LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
3.7 STEAM GENERATOR EMERGENCY HEAT REMOVAL	4.7 STEAM GENERATOR EMERGENCY HEAT REMOVAL
Applicability:	Applicability:
Applies to auxiliary feedwater pump system, auxiliary feedwater supply system, and steam generator safety valves.	Applies to surveillance of auxiliary feedwater pump system, auxiliary feedwater supply system and steam generator safety valves.
Objective:	Objective:
To insure adequate plant cooldown capabilities upon loss of normal feedwater flow and loss of main condenser vacuum.	To insure availability of the above system and valves.
Specification:	Specification:
1. Steam Line Safety Valves per unit A. Twenty ASME code safety valves (5 per steam generator) shall be operable whenever the reactor is heated above 350 °F except as specified in 3.7.1.C, 3.7.1.D, and 3.7.1.E	1. Steam Line Safety Valves per unit. A. Ten steam generator safety valves per unit shall be tested for set pressure at each refueling outage. Testing shall be done by a calibrated auxiliary lifting device or by bench testing on compressed gas. At least two of the valves tested shall be from each orifice size ("Q" or "R"). All valves on a unit shall have been tested at the end of each second refueling outage. The valves and the corresponding set pressures and orifice sizes are identified in Table 4.7-1.
B. Deleted	B. Deleted

LIMITING CONDITION FOR OPERATION			SURVEILLANCE REQUIREMENT		
3.7.1	C.	With four reactor coolant loops and associated steam generators in operation and with one or more main steam line code safety valves inoperable, operation may continue provided, that within 4 hours, either the inoperable valves are restored to operable status or the Power Range Neutron Flux High Setpoint Trip is reset for the most restrictive loop in accordance with Table 3.7-1. Valve orifice sizes are specified in Table 4.7-1.	4.7.1	C.	Not Applicable
3.7.1	D.	With three reactor coolant loops and associated steam generators in operation and with one or more main steam line code safety valves associated with an operating loop inoperable, operation may continue provided, that within 4 hours, either the inoperable valves are restored to operable status or the Power Range Neutron Flux High Setpoint Trip is reset for the most restructive operating loop in accordance with Table 3.7-2. Valve orifice sizes are specified in Table 4.7-1.	4.7.1	D.	Not Applicable

Amendments 17 & 14
JAN 29 1976

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
3.7.1 E. When the reactor is operating on 3 loops, at least two code safety valves associated wtih the remaining steam gencrator must be OPERABLE.	4.7.1 E. Not applicable
F. If these conditions cannot be met, the reactor shall be brought to the HOT SHUTDOWN condition within four hours. After a maximum of 48 hours in the HOT SHUTDOWN condition, if the system is not OPERABLE, the reactor shall be brought to the COLD SHUTDOWN condition within 24 hours.	F. Not applicable.
2. Auxiliary Feedwater Pump System, per unit .	2. Auxiliary Feedwater Pump System, per uni
A. Three independent steam generator auxiliary feedwater pumps and associated flow paths shall be OPERABLE with:	A. Each feedwater pump shall be demonstrated OPERABLE:
1. Two motor-driven auxiliary feedwater pumps, each capable of being powered from separate emergency busses, and	1. At least once per month by:
2. One steam turbine-driven auxiliary feedwtaer pump capable for being powered from an OPERABLE steam supply system.	a. Verifying the pump starts upon actuation from the control room, operates for at least ten minutes on recirculation flow, and the discharge pressure and flow are within + 10% of a point on the pump head curve, and
APPLICABILITY: Modes 1, 2, and 3	b. Verifying the pump provides at least 105 gpm flow to each steam generator

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
3.7.2	4.7.2.A.2
ACTION: a. With one motor-driven auxiliary feedwater pump inoperable, restore the pump to OPERABLE status within seven days, or be in Mode 4 within the next 12 hours. b. With two motor-driven auxiliary feedwater pumps inoperable, restore at least one pump to OPERABLE status within 8 hours or be in Mode 4 within the next 12 hours. c. With a turbine-driven auxiliary feedwater pump inoperable, and the conditions of 3.7.2 action step (d) not met, restore the turbine-driven auxiliary feedwater pump to Operable status within 72 hours or be in Mode 4 within the next 12 hours. The discharge flow paths of the motor-driven auxiliary feedwater pumps shall be realigned to provide two OPERABLE flow paths to the steam generators within the initial 8 hours. d. With a turbine driven auxiliary feedwater pump inoperable and the following conditions met or in effect: - repairs are begun immediately and every reasonable effort is made to continue the repairs uninterrupted, - the two motor driven auxiliary feedwater pumps and all their required and emergency power supplies OPERABLE, - it has been determined that the repairs can be made within 7 days, then	The surveillance and testing of the turbine driven auxiliary feedwater pump as specified in 4.7.2.A.1 need only be performed whenever the reactor is in modes 1 or 2. Whenever the reactor is taken from mode 3 into mode 2 without the required surveillance and testing have been performed within the required surveillance period, the surveillance and testing shall be performed within 4 hours after entering mode 2 or within 4 hours after completing low power physics tests after a refueling outage.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
3.7.2	4.7.2
restore the turbine driven auxiliary feedwater pump to OPERABLE status within 7 days or be in Mode 4 within the next 12 hours. The discharge flow paths of the motor driven auxiliary feedwater pumps shall be realigned to provide two OPERABLE flow paths to the steam generator within the initial 8 hours.	
e. With a turbine-driven auxiliary feedwater pump and one motor-driven auxiliary feedwater pump inoperable, restore one pump to operable status within 8 hours or be in Mode 4 within the next 12 hours.	
f. With three auxiliary feedwater pumps inoperable, make every effort to restore at least one auxiliary feedwater pump to OPERABLE status as soon as possible.*	
g. With either auxiliary feedwater pump discharge, flow paths inoperable, restore the flow path to OPERABLE status within 72 hours or be in Mode 4 within the next 12 hours.	
h. With both auxiliary feedwater pump discharge flow paths inoperable, make every effort to restore at least one flow path to OPERABLE status as soon as possible.*	
*Section 3.0.3 does not apply.	

