PROPOSED TECHNICAL SPECIFICATIONS

3.4 TURBINE CYCLE

3.4.1 OPERATING STATUS

APPLICABILITY: Applies to the operating status of turbine cycle in MODES 1, 2, and 3.

OBJECTIVE: To define conditions of the turbine cycle necessary to ensure the capability to remove decay heat from the core.

SPECIFICATION: A minimum turbine cycle steam-relieving capability of 5,706,000 lb/hr (except for testing of the main steam safety valves).

ACTION: With the turbine cycle steam-relieving capability less than 5,706,000 lb/hr, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

BASIS: A reactor shutdown from power requires subsequent removal of core decay heat. In the event of a reactor trip from high power levels, immediate decay heat removal requirements are satisfied by the steam bypass to the condensers, supplemented by release to the atmosphere. Thereafter, core decay heat can be continuously dissipated via the steam bypass to the condenser or steam dump to atmosphere as feed water in the steam generator is converted to steam by heat absorption. In the event of a planned shutdown, steam release to atmosphere is not required.

The power operated relief valves and the main steam safety valves have a total combined relief capability of 7,629,432 lb/hr. A capability of 5,706,000 lb/hr is required to maintain the pressure in turbine cycle components within ASME code allowable values in the event of full load rejection. Therefore the limiting conditions for operation can be met with less than the full number of valves in service.

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3.4.3 AUXILIARY FEEDWATER SYSTEM

APPLICABILITY: Applies to the auxiliary feedwater pumps and valves for MODES 1, 2 and 3.

OBJECTIVE: To ensure the availability of auxiliary feedwater to remove decay heat from the core.

SPECIFICATION:. Two trains of auxiliary feedwater, including associated pumps and valves, shall be OPERABLE.

ACTION:

A. With one Train of auxiliary feedwater inoperable, restore the inoperable train to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

B. With both Trains of auxiliary feedwater inoperable, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

BASIS: The OPERABILITY of the auxiliary feedwater system ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss of offsite power.

Two auxiliary feedwater trains and the steam system relief valves provide core decay heat removal capability in the event of a sustained loss of off-site power. Either auxiliary feedwater train has the capability to satisfy decay heat removal requirements from the core, with a delivered flow of at least 185 gpm per train with three intact main feedwater lines and pressurized steam generators, 125 gpm per train with two intact main feedwater lines and pressurized steam generators, and 250 gpm per train with two intact main feedwater lines and depressurized steam generators.(1)

AFW System Train A pumps and valves consist of AFW pumps G-10S and G-10 and associated valves, including flow control valves FCV-2300A, FCV-2300B, and FCV-2300C.

AFW System Train B pump and valves consist of AFW pump G-10W and associated valves, including flow control valves FCV-3300A, FCV-3300B, and FCV-3300C.

References:

(1) SCE letter dated November 20, 1987, from M. O. Medford to NRC Document Control Desk.

3.4.4 AUXILIARY FEEDWATER STORAGE TANK

APPLICABILITY: Applies to the auxiliary feedwater storage tank for MODES 1, 2 and 3.

OBJECTIVE: To ensure the availability of auxiliary feedwater to remove decay heat.

SPECIFICATION:

A. The auxiliary feedwater storage tank (AFST) shall be OPERABLE with a usable water volume of at least 190,000 gallons of water.

B. With the AFST inoperable, within 4 hours restore the AFST to OPERABLE status or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

BASIS: The OPERABILITY of the auxiliary feedwater storage tank with the minimum water volume ensures that sufficient water is available to maintain the RCS at HOT STANDBY conditions (including cooldown) for 32 hours with steam discharge to the atmosphere concurrent with total loss of offsite power. In addition, the water volume will provide sufficient margin to account for spillage that occurs during a main feedwater line break with loss of AFW flow indication prior to isolation of the broken line. Spillage is assumed to last no longer than one hour until the broken loop is identified via RCS Loop Delta-T positive indication that will be evident for the two intact steam generators. The usable water volume limit is specified relative to the bottom of the tank indicated level range (i.e., level tap). The contained water volume below this datum provides a significant margin to the NPSH and vortexing limits above the highest AFW pump suction inlet in the tank, but is not considered available for purposes of this specification.

