1. | Diesel Generator 2AB Rm. | Cross-zoned Heat |
| 2. | Diesel Generator 2CD Rm. | Cross-zoned Heat |
| 3. | DELETED | |
| 4. | 4 kV Switchgear Rms. | Cross-zoned Ionization and Infrared |
| 5. | DELETED | |
| 6. | Engr. Safety System Switchgear Rm. | Cross-zoned Ionization and Infrared |
| 7. | Switchgear Cable Vault | Cross-zoned Ionization and Infrared |
| 8. | Aux. Cable Vault | Ionization |
| 9. | Control Room Cable Vault[(a)] | Manual |
| 10. | Cable Tunnel Quad 1 | Manual |
| 11. | DELETED | |
| 12. | Cable Tunnel Quad 3N | Manual |
| 13. | Cable Tunnel Quad 3M | Manual |
| 14. | Cable Tunnel Quad 3S | Manual |
| 15. | DELETED | |

(a) Control Room Cable Vault $CO_2$ System is only required to be OPERABLE when the Halon System required by TRM 8.7.9 is inoperable.

8.7 PLANT SYSTEMS

8.7.9 Halon System

TRO 8.7.9 The Halon system located in the Control Room Cable Vault shall be OPERABLE.

APPLICABILITY: Whenever equipment in the Control Room Cable Vault is required to be OPERABLE.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Halon System inoperable due to being isolated from automatic operation for personnel protection. | A.1 | Verify ≥ one zone of fire detection instrumentation in the Control Room Cable Vault is OPERABLE. | Immediately |
| B. Halon System inoperable for reasons other than Condition A. | B.1 | Verify ≥ one zone of the fire detection instrumentation in the Control Room Cable Vault is OPERABLE. | 1 hour |
| | AND | | |
| | B.2 | Verify the Low Pressure $CO_2$ System for the Control Room Cable Vault is OPERABLE. | 1 hour |
| | AND | | |
| | B.3 | Restore the HALON System to OPERABLE status. | 28 days |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. Required Action and associated Completion Time of Condition A or Condition B is not met. | C.1 Establish a continuous fire watch patrol of the Control Room Cable Vault. | 1 hour |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.7.9.1 | Verify each Halon storage tank is ≥ 95% of full charge weight or appropriate liquid level. | 184 days |
| TRS 8.7.9.2 | Verify each Halon storage tank is ≥ 90% of full charge pressure corrected for ambient temperature. | 184 days |
| TRS 8.7.9.3 | Verify the Halon System, including associated ventilation dampers and fans, and doors, operates automatically on a simulated or actual actuation signal. | 24 months |
| TRS 8.7.9.4 | Test the Halon System actuation methods and verify proper actuation of the system. | 24 months |
| TRS 8.7.9.5 | Perform an air flow test or $CO_2$ puff test through headers and nozzles and verify there is no blockage. | 24 months |

8.7 PLANT SYSTEMS

8.7.10 Fire Rated Assemblies

TRO 8.7.10 Fire rated assemblies shall be OPERABLE as follows:

a. All fire rated assemblies (walls, floor/ceilings, and cable tray and conduit enclosures), separating safe shutdown fire areas or separating portions of redundant systems important to safe shutdown within a fire area, shall be OPERABLE; and

b. All penetration sealing devices (fire door assemblies, fire dampers, and penetration seals for penetration seal types: core bore, blockout, boot, and ventilation) in the above fire rated assemblies shall be OPERABLE.

APPLICABILITY: At all times.

ACTIONS

----------NOTE----------

Separate Condition entry is allowed for each fire rated assembly, including penetration sealing devices.

Enter the applicable Condition and Required Actions of TRM 8.7.8, Low Pressure $CO_2$ Systems, or TRM 8.7.9, Halon Systems, for each inoperable fire rated assembly that impacts OPERABILITY of TRM 8.7.8 or 8.7.9 systems.

---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more fire rated assemblies inoperable. | A.1.1 Verify the fire detection instrumentation or the Fire Suppression System on one side of the fire rated assembly is OPERABLE. | 1 hour |
| | AND | |
| | A.1.2 Patrol at least one side of the affected barrier with a fire watch. | Once per hour |
| | AND | |
| | A.1.3 Restore the barrier to OPERABLE status. | 28 days |
| | OR | |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. (continued) | ----------NOTE----------<br>Required Actions A.2.1 and A.2.2 are not applicable to fire dampers or normally opened fire doors.<br>---------- | |
| | A.2.1 Secure the sealing device in the closed position.<br><br>AND | 1 hour |
| | A.2.2 Verify the sealing device remains in the closed position.<br><br>OR | Once per 12 hour shift |
| | ----------NOTE----------<br>Required Actions A.3.1 and A.3.2 are only applicable to fire dampers and normally opened fire doors. | |
| | A.3.1 Perform appropriate HVAC and radiological reviews.<br><br>AND | 1 hour |
| | A.3.2 Secure the inoperable penetration sealing device in the closed position.<br><br>AND | 1 hour |
| | A.3.3 Verify the sealing device remains in the closed position. | Once per 12 hour shift |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. Required Action and associated Completion Time of Condition A is not met. | B.1 Establish a continuous fire watch patrol on at least one side of affected barrier. | 1 hour |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.7.10.1 | Verify each fire door, except those fire doors that are locked closed, is closed. | 24 hours |
| TRS 8.7.10.2 | Verify fire doors with hold-open and release mechanisms are free of obstructions. | 24 hours |
| TRS 8.7.10.3 | Verify each locked closed fire door is locked closed. | 7 days |
| TRS 8.7.10.4 | Inspect the hold-open, release, and closing mechanism and latches of each fire door. | 184 days |
| TRS 8.7.10.5 | Perform a visual inspection of all accessible surfaces of each fire rated assembly and verify no open penetrations. | 24 months |
| TRS 8.7.10.6 | Perform a visual inspection of each fire damper and associated hardware. | 24 months |
| TRS 8.7.10.7 | Perform a functional test of 10% of the fire dampers and verify the fire dampers close properly. | 18 months |
| TRS 8.7.10.8 | Perform a visual inspection of ≥ 10% of each type of penetration seal. If apparent changes in appearance or abnormal degradation are found that could indicate a plant wide trend, a visual inspection of an additional 10% of each type of penetration seal shall be made. This inspection process shall continue until a ≥ 10% sample with no apparent changes in appearance or abnormal degradation is found. | 24 months |

8.7 PLANT SYSTEMS

8.7.11 Liquid Holdup Tanks

TRO 8.7.11 The quantity of radioactive material in any outside temporary tank shall be limited to ≤ 10 Ci, excluding tritium and dissolved or entrained noble gases.

----------NOTE----------
Tanks included in this Requirement are outdoor tanks that are not surrounded by liners, dikes, or walls capable of holding the tanks contents and that do not have tank overflows and surrounding area drains connected to the liquid radwaste treatment system.
---

APPLICABILITY: At all times.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Quantity of radioactive material in any outdoor tank greater than limit. | A.1 | Suspend all addition of radioactive material to the tank. | Immediately |
| | AND | | |
| | A.2 | Reduce contents of the tank to within limit. | 48 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.7.11.1 | ----------NOTE----------<br>Surveillance is only required to be performed when radioactive material is being added to the tank.<br>---<br>Determine, by analysis of a representative sample, that the tank's contents are within the limit. | 7 days |

8.7 PLANT SYSTEMS

8.7.12 Explosive Gas Mixture

TRO 8.7.12 The concentration of oxygen in the waste gas holdup system shall be limited to ≤ 3% by volume if the hydrogen in the system is ≥ 4% by volume.

APPLICABILITY: At all times.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Concentration of oxygen in the waste gas holdup system > 3% but ≤ 4% by volume.<br><br>AND<br><br>Concentration of hydrogen in the waste gas holdup system ≥ 4% by volume. | A.1 Restore concentration of oxygen to ≤ 3% by volume.<br><br>OR<br><br>A.2 Restore the concentration of hydrogen to < 4% by volume. | 96 hours<br><br>96 hours |
| B. Concentration of oxygen in the waste gas holdup system > 4% by volume.<br><br>AND<br><br>Concentration of hydrogen in the waste gas holdup system > 4% by volume. | B.1 Suspend all additions of the waste gases to the system or tanks.<br><br>AND<br><br>B.2.1 Restore concentration of oxygen to ≤ 3% by volume.<br><br>OR<br><br>B.2.2 Restore the concentration of hydrogen to < 4% by volume. | Immediately<br><br><br><br>96 hours<br><br><br><br>96 hours |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. One or more required oxygen monitor(s) inoperable. | C.1 Enter Condition required by TRO 8.3.5. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.7.12.1 | Determine the concentration of oxygen in the waste gas holdup system using the oxygen monitors required OPERABLE by TRM 8.3.5. | Continuously |

8.7 PLANT SYSTEMS

8.7.13 Gas Storage Tanks

TRO 8.7.13 The quantity of radioactivity contained in each gas storage tank shall be limited to 43,800 Ci noble gas (considered Xe-133).

APPLICABILITY: At all times.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Quantity of radioactive material in one gas storage tank not within limit. | A.1 | Suspend all additions of radioactive material to the tank. | Immediately |
| | AND | | |
| | A.2 | Reduce the contents of the tank to within limit. | 48 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.7.13.1 | ----------NOTE----------<br>Surveillance is only required to be performed when radioactive material is being added to the tank.<br>---------- | |
| | Determine the quantity of radioactive material in each gas storage tank is within limit. | 7 days during addition of radioactive material<br><br>AND<br><br>24 hours during primary coolant system degassing |

8.7 PLANT SYSTEMS

8.7.14 Plant Process Computer (PPC) Derived Reactor Thermal Power

TRO 8.7.14 The PPC Derived Reactor Thermal Power calculation must be in service with:

a. A functional Leading Edge Flow Meter (LEFM) CheckPlus System; and

b. A functional PPC.

APPLICABILITY: MODE 1 greater than 3411 MWt power.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. LEFM CheckPlus System non-functional. | A.1 | Maintain steady-state reactor power. | Immediately |
| | AND | | |
| | A.2 | Maintain corrected Venturi power ≤ 3468 MWt (100%). | Immediately |
| | AND | | |
| | A.3 | Restore functionality of the LEFM CheckPlus System. | 46 hours |
| B. PPC generated reactor calorimetric calculation non-functional. | B.1 | Maintain power ≤ 100% as indicated on the highest reading Power Range Nuclear Instrument. | Immediately |
| | AND | | |
| | B.2 | Restore the functionality of the PPC generated reactor calorimetric calculation. | Prior to the next required manual calorimetric using the feedwater to steam generator flow control venturis |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| C. Required Action and associated Completion Time of Condition A not met. | C.1 Reduce core thermal power to ≤ 3411 MWt. | 2 hours |
| D. Required Action and associated Completion Time of Condition B not met. | D.1 Reduce core thermal power to ≤ 3411 MWt. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|---|
| None | NA |

8.7 PLANT SYSTEMS

8.7.15 Steam Generator Stop Valves (SGSVs), Main Feedwater Isolation Valves (MFIVs) and Main Feedwater Regulation Valves (MFRVs)

TRO 8.7.15 Surveillance Requirements TRS 8.7.15.1, 8.7.15.2, and 8.7.15.3 shall be met for the associated valve.

APPLICABILITY: When associated valve is required to be OPERABLE.

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.7.15.1 | Verify the isolation time of each SGSV is $\leq$ 8 seconds | As specified by TS SR 3.7.2.1 |
| TRS 8.7.15.2 | Verify the isolation time of each MFIV is $\leq$ 39.5 seconds | As specified by TS SR 3.7.3.1 |
| TRS 8.7.15.3 | Verify the isolation time of each MFRV is $\leq$ 6.4 seconds | As specified by TS SR 3.7.3.2 |

## 8.8 ELECTRICAL POWER SYSTEMS

### 8.8.1 Deleted

8.8 ELECTRICAL POWER SYSTEMS

8.8.2 Diesel Fuel Oil

TRO 8.8.2 The following Surveillance Requirements shall be met:

a. TRS 8.8.2.1; and

b. TRS 8.8.2.2.

APPLICABILITY: When associated emergency diesel generator is required to be OPERABLE.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. The leakage rate from an EDG fuel oil storage tank measured by the precision leakage test is > 0.05 gallons per hour. | A.1 Verify the diesel fuel oil subsystem remains operable per TS 3.8.3. | 48 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.8.2.1 | Clean each fuel oil storage tank by:<br>a. Draining fuel oil storage tank, removing the accumulated sediment, and cleaning the tank; or<br>b. Agitate the fuel oil in the storage tank while pumping the oil from the bottom of the tank through a 5-micron filter, and back to the opposite end of the tank. Three consecutive samples shall be taken and analyzed in accordance with ASTM D2276-83. If the contaminant level in any of the samples is greater than 10 mg per liter, the agitation, filtration, and sampling processes shall be repeated. If the contaminant level remains above 10 mg per liter after 3 iterations, the draining, and cleaning method described in TRS 8.8.2.1.a. | 10 years |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.8.2.2 | Verify the leakage rate from the fuel oil system, by performance of a precision leak detection test, is ≤ 0.05 gallons per hour. | 10 years |

8.8 ELECTRICAL POWER SYSTEMS

8.8.3 Supplemental Diesel Generators (SDG)

TRO 8.8.3 Two SDGs shall be available.

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

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or both SDGs not available. | A.1 Enter the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources – Operating." | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.8.3.1 | Verify:<br>a. Each SDG fuel oil storage tank contains ≥ 2200 gal of fuel oil;<br>b. Both SDGs are mechanically and electrically aligned to automatically provide standby power to 69 kV substation 4.16 kV bus 1; and<br>c. At least one SDG remote monitoring terminal is active and updating. | Once per 12 hours when supporting an extended Completion Time for Required Action B.5 of LCO 3.8.1<br><br>OR<br><br>7 days |
| TRS 8.8.3.2 | Exercise the SDGs by running each one unloaded for ≥ 5 minutes. | 14 days |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.8.3.3 | ----------NOTE----------<br>Momentary transients outside the load range do not invalidate this test.<br>----------<br><br>Verify both SDGs are synchronized and loaded and operate for ≥ 60 minutes at a combined load of ≥ 3150 kW and ≤ 4500 kW. | 92 days |
| TRS 8.8.3.4 | Verify on an actual or simulated sustained loss of voltage signal on 69 kV substation 4.16 kV bus 1:<br><br>a. 69 kV substation 4.16 kV bus 1 automatically disconnects from offsite power; and<br><br>b. Both SDGs automatically start from standby condition, synchronize, and:<br><br>1. Automatically connect to the 69 kV substation 4.16 kV bus 1;<br><br>2. Automatically operate unloaded for ≥ 5 minutes; and<br><br>3. Automatically maintain nominal steady state voltage ≥ 3910 V and ≤ 4400 V, and nominal frequency ≥ 59.4 Hz and ≤ 60.5 Hz. | 18 months |
| TRS 8.8.3.5 | Verify that the Train A and Train B load conservation trip logic can be manually actuated and manually reset using the manual control switch in the control room. | 24 months |

8.8 ELECTRICAL POWER SYSTEMS

8.8.4 Manual Alternative Reserve Sources

TRO 8.8.4 The steady state bus voltage for the manual alternate reserve source shall be ≥ 91% of the nominal bus voltage.

----------NOTE----------
The manual alternate reserve source is shared with Unit 1.
---

APPLICABILITY: Whenever the manual alternate reserve source (69 kV) is connected to any bus or buses.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Bus voltage < 91% nominal. | A.1 Adjust load on the connected buses to maintain steady state bus voltage ≥ 91% limit. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.8.4.1 | No additional Surveillance Requirements other than those required by Technical Specification 3.8.1, “AC Sources Operating,” and 3.8.2, “AC Source Shutdown.” | In accordance with applicable Technical Specification SRs |

## 8.9 REFUELING OPERATIONS

### 8.9.1 Communications

TRO 8.9.1 Direct communications shall be maintained between the control room and personnel at the refueling station.

APPLICABILITY: During CORE ALTERATIONS.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Direct communications not maintained. | A.1 Suspend CORE ALTERATIONS. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.9.1.1 | Verify direct communication between the control room and personnel at the refueling station. | 12 hours |

8.9 REFUELING OPERATIONS

8.9.2 Decay Time

TRO 8.9.2 The reactor shall be subcritical for ≥ 120 hours.

APPLICABILITY: During movement of irradiated fuel assemblies in the reactor vessel.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Reactor subcritical for less than the required time. | A.1 Suspend movement of irradiated fuel assemblies in the reactor vessel. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.9.2.1 | Verify the reactor has been subcritical for the required time. | Once each refueling prior to initial movement of irradiated fuel assemblies in the reactor vessel |

8.9 REFUELING OPERATIONS

8.9.3 Deleted

8.9 REFUELING OPERATIONS

8.9.4 Deleted

8.10 NFPA 805

8.10.1 Charging System

TRO 8.10.1 One Unit 1 charging flow path associated with support of the Unit 2 shutdown function shall be available.

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

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Required Unit 1 charging flow path not available. | A.1 | Restore required Unit 1 charging flow path to available status. | 7 days |
| B. Required Action and associated Completion Time of Condition A not met. | B.1 | Provide equivalent shutdown capability. | Immediately |
| | AND | | |
| | B.2 | Restore required Unit 1 charging flow path to available status. | 60 days |
| C. Required Action and associated Completion Time of Condition B not met. | C.1 | Be in MODE 3 | 12 hours |
| | AND | | |
| | C.2 | Be in MODE 4 | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.10.1.1 | Cycle charging line cross-tie valves from Unit 1 through full travel. Following cycling, verify charging line cross-tie valves are in the closed position. | 24 months |

8.10 NFPA 805

8.10.2 Auxiliary Feedwater (AFW) System

TRO 8.10.2 One Unit 1 AFW flow path in support of Unit 2 shutdown functions shall be available.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Required Unit 1 AFW flow path not available. | A.1 | Restore required Unit 1 AFW flow path to available status. | 7 days |
| B. Required Action and associated Completion Time of Condition A not met. | B.1 | Provide equivalent shutdown capability. | Immediately |
| | AND | | |
| | B.2 | Restore required Unit 1 AFW flow path to available status. | 60 days |
| C. Required Action and associated Completion Time of Condition B not met. | C.1 | Be in MODE 3 | 12 hours |
| | AND | | |
| | C.2 | Be in MODE 4 | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.10.2.1 | Cycle AFW cross-tie valves from Unit 1 through full travel. Following cycling, verify AFW cross-tie valves are in the closed position. | 24 months |

8.10 NFPA 805

8.10.3 Component Cooling Water (CCW) System

TRO 8.10.3 One Unit 1 CCW flow path in support of Unit 2 shutdown functions shall be available.

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

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Required Unit 1 CCW flow path not available. | A.1 | Restore required Unit 1 CCW flow path to available status. | 7 days |
| B. Required Action and associated Completion Time of Condition A not met. | B.1 | Provide equivalent shutdown capability. | Immediately |
| | AND | | |
| | B.2 | Restore required Unit 1 CCW flow path to available status. | 60 days |
| C. Required Action and associated Completion Time of Condition B not met. | C.1 | Be in MODE 3 | 12 hours |
| | AND | | |
| | C.2 | Be in MODE 4 | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.10.3.1 | Cycle CCW cross-tie valves from Unit 1 through full travel. Following cycling, verify CCW cross-tie valves are in the closed position. | 24 months |

8.10 NFPA 805

8.10.4 Essential Service Water (ESW) System

TRO 8.10.4 One Unit 1 ESW flow path in support of Unit 2 shutdown functions shall be available.

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

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. Required Unit 1 ESW flow path not available. | A.1 | Return required Unit 1 ESW flow path to available status. | 7 days |
| B. Required Action and Associated Completion Time of Condition A not met. | B.1 | Provide equivalent shutdown capability. | Immediately |
| | AND | | |
| | B.2 | Restore required Unit 1 ESW flow path to available status. | 60 Days |
| C. Required Action and Associated Completion Time of Condition B not met. | C.1 | Be in MODE 3 | 12 hours |
| | AND | | |
| | C.2 | Be in MODE 4 | 36 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.10.4.1 | ----------NOTE----------<br>Only required to be met for closed ESW cross-tie valves. | |
| | Cycle ESW cross-tie valves from Unit 1 through full travel. | 92 days |

8.10 NFPA 805

8.10.5 Steam Generator (SG) Power Operated Relief Valve (PORV) Backup Nitrogen System

TRO 8.10.5 The SG PORV Backup Nitrogen System shall be available to at least two SG PORVs.

APPLICABILITY: MODES 1, 2, and 3
MODE 4 when steam generators are relied upon for heat removal.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Required SG PORV Backup Nitrogen System not available to at least two SG PORVs. | A.1 Restore required SG PORV Backup Nitrogen System to available status. | 14 days |
| B. Required Action and associated Completion Time of Condition A not met. | B.1 Provide an alternate method for SG PORV backup operation. | 24 hours |
| C. Required Action and associated Completion Time of Conditions A and B not met. | C.1 Enter TRO 8.0.3. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.10.5.1 | Verify adequate backup nitrogen inventory. | Daily |

8.10 NFPA 805

8.10.6 Pressurizer Power Operated Relief Valve (PORV) Backup Air System

TRO 8.10.6 The Backup Air System shall be available to at least one Pressurizer PORV.

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

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Required Pressurizer PORV Backup Air System not available to at least one Pressurizer PORV. | A.1 Restore required Pressurizer PORV Backup Air System to available status. | 14 days |
| B. Required Action and associated Completion Time of Condition A not met. | B.1 Provide an alternate method for pressurizer PORV backup operation. | 24 hours |
| C. Required Action and associated Completion Time of Conditions A and B not met. | C.1 Enter TRO 8.0.3. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.10.6.1 | Verify adequate backup air bottle pressure. | Daily |

## 8.11 FLEX PORTABLE EQUIPMENT, PLANT CONNECTION POINTS, AND PLANT COMPONENTS

### 8.11.1 FLEX Portable Equipment Availability

TRO 8.11.1 The FLEX portable equipment specified in the FLEX Equipment Program shall be available.