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
3.7.3 Auxiliary Feedwater for Operation A. A condensate storage tank shall be OPERABLE with a contained water volume of at least 170,000 gallons of water. APPLICABILITY: Modes 1, 2 and 3 ACTION: A. With the condensate storage tank inoperable: 1) restore the condensate storage tank to OPERABLE status within the next 4 hours, or 2) a. within the following 4 hours demonstrate OPERABLE the service water system as a backup supply to the auxiliary feedwater pumps, and b. restore the condensate storage tank to OPERABLE status within the next 7 days or be in Mode 4 within the next 12 hours. B. With the condensate storage tank and the service water supply to the auxiliary feedwater pumps inoperable, make every effort to restore the condensate storage tank and/or service water supply to OPERABLE status.* *Section 3.0.3 does not apply.	4.7.3 Auxiliary Feedwater Supply System A. The condensate storage tank shall be demonstrated OPERABLE: 1. at least once per shift by verifying the contained water volume is within limit, and 2. the manual valves for the lined-up tank shall be verified locked open once per month. B. When the service water system is the required supply system, the system shall be demonstrated operable at least daily by stroking the power-operated service water supply valves to all operable auxiliary feedwater pumps from the control room. Performance will be acceptable if valve motion is indicated upon actuation.

Component Name	Component Number
Auxiliary Feedwater Pump-1A (2A) (turbine driven)	FW004
Auxiliary Feedwater Pump-1B (2B) (motor driven)	FW005
Auxiliary Feedwater Pump-1C (2C) (motor driven)	FW006

Auxiliary Feedwater Pump System

TABLE 4.7-2

Component Name	Component Number
Condensate Storage Tank	SC001
Auxiliary Feedwater Pump -1A (2A) service water supply valve	MOV-SW0102
Auxiliary Feedwater Pump -1B (2B) service water supply valve	MOV-SW0101
Auxiliary Feedwater Pump - 1B (2B) service water supply valve	MOV-SW0104
Auxiliary Feedwater Pump - 1C (2C) service water supply valve	MOV-SW0103
Auxiliary Feedwater Pump - 1C (2C) service water supply valve	MOV-SW0105

Auxiliary Feedwater Supply System

TABLE 4.7-3

Bases:

3.7 The twenty code steam safety valves per unit have a total combined capacity to relieve the total steam flow of one unit. These valves assure code overpressure protection is provided (1). In the event that one or more of the safety valves are inoperable, the loop steam flows are restricted to the maximum relieving capacity of the most restrictive operating loop. This is accomplished by reduction of the Power Range Neutron Flux High Setpoint Trip such that reactor power is limited to be less than the thermal power required to produce steam flow in excess of the relieving capacity of the most restrictive loop. The reactor trip setpoints are derived on the following basis:

For 4 loop operation:

$$SP = \frac{TSVC-ISVC}{TSVC} \times 109\%$$

For 3 loop operation:

$$SP = \frac{TSVC-ISVC}{TSVC} \times 75\%$$

where:

SP = Reactor Trip Setpoint
TSVC = Total safety valve relieving capacity per steam generator
ISVC= Inoperable safety valve relieving capacity per steam generator.

During 3 loop operation, at least two safety valves are retained in service for any unlikely pressurization on the non-operating steam generator.

Although not required for safe operation of the unit, the four atmospheric steam relief valves per unit, provide additional decay heat removal capability. These valves, which are air or electric motor operated, are also manually controllable from the control room, and are installed to prevent unnecessary operation of the steam generator safety valves. (1)

The auxiliary feedwater pump systems provide a very reliable source of flow to the steam generators for decay heat removal. Either the steam driven auxiliary feedwater pump or one of the two motor driven auxiliary feedwater pumps can supply the required flow of a unit. (2)

Suction to the auxiliary feedwater pumps is provided by the condensate storage tank or, as a backup, the service water system. A minimum of 170,000 gallons are required to provide for 2 hours at hot standby followed by 4 hours cooldown at 50°F per hour with steam discharge to the atmosphere concurrent with total loss of offsite power. (3) This is sufficient to reduce the reactor coolant system temperature to below 350°F when the Residual Heat Removal System may be placed in operation.

(1) FSAR, Section 10.3
(2) FSAR, Section 14.1.9
(3) FSAR, Section 6.7.2

In 3.7.2, item d, the 7 day outage time for the turbine driven auxiliary feedwater pump is to allow time to repair in place the most limiting part or component. The term "every reasonable effort" means that repairs are to begin immediately and are to continue uninterrupted until the turbine driven auxiliary feedater pump is declared operable or the unit is shutdown according to Section 3.7.2.c. Time is permitted in this definition to obtain parts on an expedited basis.

Bases:

4.7 The testing of at least two safety valves of each orifice size assures that a representative sample of valves is tested at each refueling. The testing interval assures the availability of the safety valves and of the auxiliary feedwater pump system.

The four hour delay in the surveillance and testing of the turbine driven auxiliary feedwater pump until the reactor has reached the hot standby condition is to prevent unnecessary cooldown of the reactor coolant system during periods when the reactor is not available as a heat source.