3.5.6 ACCIDENT MONITORING INSTRUMENTATION

APPLICABILITY: MODES 1, 2 and 3.

OBJECTIVE: To ensure reliability of the accident monitoring instrumentation.

SPECIFICATION: The accident monitoring instrumentation channels shown in Table 3.5.6-1 shall be OPERABLE.

ACTION:

A. With the number of OPERABLE accident monitoring instrumentation channels less than the Total Number of Channels shown in Table 3.5.6-1, except as noted in ACTIONS B and C, either restore the inoperable channel(s) to OPERABLE status within 7 days, or be in at least HOT SHUTDOWN within the next 12 hours.

B. With one or more channels of Auxiliary Feedwater Flow Rate (exclusive of steam generator wide range level indication) inoperable, restore the inoperable channel(s) to OPERABLE status within 72 hours or be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours.

C. With one or more channels of RCS Loop Delta-T inoperable, restore the inoperable channel(s) to OPERABLE status within 72 hours or be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours.

D. With the number of OPERABLE accident monitoring instrumentation channels less than the MINIMUM CHANNELS OPERABLE requirements of Table 3.5.6-1, except as noted in ACTION C, either restore the inoperable channel(s) to OPERABLE status within 48 hours or be in at least HOT SHUTDOWN within the next 12 hours.

E. The provisions of Specification 3.0.4 are not applicable for Specifications A and D above.

BASIS: The OPERABILITY of the accident monitoring instrumentation ensures that sufficient information is available on selected plant parameters to monitor and assess these variables during and following an accident. This capability is consistent with the recommendations of Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant Conditions During and Following an Accident," December 1975 and NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations."

The Auxiliary Feedwater flow transmitters are subject to the more restrictive ACTION requirements for the AFW system. In order to satisfy decay heat removal requirements and minimize

the potential for exceeding water hammer flow limits for a main feedwater line break upstream of the in-containment check valve, the OPERABILITY of AFW Train B is subject to the ability to equalize flow to the steam generators. Verification of equalization is provided by the AFW flow transmitters. If the capability to equalize flow or the ability to verify equalization is not available, Train A would be utilized to provide the necessary decay heat removal capability. AFW Train A provides adequate flow for this scenario without reliance on operator action to equalize flow.(3)

References:

(1) NRC letter dated July 2, 1980, from D. G. Eisenhut to all pressurized water reactor licensees.

(2) NRC letter dated November 1, 1983, from D. G. Eisenhut to all Pressurized Water Reactor Licensees, NUREG-0737 Technical Specification (Generic Letter No. 83-37).

(3) SCE letter dated November 6, 1987, from M. O. Medford to NRC Document Control Desk.

TABLE 3.5.6-1

ACCIDENT MONITORING INSTRUMENTATION

INSTRUMENT	TOTAL NO. OF CHANNELS	MINIMUM CHANNELS OPERABLE
Pressurizer Water Level	3	2
Auxiliary Feedwater Flow Indication*	2/steam generator	1/steam generator
Reactor Coolant System Subcooling Margin Monitor	2	1
PORV Position Indicator (Limit Switch)	1/valve	1/valve
PORV Block Valve Position Indicator (Limit Switch)	1/valve	1/valve
Safety Valve Position Indicator (Limit Switch)	1/valve	1/valve
Containment Pressure (Wide Range)	2	1
Steam Generator Water Level (Narrow Range)	1/steam generator	1/steam generator
Refueling Water Storage Tank Level	1	1
Containment Sump Water Level (Narrow Range)**	2	1
Containment Water Level (Wide Range)	2	1
Reactor Coolant System Loop Delta-T Indication	1/Loop	1/Loop

* Auxiliary feedwater flow indication for each steam generator is provided by one channel of steam generator level (Wide Range) and one channel of auxiliary feedwater flow rate. These comprise the two channels of auxiliary feedwater flow indication for each steam generator.

** Operation may continue up to 30 days with one less than the total number of channels OPERABLE.

3.5.7 AUXILIARY FEEDWATER INSTRUMENTATION

APPLICABILITY: Applies to the auxiliary feedwater system instrumentation and interlocks in MODES 1, 2 and 3.

OBJECTIVE: To ensure reliability of automatic initiation of the auxiliary feedwater system.