APPLICABILITY: As specified in the FLEX Equipment Program

----------NOTE----------
If a FLEX Strategy specified in the FLEX Equipment Program is unavailable due to the unavailability of installed plant equipment, the associated FLEX portable equipment is not required to be available.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more required FLEX portable components specified in the FLEX Equipment Program not available. | A.1 Restore the required FLEX portable component(s) to availability. | 90 days |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. Action A.1 completion time not met.<br><br>OR<br><br>One or more required FLEX portable components specified in the FLEX Equipment Program expected to be unavailable for more than 90 days.<br><br>OR<br><br>One or more required FLEX portable components specified in the FLEX Equipment Program not available during a forecast site specific external event. | B.1 Initiate action to supplement the required FLEX portable component with alternate suitable equipment. | Immediately |
| C. One or more required FLEX portable components specified in the FLEX Equipment Program as required for “N” capability not available. | C.1 Initiate actions to restore site FLEX “N” capability.<br><br>AND<br><br>C.2 Implement compensatory measures (e.g., use of alternate suitable equipment or supplemental personnel). | 24 hours<br><br>72 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|---|
| None | Not Applicable |

## 8.11 FLEX PORTABLE EQUIPMENT, PLANT CONNECTION POINTS, AND PLANT COMPONENTS

### 8.11.2 FLEX Plant Connection Points and Plant Components, and FLEX Plant Connection Points and Plant Components Combined with FLEX Portable Equipment

TRO 8.11.2 The FLEX plant connection points and plant components specified in the FLEX Equipment Program shall be available.

APPLICABILITY: As specified in the FLEX Equipment Program

ACTIONS

----------NOTE----------

Condition entry is not required for the unavailability of plant components covered by Technical Specifications or other TRM sections. Plant components not covered by Technical Specifications or other TRM sections are identified in the FLEX Equipment Program.

---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more required FLEX primary or alternate plant connection point(s) or plant components as specified in the FLEX Equipment Program not available. | A.1 Verify the associated alternate plant or primary plant connection points(s) and plant components are available.<br><br>AND<br><br>A.2 Restore the required FLEX primary or alternate plant connection point(s) or plant components to availability. | Immediately<br><br>90 days |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. One or more required FLEX primary or alternate plant connection point(s) or plant components as specified in FLEX Equipment Program expected to be unavailable for more than 90 days. | B.1 Implement compensatory measures (e.g., use of alternate suitable equipment or supplemental personnel). | Prior to expiration of the 90 day Completion Time |
| C. Action A.1 or B.1 Completion Time not met. | C.1 Initiate action to implement compensatory measures (e.g., use of alternate suitable equipment or supplemental personnel). | Immediately |
| D. Any combination of FLEX plant connection points, plant components, and FLEX Portable Equipment unavailable such that "N" capability is not available. | D.1 Initiate actions to restore the affected "N" capability to available status.<br><br>AND<br><br>D. 2 Implement compensatory measures (e.g., use of alternate suitable equipment or supplemental personnel). | 24 hours<br><br>72 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|---|
| None | Not Applicable |

## 8.11 FLEX PORTABLE EQUIPMENT, PLANT CONNECTION POINTS, AND PLANT COMPONENTS

### 8.11.3 Boric Acid Reserve Tank and Boric Acid Storage Tank for FLEX Strategies

TRO 8.11.3 The Boric Acid Reserve Tank (BART) and a Boric Acid Storage Tank (BAST) shall be available.

----------NOTE----------
The BART is shared with Unit 1.

A separate BAST is assigned to each unit.
---

APPLICABILITY: MODES 1 and 2
MODES 3 and 4 with RCS boron concentration less than the minimum boron concentration required for Mode 5.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. BART not available. | A.1 Verify a BAST and associated connection point(s) and plant components are available.<br><br>AND<br><br>A.2 Restore the BART to availability. | Immediately<br><br><br><br>90 days |
| B. BART expected to be unavailable for more than 90 days. | B.1 Implement compensatory measures (e.g., use of alternate suitable equipment, or supplemental personnel). | Prior to expiration of the 90 day Completion Time |
| C. BAST not available. | C.1 Verify the BART and associated connection point(s) and plant components are available.<br><br>AND<br><br>C.2 Restore a BAST to availability. | Immediately<br><br><br><br>90 days |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| D. BAST expected to be unavailable for more than 90 days. | D.1 Implement compensatory measures (e.g., use of alternate suitable equipment, or supplemental personnel). | Prior to expiration of the 90 day Completion Time. |
| E. Action A.1, A.2, B.1, C.1, C.2, or D.1 Completion Time not met. | E.1 Initiate action to implement compensatory measures (e.g., use of alternate suitable equipment or supplemental personnel). | Immediately |
| F. Any combination of BART unavailability, plant connection point, plant component, and FLEX Portable Equipment unavailability such that "N" capability is not available. | F.1 Initiate actions to restore the affected "N" capability to available status.<br><br>AND<br><br>F.2 Implement compensatory measures (e.g., use of alternate suitable equipment or supplemental personnel). | 24 hours<br><br>72 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.11.3.1 | Verify that the boron concentration of the water in the BART is ≥ 6,550 ppm and ≤ 7,300 ppm. | 60 days |
| TRS 8.11.3.2 | Verify that the boron concentration of the water in the BAST assigned to Unit 2 is ≥ 6,550 ppm and ≤ 7,300 ppm. | 60 days |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| ----------NOTE---------- The BART usable water volume limit is not required to be met in Modes 3 and 4 when or after it is injected into the Reactor Coolant System to meet the SDM requirements of LCO 3.1.1 ---------- | | |
| TRS 8.11.3.3 | Verify the level of borated water in the BART is as follows:<br><br>a. ≥ 36% if both Unit 1 and Unit 2 are in either of the following conditions:<br><br>MODES 1 and 2<br><br><u>OR</u><br><br>MODES 3 and 4 with RCS boron concentration less than the minimum boron concentration required for Mode 5.<br><br>b. ≥ 26% if only Unit 2 is in:<br><br>MODES 1 and 2<br><br><u>OR</u><br><br>MODES 3 and 4 with RCS boron concentration less than the minimum boron concentration required for Mode 5. | 7 days |
| ----------NOTE---------- The BAST usable water volume limit is not required to be met in Modes 3 and 4 when or after it is injected into the Reactor Coolant System to meet the SDM requirements of LCO 3.1.1 ---------- | | |
| TRS 8.11.3.4 | Verify the level of borated water in the BAST assigned to Unit 2 is ≥ 84%. | 7 days |

## 8.11 FLEX PORTABLE EQUIPMENT, PLANT CONNECTION POINTS, AND PLANT COMPONENTS

### 8.11.4 Accumulators for FLEX Strategies

TRO 8.11.4 Three accumulators shall be available.

APPLICABILITY: MODE 5 with Steam Generators Not Available
MODE 6 with Refueling Cavity not flooded to ≥ 23 ft. above the top of the reactor vessel flange.
MODE 6 with Refueling Cavity flooded ≥ 23 ft. above the top of the reactor vessel flange, with reactor internals installed, and the reactor has been shut down for < 96 hours.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Fewer than three accumulators available. | A.1 Initiate action to restore three accumulators to availability.<br><br>AND<br><br>A.2 Implement compensatory measures (e.g., use of alternate suitable equipment, or supplemental personnel). | 24 hours<br><br><br><br>72 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.11.4.1 | Verify borated water volume in each required accumulator is ≥ 921 $ft^3$ and ≤ 971 $ft^3$. | 12 hours |
| TRS 8.11.4.2 | Verify nitrogen cover pressure in each required accumulator is ≥ 131.4 psig and ≤ 658 psig. | 12 hours |

(continued)

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| TRS 8.11.4.3 | Verify boron concentration of the water in each required accumulator is ≥ 2400 ppm and ≤ 2600 ppm. | 31 days<br><br>AND<br><br>--------NOTE--------<br>Only required to be performed for affected accumulators<br>----------<br><br>Once within 6 hours after each solution volume increase of ≥ 13 $ft^3$ that is not the result of addition of water with boron concentration ≥ 2400 ppm and ≤ 2600 ppm |

## 8.12 SPENT FUEL POOL BEYOND DESIGN BASES LEVEL INSTRUMENTS

### 8.12.1 Spent Fuel Pool Beyond Design Bases Level Instruments

TRO 8.12.1 Two spent fuel pool level instruments shall be available.

APPLICABILITY: At all times.

ACTIONS

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One beyond design bases spent fuel pool level instrument not available. | A.1 Restore spent fuel pool level instrument to available status. | 90 days |
| B. Action A.1 Completion Time not met,<br><br>OR<br><br>One beyond design bases spent fuel pool level instrument expected to be unavailable for more than 90 days. | B.1 Initiate actions to implement compensatory actions. (e.g., use of alternate suitable equipment or supplemental personnel). | Immediately |
| C. Two beyond design bases spent fuel pool level instruments not available. | C.1 Initiate actions to restore one instrument to available status.<br><br>AND<br><br>C.2 Implement compensatory actions.(e.g., use of alternate suitable equipment or supplemental personnel). | 24 hours<br><br>72 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|---|
| None | Not Applicable |

# 10.0 ADMINISTRATIVE CONTROLS

## 10.1 Site Fire Brigade

A site fire brigade of at least 5 members shall be maintained onsite at all times. The fire brigade shall not include members of the minimum shift crew necessary for safe shutdown of the unit or any personnel required for other essential functions during a fire emergency.

The composition of the fire brigade may be less than the minimum requirements for a period of time not to exceed 2 hours, in order to accommodate unexpected absence provided immediate action is taken to fill the required positions.

# 10.0 ADMINISTRATIVE CONTROLS

## 10.2 Facility Staff

Each on duty shift shall be composed of at least the minimum shift crew composition shown in Table 10.2-1.

The Shift Manager and Unit Supervisor shall hold a Senior Operator License.

Table 10.2-1 (page 1 of 1)
Minimum Shift Crew Composition

| LICENSE CATEGORY | APPLICABLE MODES | |
|---|---|---|
| | 1, 2, 3, & 4 | 5 & 6 |
| SM | 1[(a)] | 1[(a)(b)] |
| SOL | 1 | None |
| OL | 2 | 1 |

(a) Shared with Cook Nuclear Plant Unit 1.

(b) Does not include the licensed Senior Operator – CA supervising CORE ALTERATIONS.

10.0 ADMINISTRATIVE CONTROLS

10.5 Programs

10.5.2 DELETED

10.5.6 Inservice Testing Program

PURPOSE:

This program provides controls for inservice testing of ASME Code Class 1, 2, and 3 pumps and valves. The ASME OM Code describes the details of this program. There are no additional Technical Requirements Manual requirements.

10.5.9 Ventilation Filter Testing Program (VFTP)

PURPOSE:

Technical Specification 5.5.9, “Ventilation Filter Testing Program (VFTP)” provides a program to test the Engineered Safety Feature (ESF) filter ventilation systems. Additionally, the TRM requires testing of the laboratory sample, taken in Technical Specification 5.5.9.c, within 31 days of removal.

DESCRIPTION:

c. The laboratory sample shall be verified within 31 days after removal.

10.5 Programs

10.5.14 DELETED

10.5.16 Iodine Monitoring Program

PURPOSE:

Technical Requirements Manual 10.5.16, “Iodine Monitoring Program,” ensures that a program is in place to accurately determine the airborne Iodine concentration in vital areas under accident conditions.

DESCRIPTION:

The program shall ensure that the capability to accurately determine the airborne concentration in vital areas under accident conditions. The program shall include the following:

1. Training of personnel;

2. Procedures for monitoring; and

3. Provision for maintenance of sampling and analysis equipment.

Table 8.3.1-2 (page 1 of 5)
Reactor Trip System Instrumentation

| FUNCTION | TRIP SETPOINTS |
|---|---|
| 1. Manual Reactor Trip | NA |
| 2. Power Range Neutron Flux | |
| a. High | ≤ 109% RTP |
| b. Low | ≤ 25% RTP |
| 3. Power Range Neutron Flux – High Positive Rate | ≤ 5% RTP with a time constant ≥ 2 sec |
| 4. Intermediate Range Neutron Flux | ≤ 25% RTP |
| 5. Source Range Neutron Flux | ≤ 1.0 E5 cps |
| 6. Overtemperature ΔT | See Note 1 |
| 7. Overpower ΔT | See Note 2 |
| 8. Pressurizer Pressure | |
| a. Low | ≥ 1931 psig |
| b. High | ≤ 2406 psig |
| 9. Pressurizer Water Level - High | ≤ 93.3% of instrument span |
| 10. Reactor Coolant Flow - Low | ≥ 89.8% of Reactor Coolant System flow per loop[(a)] |

(continued)

(a) Reactor Coolant System flow per loop is ¼ Reactor Coolant System total flow rate specified in the Core Operating Limits Report.

Table 8.3.1-2 (page 2 of 5)
Reactor Trip System Instrumentation

| FUNCTION | TRIP SETPOINTS |
|---|---|
| 11. Reactor Coolant Pump (RCP) Breaker Position | NA |
| 12. Undervoltage RCPs | ≥ 2918.6 V |
| 13. Underfrequency RCPs | ≥ 57.05 Hz |
| 14. Steam Generator (SG) Water Level – Low Low | ≥ 20.8% of narrow range instrument span – each steam generator |
| 15. SG Water Level - Low | ≥ 25.1% of narrow range instrument span – each steam generator |
| Coincident with Steam Flow Feedwater Flow Mismatch | ≤ 1.47 E6 lb/hr steam flow at RTP |
| 16. Turbine Trip | |
| a. Low Fluid Oil Pressure | ≥ 800 psig |
| b. Turbine Stop Valve Closure | ≥ 1% open |
| 17. Safety Injection (SI) Input from Engineered Safety Features Actuation System (ESFAS) | NA |
| 18. Reactor Trip System Interlocks | |
| a. Intermediate Range Neutron Flux, P-6 | NA |
| b. Low Power Reactor Trips Block, P-7 | NA |
| c. Power Range Neutron Flux, P-8 | NA |
| d. Power Range Neutron Flux, P-10 | NA |
| e. Turbine First Stage Pressure, P-13 | ≤ 46.5 psig |

(continued)

Table 8.3.1-2 (page 3 of 5)
Reactor Trip System Instrumentation

| FUNCTION | TRIP SETPOINTS |
|---|---|
| 19. Reactor Trip Breakers (RTBs) | NA |
| 20. Reactor Trip Breaker Undervoltage and Shunt Trip Mechanisms | NA |
| 21. Automatic Trip Logic | NA |

Table 8.3.1-2 (page 4 of 5)
Reactor Trip System Instrumentation

Note 1: Overtemperature $\Delta T$

$$\Delta T \leq \Delta T_O \left\{ K_1 - K_2 \frac{(1+\tau_1 S)}{(1+\tau_2 S)} [T - T'] + K_3 (P - P') - f_1(\Delta I) \right\}$$

Where: $\Delta T$ is measured RCS $\Delta T$, °F.
$\Delta T_O$ is the indicated $\Delta T$ at RTP, °F.
S is the Laplace transform operator, $sec^{-1}$.
T is the measured RCS average temperature, °F.
T´ is the nominal $T_{avg}$ at RTP, ≤ 576.0°F.

P is the measured pressurizer pressure, psig
P´ is the nominal RCS operating pressure, ≥ 2235 psig

$\frac{(1+\tau_1 S)}{(1+\tau_2 S)}$ is the function generated by the lead-lag controller for dynamic compensation

$K_1 = 1.119$ $K_2 = 0.01331$ $K_3 = 0.00058$
$\tau_1 = 28$ sec $\tau_2 = 4$ sec

$f_1(\Delta I) =$ -3.5 {33% + ($q_t$ - $q_b$)} when $q_t - q_b \leq$ -33% RTP
0% of RTP when -33% RTP < $q_t - q_b \leq$ 6% RTP
1 {($q_t$ - $q_b$) - 6%} when $q_t - q_b >$ 6% RTP

Where $q_t$ and $q_b$ are percent RTP in the upper and lower halves of the core, respectively, and $q_t + q_b$ is the total THERMAL POWER in percent RTP.

Table 8.3.1-2 (page 5 of 5)
Reactor Trip System Instrumentation

Note 2: Overpower $\Delta T$

$$\Delta T \leq \Delta T_O \left\{ K_4 - K_5 \frac{\tau_3 S}{1+\tau_3 S} T - K_6 [T - T''] - f_2(\Delta I) \right\}$$

Where: $\Delta T$ is measured RCS $\Delta T$,°F.
$\Delta T_O$ is the indicated $\Delta T$ at RTP,°F.
S is the Laplace transform operator, $sec^{-1}$.
T is the measured RCS average temperature,°F.
T″ is the nominal $T_{avg}$ at RTP, ≤ 576.0°F.

$\frac{\tau_3 S}{1+\tau_3 S}$ is the function generated by the rate lag controller for $T_{avg}$ dynamic compensation

$K_4$ = 1.113

$K_5$ = 0.02/°F for increasing $T_{avg}$
0/°F for decreasing $T_{avg}$

$K_6$ = 0.00197/°F when T > T″
0/°F when T ≤ T″

$\tau_3$ = 10 sec

$f_2(\Delta I)$ = 0

Table 8.3.2-2 (page 1 of 4)
Engineered Safety Features Actuation System Instrumentation

| FUNCTION | TRIP SETPOINTS |
|---|---|
| 1. Safety Injection (SI) | |
| a. Manual Initiation | NA |
| b. Automatic Actuation Logic and Actuation Relays | NA |
| c. Containment Pressure - High | ≤ 1.16 psig |
| d. Pressurizer Pressure - Low | ≥ 1765 psig |
| e. Steam Line Pressure | |
| (1) Low | ≥ 481.5 psig |
| (2) High Differential Pressure Between Steam Lines | ≤ 100 psi |
| 2. Containment Spray | |
| a. Manual Initiation | NA |
| b. Automatic Actuation Logic And Actuation Relays | NA |
| c. Containment Pressure – High High | ≤ 2.96 psig |
| 3. Containment Isolation | |
| a. Phase A Isolation | |
| (1) Manual Initiation | NA |
| (2) Automatic Actuation Logic and Actuation Relays | NA |
| (3) SI Input from ESFAS | NA |

(continued)

Table 8.3.2-2 (page 2 of 4)
Engineered Safety Features Actuation System Instrumentation

| FUNCTION | TRIP SETPOINTS |
|---|---|
| 3. Containment Isolation (Continued) | |
| b. Phase B Isolation | |
| (1) Manual Initiation | NA |
| (2) Automatic Actuation Logic and Actuation Relays | NA |
| (3) Containment Pressure – High High | ≤ 2.96 psig |
| 4. Steam Line Isolation | |
| a. Manual Initiation | NA |
| b. Automatic Actuation Logic and Actuation Relays | NA |
| c. Containment Pressure – High High | ≤ 2.96 psig |
| d. Steam Line Pressure – Low | ≥ 481.5 psig |
| e. High Steam Line Flow in Two Steam Lines | (a) |
| Coincident with $T_{avg}$ – Low Low | ≥ 538.9°F |
| 5. Turbine Trip and Feedwater Isolation | |
| a. Automatic Actuation Logic and Actuation Relays | NA |
| b. SG Water Level – High High | ≤ 71.6% of narrow-range instrument span each steam generator |

(continued)

(a) Less than or equal to a function as defined as $\Delta P$ corresponding to 1.6 E6 lbs/hr between 0% and 20% load and then a $\Delta P$ increasing linearly from 1.6 E6 lbs/hr at 20% load to 4.5 E6 lbs/hr at 100% load

Table 8.3.2-2 (page 3 of 4)
Engineered Safety Features Actuation System Instrumentation

| FUNCTION | TRIP SETPOINTS |
|---|---|
| 5. Turbine Trip and Feedwater Isolation (Continued) | |
| c. SI Input From ESFAS | NA |
| 6. Auxiliary Feedwater | |
| a. Automatic Actuation Logic and Relays (Solid State Protection System) | NA |
| b. Automatic Actuation Logic and Actuation Relays (Balance of Plant ESFAS) | NA |
| c. SG Water Level – Low Low | ≥ 20.8% of narrow-range span each steam generator |
| d. SI Input from ESFAS | NA |
| e. Loss of Voltage | ≥ 3243.2 and ≤ 3266.4 V with 2 sec time delay |
| f. Undervoltage Reactor Coolant Pump | ≥ 2773.6 V each bus |
| g. Trip of all Main Feedwater Pumps | NA |
| 7. Containment Air Recirculation/Hydrogen Skimmer (CEQ) System | |
| a. Manual Initiation | NA |
| b. Automatic Actuation Logic and Actuation Relays | NA |
| c. Containment Pressure – High | ≤ 1.16 psig |

(continued)

Table 8.3.2-2 (page 4 of 4)
Engineered Safety Features Actuation System Instrumentation

| FUNCTION | TRIP SETPOINTS |
|---|---|
| 8. ESFAS Interlocks | |
| a. Reactor Trip, P-4 | NA |
| b. Pressurizer Pressure, P-11 | ≤ 1910.6 psig |
| c. $T_{avg}$ – Low Low, P-12 | ≥ 538.9°F |

Table 8.3.5-2 (page 1 of 1)
LOP DG Start Instrumentation

| FUNCTION | TRIP SETPOINTS |
|---|---|
| 1. Loss of Power | |
| a. Loss of Voltage | ≥ 3243.2 and ≤ 3266.4 V with a time delay of 2 seconds |
| b. Degraded Voltage | ≥ 3946.6 and ≤ 3967.8 V with a time delay of 9 seconds[(a)] |

(a) Coincident with a Steam Generator Water Level – Low Low signal or a Safety Injection signal.

