ATTACHMENT 1

Consumers Power Company
Palisades Plant
Docket 50-255

TECHNICAL SPECIFICATIONS CHANGE REQUEST
SHUTDOWN COOLING SYSTEM

PROPOSED PAGES

May 1, 1991

19 Pages

Amendment No. 31, 51, 57, 85, 108, 118, 128,

3.1 PRIMARY COOLANT SYSTEM

Applicability

Applies to the operable status of the primary coolant system.

Objective

To specify certain conditions of the primary coolant system which must be met to assure safe reactor operation.

Specifications

3.1.1 Operable Components

a. At least one primary coolant pump or one shutdown cooling pump with a flow rate greater than or equal to 2810 gpm shall be in operation whenever a change is being made in the boron concentration of the primary coolant and the plant is operating in cold shutdown or above, except during an emergency loss of coolant flow situation. Under these circumstances, the boron concentration may be increased with no primary coolant pumps or shutdown cooling pumps running.

b. Four primary coolant pumps shall be in operation whenever the reactor is operated above hot shutdown, with the following exception:

   Before removing a pump from service, thermal power shall be reduced as specified in Table 2.3.1 and appropriate corrective action implemented. With one pump ont of service, return the pump to service within 12 hours (return to four-pump operation) or be in hot shutdown (or below) with the reactor tripped (from the C-06 panel, opening the 42-01 and 42-02 circuit breakers) within the next 12 hours. Start-up (above hot shutdown) with less than four pumps is not permitted and power operation with less than three pumps is not permitted.

c. The measured four primary coolant pumps operating reactor vessel flow shall be 140.7 x 10^6 lb/hr or greater, when corrected to 532°F.

d. Both steam generators shall be capable of performing their heat transfer function whenever the average temperature of the primary coolant is above 300°F.

e. Deleted

3.1 PRIMARY COOLANT SYSTEM (Cont'd)

3.1.1 Operable Components (cont'd)

h. Forced circulation (starting the first primary coolant pump) shall not be initiated unless one of the following conditions is met:

(1) Primary coolant cold leg temperature is > 430°F.
(2) PCS cold leg temperature is ≤ 430°F and S/G secondary temperature is less than PCS cold leg temperature.
(3) Shutdown cooling is isolated from the PCS AND PCS cold leg temperature is > 210°F and S/G secondary temperature is less than 100°F higher than PCS temperature.
(4) Shutdown cooling is isolated from the PCS AND PCS cold leg temperature is ≥ 170°F and ≤ 210°F AND S/G secondary temperature is less than 20°F higher than PCS cold leg temperature.
(5) Shutdown cooling is isolated from the PCS AND PCS cold leg temperature is ≥ 120°F and < 170°F AND S/G secondary temperature is less than 100°F higher than PCS cold leg temperature.

i. The PCS shall not be heated or maintained above 300°F unless a minimum of 375 kW of pressurizer heater capacity is available from both buses 1D and 1E. Should heater capacity from either bus 1D and 1E fall below 375 Kw, either restore the inoperable heaters to provide at least 375 Kw of heater capacity from both buses 1D and 1E within 72 hours or be in hot shutdown within the next 12 hours.

Basis

When primary coolant boron concentration is being changed, the process must be uniform throughout the primary coolant system volume to prevent stratification of primary coolant at lower boron concentration which could result in a reactivity insertion. Sufficient mixing of the primary coolant is assured if one shutdown cooling or one primary coolant pump is in operation.[1] The shutdown cooling pump will circulate the primary system volume in less than 60 minutes when operated at rated capacity. By imposing a minimum shutdown cooling pump flow rate of 2810 gpm, sufficient time is provided for the operator to terminate the boron dilution under asymmetric flow conditions.[5] The pressurizer volume is relatively inactive, therefore will tend to have a boron concentration higher than rest of the primary coolant system during a dilution operation. Administrative procedures will provide for use of pressurizer sprays to maintain a nominal spread between the boron concentration in the pressurizer and the primary system during the addition of boron.[2]

Amendment No 87, 85, 117, 118, 131,

3.1 PRIMARY COOLANT SYSTEM (PCS) (Continued)

3.1.9 SHUTDOWN COOLING - This section only applies with fuel in the reactor.

a. PCS Temperature >200°F and ≤300°F

At least two of the loops or trains listed below shall be operable and at least one loop or train shall be in operation:

1. Primary Coolant System Loop 1 consisting of an operable Steam Generator and at least one operable Primary Coolant Pump (PCP).

2. Primary Coolant System Loop 2 consisting of an operable Steam Generator and at least one operable Primary Coolant Pump (PCP).

3. Shutdown Cooling Train A.

4. Shutdown Cooling Train B.

EXCEPTION

All PCPs and Shutdown Cooling may be intentionally secured provided:

a. No operations are permitted that would cause reduction of the PCS boron concentration.

AND

b. Core outlet temperature stays at least 10°F below saturation temperature.