SPECIFICATIONS:

A. The instrumentation channels shown in Table 3.5.7-1 shall be OPERABLE with their trip setpoints set consistent with the Trip Setpoint column of Table 3.5.7-2.

B. With an instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.5.7-2, declare the channel inoperable and apply the applicable ACTION requirement of Table 3.5.7-1 until the channel is restored to OPERABLE status with the trip setpoint adjusted consistent with the Trip Setpoint Value.

C. With one instrumentation channel inoperable, take the action shown in Table 3.5.7-1.

BASIS: The OPERABILITY of the auxiliary feedwater instrumentation ensures that 1) the associated action will be initiated when the parameter monitored by each channel or combination thereof reaches its setpoint, 2) the specified coincidence logic is maintained, 3) sufficient redundancy is maintained to permit a channel to be out of service for testing or maintenance, and 4) sufficient system functional capability is available from diverse parameters.

The OPERABILITY of this instrumentation is required to provide the overall reliability, redundancy, and diversity assumed available for the protection and mitigation of accident and transient conditions. The operation of this instrumentation is consistent with the assumptions used in the accident analyses.

References: (1) NRC letter dated July 2, 1980, from D. G. Eisenhut to all pressurized water reactor licensees.

TABLE 3.5.7-1

AUXILIARY FEEDWATER INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
a. Manual Actuation	2	1	2	1, 2, 3	12
b. Automatic Actuation Logic	2	1	2	1, 2, 3	13
c. Steam Generator Water Level-Low					
i. Train A	3	2	2	1, 2, 3	14, 15
ii. Train B	3	2	2	1, 2, 3	14, 15
d. AFW Train Interlocks*					
i. Low Flow Train B/ Start Train A Flow					
1) Start Pump G10S/Open Pump G10 Discharge Valve CV-2620, AND	2	1	2	1, 2, 3	35, 36
2) Start Pump G10/Open Pump G10S Discharge Valve MOV-1202.	2	1	2	1, 2, 3	35, 36
ii. Normal Flow Train B/ Stop Train A Flow					
1) Stop Pump G10S/Close Pump G10 Discharge Valve CV-2620, OR	2	2**	2	1, 2, 3	35, 36
2) Stop Pump G10/Close Pump G10S Discharge Valve MOV-1202.	2	2**	2	1, 2, 3	35, 36

* A total of 4 flow switches monitor Train B flow and each switch represents a channel which provides the specified signals to Train A.

** Only 1 of 2 Channels is required to trip if 1 Channel has been disconnected per the requirements of ACTION 35.

ACTION 12 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 72 hours or be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours.

ACTION 13 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 72 hours or be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours; however, one channel may be bypassed for up to 8 hours for surveillance testing per Specification 4.1.8 provided the other channel is OPERABLE.

ACTION 14 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed until performance of the next required CHANNEL TEST provided the inoperable channel is placed in the tripped condition within 1 hour, or an operator shall assume continuous surveillance and actuate manual initiation of auxiliary feedwater, if necessary.

ACTION 15 - With more than one channel inoperable, an operator shall assume continuous surveillance and actuate manual initiation of auxiliary feedwater, if necessary. Restore the system to no more than one channel inoperable within 7 days, or be in HOT STANDBY within the following 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTION 35 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 72 hours or disconnect the inoperable channel within 1 hour.

ACTION 36 - With the total number of OPERABLE channels monitoring Train B flow less than 3, restore the number of OPERABLE channels to no less than 3 within 72 hours or be in at least HOT STANDBY within 6 hours and in at least HOT SHUTDOWN within the following 6 hours.

TABLE 3.5.7-2

AUXILIARY FEEDWATER INSTRUMENTATION
SETPOINTS

FUNCTIONAL UNIT	SETPOINT	ALLOWABLE VALUES
a. Manual Actuation	Not Applicable	Not Applicable
b. Automatic Actuation Logic	Not Applicable	Not Applicable
c. Steam Generator Water Level-Low	$\geq$ 5% of narrow range instrument span each steam generator	$\geq$ 0% of narrow range instrument span each steam generator
d. AFW Train Interlocks		
i. Decreasing Flow in Train B/ Start Train A Flow	23 gpm*	$\geq$ 10 gpm
ii. Increasing Flow in Train B/ Stop Train A Flow	37 gpm*	$\leq$ 48 gpm

* Each flow switch monitoring Train B flow utilizes its set and reset points for permissive signals for starting and stopping Train A.