Table 8.3.6-2 (page 1 of 1)
Containment Purge Supply and Exhaust System Isolation Instrumentation

| FUNCTION | TRIP SETPOINTS |
|---|---|
| 1. Manual Initiation | NA |
| 2. Automatic Actuation Logic and Actuation Relays | NA |
| 3. Containment Radiation | |
| a. Gaseous | NA |
| b. Particulate | NA |
| c. Area Radiation | NA |
| 4. Safety Injection (SI) Input from Engineered Safety Features Actuation System (ESFAS) | NA |

Table B-1 (page 1 of 1)
Reactor Coolant System (RCS) Pressure Isolation Valves (PIVs)

| VALVE NUMBER | VALVE SIZE (inches) | FUNCTION |
|---|---|---|
| 2-SI-170L2 | 10 | ECCS to Reactor Coolant Loop #2 Cold Leg |
| 2-RH-133 | 8 | RHR to Reactor Coolant Loop #2 Cold Leg |
| 2-SI-170L3 | 10 | ECCS to Reactor Coolant Loop #3 Cold Leg |
| 2-RH-134 | 8 | RHR to Reactor Coolant Loop #3 Cold Leg |

BASES

# B 8.0 TECHNICAL REQUIREMENT FOR OPERATION (TRO) APPLICABILITY

## BASES

| | |
|---|---|
| TROs | TRO 8.0.1 through TRO 8.0.5 establish the general requirements applicable to all TROs in Sections 8.1 through 8.10 and apply at all times, unless otherwise stated. |
| TRO 8.0.1 | TRO 8.0.1 establishes the Applicability statement within each individual Requirement as the requirement for when the TRO is required to be met (i.e., when the unit is in the MODES or other specified conditions of the Applicability statement of each Requirement). |
| TRO 8.0.2 | TRO 8.0.2 establishes that upon discovery of a failure to meet a TRO, the associated ACTIONS shall be met. The Completion Time of each Required Action for an ACTIONS Condition is applicable from the point in time that an ACTIONS Condition is entered. The Required Actions establish those remedial measures that must be taken within specified Completion Times when the requirements of a TRO are not met. This Requirement establishes that:<br><br>a. Completion of the Required Actions within the specified Completion Times constitute compliance with a Requirement; and<br><br>b. Completion of the Required Actions is not required when a TRO is met within the specified Completion Time, unless otherwise specified.<br><br>There are two basic types of Required Actions. The first type of Required Action specifies a time limit in which the TRO must be met. This time limit is the Completion Time to restore an inoperable system or component to OPERABLE status or to restore variables to within specified limits. If this type of Required Action is not completed within the specified Completion Time, a shutdown may be required to place the unit in a MODE or condition in which the Requirement is not applicable. (Whether stated as a Required Action or not, correction of the entered Condition is an action that may always be considered upon entering ACTIONS.) The second type of Required Action specifies the remedial measures that permit continued operation of the unit that is not further restricted by the Completion Time. In this case, compliance with the Required Actions provides an acceptable justification for continued operation. |

(continued)

BASES (continued)

TRO 8.0.2 (continued)

Completing the Required Actions is not required when a TRO is met or is no longer applicable, unless otherwise stated in the individual Requirement.

The nature of some Required Actions of some Conditions necessitates that, once the Condition is entered, the Required Actions must be completed even though the associated Conditions no longer exist. The individual TRO's ACTIONS specify the Required Actions where this is the case.

The Completion Times of the Required Actions are also applicable when a system or component is removed from service intentionally. The reasons for intentionally relying on the ACTIONS include, but are not limited to, performance of TRSs, preventive maintenance, corrective maintenance, or investigation of operational problems. Entering ACTIONS for these reasons must be done in a manner that does not compromise safety. Individual Requirements may specify a time limit for performing a TRS when equipment is removed from service or bypassed for testing. In this case, the Completion Times of the Required Actions are applicable when this time limit expires, if the equipment remains removed from service or bypassed.

When a change in MODE or other specified condition is required to comply with Required Actions, the unit may enter a MODE or other specified condition in which another Requirement becomes applicable. In this case, the Completion Times of the associated Required Actions would apply from the point in time that the new Requirement becomes applicable and the ACTIONS Condition(s) are entered.

TRO 8.0.3 TRO 8.0.3 establishes the actions that must be implemented when a TRO is not met and:

a. An associated Required Action and Completion Time is not met and no other Condition applies; or

(continued)

BASES (continued)

TRO 8.0.3 (continued)

b. The condition of the unit is not specifically addressed by the associated ACTIONS. This means that no combination of Conditions stated in the ACTIONS can be made that exactly corresponds to the actual condition of the unit. Sometimes, possible combinations of Conditions are such that entering TRO 8.0.3 is warranted; in such cases, the ACTIONS specifically state a Condition corresponding to such combinations and also that TRO 8.0.3 be entered immediately.

This TRO delineates the time limits for evaluating impacts on safety function and if the plant is in an unanalyzed condition, as well as time limits for establishing compensatory actions when operation cannot be maintained within the limits for safe operation as defined by the TRO and its action.

Upon entering TRO 8.0.3, 1 hour is allowed to initiate action to implement appropriate compensatory actions, to verify the unit is not in an unanalyzed condition, and to verify that a required safety function is not compromised. Within 12 hours, the Operation Director's approval of the compensatory actions and the plan for exiting TRO 8.0.3 must be obtained. The use and interpretation of specific times to complete the actions of TRO 8.0.3 are consistent with the discussion of Section 6.3, Completion Times.

When determining if the plant is in an unanalyzed condition and when determining if a required safety function is not compromised by the inoperabilities, Technical Specification requirements need to be considered.

The actions required in accordance with TRO 8.0.3 may be terminated and TRO 8.0.3 exited if any of the following occurs:

a. The TRO is now met;

b. A Condition exists for which the Required Actions have now been performed; or

c. ACTIONS exist that do not have expired Completion Times. These Completion Times are applicable from the point in time that the Condition is initially entered and not from the time TRO 8.0.3 is exited.

Exceptions to TRO 8.0.3 are addressed in the individual Requirements.

BASES (continued)

TRO 8.0.4

TRO 8.0.4 establishes limitations on changes in MODES or other specified conditions in the Applicability when a TRO is not met. It allows placing the unit in a MODE or other specified condition stated in that Applicability (e.g., the Applicability desired to be entered) when the unit conditions are such that the requirements of the TRO would not be met in accordance with TRO 8.0.4.a, TRO 8.0.4.b, or TRO 8.0.4.c.

TRO 8.0.4.a allows entry into a MODE or other specified condition in the Applicability with the TRO not met when the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time. Compliance with Required Actions that permit continued operation of the unit for an unlimited period of time in a MODE or other specified condition provides an acceptable level of safety for continued operation. This is without regard to the status of the unit before or after the MODE change. Therefore, in such cases, entry into a MODE or other specified condition in the Applicability may be made in accordance with the provisions of the Required Actions. TRO 8.0.4.b allows entry into a MODE or other specified condition in the Applicability with the TRO not met after performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate.

The risk assessment may use quantitative, qualitative, or blended approaches, and the risk assessment will be conducted using the plant program, procedures, and criteria in place to implement 10 CFR 50.65(a)(4), which requires that risk impacts of maintenance activities to be assessed and managed. The risk assessment, for the purposes of TRO 8.0.4.b, must take into account all inoperable Technical Specification and Technical Requirements Manual equipment regardless of whether the equipment is included in the normal 10 CFR 50.65(a)(4) risk assessment scope. The risk assessments will be conducted using the procedures and guidance endorsed by Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants." Regulatory Guide 1.182 endorses the guidance in Section 11 of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." These documents address general guidance for conduct of the risk assessment, quantitative and qualitative guidelines for establishing risk management actions, and example risk management actions. These include actions to plan and conduct other activities in a manner that controls overall risk, increased risk awareness by shift and management personnel, actions to reduce the duration of the condition, actions to minimize the magnitude of risk increases (establishment of backup success paths or compensatory

(continued)

BASES (continued)

TRO 8.0.4 (continued)

measures), and determination that the proposed MODE change is acceptable. Consideration should also be given to the probability of completing restoration such that the requirements of the TRO would be met prior to the expiration of ACTIONS Completion Times that would require exiting the Applicability.

TRO 8.0.4.b may be used with single, or multiple systems and components unavailable. NUMARC 93-01 provides guidance relative to consideration of simultaneous unavailability of multiple systems and components.

The results of the risk assessment shall be considered in determining the acceptability of entering the MODE or other specified condition in the Applicability, and any corresponding risk management actions. The TRO 8.0.4.b risk assessments do not have to be documented.

The Technical Requirements Manual allows continued operation with equipment unavailable in MODE 1 for the duration of the Completion Time. Since this is allowable, and since in general the risk impact in that particular MODE bounds the risk of transitioning into and through the applicable MODES or other specified conditions in the Applicability of the TRO, the use of the TRO 8.0.4.b allowance should be generally acceptable, as long as the risk is assessed and managed as stated above. However, there is a small subset of systems and components that have been determined to be more important to risk and use of the TRO 8.0.4.b allowance is prohibited. The TROs governing these system and components contain Notes prohibiting the use of TRO 8.0.4.b by stating that TRO 8.0.4.b is not applicable.

TRO 8.0.4.c allows entry into a MODE or other specified condition in the Applicability with the TRO not met based on a Note in the Specification which states TRO 8.0.4.c is applicable. These specific allowances permit entry into MODES or other specified conditions in the Applicability when the associated ACTIONS to be entered do not provide for continued operation for an unlimited period of time and a risk assessment has not been performed. This allowance may apply to all the ACTIONS or to a specific Required Action of a requirement. The risk assessments performed to justify the use of TRO 8.0.4.b usually only consider systems and components. For this reason, TRO 8.0.4.c is typically applied to requirements which describe values and parameters.

The provisions of this TRO should not be interpreted as endorsing the failure to exercise the good practice of restoring systems or components to OPERABLE status before entering an associated MODE or other specified condition in the Applicability.

(continued)

BASES (continued)

TRO 8.0.4 (continued)

The provisions of TRO 8.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS. In addition, the provisions of TRO 8.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that result from any unit shutdown. In this context, a unit shutdown is defined as a change in MODE or other specified condition in the Applicability associated with transitioning from MODE 1 to MODE 2, MODE 2 to MODE 3, MODE 3 to MODE 4, and MODE 4 to MODE 5.

Upon entry into a MODE or other specified condition in the Applicability with the TRO not met, TRO 8.0.1 and TRO 8.0.2 require entry into the applicable Conditions and Required Action until the Condition is resolved, until the TRO is met, or until the unit is not within the Applicability of the Technical Requirements Manual requirement.

TRSs do not have to be performed on the associated inoperable equipment (or on variables outside the specified limits), as permitted by TRS 8.0.1. Therefore, utilizing TRO 8.0.4 is not a violation of TRS 8.0.1 or TRS 8.0.4 for any TRSs that have not been performed on inoperable equipment. However, TRSs must be met to ensure OPERABILITY prior to declaring the associated equipment OPERABLE (or variable within limits) and restoring compliance with the affected TRO.

TRO 8.0.5

TRO 8.0.5 establishes the allowance for restoring equipment to service under administrative controls when it has been removed from service or declared inoperable to comply with ACTIONS. The sole purpose of this Requirement is to provide an exception to TRO 8.0.2 (e.g., to not comply with the applicable Required Action(s)) to allow the performance of required testing to demonstrate:

a. The OPERABILITY of the equipment being returned to service; or

b. The OPERABILITY of other equipment.

The administrative controls ensure the time the equipment is returned to service in conflict with the requirements of the ACTIONS is limited to the time absolutely necessary to perform the required testing to demonstrate OPERABILITY. This Requirement does not provide time to perform any other preventive or corrective maintenance.

# B 8.0 TECHNICAL REQUIREMENTS SURVEILLANCE (TRS) APPLICABILITY

BASES

| | |
|---|---|
| TRSs | TRS 8.0.1 through TRS 8.0.4 establish the general requirements applicable to all Requirements in Sections 8.1 through 8.10 and apply at all times, unless otherwise stated. |
| TRS 8.0.1 | TRS 8.0.1 establishes the requirement that TRSs must be met during the MODES or other specified conditions in the Applicability for which the requirements of the TROs apply, unless otherwise specified in the individual TRSs. This TRS is to ensure that TRSs are performed to verify the OPERABILITY of systems and components, and that variables are within specified limits. Failure to meet a TRS within the specified Frequency, in accordance with TRS 8.0.2, constitutes a failure to meet a TRO. Surveillances may be performed by means of any series of sequential, overlapping, or total steps provided the entire Surveillance is performed within the specified Frequency.<br><br>Systems and components are assumed to be OPERABLE when the associated TRSs have been met. Nothing in this TRS, however, is to be construed as implying that systems or components are OPERABLE when:<br><br>a. The systems or components are known to be inoperable, although still meeting the TRSs; or<br><br>b. The requirements of the TRS(s) are known not to be met between required TRS performances.<br><br>TRSs do not have to be performed when the unit is in a MODE or other specified condition for which the requirements of the associated TRO are not applicable, unless otherwise specified.<br><br>Unplanned events may satisfy the requirements (including applicable acceptance criteria) for a given TRS. In this case, the unplanned event may be credited as fulfilling the performance of the TRS. This allowance includes those TRSs whose performance is normally precluded in a given MODE or other specified condition.<br><br>TRSs, including TRSs invoked by Required Actions, do not have to be performed on inoperable equipment because the ACTIONS define the remedial measures that apply. TRSs have to be met and performed in accordance with TRS 8.0.2, prior to returning equipment to OPERABLE status. |

(continued)

BASES (continued)

TRS 8.0.1 (continued)

Upon completion of maintenance, appropriate post maintenance testing is required to declare equipment OPERABLE. This includes ensuring applicable TRSs are not failed and their most recent performance is in accordance with TRS 8.0.2. Post maintenance testing may not be possible in the current MODE or other specified conditions in the Applicability due to the necessary unit parameters not having been established. In these situations, the equipment may be considered OPERABLE provided testing has been satisfactorily completed to the extent possible and the equipment is not otherwise believed to be incapable of performing its function. This will allow operation to proceed to a MODE or other specified condition where other necessary post maintenance testing can be completed.

TRS 8.0.2

TRS 8.0.2 establishes the requirements for meeting the specified Frequency for TRSs and any Required Action with a Completion Time that requires the periodic performance of the Required Action on a “once per . . .” interval.

TRS 8.0.2 permits a 25% extension of the interval specified in the Frequency. This extension facilitates TRS scheduling and considers plant operating conditions that may not be suitable for conducting the TRS (e.g., transient conditions or other ongoing TRS or maintenance activities).

The 25% extension does not significantly degrade the reliability that results from performing the TRS at its specified Frequency. This is based on the recognition that the most probable result of any particular TRS being performed is the verification of conformance with the TRSs. The exception to TRS 3.0.2 are those TRSs for which the 25% extension of the interval specified in the Frequency does not apply. These exceptions are stated in the individual TRSs. The requirements of regulations take precedence over the TRM. The TRM cannot in and of itself extend a test interval specified in the regulations.

As stated in TRS 8.0.2, the 25% extension also does not apply to the initial portion of a periodic Completion Time that requires performance on a “once per . . .” basis. The 25% extension applies to each performance after the initial performance. The initial performance of the Required Action, whether it is a particular TRS or some other remedial action, is considered a single action with a single Completion Time. One reason for not allowing the 25% extension to this Completion Time is that such an action usually verifies that no loss of function has occurred by checking

(continued)

BASES (continued)

TRS 8.0.2 (continued)

the status of redundant or diverse components or accomplishes the function of the inoperable equipment in an alternative manner.

The provisions of TRS 8.0.2 are not intended to be used repeatedly merely as an operational convenience to extend TRS intervals (other than those consistent with refueling intervals) or periodic Completion Time intervals beyond those specified.

TRS 8.0.3

TRS 8.0.3 establishes the flexibility to defer declaring affected equipment inoperable or an affected variable outside the specified limits when a TRS has not been completed within the specified Frequency. A delay period of up to 24 hours or up to the limit of the specified Frequency, whichever is greater, applies from the point in time it is discovered that the TRS has not been performed in accordance with TRS 8.0.2, and not at the time that the specified frequency was not met.

This delay period provides adequate time to complete TRSs that have been missed. This delay period permits the completion of a TRS before complying with Required Actions or other remedial measures that might preclude completion of the TRS.

The basis for this delay period includes consideration of unit conditions, adequate planning, availability of personnel, the time required to perform the TRS, the safety significance of the delay in completing the required TRS, and the recognition that the most probable result of any particular TRS being performed is the verification of conformance with the requirements. When a TRS with a Frequency based not on time intervals, but upon specified unit conditions or operational situations (e.g., prior to entering MODE 1 after each fueling loading), is discovered not to have been performed when specified, TRS 8.0.3 allows the full delay period of up to the specified frequency to perform the TRS. However, since there is not a time interval specified, the missed TRS should be performed at the first reasonable opportunity. TRS 8.0.3 provides a time limit for and allowances for, the performance of, TRSs that become applicable as a consequence of MODE changes imposed by Required Actions.

Failure to comply with specified Frequencies for TRSs is expected to be an infrequent occurrence. Use of the delay period established by TRS 8.0.3 is a flexibility which is not intended to be used as an operational convenience to extend TRS intervals. While up to 24 hours or the limit of the specified Frequency is provided to perform the missed

(continued)

BASES (continued)

TRS 8.0.3 (continued)

Surveillance, it is expected that the missed TRS will be performed at the first reasonable opportunity. The determination of the first reasonable opportunity should include consideration of the impact on plant risk (from delaying the TRS as well as any plant configuration changes required or shutting the plant down to perform the TRS) and impact on any analysis assumptions, in addition to unit conditions, planning, availability of personnel, and the time required to perform the TRS. This risk impact should be managed through the program in place to implement 10 CFR 50.65(a)(4) and its implementation guidance Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants." This Regulatory Guide addresses consideration of temporary and aggregate risk impacts, determination of risk management action thresholds, and risk management action up to and including plant shutdown. The missed Surveillance should be treated as an emergent condition as discussed in the Regulatory Guide. The risk evaluation may use quantitative, qualitative, or blended methods. The degree of depth and rigor of the evaluation should be commensurate with the importance of the component. Missed TRSs for important components should be analyzed quantitatively. If the results of the risk evaluation determine the risk increase is significant this evaluation should be used to determine the safest course of action. All missed TRSs will be placed in the licensee's Corrective Action Program.

If a TRS is not completed within the allowed delay period, then the equipment is considered inoperable or the variable then is considered outside the specified limits and the Completion Times of the Required Actions for the applicable TRO Conditions begin immediately upon expiration of the delay period. If a TRS is failed within the delay period, then the equipment is inoperable, or the variable is outside the specified limits and the Completion Times of the Required Actions for the applicable TRO Conditions begin immediately upon the failure of the TRS.

Completion of the TRS within the delay period allowed by this TRS, or within the Completion Time of the ACTIONS, restores compliance with TRS 8.0.1.

TRS 8.0.4 TRS 8.0.4 establishes the requirement that all applicable TRSs must be met before entry into a MODE or other specified condition in the Applicability.

(continued)

BASES (continued)

TRS 8.0.4 (continued)

This TRS ensures that system and component OPERABILITY requirements and variable limits are met before entry into MODES or other specified conditions in the Applicability for which these system and components ensure safe operation of the unit. The provisions of this TRS should not be interpreted as endorsing the failure to exercise the good practice of restoring systems or components to OPERABLE status before entering an associated MODE or other specified condition in the Applicability.

A provision is included to allow entry into a MODE or other specified condition in the Applicability when a TRO is not met due to TRS not being met in accordance with TRO 8.0.4.

However, in certain circumstances, failing to meet a TRS will not result in TRS 8.0.4 restricting a MODE change or other specified condition change. When a system, subsystem, division, component, device, or variable is inoperable or outside its specified limits, the associated TRS(s) are not required to be performed, per TRS 8.0.1, which states that TRSs do not have to be performed on inoperable equipment. When equipment is inoperable, TRS 8.0.4 does not apply to the associated TRS(s) since the requirement for the TRS(s) to be performed is removed. Therefore, failing to perform the TRSs within the specified Frequency does not result in a TRS 8.0.4 restriction to changing MODES or other specified conditions of the Applicability. However, since the TRO is not met in this instance, TRO 8.0.4 will govern any restrictions that may (or may not) apply to MODE or other specified condition changes. TRS 8.0.4 does not restrict changing MODES or other specified conditions of the Applicability when a Surveillance has not been performed within the specified Frequency, provided the requirement to declare the TRO not met has been delayed in accordance with TRS 8.0.3.

The provisions of TRS 8.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that are required to comply with ACTIONS. In addition, the provisions of TRS 8.0.4 shall not prevent changes in MODES or other specified conditions in the Applicability that result from any unit shutdown. In this context, a unit shutdown is defined as a change in MODE or other specified condition in the Applicability associated with transitioning from MODE 1 to MODE 2, MODE 2 to MODE 3, MODE 3 to MODE 4, and MODE 4 to MODE 5.

(continued)

BASES (continued)

TRS 8.0.4 (continued)

The precise requirements for performance of TRSs are specified such that exceptions to TRS 8.0.4 are not necessary. The specific time frames and conditions necessary for meeting the TRSs are specified in the Frequency, in the TRS, or both. This allows performance of TRSs when the prerequisite condition(s) specified in a TRS procedure require entry into the MODE or other specified condition in the Applicability of the associated TRO prior to the performance or completion of a TRS. A TRS that could not be performed until after entering the TRO Applicability would have its Frequency specified such that it is not "due" until the specific conditions needed are met. Alternately, the TRS may be stated in the form of a Note as not required (to be met or performed) until a particular event, condition, or time has been reached. Further discussion of the specific formats of TRSs' annotation is found in Section 6.4, Frequency.

8.1 REACTIVITY CONTROL SYSTEMS

B 8.1.1 Boration System - Operating

Bases

The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include 1) borated water sources, 2) charging pumps, 3) separate flow paths, and 4) boric acid transfer pumps.

