

PLANT SYSTEMS

AUXILIARY FEEDWATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2 ~~Two independent steam generator auxiliary feedwater pumps and associated flow paths shall be OPERABLE.~~

insert attached

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

- a. ~~With one Auxiliary Feedwater System inoperable, restore the inoperable system to OPERABLE status within 72 hours or be in HOT SHUTDOWN within the next 12 hours.~~ insert attached
- b. With any Auxiliary Feed Pump Turbine Inlet Steam Pressure Interlocks inoperable, restore the inoperable interlocks to OPERABLE status within 7 days or be in HOT SHUTDOWN within the next 12 hours.
- c. insert attached

SURVEILLANCE REQUIREMENTS

4.7.1.2.1 Each Auxiliary Feedwater System shall be demonstrated OPERABLE:

- a. At least once ⁹² per 31 days on a ^{train} STAGGERED TEST BASIS by: *
 - 1. Verifying that each steam turbine driven pump develops a differential pressure of ≥ 1070 psid on recirculation flow when the secondary steam supply pressure is greater than 800 psia, as measured on PI SP 12B for pump 1-1 and PI SP 12A for pump 1-2. The provisions of Specification 4.0.4 are not applicable for entry into ~~Mode 3.~~
- b. At least once per 31 days on a STAGGERED TEST BASIS by:
 - 1. Verifying that each valve (power operated or automatic) in the flow path is in its correct position.
 - 2. Verifying that all manual valves in the auxiliary feedwater pump suction and discharge lines that affect the system's capacity to deliver water to the steam generator are locked in their proper position.
 - 3. Verifying that valves CW 196, CW 197, FW 32, FW 91 and FW 106 are closed.
- c. At least once per 18 months by:
 - 1. Verifying that each automatic valve in the flow path actuates to its correct position on an ~~auxiliary feedwater~~ actuation test signal.
 - 2. Verifying that each pump starts automatically upon receipt of an ~~auxiliary feedwater~~ actuation test signal. The provisions of Specification 4.0.4 are not applicable for entry into MODE 3.

MODE 3

1

2

3

c

Insert attached footnote "**"

Insert for TS 3.7.1.2

Two trains of auxiliary feedwater, each consisting of an auxiliary feedwater pump and associated flow path to both steam generators, shall be OPERABLE.

Insert for TS 3.7.1.2 ACTION

- a. With one train of auxiliary feedwater inoperable to either steam generator, restore the inoperable train to OPERABLE status within 72 hours or be in HOT SHUTDOWN within the next 12 hours.
- c. With steam generator inlet valves AF 599 or AF 608 closed, re-open the closed valve AF 599 or AF 608 within one hour or be in HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours.

Insert for SR 4.7.1.2.1.a Footnote "*"

- * When conducting tests of an auxiliary feedwater train in MODES 1, 2, and 3 which require local manual realignment of valves that make the system inoperable, the Motor Driven Feedwater Pump and its associated flow paths shall be OPERABLE per Specification 3.7.1.7 during the performance of this surveillance. If the Motor Driven Feedwater Pump or an associated flow path is inoperable, a dedicated individual shall be stationed at the realigned auxiliary feedwater train's valves (in communication with the control room) able to restore the valves to normal system OPERABLE status.

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

3. Verifying that there is a flow path ~~between each auxiliary feedwater pump and each steam generator~~ by pumping water from the Condensate Storage Tank to ~~the steam generator~~ ~~generators~~.

~~The flow path to the steam generator shall be verified by either steam generator level change or Auxiliary Feedwater Safety Grade Flow Indication. Verification of the Auxiliary Feedwater System's flow capacity is not required.~~

d. The Auxiliary Feed Pump Turbine Steam Generator Level Control System shall be demonstrated OPERABLE by performance of a CHANNEL CHECK at least once per 12 hours, a CHANNEL FUNCTIONAL TEST at least once per 31 days, and a CHANNEL CALIBRATION at least once per 18 months.

e. The Auxiliary Feed Pump Suction Pressure Interlocks shall be demonstrated OPERABLE by performance of a CHANNEL FUNCTIONAL TEST at least once per 31 days, and a CHANNEL CALIBRATION at least once per 18 months.

f. After any modification or repair to the Auxiliary Feedwater System that could affect the system's capability to deliver water to the steam generator, the affected flow path shall be demonstrated available as follows:

~~1. If the modification or repair is downstream of the test flow line, the auxiliary feed pump shall pump water from the Condensate Storage Tank to the steam generator, and the flow path availability will be verified by steam generator level change or Auxiliary Feedwater Safety Grade Flow Indication.~~

2. If the modification or repair is upstream of the test flow line, the auxiliary feed pump shall pump water through the Auxiliary Feedwater System to the test flow line; and the flow path availability will be verified by flow indication in the test flow line. ~~(see note below)~~

This Surveillance Testing shall be performed prior to entering MODE 3 if the modification is made in MODES 4, 5 or 6. Verification of the Auxiliary Feedwater System's flow capacity is not required.