4.1.8 AUXILIARY FEEDWATER INSTRUMENTATION

APPLICABILITY: Applies to the auxiliary feedwater instrumentation and interlocks in MODES 1, 2 and 3.

OBJECTIVE: To ensure reliability of automatic initiation of the auxiliary feedwater system.

SPECIFICATION: A. Each instrumentation channel shall be demonstrated OPERABLE by the performance of the surveillance requirements specified in Table 4.1.8-1.

BASIS: The surveillance requirements specified for this instrumentation ensure that the overall system functional capability is maintained comparable to the original design standards. The periodic surveillance tests performed at the minimum frequencies are sufficient to demonstrate this capability.

References: (1) NRC letter dated July 2, 1980, from D. G. Eisenhut to all pressurized water reactor licensees.

TABLE 4.1.8-1

AUXILIARY FEEDWATER INSTRUMENTATION

SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL TEST	TRIP ACTUATING DEVICE OPERATIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
a. Manual	N/A	N/A	N/A	R	1, 2, 3
b. Automatic Actuation Logic	N/A	N/A	M	N/A	1, 2, 3
c. Steam Generator Water Level-Low	S	R	M	N/A	1, 2, 3
d. AFW Train Interlocks	N/A	R	M	N/A	1, 2, 3

4.1.9 AUXILIARY FEEDWATER SYSTEM SURVEILLANCE

APPLICABILITY: Applies to the auxiliary feedwater pumps and valves for MODES 1, 2 and 3.

OBJECTIVE: To ensure the reliability of the auxiliary feedwater system.

SPECIFICATION:

A. Each auxiliary feedwater pump shall be demonstrated OPERABLE by testing each pump in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the NRC pursuant to 10 CFR 50.55a(g)(6)(i).

B. At least once per 31 days an inspection shall be made to verify that each non-automatic valve in the emergency flow path that is not locked, sealed, or otherwise secured in position is in its correct position.

C. Each auxiliary feedwater Train shall be demonstrated OPERABLE at least once per 18 months by:

1. Verifying that the AFW Train B pump starts as designed automatically upon receipt of an auxiliary feedwater actuation test signal.

2. Verifying that the AFW Train A motor driven pump starts as designed automatically upon receipt of auxiliary feedwater actuation AND Train B low flow test signals. Subsequently, verify the pump stops upon receipt of a Train B positive flow test signal.

3. Within 72 hours after entering MODE 3, verifying that the AFW Train A steam driven pump enters warm-up mode upon receipt of an auxiliary feedwater actuation test signal. Subsequently, verify pump starts upon receipt of a Train B low flow test signal, and returns to warm-up mode upon receipt of Train B positive flow test signal.

4. Verifying that each automatic valve in the flow path actuates to its correct position upon receipt of actuation test signals.

D. When the reactor coolant system pressure remains less than 500 psig for a period longer than thirty (30) days, flow tests shall be performed to verify the emergency flow paths from the auxiliary feedwater storage tank to each steam generator, using each motor driven auxiliary feedwater pump prior to increasing

reactor coolant system pressure above 500 psig. The flow tests shall be conducted with the auxiliary feedwater system valves in their emergency alignment. Within 72 hours after entering MODE 3, the steam driven auxiliary feedwater pump shall be similarly tested.

E. The provisions of Specification 4.0.4 are not applicable for entry into MODE 3 for the steam driven auxiliary feedwater pump. However, the steam driven AFW pump must be OPERABLE in all other respects.

BASIS:

The OPERABILITY of the auxiliary feedwater system ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss of offsite power.

The design of the Auxiliary Feedwater System further ensures sufficient AFW flow into the intact feedwater lines without exceeding pump run-out or water hammer limits for any applicable design basis event with or without concurrent loss of offsite power and a single active failure.(2,3)

References:

(1) NRC letter dated July 2, 1980 from D. G. Eisenhut to all pressurized water reactor licensees.

(2) SCE letter dated November 6, 1987 from M. O. Medford to NRC Document Control Desk.

(3) SCE letter dated November 20, 1987, from M. O. Medford to NRC Document Control Desk.