With the RCS average temperature above 350°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

A note has been added to TRO 8.1.1 that requires the charging pump in the RWST flow path to be separate from the charging pump in the boric acid tank flow path. The purpose of this note is to ensure that two separate charging pumps are OPERABLE to support boration capability with the unit in MODES 1-3.

The boration capability of either system is sufficient to provide the required SHUTDOWN MARGIN from all operating conditions after xenon decay and cooldown to 350°F. The maximum expected boration capability, usable volume requirement, is 8500 gallons of 6550 ppm borated water from the boric acid storage tanks for providing required SHUTDOWN MARGIN after xenon decay and cooldown to 547°F and additional borated water from a second boric acid tank, or batching tank, or refueling water storage tank for further cooldown to 350°F. With the refueling water storage tank as the only source, based on conservative calculations, a maximum of 99598 gallons of 2400 ppm borated water is required.

During performance of TRS 8.1.1.7, the actual or simulated signal shall be from a RWST refueling water sequencing signal.

8.1 REACTIVITY CONTROL SYSTEMS

B 8.1.2 Boration System - Shutdown

Bases

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The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include 1) borated water sources, 2) charging pumps, 3) separate flow paths, and 4) boric acid transfer pumps.

With the RCS average temperature below 200°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity change in the event the single injection system becomes inoperable.

The boration capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1% $\Delta k/k$ after xenon decay and cooldown from 200°F to 68°F. This condition requires either 900 gallons of 6,550 ppm borated water from the boric acid storage tanks or 5,000 gallons of 2400 ppm borated water from the refueling water storage tank.

The OPERABILITY of boron injection system during REFUELING ensures that this system is available for reactivity control while in MODE 6.

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8.1 REACTIVITY CONTROL SYSTEMS

B 8.1.3 Boration System – Hot Shutdown

Bases

The boron injection system ensures that negative reactivity control is available between 200°F and 350°F. The components required to perform this function include 1) borated water source (a BAST or RWST), 2) charging pump, and 3) boric acid transfer pump (if a BAST is the borated water source).

TRS 8.1.3.1 requires the boron injection subsystem, including all required equipment in the subsystem such as the designated charging pump, RWST or a BAST, boric acid transfer pump (if a BAST is the designated borated water source), piping, and valves, to meet the surveillance requirements of TRM 8.1.1, Boration System – Operating.

Surveillance requirement TRS 8.1.3.1 specifies for the single required boration flow path, the surveillance requirements of TRM 8.1.1 are required to be satisfied.

With the RCS average temperature below 350°F, one injection system is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting positive reactivity change in the event the single injection system becomes inoperable.

The boration capability required below 350°F is sufficient to provide a SHUTDOWN MARGIN of 1.3% Δk/k after xenon decay and cooldown from 350°F to 200°F. This condition requires either 8,500 gallons of 6550 ppm borated water from a boric acid storage tank or 100,000 gallons of 2400 ppm borated water from the refueling water storage tank. A note in TRS 8.1.1.4 specifies the usable water volume limit is not required to be met in Mode 4 when or after it is injected into the Reactor Coolant System to meet the SHUTDOWN MARGIN of LCO 3.1.1.

During performance of TRS 8.1.1.7, the actual or simulated signal shall be from a RWST refueling water sequencing signal. TRM 8.1.3 does not require this to be satisfied if a BAST is the credited borated water source.

TRM 8.1.1 applicability was changed from Modes 1-4 to Modes 1-3 and TRM 8.1.3 applicable only in Mode 4 was created with only one operable charging pump required. With only one charging pump capable of injecting to the RCS and Pressurizer PORVs NRV-152 and NRV-153 operable as LTOP relief paths, 450 psig RCS Loop 2 safety valve SV-103 is not required as an LTOP relief path. This allows RCS Loop 2 hot leg valves IMO-128 and ICM-129 to be closed before exiting LCO 3.4.12 LTOP restrictions (all RCS cold leg temperatures above 266 degrees F in Unit 1 or 299 degrees F in Unit 2).

B 8.2 Power Distribution Limits

B 8.2.1 Heat Flux Hot Channel Factor ($F_Q(Z)$)

BASES

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In February of 2015 Westinghouse transmitted Nuclear Safety Advisory Letter NSAL-15-1, which identified a non-conservatism in the application of the penalty factor which would be applied to the transient heat flux hot channel factor $F_Q(Z)$, or $F_Q^W(Z)$, per Technical Specification (TS) Surveillance Requirement (SR) 3.2.1.2. TS SR 3.2.1.2 requires that if the steady state $F_Q(Z)$, or $F_Q^C(Z)$, has increased from the value obtained during the previous flux map surveillance, a penalty factor of 1.02 (or an appropriate factor specified in the Core Operating Limits Report (COLR)) will be applied to the transient $F_Q(Z)$ value. This penalty factor is used to ensure that the transient heat flux hot channel factor assumed in the safety analysis is maintained under all conditions during the interval until the next $F_Q(Z)$ surveillance, which is required within 31 Effective Full Power Days (EFPD). However, NSAL-15-1 states that under some conditions, the current TS SR 3.2.1.2 may not be sufficient to assure that the transient $F_Q(Z)$ assumed in the safety analysis is maintained as the limiting value in the intervals when the $F_Q(Z)$ surveillance is performed. In these cases, the penalty is required in order to assure that the value assumed in the safety analysis remains valid at all times. Therefore, Note 2 to SR 3.2.1.2 is inadequate and compensatory measures are required in order to assure that transient $F_Q(Z)$ will always be conservatively calculated.

Currently, the penalty factor of 1.02, or a factor specified in the COLR (whichever is greater), is applied to the transient $F_Q(Z)$ if the steady state $F_Q(Z)$ has increased since the previous $F_Q(Z)$ surveillance. The vendor recommended compensatory measures are included in NSAL-15-1; and involve applying the penalty factor of 1.02, or a factor specified in the COLR (whichever is greater), to the transient $F_Q(Z)$ if:

- The transient $F_Q(Z)$ has increased since the previous $F_Q(Z)$ surveillance, OR
- The transient $F_Q(Z)$ is expected to increase prior to the next $F_Q(Z)$ surveillance.

The criteria are in addition to current TS requirements to apply the penalty factor when the steady state $F_Q(Z)$ has increased since the previous $F_Q(Z)$ surveillance. Therefore, the compensatory measures will add two additional checks in order to determine if the penalty factor of 1.02, or a factor specified in the COLR (whichever is greater), shall be applied to the transient $F_Q(Z)$. As is the case currently, if the transient $F_Q(Z)$ is shown to be below the $F_Q(Z)$ limit then the next surveillance may be deferred for 31 EFPD, and this will not be changed by the Compensatory Measures.

In order to determine whether the transient $F_Q(Z)$ is expected to increase prior to the next $F_Q(Z)$ surveillance, terminology is introduced into Note 2 of the Technical Requirements Surveillance 8.2.1.2 to use the W(Z) value from the COLR at a burnup projected at the next surveillance ($B_{n+1}$). Applying this W(Z) to the current measured steady state $F_Q(Z)$ (at $B_n$, the current burnup) will provide the projected transient $F_Q(Z)$.

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8.3 INSTRUMENTATION

B 8.3.1 Movable Incore Detectors

Bases

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The OPERABILITY of the movable incore detectors with the specific minimum complement of equipment ensures that the measurements obtained from use of this system accurately represent the spatial neutron flux distribution of the reactor core.

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8.3 INSTRUMENTATION

B 8.3.2 Seismic Instrumentation

Bases

The OPERABILITY of the seismic instrumentation ensures that sufficient capability is available to promptly determine the magnitude of a seismic event and evaluate the response of those features important to safety. This capability is required to permit comparison of the measured response to that used in the design basis for the facility.

BACKGROUND

Regulatory Guide (RG) 1.12, Revision 2, (Ref. 1) describes acceptable seismic instrumentation systems for nuclear power plants. While Cook Nuclear Plant is not committed to RG 1.12, the requirements of RG 1.12 were met with the replacement of the Seismic Monitoring System per EC-0000052420. Additional discussion on the function and purpose of the Seismic Monitoring System can be located in the UFSAR, Section 1.1.4 (Ref. 2).

REFERENCES

1. Regulatory Guide 1.12, Revision 2, “Nuclear Power Plant Instrumentation for Earthquakes,” March 1997.
2. UFSAR, Section 1.1.4.

8.3 INSTRUMENTATION

B 8.3.3 Meteorological Instrumentation

Bases

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The OPERABILITY of the meteorological instrumentation ensures that sufficient meteorological data is available for estimating potential radiation doses to the public as a result of routine or accidental release of radioactive materials to the atmosphere. This capability is required to evaluate the need for initiating protective measures to protect the health and safety of the public. For the meteorological instrumentation, the required channel check consists of a qualitative assessment of channel behavior during operation by observation. For the 10 m wind speed and wind direction instruments the channel check also includes, when possible, a comparison of channel indications.

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8.3 INSTRUMENTATION

B 8.3.4 NFPA 805 Remote Shutdown Instrumentation

Bases

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The OPERABLILITY of the NFPA 805 remote shutdown instrumentation ensures that sufficient instrumentation is available to permit shutdown of the facility to MODE 5 conditions at the local shutdown indication (LSI) panel. In the event of a fire, normal power to the LSI panel may be lost. As a result, capability to repower the LSI panels from Unit 1 has been provided. If the alternate power supply is not available, fire watches will be established in those areas where loss of normal power to the LSI panels could occur in the event of fire. This will consist of either establishing continuous fire watches or verifying OPERABILITY of fire detectors per TRM Section 8.7.4 and establishing hourly fire watches. The details of how these fire watches are to be implemented are included in a plant procedure.

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8.3 INSTRUMENTATION

B 8.3.5 Explosive Gas Monitoring Instrumentation

Bases

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This instrumentation includes provisions for monitoring the concentrations of potentially explosive gas mixtures in the waste gas holdup system. The OPERABILITY and use of this instrumentation is consistent with the requirement of Plant Specific Design Criteria specified in Section 1.4 of the Updated Final Safety Analysis Report for the Donald C. Cook Nuclear Plant.

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8.3 INSTRUMENTATION

B 8.3.6 ATWS Mitigation System Actuation Circuitry (AMSAC)

Bases

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Operability of the anticipated transient without scram (ATWS) mitigation system actuation circuitry (AMSAC) ensures it will be available in the event of an ATWS. An ATWS is an anticipated operational occurrence that is accompanied by a failure of the reactor trip system (RTS) to shut down the reactor. The AMSAC was installed to satisfy the requirements of 10 CFR 50.62, "Requirements for Reduction of Risk from Anticipated Transients Without Scram (ATWS) Events for Light-Water-Cooled Nuclear Power Plants," (known as the ATWS Rule). The AMSAC, which is diverse from the RTS, is required to initiate the auxiliary feedwater system and a turbine trip for ATWS events. The AMSAC logic is automatically armed above 40% reactor power. Main feedwater (MFW) flow-sensing instrumentation activates the AMSAC when the MFW flow is below the low flow setpoint.

The Westinghouse Owner's Group (WOG) submitted Topical Report WCAP-10858, "AMSAC Generic Design Package," in response to 10 CFR 50.62. The results of the NRC's review of the generic ATWS design were provided in a safety evaluation report (SER) entitled, "Anticipated Transient Without Scram – Donald C. Cook Nuclear Plant, Units 1 and 2," dated September 24, 1986. This SER required submittal of certain plant specific design features. Based on I&M's subsequent submittals, the NRC approved the plant-specific AMSAC design in an SER dated April 14, 1989, "Compliance with ATWS Rule 10 CFR 50.62." The SER addresses I&M's approved method of complying with the ATWS Rule.

AMSAC inoperability should be evaluated in accordance with the Corrective Action Program to determine whether the condition is adverse to quality. For example, a planned surveillance test is not considered an adverse condition.

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8.3 INSTRUMENTATION

B 8.3.7 Post Accident Monitoring (PAM) Instrumentation

Bases

PAM Instrumentation includes those instruments that address the recommendations of Regulatory Guide (RG) 1.97, Revision 3, 1983. Instrument channels that measure variables categorized as Type A and Category 1 are found in Technical Specification (TS) 3.3.3. Unit specific RG 1.97 analyses were performed and required instrumentation is identified in Updated Final Safety Analysis Report Table 7.8-1. Except for Function 6, this technical requirement provides the variables that were in TS prior to conversion to Improved Standard TS, but are not Type A or Category 1 variables. Functions 1 and 3 have been deleted since they are not RG 1.97 instrumentation. Function 2, while not RG 1.97 instrumentation, has a footnote that allows acoustic monitoring of the pressurizer power operated relief valve position which is RG 1.97 instrumentation. Function 2 remains to allow for increased operator flexibility for meeting the limiting condition for operation.

BASES FOR FUNCTION 6, HYDROGEN MONITORS

BACKGROUND

The containment hydrogen monitors were previously required to be operable by Technical Specification 3.3.3. They were required to be operable to detect high hydrogen concentration conditions that represent a potential for containment breach from an uncontrolled hydrogen burn following a design-basis loss of coolant accident (LOCA). However, a Unit 1 and Unit 2 license amendment (Reference 1) deleted hydrogen monitor requirements from Technical Specification 3.3.3. Deletion of Technical Specification 3.3.3 was based on a change to the applicable regulation, 10 CFR 50.44, such that it no longer defined a design-basis LOCA hydrogen release, and eliminated requirements for hydrogen control systems to mitigate such a release. The regulation change was based on a determination that a hydrogen release from a design-basis LOCA was not risk-significant. As a required condition of the Unit 1 and Unit 2 license amendment, I&M committed to maintain a hydrogen monitoring system capable of diagnosing beyond design-basis accidents. Additionally, 10 CFR 50.44 requires that licensees provide monitoring equipment capable of continuously measuring the concentration of hydrogen in the containment atmosphere following a significant beyond design-basis accident for accident management, including emergency planning.

BACKGROUND (continued)

Two hydrogen monitors are provided (PAS-H2-A-CRI and PAS-H2-B-CRI for ESR-1 through 9) to provide redundancy and independence. Each hydrogen monitor is powered from a separate Engineered Safety Features bus. Each hydrogen monitor is capable of determining hydrogen concentration in the range of 0 to 30% hydrogen by volume. Each analyzer must be capable of sampling the containment.

TRO

Two hydrogen monitor channels are required to be OPERABLE. This requirement is identical to that which was previously specified in Technical Specification Table 3.3.3-1. Portions of the Bases for the previous Technical Specification 3.3.3 LCO have not been restated here to preclude the implication that that the hydrogen monitors are needed for mitigation of a design-basis LOCA.

Two OPERABLE channels ensure no single failure prevents operators from getting the information necessary for them to determine the safety status of the unit, and to bring the unit to and maintain it in a safe condition following a beyond design basis accident. Furthermore, OPERABILITY of two channels allows a CHANNEL CHECK during the post accident phase to confirm the validity of displayed information.

APPLICABILITY

The specified applicability of these TRM requirements, MODES 1, 2 and 3, is identical to that which was previously specified in the Applicability statement for Technical Specification 3.3.3. Portions of the Bases for the previous Technical Specification 3.3.3 Applicability statement have not been restated here to preclude the implication that that the hydrogen monitors are needed for mitigation of a design-basis LOCA. In MODES 4, 5, and 6, unit conditions are such that the likelihood of an event that would require hydrogen monitors is low; therefore, the hydrogen monitors are not required to be OPERABLE in these MODES.

ACTIONS

A.1

Condition A applies when one hydrogen monitor is inoperable. Required Action A.1 requires restoring the inoperable channel to OPERABLE status within 30 days. This requirement is identical to that which was previously specified by Technical Specification 3.3.3 Required Action A.1. Portions of the Bases for the previous Technical Specification 3.3.3 Action A.1 have not been restated here to preclude the implication that that the hydrogen monitors are needed for mitigation of a design-basis LOCA. The 30 day Completion Time is based on operating experience and takes into account the remaining OPERABLE channel, and the low probability of an event requiring hydrogen monitors during this interval.

ACTIONS (continued)

B.1

Condition B applies when the Required Action and associated Completion Time for Condition A are not met. This Required Action specifies immediate initiation of actions in TRO 8.0.3. This differs from the Required Action for Condition B in TS 3.3.3, which would require that action be initiated immediately in accordance with TS 5.6.6. TS 5.6.6 would require that a report be submitted to the NRC within the following 14 days. The Required Action to immediately enter TRO 8.0.3 specified for Condition B in TRM 8.3.7 is appropriate because it is consistent with the existing action specified in the TRM for failure to restore, within 30 days, one inoperable channel of the other Post Accident Monitoring Instrumentation in TRM 8.3.7. This action is also appropriate because hydrogen monitors are not required for the mitigation of a design-basis LOCA, and the Required Action is consistent with the change in requirement control from the NRC to I&M.

C.1

Condition C applies when both required hydrogen monitors are inoperable. Required Action C.1 requires restoring at least one inoperable channel to OPERABLE status within 7 days. This differs from the Required Action for previous Condition E in TS 3.3.3, which would require that at least one hydrogen monitor channel be restored to operable status within 72 hours (3 days).

The Required Action to restore one channel to operable status within 7 days rather than 3 days is reasonable considering the low probability of a beyond design-basis event which could generate significant amounts of hydrogen in containment during a 7 day period. The 7 day Completion Time is also consistent with the Completion Time specified in TRM 8.3.3 and TRM 8.3.8 for restoring inoperable channels of other Emergency Plan related instrumentation if there are no operable channels. Additionally, specifying a 7 day Completion Time for restoring one hydrogen monitor channel to operability when no channels are operable is consistent with the TRMs (or equivalent) of several other plants that have implemented TSTF-447.

D.1

Condition D applies when two hydrogen monitor channels are inoperable for more than 7 days. The Required Action is to immediately enter TRO 8.0.3. This differs from the Required Action for previous Condition G in TS 3.3.3, which would have required that the unit be in Mode 3 within 6 hours and in Mode 4 within 12 hours.

BASES

ACTIONS (continued)

The Required Action to immediately enter TRO 8.0.3 rather than commence a unit shutdown is appropriate because the hydrogen monitoring system is not credited for the mitigation of a design basis LOCA. In lieu of specifying a unit shutdown, TRM 8.3.7 specifies the standard action identified in the TRM (TRO 8.0.3) when an associated Required Action and Completion Time is not met and no other Condition applies. TRO 8.0.3 therefore establishes the standard "default" actions for the TRM, just as LCO 3.0.3 establishes the standard "default" actions for the TS. However, unlike LCO 3.0.3, TRO 8.0.3 does not require a unit shutdown because TRM requirements need not be met to assure the plant is operating within the bounds of the design basis accident analyses.

TECHNICAL REQUIREMENTS SURVEILLANCE

TRS 8.3.7.4

This TRS requirement is identical to the requirement previously in Technical Specification Surveillance Requirement 3.3.3.3. Therefore, previous satisfactory performance of Technical Specification Surveillance Requirement 3.3.3.3 satisfies this TRS.

A CHANNEL CALIBRATION is performed every 92 days for the hydrogen monitors. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test verifies that the channel responds to measured parameter with the necessary range and accuracy. The CHANNEL CALIBRATION shall be performed using a 4% and 15% nominal hydrogen gas, balance nitrogen. The 92 day Frequency is based on operating experience.

REFERENCES

1. Letter from P. S. Tam, U. S. Nuclear Regulatory Commission, to L. J. Weber, Indiana Michigan Power Company, "Donald C. Cook Nuclear Plant, Units 1 and 2 – Issuance of Amendments Re. Elimination of Requirements for Hydrogen Recombiners and Hydrogen Monitors (TAC No. ME4709 and ME4710)." dated December 14, 2010.

8.3 INSTRUMENTATION

B 8.3.8 Radiation Monitoring Instrumentation

Bases

Noble gas effluent monitors provide information, during and following an accident, which is considered helpful to the operator in assessing the plant condition. It is desired that these monitors be OPERABLE at all times during operation, but they are not required for safe shutdown of the plant. Anytime a monitor is INOPERBLE during an accident involving a radiological release, and that monitor is important for assessing the release, the expectation is to initiate the preplanned alternate method of monitoring the appropriate parameter(s) as soon as practical in order to assess plant conditions. In such cases, the preplanned alternate method of monitoring the appropriate parameter(s) must be initiated within 72 hours.

Table 8.3.8-1 is based on the following Alarm/Trip Setpoints and Measurement Range for each instrument listed. For the unit vent noble gas monitors, it should be noted that there is an automatic switchover from the low/mid-range channels to the high-range channel when the upper limits of the mid-range channel measurement ranges are reached. In this case there is no flow to the mid-range channels from the unit vent sample line. This is considered to represent proper operation of the monitor. Therefore, if automatic switchover to the high-range should occur, and the mid-range detectors are capable of functioning when flow is re-established, the mid-range channels should not be declared inoperable and the ACTION statement in the TRM does not apply. This is also true while purging the mid-range chambers following a large activity excursion prior to resumption of low-level monitoring and establishment of a new background.

Required Action C.1 may be performed with portable monitoring instrumentation.

Bases (continued)

Table 8.3.8-2 (page 1 of 2)
Radiation Monitoring Instrumentation

| INSTRUMENT | ALARM/TRIP SETPOINT | MEASUREMENT RANGE[a] |
|---|---|---|
| 1. Area Monitor - Upper Containment (VRS 2101/2201) | ≤ 54 mR/hr[b] | $10^{-4}$R/hr to 10R/hr |
| 2. Noble Gas Effluent Monitors | | |
| a. Unit Vent Effluent Monitors | | |
| (1) Mid Range (VRS 2507) | Not Applicable[c] | $1.3x10^{-3}$µCi/cc to $7.5x10^{+2}$µCi/cc |
| (2) High Range (VRS 2509) | Not Applicable[c] | $2.9x10^{-2}$µCi/cc to $1.6x10^{+4}$µCi/cc |
| b. Steam Generator PORV (MRA 2601) (MRA 2602) (MRA 2702) (MRA 2701) | Not Applicable.[c] | 0.1µCi/cc to $1.0x10^{2}$ µCi/cc |
| c. Steam Jet Air Ejector Vent Monitors | | |
| (1) Mid Range (SRA 2907) | Not Applicable[c] | $1.3x10^{-3}$µCi/cc to $7.5x10^{+2}$µCi/cc |
| (2) High Range (SRA 2909) | Not Applicable[c] | $2.9x10^{-2}$µCi/cc to $1.6x10^{+4}$µCi/cc |

(continued)

(a) This is the minimum required sensitivity of the instrument. Indicated values on these instruments above or below these minimum sensitivity ranges are acceptable and indicate existing conditions not instrument operability.