Insert attached footnote "*"

~~Note: When conducting tests of the Auxiliary Feedwater System in MODES 1, 2, and 3 which require local manual realignment of valves that make the system inoperable, a dedicated individual shall be stationed at the valves (in communication with the control room) able to restore the valves to normal system OPERABLE status.~~

Insert attached

Insert for SR 4.7.1.2.1.f.1

1. If the modification or repair is downstream of the test flow line, each auxiliary feed pump(s) associated with the affected flow path shall pump water from the Condensate Storage Tank to the steam generator(s) associated with the affected flow path; and the flow path availability will be verified by steam generator level change or Auxiliary Feedwater Safety Grade Flow Indication.

Insert for SR 4.7.1.2.1.f.2 Footnote "*"

- * When conducting tests of an auxiliary feedwater train in MODES 1, 2, and 3 which require local manual realignment of valves that make the system inoperable, the Motor Driven Feedwater Pump and its associated flow paths shall be OPERABLE per Specification 3.7.1.7 during the performance of this surveillance. If the Motor Driven Feedwater Pump or an associated flow path is inoperable, a dedicated individual shall be stationed at the realigned auxiliary feedwater train's valves (in communication with the control room) able to restore the valves to normal system OPERABLE status.

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- g. Following each extended cold shutdown (> 30 days in MODE 5), by:
1. Verifying that there is a flow path ^{to both} ~~between~~ ^{from} each auxiliary feedwater pump ~~and each steam generator~~ ^{generators} by pumping Condensate Storage Tank water ~~to the steam generator~~ ^{paths}. The flow path ~~to the steam generator~~ shall be verified by either steam generator level change ^{with each pump} or Auxiliary Feedwater Safety Grade Flow Indication. ^{both}

Verification of the Auxiliary Feedwater System's flow capacity is not required.

4.7.1.2.2 The Auxiliary Feed Pump Turbine Inlet Steam Pressure Interlocks shall be demonstrated OPERABLE when the steam line pressure is greater than 275 psig, by performance of a CHANNEL FUNCTIONAL TEST at least once per 31 days, and a CHANNEL CALIBRATION at least once per 18 months. The CHANNEL FUNCTIONAL TEST shall be performed within 24 hours after exceeding 275 psig during each plant startup, if the test has not been performed within the last 31 days.

The provisions of Specification 4.0.4 are not applicable for entry into MODE 3.

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3/4.7.1.2 AUXILIARY FEEDWATER SYSTEMS

The OPERABILITY of the Auxiliary Feedwater System ensures that the Reactor Coolant System can be cooled down to less than 280°F from normal operating conditions in the event of a total loss of offsite power. The OPERABILITY of the Auxiliary Feed Pump Turbine Inlet Steam Pressure Interlocks is required only for high energy line break concerns and does not affect Auxiliary Feedwater System OPERABILITY.

Each steam driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 600 gpm at a pressure of 1050 psig to the entrance of the steam generators. This capacity is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 280°F where the Decay Heat Removal System may be placed in operation.

the required feedwater flow at the full open pressure of the Main Steam Safety Valves as assumed in the Updated Safety Analysis Report.

(3/4.7.1.2 Continued on page B 3/4 7-2)

Closure of valves AF 599 or AF 608 will render both trains of the Auxiliary Feedwater System and the Motor Driven Feedwater Pump System inoperable. This is because closure of these valves would result in a complete loss of auxiliary feedwater to the steam generators for certain postulated feedwater line and steam line breaks.

PLANT SYSTEMS

BASES

3/4.7.1.2 AUXILIARY FEEDWATER SYSTEMS (Continued)

Following any modifications or repairs to the Auxiliary Feedwater System piping from the Condensate Storage Tank through auxiliary feed pumps to the steam generators that could affect the system's capability to deliver water to the steam generators, following extended cold shutdown, a flow path verification test shall be performed. This test may be conducted in MODES 4, 5 or 6 using auxiliary steam to drive the auxiliary feed pumps turbine to demonstrate that the flow path exists from the Condensate Storage Tank to the steam generators via auxiliary feed pumps.