(b) The monitor trip setpoint is based on 10 CFR 20 limits. A homogenous mixture of the containment atmosphere is assumed. The setpoint value is defined as the monitor reading when the purge is operating at the maximum flow rate.

(c) These monitors are used to provide data to assist in post-accident off-site dose assessment.

Bases (continued)

Table 8.3.8-2 (page 2 of 2)
Radiation Monitoring Instrumentation

| INSTRUMENT | ALARM/TRIP SETPOINT | MEASUREMENT RANGE[(a)] |
|---|---|---|
| 3. Spent Fuel Storage (RRC-330 | ≤ 15 mR/hr[(d)] | $1x10^{-1}$mR/hr to $1x10^{+4}$mR/hr |
| or 12-VRS-5006) | ≤ 15 mR/hr[(d)] | $1x10^{-2}$mR/hr to $1x10^{+2}$mR/hr |

(a) This is the minimum required sensitivity of the instrument. Indicated values on these instruments above or below these minimum sensitivity ranges are acceptable and indicate existing conditions not instrument operability.

(d) The monitor setpoint is selected to alarm and trip consistent with 10 CFR 70.24(a) (2).

8.4 REACTOR COOLANT SYSTEM (RCS)

B 8.4.1 Chemistry

Bases

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The limitations on Reactor Coolant System chemistry ensure that corrosion of the Reactor Coolant System is minimized and reduces the potential for Reactor Coolant System leakage or failure due to stress corrosion. Maintaining the chemistry within the Steady State Limits provides adequate corrosion protection to ensure the structural integrity of the Reactor Coolant System over the life of the plant. The associated effects of exceeding the oxygen, chloride, and fluoride limits are time and temperature dependent. Corrosion studies show that operation may be continued with contaminate concentration levels in excess of the Steady State Limits, up to the Transient Limits, for the specified limited time intervals without having a significant effect on the structural integrity of the Reactor Coolant System. The time interval permitting continued operation within the restrictions of the Transient Limits provides time for taking corrective actions to restore the contaminant concentrations to within the Steady State Limits.

The Surveillance Requirements provide adequate assurance that concentrations in excess of the limits will be detected in sufficient time to take corrective action.

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8.4 REACTOR COOLANT SYSTEM (RCS)

B 8.4.2 Pressurizer

Bases

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All components in the Reactor Coolant System are designed to withstand the effects of cyclic loads due to system temperature and pressure changes. These cyclic loads are introduced by normal load transients, reactor trips, and startup and shutdown operations. The various categories of load cycles used for design purposes are provided in Section 4.1.4 of the UFSAR. During startup and shutdown, the rates of temperature and pressure changes are limited so that the maximum specified heatup and cooldown rates are consistent with the design assumptions and satisfy the stress limits for cyclic operation. The pressurizer is determined to be acceptable for continued operation by performing an analysis of the effects of the out-of-limit condition on the fracture toughness properties of the pressurizer.

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8.4 REACTOR COOLANT SYSTEM (RCS)

B 8.4.3 ASME Code Class 1, 2, and 3 Components

Bases

The inspection and testing programs for ASME Code Class 1, 2, and 3 components ensure that the structural integrity of these components will be maintained at an acceptable level throughout the life of the plant. To the extent applicable, the inspection program for these components is in compliance with Section XI of the ASME Boiler and Pressure Vessel Code.

As noted in correspondence ML050620034 (Safety Evaluation Report that addressed relocation of CTS 3/4.4.10.1 to the TRM):

"The monitoring activity is of a preventive nature rather than a mitigative action. Other TSs require important systems to be OPERABLE (for example, Emergency Core Cooling Systems) and in a ready state for mitigative action. This TS is more directed toward prevention of component degradation and continued long-term maintenance of acceptable structural conditions. Hence, it is not necessary to retain this Specification to ensure immediate OPERABILITY of safety systems."

Per the Bases for LCO 3.4.3, RCS Pressure and Temperature (P/T) Limits, compliance with the P/T limit curves establishes operating limits that provide a margin to brittle failure of the reactor vessel and piping of the reactor coolant pressure boundary. This ensures compliance with the COMPLETION TIME of CONDITION A.

8.4 REACTOR COOLANT SYSTEM (RCS)

B 8.4.4 Reactor Vessel Head and Pressurizer Steam Space Vents

Bases

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The Reactor Coolant Vent System is provided to exhaust noncondensible gases and/or steam from the primary system that could inhibit natural circulation core cooling. It has been designed to vent a volume of hydrogen approximately equal to one-half of the RCS volume in one hour at system design pressure and temperature.

The Reactor Coolant Vent System is comprised of the Reactor Vessel Head Vent System and the Pressurizer Steam Space Vent System. Each of these subsystems consists of a single line containing a common manual isolation valve inside containment, splitting into two parallel flow paths. Each flow path provides the design basis venting capacity and contains two 1E DC powered solenoid isolation valves, which fail closed. This valve configuration/redundancy serves to minimize the probability of inadvertent or irreversible actuation while ensuring that a single failure of a remotely-operated vent valve, power supply, or control system does not prevent isolation of the vent path. The pressurizer steam space vent is independent of the PORVs and safety valves and is specifically designed to exhaust gases from the pressurizer in a very high radiation environment. In addition, the OPERABILITY of one reactor vessel head vent path and one pressurizer steam space vent path will ensure that the capability exists to perform this venting function.

The function, capabilities, and testing requirements of the Reactor Coolant Vent System are consistent with the requirements of Item II.B.1 of NUREG-0737, “Clarification of TMI Action Plan Requirement,” November 1980.

The minimum required systems to meet the Requirement and not enter into an ACTION statement are one vent path from the reactor vessel head and one vent path from the pressurizer steam space.

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8.4 REACTOR COOLANT SYSTEM (RCS)

B 8.4.5 Reactor Coolant System (RCS) Total Flow Rate

Bases

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The purpose of this Requirement is to ensure the flow indicators used to verify RCS flow for compliance with TS 3.4.1 are OPERABLE.

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8.4 REACTOR COOLANT SYSTEM (RCS)

B 8.4.6 Power Operated Relief Valve (PORV) Emergency Air Tank Low Pressure Alarm

Bases

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No Bases information is provided.

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8.4 REACTOR COOLANT SYSTEM (RCS)

B. 8.4.7 DELETED

8.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

B 8.5.1 Emergency Core Cooling Systems (ECCS)

Bases

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Technical Requirements Surveillance (TRS) 8.5.1.1 and 8.5.1.2 were included in the Technical Requirements Manual as part of the Improved Technical Specification (ITS) conversion process. TRS 8.5.1.1 ensures that prior to entering Mode 4 from Mode 5, the containment is inspected to ensure that no loose debris is present which could challenge the recirculation function of the ECCS. This inspection is not required provided controls have been established to ensure containment cleanliness during the entry. TRS 8.5.1.2 ensures that following a containment entry in Modes 1, 2, 3, or 4, any debris is removed that could clog the containment recirculation sump following a LOCA. Both of these TRSs support the Programmatic Controls described in Section 6.2.6 of the UFSAR. Control is maintained by, but not limited to, maintaining all administrative controls and conditions required for Containment operability and access control for Mode 1, 2, 3 or 4 (Reference 1).

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REFERENCE: 1. PMP-4010-CAC-001, Containment Access Control

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8.6 CONTAINMENT SYSTEMS

B 8.6.1 Ice Bed Temperature Monitoring System

Bases

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The OPERABILITY of the Ice Bed Temperature Monitoring System ensures that the capability is available for monitoring the ice temperature. In the event the monitoring system is inoperable, the ACTION requirements ensure an alternate method is developed for performing SURVEILLANCE REQUIREMENT 3.6.11.1.

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8.6 CONTAINMENT SYSTEMS

B 8.6.2 Inlet Door Position Monitoring System

Bases

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The OPERABILITY of the inlet door position monitoring system ensures that the capability is available for monitoring the individual door position. In the event the monitoring system is inoperable, the ACTION requirements ensure an alternate method is developed for performing SURVEILLANCE REQUIREMENT 3.6.12.1.

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B 8.6 CONTAINMENT SYSTEMS

B 8.6.3 DELETED

8.6 CONTAINMENT SYSTEMS

B 8.6.5 DELETED

8.6 CONTAINMENT SYSTEMS

B 8.6.6 Accumulator Temperature

Bases

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In February of 2012, the Nuclear Regulatory Commission (NRC) issued an information request pursuant to 10 CFR 50.54(f) related to the estimated effect on peak cladding temperature (PCT) in Westinghouse furnished realistic emergency core cooling system (ECCS) evaluation models from thermal conductivity degradation (TCD). The WEC analysis for CNP showed that the 10 CFR 50.46 requirement that post-LOCA peak cladding temperature remain below 2200 °F was met when TCD was considered and certain operating restrictions were implemented. To support the analysis, accumulator temperature in Unit 2 must be restricted to a band of 60°F to 115°F.

There is no instrument that provides a direct indication of accumulator temperature. It is assumed that the contents of the accumulators are at the same temperature as the ambient air temperature. If accumulator area ambient air temperature instrumentation is not available (see below) or if accumulator area ambient air temperature is outside of TRO limits, direct external temperature measurements of the accumulators are performed to obtain a more accurate indication of accumulator temperature.

Accumulator area ambient air temperatures are recorded on a strip chart recorder in the Control Room. Readings from 2-ETR-19 (Containment 612 Elevation East Containment Lower Vent Room Temperature Recorder Thermal Sensor, 2-SG-18 point 9) and 2-ETR-21 (Containment 612 Elevation West Containment Lower Vent Room Temperature Recorder Thermal Sensor, 2-SG-18 point 11) are used to demonstrate compliance with the TRO. Both readings must be within the temperature band. If one of the instruments is not available, the reading from the other instrument may be used in its place if all of the lower containment ventilation units (CLVs) and their supporting systems are in service. If all of the lower containment ventilation units (CLVs) are not in service or if both of the permanently installed instruments are not available, operators may take accumulator external surface temperature measurements locally to satisfy the TRS requirement.

The TRO is applicable when accumulators must be capable of injecting per TS 3.5.1. If accumulator temperature is outside of the band, Condition A directs that it be restored within 8 hours. The 8 hour period is consistent with TS 3.6.5, Condition A, for containment air temperature. If accumulator temperature cannot be restored within 8 hours, Condition B directs the measurement of accumulator external surface temperature. Measurements are only required on accumulators in rooms with out of specification temperatures. A contact thermometer or other appropriate device as specified by Engineering shall be used. The device must be calibrated and have an appropriate range for the measurement. The measurement shall be taken in the vicinity of the horizontal beltline of the accumulator. A two hour initial completion time is provided to allow for appropriate briefings and preparation for Containment entry to perform the measurements. The measurements are performed every eight hours thereafter until the accumulator area ambient air temperature is brought into the required band. If the accumulator area ambient air temperature cannot be controlled within the operating band

Bases (continued)

and the accumulator external surface temperature is outside of the operating band, Condition C directs moving to an operating Mode where the TRO is not applicable. A TRS to assure compliance is performed once each day.

Reference: DIT-B-03486, Cook Units 1 and 2 Inputs for LOCA Evaluation of Thermal Conductivity Degradation.

DIT-B-03268, Alternate Containment Temperature Measurement Points for a Single Point Failure

8.7 PLANT SYSTEMS

B 8.7.1 Steam Generator Pressure and Temperature Limit

Bases

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The limitation on steam generator pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on average steam generator impact values taken at +10°F and are sufficient to prevent brittle fracture.

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8.7 PLANT SYSTEMS

B 8.7.2 Sealed Source Contamination

Bases

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The limitations on removable contamination for sources requiring leak testing, including alpha emitters, are based on 10 CFR 70.39(c) limits for plutonium. This limitation will ensure that leakage from byproducts, source and special nuclear material sources will not exceed allowable intake values.

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8.7 PLANT SYSTEMS

B 8.7.3 DELETED

8.7 PLANT SYSTEMS

B 8.7.4 Fire Detection Instrumentation

Bases

OPERABILITY of the fire detection instrumentation ensures that adequate detection capability is available for the prompt detection of fires. This capability is required in order to detect and locate fires in their early stages. TRM fire detection systems consist of fire detection systems which are credited for NFPA 805 Chapter 4, “Separation,” or are considered High Safety Significant (HSS) systems by the NFPA 805 Monitoring Program Analysis (FPMP), or are required for another Licensing Action. These systems are an integral element in the overall facility fire protection program.

Fire detection OPERABILITY is based on the appropriate type of detectors providing adequate coverage of the fire zone and providing notification to the control room in the event of a fire.

Adjacent fire detectors are defined as any detectors physically adjacent to another detector on the same detection circuit in the fire zone.

Pneumatic detection systems (supervised air pilot headers) are part of the Auxiliary Building pre-action suppression systems protecting the 587’ and 609’ elevations and the fire pump house (see TRM 8.7.6 Table 8.7.6-1 for areas protected by 12-FP-324, 12-FP-371 and 12-FP-739). Pneumatic detection systems provide a thermal activated detector that actuates at lower temperature than the water suppression systems and therefore provides for early notification of a fire to the control room.

The supervised detector alarm circuits include the detector circuits, fire and trouble alarm circuits from the remote fire protection control panel to the Control Room emergency fire control panel, and audible fire and trouble alarm circuits.

All hourly fire watch patrols are performed at intervals of sixty minutes with a margin of fifteen minutes.

A continuous fire watch requires that a trained individual be in the specified area at all times and that each fire zone within the specified area be patrolled at least once every fifteen minutes with a margin of five minutes.

Equipment identification numbers for detectors listed in Table 8.7.4-1 are included in Fire Protection Program Impact Review (FPPR) 2014-0013.

8.7 PLANT SYSTEMS

B 8.7.5 Fire Suppression Water System

Bases

The Fire Suppression Water System consists of the fire protection water storage tanks, fire pumps, and water distribution piping required to provide flow to the required fire suppression systems. TRM fire suppression water systems consist of suppression systems which are credited for NFPA 805 Chapter 4, “Separation,” or are determined to be High Safety Significant (HSS) systems by the NFPA 805 Monitoring Program Analysis (FPMP), or are required for other Licensing Action, and is a major element in the facility fire protection program.

In the event that portions of the Fire Suppression Water System are inoperable, alternate backup fire fighting equipment is required to be made available in the affected areas until the inoperable equipment is restored to service. Backup fire protection equipment will normally take the form of permanently mounted fire extinguishers and/or fire hose stations in or near the area, or fire hose routed to the affected area. In the event that the fire water tanks become inoperable, a crosstie between the Lake Township municipal water supply and the plant fire protection water supply will be established.

The Surveillance Requirements provide assurance that the minimum OPERABILITY requirements of the Fire Suppression Water System are met.

The Fire Suppression Water System has three fire pumps common to both units which discharge into underground ring headers. One motor-driven horizontal centrifugal fire pump rated at 2500 gpm that takes suction from the fire water storage tanks and two diesel-engine-driven horizontal centrifugal fire pumps rated at 2500 gpm that take suction from the fire water storage tanks. Having a combination of diesel-driven and electric motor-driven pumps in the system design satisfies the requirements of NFPA 805 Design Element 3.4.5, “Water Supply Pump Diversity and Redundancy.” The minimum acceptable fire pump performance curve to satisfy the largest fire suppression system demands is identified in Report R2527-001-001, Fire Protection Water Main Loop and Fire Pump Set Point Adequacy Determination.

The AC power of the fire pumps is from two separate 12kV sources. The normal source is derived from the 69kV Bus #1 via Transformer #7 and the alternate source is the Livingston Road 12kV line. Each 12kV source is stepped down to 600VAC through its respective transformer and connected to the pump house 600VAC distribution bus.

The 600VAC distribution bus provides power to the Motor Driven Fire Pump (MDFP) and motor control centers. The motor control centers provide power to the pump house auxiliary equipment. Loss of the Fire Pump House AC power source renders the MDFP INOPERABLE and requires an alternate backup pump or manual transfer of the AC power source within 7 days.

Both Diesel Driven Fire Pumps (DDFP) have two 120VAC independent battery chargers located in the respective DDFP Controllers. The Diesel Fire Pump Controller also provides Main Control Room alarm functions for the following parameters, high cooling water temperature, low oil pressure, failure to start, battery failure, over speed and charger failure. Loss of the 120VAC and charger failure will not prevent starting of the DDFP with batteries > 24VDC.

Bases (continued)

DDFP batteries > 24VDC satisfy the manufacturers electrical design criteria for the Underwriters Laboratories/Factory Mutual approved assembly and National Fire Protection Association (NFPA) 20 Standard for the Installation of Stationary Fire Pumps. OPERABILITY of the DDFP is established by maintaining > 24VDC and $\leq$ 2 charging amps to ensure adequate voltage and battery capacity to start the diesel engine. The $\leq$ 2 charging amps ensure the battery charger is off fast (equalize) charge and on slow (float) charge and that the batteries remain at full capacity, (ref. NFPA 20.)

Each DDFP assembly is electrically designed for 24VDC. This provides the bases for the TRS 8.7.5.3 OPERABILITY criteria of > 24VDC. Each DDFP Controller has local battery voltage and charging amp indication for each battery bank. The voltage and charging amp meters are factory calibrated and cannot be used to satisfy TRS 8.7.5.3. Controller volt and amp meters are not periodically field calibrated. Therefore, local verification of batteries > 24VDC and charging current $\leq$ 2 amps for each starting battery bank using instrumentation with an accuracy of $\pm$ 1% per is required to satisfy TRS 8.7.5.3. DDFP charger failure or local controller battery indication of $\leq$ 24VDC requires verification of at least 24.1VDC once per hour for each starting battery bank using instrumentation capable of $\pm$ 1.0% accuracy to assure voltage will not fall below 24VDC before the next hour. The TRS 8.7.5.3 > 24V and $\leq$ 2 charging amps is not an OPERABILTY requirement for a DDFP while the engine is starting or running with the alternator charging because the DDFP is in service.

The CNP Licensing Basis requires the DDFPs have a fuel system capable of at least 8 hours of operation (Ref. NFPA 20). This also satisfies NFPA 805 Design Element 3.5.3, “Water Supply Flow Code Requirements,” to provide sufficient fire water supply for the largest expected flow rate for a period of 2 hours and additional demand for hose streams, routine testing and training. The diesel engines have demonstrated a fuel usage of approximately 12-20 gallons per hour. Therefore, fuel supply to meet an 8 hour engine usage of 20 gallons per hour provides the Bases for TRS 8.7.5.6 that the fuel storage tanks contain ≥ 160 gallons.

All hourly fire watch patrols are performed at intervals of sixty minutes with a margin of fifteen minutes. A continuous fire watch requires that a trained individual be in the specified are at all times and that each fire zone within the specified area be patrolled at least once every fifteen minutes with a margin of five minutes. A control valve is defined as a valve that when closed does not leave an alternate open flow path to a TRM required system. A sectionalizing valve is defined as a valve that when closed does not prevent an alternate open flow path to a TRM system and hence the closure of a sectionalizing valve does not make the Fire Suppression Water System inoperable. Under certain situations, the closure of a sectionalizing valve followed by the closure of a second valve will not leave an open flow path to one of the required TRM Water Suppression Systems (ref TRM 8.7.6). In this instance, TRM 8.7.6 condition should also be entered as required.

8.7 PLANT SYSTEMS

B 8.7.6 Water Suppression System

Bases

TRM fire suppression water systems consist of suppression systems which are credited for NFPA 805 Chapter 4, “Separation,” or are determined to be High Safety Significant (HSS) systems by the NFPA 805 Monitoring Program Analysis (FPMP), or are required for another Licensing Acton and are a major element in the facility fire protection program.

TRM 8.7.5. is required to support TRM 8.7.6. Engineering may be required to determine the impact of unavailable components within TRM 8.7.5 (e.g., degraded distribution piping or alignment etc.) upon TRM 8.7.6.

Many of the ACTIONS take credit for OPERABLE fire detection instrumentation in lieu of a fire watch when a fire water system is inoperable. OPERABLE fire detection instrumentation provides sufficient early warning capability of a fire to the appropriate Control Room. Fire detection instrumentation shall be considered OPERABLE provided the Control Room has not been informed that the fire detection instrumentation is inoperable.

Each required water suppression system functions independently from one another.

Some areas of the plant have multiple water suppression systems that are credited by TRM 8.7.6, or a fire detection system credited by TRM 8.7.4. Areas with other TRM credited fire detection or alternate water suppression do not require a fire watch because these other systems act to perform similar safety function as the inoperable system (i.e., identify a fire is occurring, contain the fire).

In the event that portions of the TRM 8.7.5, “Fire Water Suppression System,” are inoperable, alternate backup firefighting equipment is required to be made available in the affected areas until the inoperable equipment is restored to service. Backup fire protection equipment will normally take the form of permanently mounted fire extinguishers and/or fire hose stations in or near the area, or fire hose routed to the affected area.

Areas that become a high radiation area due to changing plant conditions are posted to control personnel entry and necessary work. These actions reduce the potential for a transient fire and therefore a hourly fire watch patrol is adequate to ensure that there are no changing fire conditions within the affected area.

All hourly fire watch patrols are performed at intervals of sixty minutes with a margin of fifteen minutes.

A continuous fire watch requires that a trained individual be in the specified area at all times and that each fire zone within the specified area be patrolled at least once every fifteen minutes with a margin of five minutes.

8.7 PLANT SYSTEMS

B 8.7.7 DELETED

## B 8.7.8 Low Pressure $CO_2$ Systems

Bases

The OPERABILITY of the Low Pressure $CO_2$ Systems ensures that adequate fire suppression capability is available to confine and extinguish fires occurring in selected portions of the facility. TRM low pressure $CO_2$ systems consist of $CO_2$ systems which are credited for NPFA 805 Chapter 4, “Separation,” or are determined to be High Safety Significant (HSS) systems by the NFPA 805 Monitoring Program Analysis (FPMP), or as required for another Licensing Action. These systems are an integral element in the overall facility fire protection program.

Low Pressure $CO_2$ System actuation methods include automatic actuation from detection systems, manual pushbutton station, and manual pneumatic release.

In the event that one or more Low Pressure $CO_2$ Systems requiring automatic actuation must be isolated for personal protection to permit entry for routine tours, maintenance, construction, or surveillance testing in the protected area, the fire detection instrumentation required to be OPERABLE by TRM 8.7.4 shall be verified to be OPERABLE. Isolation of an automatic Low Pressure $CO_2$ System temporarily puts this system in a manual actuation mode.

Reliance on the fire detection instrumentation, in conjunction with the ability to manually discharge the Low Pressure $CO_2$ Systems, will provide adequate fire protection for periods when personnel are required to work in these areas and the automatic release function has been disabled by the switch.

All hourly fire watch patrols are performed at intervals of sixty minutes with a margin of fifteen minutes.

A continuous fire watch requires that a trained individual be in the specified area at all times and that each fire zone with in the specified area be patrolled at least once every fifteen minutes with a margin of five minutes.

Many of the ACTIONS take credit for OPERABLE fire detection instrumentation in lieu of a fire watch when a fire protection system is inoperable. OPERABLE fire detection instrumentation provides sufficient early warning capability of a fire to the appropriate Control Room. Fire detection instrumentation shall be considered OPERABLE provided that the Control Room has not been informed that the instrumentation is inoperable.

The Surveillance Requirements provide assurance that the minimum OPERABILITY requirements of the Low Pressure $CO_2$ Systems are met. In addition, an allowance is made for ensuring a sufficient volume of $CO_2$ in the Low Pressure $CO_2$ Systems storage tank by verifying the level and pressure of the tank.

Inoperable or impaired TRM 8.7.10, Fire Rated Assemblies, including doors, penetration sealing devices, and fire dampers shall be reviewed for impact on OPERABILITY of TRM 8.7.8, Low Pressure $CO_2$ Systems. Degraded fire rated assemblies potentially adversely impact the

Bases (continued)

pressure envelope and the ability of the gaseous $CO_2$ systems to maintain the required NFPA Code concentration and soak time, thereby requiring compensatory action per TRM 8.7.8.

The Control Room Cable Vault is protected by an automatic HALON suppression system that is required to be OPERABLE in TRM 8.7.9. The automatic HALON suppression system provides an adequate safety function for when the manual $CO_2$ suppression system is inoperable. The automatic HALON suppression system function requires an OPERABLE fire detection system in the area.

Manual actuation of Low Pressure $CO_2$ Systems provides adequate fire protection for the protected areas based on OPERABLE fire detection instrumentation in the area, low combustible loading, and prompt fire brigade response to alarms.

During Surveillance Testing of a Low Pressure $CO_2$ System with the system made inoperable, the requirement for a continuous fire watch may be suspended during periods of the test which result in a discharge into the $CO_2$ protected area. Similarly, if a $CO_2$ actuation occurs which results in the need to have the Low Pressure $CO_2$ System made inoperable, the requirement for a continuous fire watch may be suspended. In either case, the area affected shall be restored to habitability as soon as practicable, after which the continuous fire watch is to be re-established if the Low Pressure $CO_2$ System is still inoperable.

The minimum quantity of $CO_2$ stored in the 17 ton tank must be adequate for two complete discharges of the largest system. The design minimum amount of $CO_2$ required in the tank is 60.4% and is the TRM lower limit. An administrative value of 70% has been set to maintain a conservative tank level margin. This conservative value was previously reviewed and approved by the PORC at meeting #2486 in February 1991.

8.7 PLANT SYSTEMS

B 8.7.9 Halon System

Bases

The OPERABILITY of the Halon System ensures that adequate fire suppression capability is available to confine and extinguish fires occurring in the Control Room Cable Vault. The TRM required HALON systems consist of systems which are credited for NFPA 805 Chapter 4, "Separation," or are determined to be High Safety Significant (HSS) systems by the NFPA 805 Monitoring Program Analysis (FPMP), or are required for another Licensing Action. These systems are an integral element in the overall facility fire protection program.

Halon system actuation methods include automatic actuation from detection system, manual pushbutton station, and a manual cylinder actuator.

In the event that the Halon System must be isolated for personal protection to permit entry for routine tours, maintenance, construction, or surveillance testing in the protected area, the fire detection instrumentation required to be OPERABLE by TRM 8.7.4 shall be verified to be OPERABLE. Isolation of an automatic Halon System temporarily puts this system in a manual actuation mode.

Reliance on the fire detection instrumentation, in conjunction with the ability to manually discharge the Halon System, will provide adequate fire protection for periods when personnel are required to work in these areas.

The ACTIONS take credit for OPERABLE fire detection instrumentation in lieu of a fire watch when a fire protection system is inoperable. OPERABLE fire detection instrumentation provides sufficient early warning capability of a fire to the appropriate Control Room. Fire detection instrumentation shall be considered OPERABLE provided that the Control Room has not been informed that the instrumentation is inoperable.

The Surveillance Requirements provide assurance that the minimum OPERABILITY requirements of the Halon System are met. In addition, an allowance is made for ensuring a sufficient volume of Halon in the Halon storage tanks by verifying the weight or liquid level and pressure of the tanks.

Inoperable or impaired TRM 8.7.10, Fire Rated Assemblies, including doors, penetration sealing devices, and fire dampers shall be reviewed for impact on OPERABILITY of TRM 8.7.9, Halon Systems. Degraded fire rated assemblies potentially adversely impact the pressure envelope and ability of the gaseous Halon systems to maintain the required NFPA Code concentration and soak time, thereby requiring compensatory action per TRM 8.7.9.

The Control Room Cable Vault is protected by a manual $CO_2$ system that is required to be OPERABLE in TRM 8.7.8. The manual $CO_2$ suppression system is actuated from the Control Room main panel and provides an adequate safety function for when the automatic Halon System is inoperable. The Control Room operator relies on an OPERABLE fire detection system in that area for prompt notification of a fire.

Bases (continued)

All hourly fire watch patrols are performed at intervals of sixty minutes with a margin of fifteen minutes.

A continuous fire watch requires that a trained individual be in the specified area at all times and that each fire zone within the specified area be patrolled at least once every fifteen minutes with a margin of five minutes.

In the event that the Control Room Cable Vault Halon System is inoperable, the ACTIONS provided maintain the facility's fire protection program and allows for continued operation or startup of the facility until the inoperable Halon System is restored to OPERABILITY. However, it is not the intent to rely on backup systems or other compensatory measures for an extended period of time and action will be taken to restore the inoperable Halon System to OPERABLE status within a reasonable period.

8.7 PLANT SYSTEMS

B 8.7.10 Fire Rated Assemblies

Bases

The OPERABILITY of the fire barriers and barrier penetrations ensure that fire damage will be limited. The design features minimize the possibility of a single fire involving more than one fire area prior to detection and extinguishment. The fire barriers and fire barrier penetration sealing devices are periodically inspected to verify their OPERABILITY. The functional testing of the fire dampers is provided to ensure that the dampers remain functional. The ventilation seals are seals around ductwork penetrating fire barriers. It is not the intent to rely on backup systems or other compensatory measures for an extended period of time and action will be taken to restore the inoperable portions of the fire rated assembly to OPERABLE status within a reasonable period.

For the purpose of determining OPERABILITY, an OPERABLE fire rated assembly and/or penetration sealing device is one that is capable of performing its intended safety function.

The ACTIONS take credit for OPERABLE fire detection instrumentation in lieu of a fire watch when a fire rated assembly is inoperable. OPERABLE fire detection instrumentation provides sufficient early warning capability of a fire to the appropriate Control Room. Fire detection instrumentation shall be considered OPERABLE provided that the Control Room has not been informed that the instrumentation is inoperable.

All hourly fire watch patrols are performed at intervals of sixty minutes with a margin of fifteen minutes.

A continuous fire watch requires that a trained individual be in the specified area at all times and that each fire zone within the specified area be patrolled at least once every fifteen minutes with a margin of five minutes.

Inoperable or impaired fire rated assemblies, including doors, penetration sealing devices, and fire dampers shall be reviewed for impact on OPERABILITY of TRM 8.7.8, Low Pressure $CO_2$ Systems and TRM 8.7.9, Halon Systems. Degraded fire rated assemblies potentially adversely impact the pressure envelope and ability of the gaseous $CO_2$ and Halon systems to maintain the required NFPA Code concentration and soak time, thereby requiring compensatory action per TRM 8.7.8 or TRM 8.7.9.

Types of penetration seals are core bore, blockout, boot, and ventilation required for NFPA 805 compliance. Fire barriers also include cable tray and conduit enclosures required for NFPA 805 compliance.

Fire dampers in gaseous suppression system pressure boundaries are often provided with two separate means of actuation, to allow either the actuation of the gaseous suppression to close the damper or thermal means to allow heat from a fire to close the damper. IF the gaseous suppression system is out of service, the fire damper remains OPERABLE when provided with a

Bases (continued)

thermal means of actuation. Reference 1 as well as applicable drawings for each damper identifies the actuation means for each damper.

REFERENCES

1. ES-HVAC-0803-QCN, Fire Dampers

8.7 PLANT SYSTEMS

B 8.7.11 Liquid Holdup Tanks

Bases

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Restricting the quantity of radioactive material contained in the specified tanks provides assurance that in the event of an uncontrolled release of the tanks' contents, the resulting concentrations would be less than the limits of 10 CFR Part 20, Appendix B, Table II, Column 2, at the nearest potable water supply and the nearest surface water supply in an Unrestricted Area.

This Requirement, being applicable to outside temporary tanks, does not apply to the refueling water storage tank, primary water storage tank, or the condensate storage tank, since they are part of the permanent plant design.

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8.7 PLANT SYSTEMS

B 8.7.12 Explosive Gas Mixture

Bases

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This specification is provided to ensure that the concentration of potentially explosive gas mixtures contained in the waste gas treatment system is maintained below the flammability limits of hydrogen and oxygen mixtures. Maintaining the concentration of hydrogen or oxygen below their flammability limits provides that the releases of radioactive materials will be controlled in conformance with the requirements of the General Design Criterion specified in Section 11.1 of the Final Safety Analysis Report for the Donald C. Cook Nuclear Plant.

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8.7 PLANT SYSTEMS

B 8.7.13 Gas Storage Tanks

Bases

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Restricting the quantity of radioactivity contained in each gas storage tank provides assurance that in the event of an uncontrolled release of the tanks' contents, the resulting total body exposure to an individual at the nearest site boundary will not exceed 0.5 rem. This is consistent with Standard Review Plan 15.7.1, "Waste Gas System Failure."

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8.7 PLANT SYSTEMS

B 8.7.14 Plant Process Computer Derived Reactor Thermal Power

Bases

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The LEFM CheckPlus System measures calorimetric plant power to provide one means of ensuring compliance with the maximum power level (3468 MWt) specified in Paragraph 2.C(1) of the Unit 2 Facility Operating License and the Technical Specification definition of RATED THERMAL POWER. To support plant operation above 3411 MWt (98.35%), the LEFM CheckPlus System must be in service. For the feedwater flow measurement instrumentation system to be in service, the LEFM CheckPlus System and the plant process computer (PPC) or a temporary plant process computer (TPPC as described below) must be functional. The loss of a single plane of transducers in the LEFM CheckPlus System is considered a non-functional LEFM condition.

When the PPC is in service, Operations personnel in the control room would be alerted to an LEFM Power Calorimetric off-normal condition or failure by the color of the indication of calorimetric power point, U1118L (Total Reactor Thermal Power). The calorimetric power point, which is normally green, will be indicated in some color other than green, potentially yellow, white, or magenta. An off-normal or failure of the venturi based calorimetric calculation will also be indicated by the computer point, U1118V, indicating in a color other than green. PPC points U1118L or U1118V that are not green, yellow, or white (white is only applicable to U1118L) indicate an unusable PPC point. If both computer points, U1118L and U1118V, are unusable, this is equivalent to a loss of PPC for determination of thermal power. The illumination of the "PLANT PROCESS COMPUTER FAILURE" window (Annunciator #211, Drop #50) (TPPC does not impact this drop)) is also an indication of a PPC failure in the context of this Technical Requirement. However, the TPPC has its own audio and visual alarm on the TPPC workstation located in the Control Room.

If the LEFM Power Calorimetric indication, U1118L, or Corrected Venturi Power Calorimetric Calculation, U1118V, is "yellow" and the cause for the yellow indication cannot be identified and controlled per current operating procedures, then this shall be considered a FAILURE of that PPC point and requirements for a PPC point that is not green, yellow, or white apply.

A "white" LEFM Power Calorimetric indication reflects a condition that does not affect indicated power or accuracy, e.g. a loss of communication redundancy from the LEFM CheckPlus System. The CheckPlus system shall still be considered to be functional.

If the PPC is not available, the LEFM CheckPlus System may be verified functional by verifying the 2-FFQ-200-EU display screen status "Check" icon is not in the "Red (Fail)" status by use of a Temporary PPC (TPPC) which utilizes a temporary R*Time server and the data acquisition equipment to gather the data points required to calculate Total Reactor Thermal Power. The TPPC will maintain the same color status indication as the PPC. The LEFM Flow, Pressure, and Temperature indications may then be used in conjunction with additional instrumentation meeting required accuracy tolerances for performance of LEFM Power Calorimetric Calculations.

Bases

For a non-functional LEFM CheckPlus System, the 46-hour clock starts at the time of the LEFM failure (i.e., the time the LEFM Power Calorimetric value shows a color other than green or yellow or white on the PPC or the TPPC). Steady-state core power conditions, as used in Action A.1 mean that power does not change by more than 10 percent during the period in which the LEFM is non-functional. (NOTE: Reactor Power shall not exceed 100% power, 3468 MWt.) If the computer point, U1118L, is not green, yellow, or white, and there is no indication of a further failure of the PPC (U1118V is green or yellow), then the Corrected Venturi Power Calorimetric Calculation will be used to meet the calorimetric requirements (daily heat balance) of Surveillance Requirement 3.3.1.2 for up to 46 hours from the time of failure.

If the LEFM CheckPlus System Power Calorimetric indication is not returned to a functional "green," "yellow," or "white" status within the 46-hour limit, plant power will be reduced to ≤ 3411 MWt (98.35%) and any further calorimetrics will be performed based on the venturi calculation until the LEFM is returned to a functional "green," "yellow," or "white" status. The power reduction will be in accordance with current operating procedures such that the plant will be operating at, or below, the pre-uprated maximum power level (3411 MWt) (98.35%) when the 48-hour allowed outage time has elapsed.

A loss of both the LEFM System calorimetric power and the corrected venturi calorimetric power will be treated as a loss of the PPC. If the LEFM CheckPlus System remains functional, it may be used in conjunction with the TPPC and additional instrumentation meeting required accuracy tolerances for performance of Manual LEFM Power Calorimetric Calculations. If the LEFM CheckPlus System is non-functional, or the required accuracy tolerances cannot be met for the additional instrumentation required, plant power must be reduced to ≤ 3411 MWt (98.35%) in a timeframe necessary to support the next Manual Venturi Power Calorimetric Calculation. A Manual Venturi Power Calorimetric Calculation shall not be performed at > 3411 MWt (98.35%).

SURVEILLANCE REQUIREMENTS

Status of the LEFM CheckPlus system is indicated in the control room on the PPC screen that displays the calorimetric power level. The LEFM status and related calorimetric calculation are normally determined to be functional based on PPC computer point status.

If the PPC is not available, the status of the LEFM CheckPlus System may be indicated in the control room on a TPPC screen that displays the calorimetric data. The LEFM status and related calorimetric calculation would also be determined to be functional based on the TPPC computer point status.

REFERENCES

1. Letter from J.E. Pollock, I&M, to NRC Document Control Desk, "Donald C. Cook Nuclear Plant Unit 2 License Amendment Request for Appendix K Measurement Uncertainty Recapture – Power Uprate Request," AEP:NRC:2902, dated November 15, 2002.

Bases

REFERENCES (continued)

2. Letter from J. F. Stang, NRC to A. C. Bakken, III, I&M, “Donald C. Cook Nuclear Power Plant, Unit 2 – Issuance of Amendment Regarding Measurement Uncertainty Recapture Power Uprate (TAC No. MB6751)”, dated May 3, 2003.

3. Temporary Modification 2-TM-13-27, Temporary PPC for U2 PPC Replacement.

4. Modification EC-0000056125, Unit 2 Feedwater LEFM Software and PPC Update.

8.7 PLANT SYSTEMS

B 8.7.15 Steam Generator Stop Valves (SGSVs), Main Feedwater Isolation Valves (MFIVs) and Main Feedwater Regulation Valves (MFRVs)

Bases

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This TRM provides specific isolation time limits for the SGSVs, MFIVs, and MFRVs to support performance of TS SR 3.7.2.1, 3.7.3.1, and 3.7.3.2 as specified by License Amendment 301. This License Amendment was initiated in response to the condition identified in AR 2010-10259.

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8.8 ELECTRICAL POWER SYSTEMS

B 8.8.1 Deleted

8.8 ELECTRICAL POWER SYSTEMS

B 8.8.2 Diesel Fuel Oil

Bases

The basis for the leakage limit of 0.05 gallons per hour is to provide margin to ensure compliance with the 0.1 gallons per hour limit specified in National Fire Protection Association, NFPA 329, Recommended Practice for Handling Releases of Flammable and Combustible Liquids and Gases, 1999 Edition.

Diesel Fuel Oil System operability is defined by Technical Specification (TS) 3.8.3, "Diesel Fuel Oil." TS 3.8.3 requires a volume of greater than 39,500 gal of fuel oil, fuel oil particulate is within standards, and fuel oil properties are maintained within limits. If the leak can be managed such that these parameters are met, then the Diesel Fuel Oil System and the emergency diesel generators associated with a given fuel oil storage tank would be able to perform their specified safety functions. The Completion Time of 48 hours is based on allowing adequate time to perform any actions or surveillances that may be needed to determine if the leak affects the operability of the Diesel Fuel Oil system.

The corrective action process is used to evaluate what actions, if any, are needed to manage the leak to ensure the Diesel Fuel Oil System remains in compliance with TS 3.8.3. The corrective action process is also used to evaluate how to repair the leak, address actions required per NFPA 329, and environmental requirements. Loss of fuel oil out of the fuel oil storage tanks is not preferable as it provides a mode of communication to the outside environment.

8.8 ELECTRICAL POWER SYSTEMS

B 8.8.3 Supplemental Diesel Generators (SDGs)

Bases

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In the unlikely event that an emergency diesel generator (DG) fails to energize its associated Class 1E emergency bus when required, two available SDGs operating in tandem can provide a supplemental alternating current (AC) power source to energize the affected emergency bus even if the 69 kilovolt (kV) alternate offsite power source is inoperable. This capability is the basis for the extended 14 day Completion Time of Required Action B.5 of LCO 3.8.1, "AC Sources - Operating," Condition B, "One required DG inoperable," (References 1 through 6).

Available SDGs will sense a sustained loss of voltage on 69 kV substation 4.16 kV bus 1 (4.16 kV bus 1), and then will automatically start and reenergize 4.16 kV bus 1. Automatic SDG starting and energization of 4.16 kV bus 1 will be preceded by the opening of a motor operated disconnect to isolate the 69 kV alternate offsite power supply. This feature of the automatic starting logic ensures that subsequent restoration of the 69 kV alternate offsite power source does not inadvertently parallel the offsite source with the SDGs.

Once reenergized by the SDGs, 4.16 kV bus 1 can be manually aligned to a single Class 1E emergency bus in either unit. Breaker interlocks associated with ensuring that 4.16 kV bus 1 is not inadvertently paralleled with any other power source supplying a Class 1E emergency bus will remain functional when the SDGs are powering 4.16 kV bus 1. Prior to manually placing the SDG on the selected Class 1E emergency bus, non–essential loads are removed by manually actuating the load conservation trip (LCT) logic. Once the SDGs have been manually aligned to a Class 1E emergency bus, the emergency loads on that bus can be manually energized. Non–essential loads may be restored if desired by manually resetting the LCT logic.

The SDGs have a combined continuous capacity rating of 4500 kW which exceeds the 3500 kW continuous capacity rating of any single emergency DG. The SDG capacity is sufficient to power at least one train of vital equipment needed to ensure that safe shutdown conditions following a station blackout (SBO) can be maintained. A single train of SBO loads requires slightly less than 55% of the combined capacity of the two SDGs.

The SDGs are required to be available in Modes 1, 2, 3, and 4 corresponding with the Mode applicability of LCO 3.8.1. Since the SDGs are shared between units, they will be maintained available when either unit is in Mode 1, 2, 3, or 4. The SDGs are included in the Maintenance Rule Program as High Safety Significant components to ensure target availability levels are maintained.

When one or both SDGs are not available (TRO 8.8.3 Condition A) the Required Action is to immediately enter the applicable Conditions and Required Actions of LCO 3.8.1. This applicable Condition is LCO 3.8.1 Condition B, "One required DG inoperable." If LCO 3.8.1 Condition B exists when one or both SDGs are not available, then LCO 3.8.1 Required Action C.1 requires restoring both SDGs to available status within 72 hours, or LCO 3.8.1

Bases

Required Action C.2 requires the inoperable DG be restored within 72 hours. TRO 8.8.3 Condition A has no additional Required Action if LCO 3.8.1 Condition B does not exist. For this reason, whenever LCO 3.8.1 Condition B is first determined to exist, then LCO 3.8.1 Required Action B.1 requires verification within 1 hour that TRO 8.8.3 is met. Subsequently, as long as LCO 3.8.1 Condition B remains applicable, then TRS 8.8.3.1 is required to be performed every 12 hours.