Verification of the turbine plant cooling water valves (CW 196 and CW 197), the startup feedwater pump suction valves (FW 32 and FW 91), and the startup feedwater pump discharge valve (FW 106) in the closed position is required to address the concerns associated with potential pipe failures in the auxiliary feedwater pump rooms, that could occur during operation of the startup feedwater pump.

3/4.7.1.3 CONDENSATE STORAGE TANKS

The OPERABILITY of the Condensate Storage Tanks with the minimum water volume ensures that sufficient water is available to maintain the RCS at HOT STANDBY conditions for 13 hours with steam discharge to atmosphere and to cooldown the Reactor Coolant System to less than 280° under normal conditions (i.e., no loss of offsite power). The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics.

3/4.7.1.4 ACTIVITY

The limitations on secondary system specific activity ensure that the resultant offsite radiation dose will be limited to a small fraction of 10 CFR Part 100 limits in the event of a steam line rupture. This dose includes the effects of a coincident 1.0 GPM primary to secondary tube leak in the steam generator of the affected steam line. These values are consistent with the assumptions used in the safety analyses.

3/4.7.1.5 MAIN STEAM LINE ISOLATION VALVES

The OPERABILITY of the main steam line isolation valves ensures that no more than one steam generator will blowdown in the event of a steam line rupture. This restriction is required to 1) minimize the

Insert for SR 4.7.1.7.a Footnote

- * When conducting tests of the Motor Driven Feedwater Pump System in MODE 1 greater than 40% RATED THERMAL POWER which require local manual realignment of valves that make the system inoperable, both auxiliary feedwater pumps and their associated flow paths shall be OPERABLE per Specification 3.7.1.2 during the performance of this surveillance. If one auxiliary feedwater pump or flow path is inoperable, a dedicated individual shall be stationed at the realigned Motor Driven Feedwater Pump System's valves (in communication with the control room) able to restore the valves to normal system OPERABLE status.

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

(Ability is demonstrated by verifying the presence of handwheels for all manual valves and the presence of either handwheels or available power supply for motor operated valves.)

c

At least once per 92 days and prior to entry into MODE 3 from MODE 4 (if not performed in the past 92 days) by * and **

1. Verifying proper operation of each power operated and automatic valve in the Motor Driven Feedwater Pump flow path to the Auxiliary Feedwater System.
2. Verifying proper operation of the Motor Driven Feedwater Pump. *

d

At least once per 18 months by:

1. Verifying that there is a flow path between the Motor Driven Feedwater Pump System and the Auxiliary Feedwater System by pumping water from the Condensate Storage Tanks to the steam generators. The flow path to the steam generators shall be verified prior to entering MODE 3 from MODE 4 by either steam generator level change or Auxiliary Feedwater flow indication. Verification of Motor Driven Feedwater Pump System flow capacity is not required.
2. Verifying proper operation of the Motor Driven Feedwater Pump lube oil interlocks.
3. Verifying proper operation of manual valves by shifting the Motor Driven Feedwater Pump between the Main Feedwater System and the Auxiliary Feedwater System.

Safety Grade Flow Indication

~~When conducting tests of the Motor Driven Feedwater Pump System in MODE 1 greater than 40% RATED THERMAL POWER which require local manual realignment of valves that make the system inoperable, a dedicated individual shall be stationed at the valves (in communication with the control room) able to restore the valves to normal system OPERABLE status.~~

insert attached

**If the Motor Driven Feedwater Pump cannot be tested within the time period specified, due to being aligned to the Main Feedwater System, the Surveillance Requirement shall be met within 72 hours after the Motor Driven Feedwater Pump has been aligned to the Auxiliary Feedwater System for 1 hour.

Insert for SR 4.7.1.7.c.2 Footnote

- * When conducting tests of the Motor Driven Feedwater Pump System in MODE 1 greater than 40% RATED THERMAL POWER which require local manual realignment of valves that make the system inoperable, both auxiliary feedwater pumps and their associated flow paths shall be OPERABLE per Specification 3.7.1.2 during the performance of this surveillance. If one auxiliary feedwater pump or flow path is inoperable, a dedicated individual shall be stationed at the realigned Motor Driven Feedwater Pump System's valves (in communication with the control room) able to restore the valves to normal system OPERABLE status.