TRS 8.8.3.1

This surveillance verifies the minimum fuel quantity necessary to provide a nominal 24-hour on-site fuel supply for each SDG fuel oil tank. The 2200 gallons minimum fuel supply specified for each SDG is sufficient, with the SDGs operating in tandem, to power one train of SBO loads for 24 hours.

This surveillance also verifies that the SDGs are mechanically and electrically ready to automatically power 69 kV substation 4.16 kV bus 1. Mechanical readiness includes visual verification by walk–down to ensure no obvious signs of impairment such as missing/damaged components, leaking fluids or externally obstructed intake/exhaust/cooling (radiator) systems. Jacket water heater inlet and outlet valve positions are verified and, when outdoor temperature has been below 32°F continuously for more than 4 hours since the last performance of the surveillance, jacket water heating and enclosure heating are also verified. Electrical readiness includes verification of correct SDG switch, breaker, and motor operated disconnect positions. Control power is verified to the SDG breakers, motor operated disconnect, and sensing devices associated with the undervoltage detection circuit.

The SDG programmable logic controller is verified to be maintaining communication with at least one remote monitoring terminal. Since the system starts automatically and may be monitored from either Control Room, only a single remote monitoring terminal is required to be active and updating.

The surveillance does not require verification of breaker operability necessary to manually align 4.16 kV bus 1 to the emergency buses because this path is common to the 69 kV alternate qualified offsite circuit. The 69 kV manual alignment capability is addressed by LCO 3.8.1 for all of the qualified offsite circuits. As stated in the Bases for LCO 3.8.1:

> A qualified offsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling and controls required to transmit power from the offsite transmission network to the onsite Class 1E emergency buses.

The Bases for SR 3.8.1.1 states, in part:

> This SR ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network.

SR 3.8.1.1 has a 7 day frequency which is consistent with the 7 day frequency of TRS 8.8.3.1.

Bases

TRS 8.8.3.2

The unloaded run of the SDGs for at least 5 minutes every 14 days assures the SDGs have adequate protection from internal corrosion of cylinder walls and bearings and maintains the fuel oil system primed. The surveillance and associated frequency is based on vendor recommendations.

TRS 8.8.3.3

SDG load testing is accomplished with the SDGs paralleled to the 69 kV alternate offsite AC power source. The minimum load of 3150 kW is the same as the minimum load specified by SR 3.8.1.3 for the emergency DGs. The maximum load specified is the combined continuous duty rating of the SDGs. SR 3.8.1.3 for the DGs is also performed with the DGs paralleled to offsite power. Since voltage and frequency are dependent on grid voltage and frequency during this testing, neither surveillance specifies voltage or frequency acceptance criteria. The 92 day frequency for TRS 8.8.3.3 is based on NUMARC 87-00 guidance (Reference 7) for an SBO alternate AC power source, even though the SDGs are not credited for fulfilling SBO requirements (Reference 3). The 92 day frequency is also consistent with vendor recommendations for maintaining engine/generator reliability.

Although no power factor requirements are established by this SR, the SDG is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while the 1.0 is an operational goal to ensure circulating currents are minimized. The load band is provided to sufficiently demonstrate the SBO loading requirement without unnecessary overloading of the SDG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain SDG reliability.

The minimum 60 minute load test is adequate to demonstrate availability, since the SDGs reach operating temperature within that time. NRC guidance provided for the safety related emergency diesel generators (EDGs), Section C.2.2.2 of Regulatory Guide 1.9 (Reference 10) and SR 3.8.1.3 of NUREG-1431 (Reference 9) both specify a load test minimum duration of 60 minutes for demonstrating operability of Class 1E EDGs. The same 60 minute minimum load duration has been conservatively applied to the SDGs even though they are not Class 1E equipment. Therefore, the SR required minimum 60 minute load test is appropriate for demonstrating availability of the SDGs.

Operation of the SDGs under load may be performed for durations in excess of 60 minutes for the purpose of improving the long term reliability of the SDGs, per vendor recommendations. However, this additional operating time is not necessary to demonstrate availability per the SR.

TRS 8.8.3.4

This surveillance demonstrates an automatic SDG start sequence initiated by a sustained loss of voltage on 4.16 kV bus 1, thereby ensuring that the voltage sensing devices and their associated logic circuits function properly. The surveillance includes a demonstration that the

Bases

SDGs will automatically maintain the specified voltage and frequency. The steady-state voltage and frequency requirements of this TRS have been nominally specified to demonstrate a performance envelope for the SDGs consistent with that of the emergency DGs (Regulatory Guide 1.9). The surveillance acceptance criteria are considered nominal given the non-safety related classification of this system, and are not required to include the uncertainties of the instruments used to measure the voltage and frequency during surveillance testing.

The 18–month frequency for TRS 8.8.3.4 is based on NUMARC 87-00 guidance (Reference 7) for a SBO alternate AC power source even though the SDGs are not credited for fulfilling SBO requirements (Reference 3). After sufficient SDG performance data has been obtained, the frequency of testing SDG automatic features may be extended to 24 months using the guidance in Generic Letter 91-04 (Reference 8).

TRS 8.8.3.5

To afford the SDGs the same overload protection from non–essential loads as is provided the emergency DGs, the LCT logic can be manually actuated prior to manually placing the SDGs on an emergency bus. This is accomplished from the control room with separate Train A and Train B manual LCT control switches. TRS 8.8.3.5 verifies the ability of these switches to support manual loading of the SDGs to their respective emergency buses. The 24 month frequency is based on the test frequency for the automatic actuation of the load conservation logic for the DGs. The manual LCT switches energize the same LCT actuation relay as is energized automatically for the DGs.

References

1. Letter from J. N. Jensen, Indiana Michigan Power Company (I&M), to U. S. Nuclear Regulatory Commission (NRC) Document Control Desk, “Donald C. Cook Nuclear Plant Units 1 and 2 - Docket Nos. 50-315 and 50 316 - Extension of Allowed Outage Times for Emergency Diesel Generators, 69 kV Offsite Power Circuit, Component Cooling Water, and Essential Service Water,” AEP:NRC:4811, dated September 21, 2004 (ML042780478).

2. Letter from J. N. Jensen, I&M, to NRC Document Control Desk, “Partial Response to Request For Additional Information Regarding License Amendment Request to Extend the Allowed Outage Times for Emergency Diesel Generators, 69 kV Offsite Power Circuit, Component Cooling Water, and Essential Service Water (TAC Nos. MC4525 and MC4526),” AEP:NRC:5811, dated March 18, 2005 (ML050890319).

3. Letter from D. P. Fadel, I&M, to NRC Document Control Desk, “Response to Request For Additional Information Regarding License Amendment Request to Extend the Allowed Outage Times for Emergency Diesel Generators, 69 kV Offsite Power Circuit, Component Cooling Water, and Essential Service Water (TAC Nos. MC4525 and MC4526),” AEP:NRC:5811-01, dated April 7, 2005 (ML051020239).

4. Letter from J. N. Jensen, I&M, to NRC Document Control Desk, “Remainder of Response to Request For Additional Information Regarding License Amendment Request to Extend the Allowed Outage Times for Emergency Diesel Generators, 69 kV Offsite Power Circuit, Component Cooling Water, and Essential Service Water (TAC Nos. MC4525 and MC4526),” AEP:NRC:5811-02, dated May 6, 2005 (ML051380429).

Bases

References (continued)

5. Letter from D. P. Fadel, I&M, to NRC Document Control Desk, Response to Request For Additional Information Regarding License Amendment Request to Extend the Allowed Outage Times for Emergency Diesel Generators (TAC Nos. MC4525 and MC4526),” AEP:NRC:5811-03, dated August 10, 2005 (ML052300235).

6. Letter from J. N. Jensen, I&M, to NRC Document Control Desk, “Updated Information Regarding License Amendment Request to Extend the Allowed Outage Time for the Emergency Diesel Generators (TAC Nos. MC4525 and MC4526),” AEP:NRC:5811-04, dated September 19, 2005 (ML052710181).

7. NRC Regulatory Guide 1.155, “Station Blackout,” dated August 1, 1988.

8. NRC Generic Letter 91-04, "Changes in Technical Specifications Surveillance Intervals to Accommodate a 24-Month Fuel Cycle," dated April 2, 1991.

9. NUREG-1431, “Standard Technical Specifications, Westinghouse Plants,” Revision 2, April 30, 2001.

10. Regulatory Guide 1.9, “Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants," Revision 3, July 1993.

8.8 ELECTRICAL POWER SYSTEMS

B 8.8.4 Manual Alternative Reserve Sources

Bases

No Bases information is provided.

8.9 REFUELING OPERATIONS

B 8.9.1 Communications

Bases

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The requirement for communication capability ensures that refueling station personnel can be promptly informed of significant changes in the facility status or core reactivity conditions during CORE ALTERATIONS.

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8.9 REFUELING OPERATIONS

B 8.9.2 Decay Time

Bases

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The minimum requirement for reactor subcriticality prior to movement of irradiated fuel assemblies in the reactor pressure vessel ensures that sufficient time has elapsed to allow the radioactivity decay of the short lived fission products. The 120-hour decay time is consistent with the assumptions used in the fuel handling accident analyses.

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8.9 REFUELING OPERATIONS

B 8.9.3 Deleted

8.9 REFUELING OPERATIONS

B 8.9.4 Deleted

8.10 NFPA 805

B 8.10.1 Charging System

Bases

The charging flowpath of Unit 1 required for the Unit 2 shutdown support ensures that flow is available to Unit 2 and addresses the requirements of 10 CFR 50.48(c), “NFPA 805.” The Unit 1 flowpath consists of a charging pump powered from an electrical bus and associated water supplies and delivery system. Fire watches posted in the affected areas (i.e., Unit 2 areas requiring use of the Unit 1 charging system in the event of a fire) may serve as the equivalent shutdown capability specified in the action statements of TRM 8.10.1. In the affected areas, either establish continuous fire watches or verify the OPERABILITY of fire detectors per TRM 8.7.4 and establish hourly fire watch patrols. The required Unit 1 equipment along with the surveillance requirements necessary to ensure that this equipment is capable of fulfilling its intended NFPA 805 alternate safe shutdown function have been established and are included in a plant procedure. An additional plant procedure details how the above noted fire watches will be implemented.

8.10 NFPA 805

B 8.10.2 Auxiliary Feedwater System

Bases

The auxiliary feedwater flowpath, with a pump and associated water supplies and piping, will support cooling requirements of Unit 2. This capacity addresses the 10 CFR 50.48(c), "NFPA 805," safe shutdown requirements. Fire watches posted in the affected unit areas (i.e., Unit 2 areas requiring use of the Unit 1 auxiliary feedwater system in the event of a fire) may serve as the equivalent shutdown capability specified in the action statements of Requirement 8.10.2. In the affected areas, either establish continuous fire watches or verify the OPERABILITY of fire detectors per TRM 8.7.4 and establish hourly fire watch patrols. A detection system is considered OPERABLE if: (1) ≥ ½ the total detectors in the affected zones are OPERABLE; AND (2) no two adjacent fire detectors in the affected zones are inoperable. The required opposite unit equipment along with the surveillance requirements necessary to ensure that this equipment is capable of fulfilling its intended NFPA 805 alternate safe shutdown function have been established and are included in a plant procedure. An additional procedure details how the above noted fire watches will be implemented.

8.10 NFPA 805

B 8.10.3 Component Cooling Water (CCW) System

Bases

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The OPERABILITY of the Unit 1 flow paths which support Unit 2 shutdown functions ensures the availability of cooling functions on Unit 2 and addresses the requirements of 10 CFR 50.48(c), “NFPA 805.” The required flow path consists of a pump and associated water supplies and delivery systems. Fire watches posted in the affected opposite unit areas (i.e., Unit 2 areas requiring use of the Unit 1 component cooling water system in the event of a fire) may serve as the equivalent shutdown capability specified in the ACTION statement for TRM 8.10.3. In the affected areas, either establish continuous fire watches or verify the OPERABILITY of fire detectors per TRM 8.7.4 and establish hourly fire watch patrols. The required opposite unit equipment along with the surveillance requirements necessary to ensure that this equipment is capable of fulfilling its intended NFPA 805 alternate safe shutdown function have been established and are included in a plant procedure. An additional plant procedure details how the above noted fire watches will be implemented.

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8.10 NFPA 805

B 8.10.4 Essential Service Water (ESW) System

Bases

TRO 8.10.4 ensures a shutdown cooling flow path from Unit 1 is maintained available for Unit 2. The available shutdown cooling flow path is necessary to support Unit 2 in the event of a 10 CFR 50.48(c), "NFPA 805," fire. The available flow path may have a closed cross-tie valve(s) when required by Technical Specifications. For 10 CFR 50.48(c), "NFPA 805," it is assumed that the valve can be opened by local manual operation.

The OPERABILITY of the Unit 1 flow paths which support Unit 2 shutdown functions ensure the availability of cooling functions on Unit 2 and addresses the requirements of 10 CFR 50.48(c), "NFPA 805." The required flow path consists of a pump and associated water supplies and delivery systems. Fire watches posted in the affected unit areas (i.e., Unit 2 areas requiring use of the Unit 1 ESW system in the event of a fire) may serve as the equivalent shutdown capability specified in the action statements of Requirement 8.10.4. In the affected areas, either establish continuous fire watches or verify the OPERABILITY of fire detectors per TRM 8.7.4 and establish hourly fire watch patrols. The required opposite unit equipment along with the surveillance requirements necessary to ensure that this equipment is capable of fulfilling its intended NFPA 805 alternate safe shutdown function have been established and are included in a plant procedure.

8.10 NFPA 805

8.10.5 Steam Generator (SG) Power Operated Relief Valve (PORV) Backup Nitrogen System

Bases

TRO 8.10.5 ensures the SG PORV Backup Nitrogen System is maintained available to support placing Unit 2 in cold shutdown in the event of a fire that causes the loss of the plant air system. To comply with 10 CFR 50.48(c), "NFPA 805," the SG PORV Backup Nitrogen System provides the capability to operate the SG PORVs for Reactor Coolant System temperature control during a unit cooldown with the plant air system unavailable. While backup nitrogen is supplied to all of the SG PORVs, it is only required for two SG PORVs as only two PORVs are needed to support an NFPA 805 unit cooldown.

If the SG PORV Backup Nitrogen System is not available to at least two SG PORVs, the system must be restored to available status within 14 days. If the SG PORV Backup Nitrogen System is not restored to available status within 14 days, Condition B directs that an alternate means of SG PORV backup operation be provided within 24 hours. This can be satisfied by verifying that the SG PORV manual operators (handwheels) are available for use for at least two SG PORVs. If the alternate is not available, Condition C directs entry into TRO 8.0.3.

The Nitrogen System also provides a backup pneumatic supply for automatic and remote SG PORV operation from the main control room. SG PORV Backup Nitrogen is normally aligned but will only supply the SG PORVs in the event of a loss of Control Air pressure. Automatic and remote SG PORV operation from the main control room is not needed for operability for NFPA 805. TRS 8.10.5.1 provides assurance that the SG PORV Backup Nitrogen System is available by requiring daily verification of adequate nitrogen inventory. This requirement may be satisfied during routine plant tours by verifying that there are two nominally full bulk nitrogen tanks, as defined in the engineering analysis, available to be placed in service. This requirement allows for operation of the SG PORVs in accordance with established NFPA 805 procedures.

References

1. MD-12-N2-001-N, Steam Generator PORV N2 Supply Requirements for Consumed Volume and Tank Pressure

2. EC-0000052530, Steam Generator PORV Nitrogen Supply

8.10 NFPA 805

8.10.6 Pressurizer Power Operated Relief Valve (PORV) Backup Air System

Bases

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TRO 8.10.6 ensures the Pressurizer PORV Backup Air System is maintained available to support placing Unit 2 in cold shutdown in the event of a fire that causes the loss of the plant air system. To comply with 10 CFR 50.48(c), "NFPA 805," the Pressurizer PORV Backup Air System provides the capability to operate the pressurizer PORVs for Reactor Coolant System pressure control during a unit cooldown with the plant air system unavailable. Two of the three Pressurizer PORVs (NRV-152 and NRV-153) have independent backup air systems. Only one of these two valves is needed during an NFPA 805 plant cooldown.

If the Pressurizer PORV Backup Air System is not available, Condition A requires that the system be restored to available status within 14 days. Since the Pressurizer PORV backup air systems are independent and only one PORV must be available per the TRO, the backup air systems for both NRV-152 and NRV-153 must be unavailable before Condition A is applicable. If the Pressurizer PORV backup air systems are not restored to available status within 14 days, Condition B that an alternate means of Pressurizer PORV backup operation be provided within 24 hours. If the alternate is not available, Condition C directs entry into TRO 8.0.3.

TRS 8.10.6.1 provides assurance that the Pressurizer PORV Backup Air System is available by requiring daily verification of adequate air bottle pressure. This may be performed by verifying that the Control Room annunciators for low air bottle pressure are not in alarm. If the annunciator is not available, the pressure may be verified to be above the low alarm setpoint locally.

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# 8.11 FLEX PORTABLE EQUIPMENT, PLANT CONNECTION POINTS, AND PLANT COMPONENTS

## B 8.11.1 FLEX PORTABLE EQUIPMENT AVAILABILITY

Bases

BACKGROUND

On March 11, 2011, an earthquake and resulting tsunami initiated a severe accident at the Fukushima Dai-ichi nuclear power plant in Japan. The tsunami exceeded the plant's design basis and flooded the site's emergency power supplies and electrical distribution system. The extended loss of power severely compromised the plant safety systems and ultimately led to core damage in three reactors. In response to these events, the NRC issued NRC Order EA-12-049 (Reference 1) requiring licensees to develop strategies that would be available if an extended loss of ac electrical power and loss of access to the ultimate heat sink occurred simultaneously at all units on a site.

The NRC has endorsed (Reference 2) Nuclear Energy Institute document NEI 12-06 (Reference 3) as an acceptable means of meeting the requirements of the order. The program that implements the guidelines provided in NEI 12-06 is termed the "FLEX" program. The FLEX program strategies consist of three phases. Phase 1 uses installed equipment and resources to initially maintain the key safety functions of core cooling, containment, and SFP cooling. Phase 2 uses portable onsite equipment to maintain these key safety functions. NEI 12-06 requires that licensees have sufficient Phase 2 equipment to maintain the key safety functions at all units on-site, plus one additional unit, i.e., an N+1 capability, where "N" is the number of units on-site. Phase 3 uses resources brought from off site to sustain the key safety functions indefinitely.

BASES

NEI 12-06 requires that the FLEX portable equipment sufficient to provide "N" and "N+1" capability be maintained available. TRM 8.11.1 implements these availability requirements for CNP. The major FLEX portable equipment to which these availability requirements apply is identified in the PMP (Reference 4) that implements the FLEX Equipment Program. Attachment 2 to that PMP explicitly identifies the major FLEX Phase 2 "N" and "N+1"portable equipment that is to be maintained available, along with the associated FLEX strategies, plant connection points, and Mode of applicability. Smaller portable FLEX equipment (hoses, cables, fittings, tools, etc.) that supports the "N" and "N+1" capabilities is identified Reference 5, which requires periodic inventory and checks of all FLEX portable equipment. Reference 5 also requires that any components identified as unsatisfactory at any time be documented in the CNP corrective Action Program, and promptly evaluated for impact of the associated FLEX "N" and "N+1" strategies. Reference 6 requires that Operations shift management be promptly notified if unsatisfactory FLEX equipment adversely affects "N" or "N+1" strategies. Additionally, Reference 6 requires that the Operations Shift Manager be immediately notified of the unavailability of installed and portable equipment used to mitigate a beyond design basis external event.

(continued)

BASES (cont'd)

If FLEX portable equipment is made or found to be unavailable, the appropriate TRM 8.11.1 Condition is to be entered and the Required Actions taken within the associated Completion Time. If the Required Actions include compensatory actions (e.g., use of alternate suitable equipment or supplemental personnel) the FLEX Program Owner should be consulted per Reference 4.

As stated above, Reference 5 requires periodic inventory and checks of portable FLEX equipment. Additionally, the FLEX Equipment Program (Reference 4) includes periodic and preventive maintenance requirements. Unsatisfactory results would be evaluated for impact on FLEX portable equipment availability. Therefore, no Surveillance Requirements are specified by TRM 8.11.1.

REFERENCES:

1. Order EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012, ADAMS Accession No. ML12054A736.

2. NRC "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," Revision 0, dated August 29, 2012, ADAMS Accession No. ML12229A174.

3. Nuclear Energy Institute document NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0, dated August 21, 2012, ADAMS Accession No. ML12242A378.

4. PMP-4027-FSG-002, "FLEX Equipment Program."

5. 12-OHP-5030-FSG-523, "FLEX Equipment Inventory and Checks."

6. PMP-7030-CAP-001, "Cook Plant Action Form Instructions."

8.11 FLEX PORTABLE EQUIPMENT, PLANT CONNECTION POINTS, AND PLANT COMPONENTS

B 8.11.2 FLEX PLANT CONNECTION POINTS AND PLANT COMPONENTS, AND FLEX PLANT CONNECTION POINTS AND PLANT COMPONENTS COMBINED WITH FLEX PORTABLE EQUIPMENT

Bases

BACKGROUND

See the "Background" for TRM 8.11.1.

BASES

NEI 12-06 (Reference 1) requires that the primary and alternate plant connection points for portable FLEX equipment be maintained available. TRM 8.11.2 implements these availability requirements for CNP. The equipment connection points to which these availability requirements apply are identified in the PMP (Reference 2) that implements the FLEX Equipment Program. Attachment 2 to that PMP explicitly identifies the primary and alternate connection points for FLEX portable equipment that are to be maintained available, along with the associated FLEX strategies, portable equipment, and Mode of applicability.

In addition to the FLEX equipment connection points, I&M has elected to apply the NEI12-06 availability requirements to active plant components in the flowpaths associated with the connection points and their strategies. These plant components are listed in Figure 1 of Reference 2. As recognized in NEI 12-06, the availability of many plant components credited in FLEX strategies is adequately controlled by other formal processes (e.g. Technical Specifications and the Technical Requirements Manual). Therefore, Figure 1 of Reference 2 does not include plant components that are governed by Technical Specifications or other Technical Requirements Manual sections.

If plant connection points for FLEX portable equipment, or the associated plant components listed in Figure 1 of Reference 2, are made or found to be unavailable, the appropriate TRM 8.11.2 Condition is to be entered and the Required Actions taken within the associated Completion Time. If the Required Actions include compensatory actions (e.g., use of alternate suitable equipment or supplemental personnel) the FLEX Program Owner, should be consulted per Reference 2.

The FLEX equipment connection points and plant components that are controlled by this TRM are located in installed plant systems that are subject to maintenance and inspection requirements commensurate with their normal operating function. Therefore, no Surveillance Requirements are specified by TRM 8.11.2.

REFERENCES:

1. Nuclear Energy Institute document NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0, August 21, 2012, ADAMS Accession No. ML 12242A378.

2. PMP-4027-FSG-002, "FLEX Equipment Program."

8.11 FLEX PORTABLE EQUIPMENT, PLANT CONNECTIONS POINTS, AND PLANT COMPONENTS

B 8.11.3 Boric Acid Reserve Tank and Boric Acid Storage Tank for FLEX Strategies

Bases

BACKGROUND

See the "Background" for TRM 8.11.1.

TRO

The FLEX strategies for compliance with NEI 12-06, Revision 0, (Reference 1) were initially implemented in October 2015 for Unit 1 and April 2016 for Unit 2. The initial Phase 2 FLEX strategies included crediting the Boric Acid Storage Tanks (BASTs) as the primary source of borated make-up water during an RCS cooldown following an extended loss of alternating current power (ELAP), with the unit(s) initially in Modes 1 through 4. The requirements for BAST inventory and boron concentration in existing TRM 8.1.1, "Boration System – Operating," were credited as supporting the initial strategy that utilized the BASTs.

The Phase 2 strategy was subsequently changed (Reference 2) to credit the Boric Acid Reserve Tank (BART), rather than the BASTs, as the primary source of borated make-up water during a Phase 2 RCS cooldown following an ELAP. Accordingly, TRM 8.11.3 requires that the BART be available to perform this function in the operating conditions under which borated makeup from the BART would be needed to maintain sub-criticality for the cooldown to MODE 5. These operating conditions are MODES 1 and 2, or MODES 3 and 4 with RCS boron concentration less than the minimum boron concentration required for Mode 5 as determined in accordance with Reference 3. If the unit is in MODE 3 or 4 with RCS boron concentration greater than the minimum boron concentration required for Mode 5, the only borated makeup needed would be that necessary for reactor coolant contraction and leakage. Makeup from the RWST would be adequate for those functions. The availability of the RWST would be assured by Technical Specification 3.5.4, "Refueling Water Storage Tank." As described in Reference 2, the BASTs are credited as an alternate source of borated make-up water. If the BART is not available, TRM 8.11.3 requires verification that the alternate source, the BASTs, are available.

TRM 8.11.3 was originally written with no surveillance requirements for the BASTs because TRM 8.1.1 ensured a BAST was available in Modes 1-4. Subsequently, TRM 8.1.1 applicability was changed to Modes 1 through 3 and a new TRM 8.1.3 applicable in Mode 4 required only one borated water source, either a BAST or the RWST. Because in Mode 4 only, the Reactivity Control Systems (8.1) TRMs no longer required an operable BAST, the FLEX requirements for a BAST were added to TRM 8.11.3.

The TRM 8.11.3 Conditions, Required Actions, and Completion Times were derived from requirements in NEI 12-06, Revision 2 (Reference 4), Section 11.5.3, for managing the unavailability of connection points that directly support a FLEX mitigation strategy. Although initial CNP compliance with NRC Order EA-12-049 is based on compliance with NEI 12-06, Revision 0, compliance with NEI 12-06, Revision 2, is expected to be required in the future.

BASES

TRO (continued)

Use of the slightly more restrictive requirements of Revision 2 of NEI 12-06 as the basis for TRM 8.11.3 assures compliance following the transition from Revision 0.

The ≥ 6,550 ppm value for the minimum boron concentration required by surveillance requirement TRS 8.11.3.1 (for the BART) and TRS 8.11.3.2 (for a BAST) supports the assumptions of the inventory control and long-term subcriticality analysis performed by Westinghouse (Reference 5). The ≤ 7,300 ppm upper limit on boron concentration provides assurance that the associated ≈ 56 °F precipitation temperature would not be reached following an ELAP. The BART does not rely on heat tracing to preclude precipitation and the heat tracing on the BASTs would be non-functional during an ELAP. The BART and BASTs are located below grade in the Auxiliary Building, and area temperatures would remain relatively stable following an ELAP since ventilation would be disabled. After 24 hours, boron injection into the RCS would no longer be needed. The ≤ 7,300 value bounds the highest concentration typically occurring during normal plant operations, thereby minimizing the likelihood of unnecessary entry into the TRM Conditions for an unavailable BART or BAST.

The 60 day Frequency specified for verifying the boron concentration of the BART contents is reasonable in that:

- The 60 day frequency does not require excessive performance of the BART recirculation and sampling process (which can take several days), and
- The required concentration is assured between samples by procedures that require calculating the change in concentration when additions are made to the BART.

The borated water levels in the BART specified in surveillance TRS 8.11.3.3 are the percent water levels as read in installed instrumentation, as calculated by CNP Design Engineering – Instrument & Control, and documented in Reference 7. These percent water levels assure that the necessary borated water volume determined by the Reference 5 Westinghouse analyses will be available for each unit. The TRS 8.11.3.3 requirements are structured to recognize that the BART is common to Unit 1 and Unit 2, and the necessary percent level depends on the status of each unit. The 7 day Frequency specified for surveillance TRS 8.11.3.3 is consistent with the 7 day Frequency specified for verifying the borated water level in the previous primary source of borated makeup (the BAST), per TRM Section 8.1, “Reactivity Control Systems.”

Reference 7 also includes information on minimum levels required in each BAST assigned to Unit 1 and Unit 2 (TRS 8.11.3.4) as the necessary borated water source volume determined by the Reference 5 Westinghouse analyses.

A note is included in TRS 8.11.3.3 (BART level) and TRS 8.11.3.4 (BAST level) specifying if boric acid from that source has been injected into the Reactor Coolant System for shutdown margin (TS 3.1.1), the minimum level required by the associated TRS is not required.

BASES

REFERENCES

1. Nuclear Energy Institute document NEI 12-06, “Diverse and Flexible Coping Strategies (FLEX) Implementation Guide,” Revision 0, ADAMS Accession No. ML12242A378.

2. “Final Integrated Plan, U. S. Nuclear Regulatory Commission Order EA-12-049, Strategies For Beyond-Design-Basis External Events, Donald C. Cook Nuclear Plant Units 1 and 2” (FIP), Revision 2.

3. Unit 1 procedure 1-OHP-4021-001-012, ” Determination of Reactor Shutdown Margin.”

4. Nuclear Energy Institute document NEI 12-06, “Diverse and Flexible Coping Strategies (FLEX) Implementation Guide,” Revision 2, ADAMS Accession No. ML16005A625.

5. Westinghouse Electric Company Calculation Note CN-FSE-13-13-R, “D.C. Cook Unit 1 and Unit 2 (AEP/AMP) Reactor Coolant System (RCS) Inventory Control and Long-Term Subcriticality Analysis to Support the Diverse and Flexible Coping Strategy (FLEX), Revision 1.

6. Letter from J. B. Hichman, NRC, to E. E. Fitzpatrick, I&M, “Donald C. Cook Nuclear Plant, Units I and 2 - Issuance Of Amendments Re: Boric Acid Concentration Reduction (TAC Nos. M94940 and M94941),” dated August 7, 1997, ADAMS Accession No. ML021060704.

7. Donald C. Cook Nuclear Plant Information Change Package, ICP-01679, “Updates to ECP No. 1-2-00-14, EOP Footnotes,” Revision 1.

8.11 FLEX PORTABLE EQUIPMENT, PLANT CONNECTIONS POINTS, AND PLANT COMPONENTS

B 8.11.4 Accumulators for FLEX Strategies

Bases

BACKGROUND

See the "Background" for TRM 8.11.1.

BASES

If the unit is in MODE 5 with SGs unavailable, or MODE 6 with the Refueling Cavity water level less than 23 ft. above the top of the reactor vessel head flange, or MODE 6 with Refueling Cavity flooded ≥ 23 ft. above the top of the reactor vessel flange, with reactor internals installed, and the reactor has been shut down for < 96 hours, the Phase 2 FLEX strategies rely on RCS feed-and-bleed to provide core cooling following a simultaneous extended loss of alternating current electric power (ELAP) and loss of normal access to the ultimate heat sink (LUHS). Initial RCS borated water makeup for feed-and bleed may be provided from three accumulators in which a nitrogen overpressure has been maintained. The contents of each accumulator can be sequentially injected into the RCS by throttling open individual motor operated accumulator outlet valves. The valves would be powered from a pre-staged portable FLEX genera tor. The injection water from the accumulators would be used to maintain core cooling while portable FLEX pumps, hoses, mixing "T", and associated fittings are deployed to provide pumped RCS feed from the RWST followed by blended feed from the RWST and forebay. In MODE 5, a pressurizer PORV can be opened if necessary to allow RCS heat up and expansion to rupture the Pressurizer Relief Tank relief disc to provide a bleed path. Two pressurizer PORVs (NRV-152 and NRV-153) have backup air tanks, and power to a PORV control circuit would be provided by the associated Train A or Train B battery. Although accumulator injection may not rupture the disc, the RCS inventory would provide adequate core cooling until pumped RCS feed is initiated. As documented in Reference 1, the pumped RCS feed is capable of rupturing the Pressurizer Relief Tank relief disc. In MODE 6, the bleed path would be provided by a previously removed Pressurizer manway, previously removed Pressurizer safety valves, a previously removed hot leg side SG primary manway, or a previously removed reactor vessel head as described in Procedure PMP-4100-SDR-001 (Reference 2) and 1/2-OHP-4027-FSG-14 (Reference 3). In MODE 6 with Refueling Cavity flooded ≥ 23 ft. above the top of the reactor vessel flange, with reactor internals installed, and the reactor has been shut down for < 96 hours, the upper internals potentially restrict the flow communication between the core/upper plenum and the refueling water if RHR cooling is lost. The 96 hour value is based on the amount of time to allow reactor decay heat to reduce to a point where adequate cooling is provided by boil off with the reactor internals installed. This is documented in Westinghouse letter AEP-02-6 (Reference 11).

When the FLEX strategies program was initially implemented, existing Technical Specification 3.5.1, "Accumulators," was credited for supporting this strategy by the inclusion of a requirement

(continued)

Bases (Continued)

BASES (continued)

in procedure PMP-4100-SDR-001 that three SI accumulators meeting inventory, pressure, and boron concentration requirements of Technical Specification 3.5.1 be OPERABLE when the SGs are not available for RCS cooling and the Reactor Cavity is not filled. However, as documented in AR 2017-0929 (Reference 4), accumulator isolation valve leakage can result in a loss of level in the accumulators with the RCS at reduced pressure, e.g., MODE 5 or 6. The consequential need to refill the accumulators can result in potentially unnecessary operator burden during outages. Therefore, less restrictive accumulator pressure and level requirements were requested. Accordingly TRM 8.11.4 was issued to specify FLEX-specific accumulator parameters in lieu of relying on Technical Specification 3.5.1 and PMP-4100-SDR-001. The bases for the individual TRM 8.11.4 sections are described below.

TRO

TRO 8.11.4 requires that three accumulators be available. These accumulators would provide initial RCS feed while portable FLEX equipment is deployed to provide pumped RCS feed.

APPLICABILITY

The TRO 8.11.4 Applicability statement corresponds to the initial conditions assumed in the FLEX strategy that is supported by the TRM, i.e., MODE 5 with SGs Not Available, or MODE 6 with Refueling Cavity not flooded to ≥ 23 ft. above the top of the reactor vessel flange, or MODE 6 with Refueling Cavity flooded ≥ 23 ft. above the top of the reactor vessel flange, with reactor internals installed, and the reactor has been shut down for < 96 hours.

ACTIONS

NEI 12-06 (Reference 5) does not provide specific availability requirements for installed plant components that are credited in FLEX strategies. Therefore, analogous NEI 12-06 requirements for managing the unavailability of portable FLEX equipment were used to establish availability requirements for the three accumulators. Although other RCS makeup sources may be available, the accumulators are the only source that can currently be credited in the FLEX strategy under the Applicability conditions discussed above. Therefore, a condition in which less than three accumulators are available is analogous a condition in which less than N portable FLEX equipment is available.

In both conditions, the credited FLEX strategy for providing adequate core cooling following a simultaneous ELAP and LUHS under the applicable plant conditions would not be feasible. Accordingly, the Completion Time to initiate action to restore the required accumulator availability is the same time specified by NEI 12-06 for initiating action to restore N FLEX capability, i.e., 24 hours.

Similarly, the Completion Time for implementing compensatory measures if the required accumulator availability is not restored is the same time specified by NEI 12-06 for implementing compensatory measures if N FLEX capability is not restored, i.e., 72 hours.

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Bases (Continued)

SURVEILLANCE REQUIREMENTS

The TRM 8.11.4. Surveillance Requirements for the accumulators were derived from Technical Specification 3.5.1 Surveillance Requirements, which were replicated, modified, or excluded as follows:

The individual Technical Specification 3.5.1 Surveillance Requirements apply to "each accumulator," since LCO 3.5.1 requires that all four accumulators be operable. The TRM 8.11.4 Surveillance Requirements apply to "each required accumulator" since the TRO only requires that three accumulators be available.

SR 3.5.1.1 requires verification that all accumulator isolation valves are open, and SR 3.5.1.5 requires verification that power is removed from all accumulator isolation valves. These requirements are applicable with the unit in MODEs 1, 2, or 3, but are not appropriate when the unit is in MODEs 5 or 6, which are the MODEs in which the FLEX strategy supported by this TRM would be implemented. Procedure 1/2-OHP-4021-001-004 (Reference 6) assures that the accumulator isolation valves will be closed when the unit is in MODEs 5 or 6, which is consistent with the applicable FLEX strategy. Therefore, the SR 3.5.1.1 and SR 3.5.1.5 requirements were not included in TRM 8.11.4.

SR 3.5.1.2 requires verification that the borated water volume in each accumulator is ≥ 921 $ft^3$ and ≤ 971 $ft^3$. As documented in Action 7 of AR 2017-0929 (Reference 4), a time validation was performed which determined that the 921 $ft^3$ minimum volume requirement is necessary for the FLEX strategy because it assures that adequate RCS feed flow can be maintained for a period sufficient to allow transition to the pumped feed from the RWST. Therefore, a reduction of the SR 3.5.1.2 minimum borated water volume could not be justified and the ≥ 921 $ft^3$ value was retained in TRS 8.11.4.1. The ≤ 971 $ft^3$ maximum water volume requirement of SR 3.5.1.2 was retained in TRS 8.11.4.1 to assure that the pressurized nitrogen gas volume in the accumulator is adequate to maintain the required RCS feed flow as documented in Calculation MD-12-FLEX-006-S (Reference 7).

SR 3.5.1.3 requires verification that the accumulator nitrogen pressure is ≥ 585 psig and ≤ 658 psig. Calculation MD-12-FLEX-006-S determined that an RCS feed flow adequate for the FLEX strategy (20 cubic feet per minute per Reference 8) can be achieved with an initial accumulator pressure of 131.4 psig, which is a significantly less restrictive minimum accumulator pressure than that required by SR 3.5.1.3. Therefore, TRS 8.11.4.2 specifies a minimum accumulator pressure of ≥ 131.4 psig., which accounts for instrument uncertainties as documented in MD-12-FLEX-006-S. TRS 8.11.4.2 specifies a maximum accumulator pressure of ≤ 658 psig. That pressure is consistent with SR 3.5.1.3, and is based on Low Temperature Overpressure Protection (LTOP) considerations as documented in the Bases for Technical Specification 3.4.12, "LTOP System."

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Bases (Continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.4 requires verification that accumulator boron concentration is ≥ 2400 ppm and ≤ 2600 ppm. These boron concentration requirements were retained in TRS 8.11.4.3 to assure long term subcriticality consistent with Westinghouse Calculation Note CN-FSE-13-13-R (Reference 9). The TRS 8.11.4.3 Note differs from the SR 3.5.1.4 Note in that the TRS Note recognizes that volume additions with boron concentration ≥ 2400 ppm and ≤ 2600 ppm can come from sources other than the RWST.

The Frequencies specified for all Technical Specification 3.5.1 Surveillance Requirements is “In accordance with the Surveillance Frequency Control Program.” That program (Reference 10) does not apply to TRM Surveillance Requirements. The Frequencies specified for TRS 8.11.4.1 through TRS 8.11.4.3 were therefore established as the Frequency that was specified for the corresponding Technical Specification 3.5.1 Surveillance Requirement prior to implementation of the Surveillance Frequency Control Program. Those Frequencies were the same Technical Specification 3.5.1 Frequencies specified by that program when TRM 8.11.4 was issued.

REFERENCES

1. Calculation 32-9218372, “DC Cook FLEX-PRT Rupture Disk Burst Calculation.”
2. Procedure PMP-4100-SDR-001, “Plant Shutdown Safety and Risk Management.”
3. Procedure 1/2-OHP-4027-FSG-14, “Shutdown RCS Makeup.”
4. AR 2017-0929, “Relax FLEX SDR Accumulator Pressure and Level Requirements.”
5. Nuclear Energy Institute document NEI 12-06, “Diverse and Flexible Coping Strategies (FLEX) Implementation Guide.”
6. Procedure 1/2-OHP-4021-001-004, “Plant Cooldown from Hot Standby to Cold Shutdown.”
7. Calculation MD-12-FLEX-006-S, “Minimum SI Accumulator Pressure for FLEX.”
8. Plant Specific Background Document 12-OHP-4027-FSG-1 4BD, “Shutdown RCS Makeup.”
9. Westinghouse Calculation Note CN-FSE-13-13-R, “D.C. Cook Unit 1 and Unit 2 (AEP/AMP) Reactor Coolant System (RCS) Inventory Control and Long-Term Subcriticality Analysis to Support the Diverse and Flexible Coping Strategy (FLEX).”

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Bases (Continued)

REFERENCES (continued)

10. PMI-5078, “Surveillance Frequency Control Program.”

11. Westinghouse Letter AEP-02-6, “D.C. Cook Unit 2 Thermal Hydraulic Evaluation Refueling Cavity Flooded and Upper Internals in Place,” dated January 8, 2002.

# 8.12 SPENT FUEL POOL BEYOND DESIGN BASES LEVEL INSTRUMENTS

## B 8.12.1 Spent Fuel Pool Beyond Design Bases Level Instruments

### Bases

On March 11, 2011, an earthquake and resulting tsunami initiated a severe accident at the Fukushima Dai-ichi nuclear power plant in Japan. The tsunami exceeded the plant's design basis and flooded the site's emergency power supplies and electrical distribution system.

During the event, concern grew that the spent fuel in the spent fuel pools was overheating and causing a high temperature reaction of steam and zirconium fuel cladding generating hydrogen gas. This concern persisted primarily due to a lack of readily available and reliable information on water levels in the spent fuel pools. Helicopter water drops, water cannons, and cement delivery vehicles with articulating booms were used to refill the spent fuel pools, which diverted resources and attention from other efforts. Subsequent analysis determined that the water level in the spent fuel pools did not drop below the top of the stored fuel and no significant fuel damage occurred. The lack of information on the condition of the spent fuel pools contributed to a poor understanding of possible radiation releases and adversely impacted effective prioritization of emergency response actions by decision makers. In this manner, the Fukushima accident demonstrated the confusion and misapplication of resources that can result from beyond-design-basis external events when adequate instrumentation is not available.

As a result, the NRC issued NRC Order EA-12-051 (Reference 1) requiring licensees to provide two instrument channels to monitor water level from the normal level to the top of the used fuel rack in the pool, provide a display in an area accessible following a severe event, provide independent electrical power to each instrument channel, and provide an alternate remote power connection capability. The NRC also issued guidance (Reference 2) to assist nuclear power reactor licensees with the identification of measures needed to comply with the order. The NRC guidance stated that conformance with Nuclear Energy Institute document NEI 12-02 (Reference 3) was an acceptable method for use in satisfying the requirements of the order. Section 4.3 of NEI 12-02 specifies the availability requirements for the instrument channels. TRM Section 8.12.1 implements those availability requirements.

If compensatory actions (e.g., use of alternate suitable equipment or supplemental personnel) are required by TRM 8.12.1, the applicable system owner should be consulted per the FLEX Equipment Program PMP (Reference 4). The FLEX Equipment Program PMP also includes periodic and preventive maintenance requirements. Missed periodic or preventative maintenance activities or unacceptable results would be evaluated for impact on equipment availability per plant procedures. Therefore, no Surveillance Requirements are specified by TRM 8.12.1.

Bases

References

1. NRC Order EA-12-051, “Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation,” dated March 12, 2012, ADAMS Accession No. ML12056A044).
2. NRC document JLD-ISG-2012-03, “Compliance with Order EA-12-051, “Reliable Spent Fuel Pool Instrumentation, Interim Staff Guidance,” Revision 0, dated August 29, 2012, ADAMS Accession No. ML12221A339.
3. NEI 12-02, “Industry Guidance for Compliance with NRC Order EA-12-051, ‘To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation,’ ” Revision 1, dated August 24, 2012, ADAMS Accession No. ML122400399.
4. PMP-4027-FSG-002, “FLEX Equipment Program.”