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

e. After any modification or repair to the Motor Driven Feedwater Pump System that could affect the system's capability to deliver water from the Condensate Storage Tanks to the Auxiliary Feedwater System, the affected flow path shall be demonstrated available as follows:***

1. If the modification or repair is in the Auxiliary Feedwater flow path downstream of the Motor Driven Feedwater Pump test flow line tie-in, the Motor Driven Feedwater Pump shall pump water from the Condensate Storage Tanks to the Auxiliary Feedwater System and the flow path availability will be verified by either steam generator level change or Auxiliary Feedwater ~~flow indication~~.

2. If the modification or repair is upstream of the Motor Driven Feedwater Pump test flow line tie-in, the Motor Driven Feedwater Pump shall pump water from the Condensate Storage Tanks to the test flow line and the flow path availability will be verified by Motor Driven Feedwater Pump ~~flow indication~~.

f. Following each extended COLD SHUTDOWN (greater than 30 days in MODE 5), by:

1. Verifying that there is a flow path between the Motor Driven Feedwater System and the Auxiliary Feedwater System by pumping water from the Condensate Storage Tanks to the steam generators. The flow path to the steam generators shall be verified prior to entering MODE 3 from MODE 4 by either steam generator level change or Auxiliary Feedwater ~~flow indication~~. Verification of Motor Driven Feedwater Pump flow capacity is not required.

Safety Grade Flow Indication.

***This surveillance testing shall be performed prior to entering MODE 3 from MODE 4 if the modification is made in MODES 4, 5, or 6. Verification of the Motor Driven Feedwater Pump flow capacity is not required.

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positive reactivity effects of the Reactor Coolant System cooldown associated with the blowdown, and 2) limit the pressure rise within containment in the event the steam line rupture occurs within containment. The OPERABILITY of the main steam isolation valves within the closure times of the surveillance requirements are consistent with the assumptions used in the safety analyses.

3/4.7.1.6 SECONDARY WATER CHEMISTRY - Deleted

The Motor Driven Feedwater Pump System must be capable of providing feedwater flow to each steam generator in order to be OPERABLE.

3/4.7.1.7 MOTOR DRIVEN FEEDWATER PUMP SYSTEM

The OPERABILITY of the Motor Driven Feedwater Pump System ensures that the Reactor Coolant System can be cooled down from normal operating conditions in the event of the total loss of Main Feedwater and Auxiliary Feedwater Pumps.

The Motor Driven Feedwater Pump flow capability ensures that adequate feedwater flow is available to remove Decay Heat and reduce the Reactor Coolant System temperature to where the Decay Heat System may be placed into operation.

When at 40% RATED THERMAL POWER or less and in MODES 1, 2, or 3, the Motor Driven Feedwater Pump System may be aligned to provide a flow path from the Deaerator Storage Tank through the Motor Driven Feedwater Pump to the Main Feedwater System. During this Motor Driven Feedwater Pump mode of operation, a flow path from the Condensate Storage Tanks through the Motor Driven Feedwater Pump to the Auxiliary Feedwater System shall be maintained with the ability for manual positioning of valves such that

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the flow path can be established. The ability for local, manual operation is demonstrated by verifying the presence of the handwheels for all manual valves and the presence of either handwheels or available power supply for motor operated valves.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

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 110°F and 237 psig are based on a steam generator RT_{NDT} of 40°F and are sufficient to prevent brittle fracture.

3/4.7.3 COMPONENT COOLING WATER SYSTEM

The OPERABILITY of the component cooling water system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the safety analyses.

3/4.7.4 SERVICE WATER SYSTEM

The OPERABILITY of the service water system ensures that sufficient cooling capacity is available for continued operation of safety related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the safety analyses.

3/4.7.5 ULTIMATE HEAT SINK

The limitations on the ultimate heat sink level and temperature ensure that sufficient cooling capacity is available to either 1) provide normal cooldown of the facility, or 2) to mitigate the effects of accident conditions within acceptable limits.

The limitations on minimum water level and maximum temperature are based on providing a 30 day cooling water supply to safety related equipment without exceeding their design basis temperature and is consistent with the recommendations of Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Plants" March 1974.

3/4.7.6 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

The OPERABILITY of the control room emergency ventilation system ensures that 1) the ambient air temperature does not exceed the allowable temperature for continuous duty rating for the equipment and instrumentation cooled by this system and 2) the control room will remain habitable for operations personnel during and following all credible accident conditions. The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation exposure to personnel occupying the control room to 5 rem or less whole body, or its equivalent. This limitation is consistent with the requirements of General Design Criterion 19 of Appendix "A", 10 CFR 50.