ACTION

A. If only 1 PCS loop is operable and no SDC trains are operable:

1. Immediately initiate corrective action to return a second loop or train to operable status.

B. If only 1 SDC train is operable and no PCS loops are operable:

1. Immediately initiate corrective action to return a second loop or train to operable status,

AND

2. If a second loop or train cannot be returned to operable status be less than 200°F within 24 hours.

C. If no PCS loops or Shutdown Cooling trains are in operation when required:

1. Immediately suspend all operations involving a reduction in PCS boron concentration,

AND

2. Immediately initiate corrective action to return the required loops or trains to operation.

3.1 PRIMARY COOLANT SYSTEM (PCS) (Continued)

3.1.9 SHUTDOWN COOLING (Continued)

b. PCS Temperature ≤200°F - Loops Filled

At least one of the loops or trains listed below shall be operable and in operation and one additional loop or train shall be operable or the secondary side water level of each steam generator shall be higher than the minus 84 percent level:

1. Primary Coolant System Loop 1 consisting of an operable Steam Generator and at least one operable Primary Coolant Pump (PCP).

2. Primary Coolant System Loop 2 consisting of an operable Steam Generator and at least one operable Primary Coolant Pump (PCP).

3. Shutdown Cooling Train A.

4. Shutdown Cooling Train B.

EXCEPTION

All PCPs and Shutdown Cooling may be intentionally secured provided:

a. No operations are permitted that would cause reduction of the PCS boron concentration,

AND

b. Core outlet temperature does not exceed 200°F.

ACTION

A. If only one PCS loop or SDC train is operable when two are required:

1. Immediately initiate corrective action to return the required loops or trains to operable status.

B. If a required Steam Generator has less than the specified water level:

1. Immediately initiate corrective action to restore the required Steam Generator water level.

C. If no PCS loops or Shutdown Cooling trains are in operation when required:

1. Immediately suspend all operations involving a reduction in PCS boron concentration,

AND

2. Immediately initiate corrective action to return the required loops or trains to operation.

3.1 PRIMARY COOLANT SYSTEM (PCS) (Continued)

3.1.9 SHUTDOWN COOLING (Continued)

c. PCS Temperature ≤200°F - Loops not filled

Two Shutdown Cooling trains (SDC) shall be operable, and at least one train shall be in operation.

EXCEPTIONS:

1. One SDC train may be intentionally rendered inoperable for testing or maintenance provided:

   a. The other SDC train is in operation.

2. All Shutdown Cooling may be intentionally secured provided:

   a. No operations are permitted that would cause reduction of the PCS boron concentration,

   AND

   b. Core outlet temperature does not exceed 200°F.

ACTION

A. If only one SDC train is operable when two are required:

   1. Immediately initiate corrective action to return two trains to operable status.

B. If no SDC trains are in operation when required:

   1. Immediately suspend all operations involving a reduction in PCS boron concentration,

   AND

   2. Immediately initiate corrective action to return the required trains to operation.

3.1.9 SHUTDOWN COOLING (Continued)

BASIS

A shutdown cooling train may vary in actual component configuration, method of operation and control, but it shall always accomplish the objective of transferring decay heat from the reactor to Lake Michigan as the ultimate heat sink. As a minimum, a shutdown cooling train requires: a shutdown cooling pump, one component cooling water pump, one service water pump, and appropriate piping, valves and controls for the equipment to perform its function. All of this equipment must also have adequate electrical power to be operable.

"Loops filled" means the Primary Coolant System (PCS) loops are intact, not blocked by dams and totally filled with coolant. This permits partial draining of the PCS provided air has not entered the PCS loops.

The loops are considered "not filled" after the PCS has been drained so air has entered the loops and air sweeps have not been completed to remove the air. Once the PCS loops have been drained to any extent (install steam generator nozzle dams for example) there could be sufficient air trapped in the upper portion of the steam generator u-tubes, even after the PCS water level is raised, to prevent natural circulation in the PCS. For this reason, the steam generators cannot be considered operable when the PCS loops are not completely filled with coolant and the air sweeps completed.

With the PCS temperature >200°F and ≤300°F a single primary coolant loop or shutdown cooling train provides sufficient heat removal capability for removing decay heat. Natural circulation is adequate for core heat removal, however it may not provide adequate mixing of the PCS coolant during PCS boron concentration changes. Therefore, forced circulation is required during these operating conditions, except during intervals when the required loops or trains can be intentionally rendered inoperable provided additional constraints are followed. Single failure considerations require a second loop or train (either PCS or shutdown cooling) be operable. Operation of the shutdown cooling trains is limited to when the PCS temperature is ≤300°F because 300°F is the maximum temperature used in the stress analysis of the shutdown cooling system piping.

When the PCS temperature <200°F and the loops filled, a single primary coolant loop or shutdown cooling train provides sufficient heat removal capability for removing decay heat. The steam generators remove heat by bulk heating of the secondary side water rather that creating steam. Natural circulation is adequate as a backup means for core heat removal, however it may not provide adequate mixing of the PCS coolant during PCS boron concentration changes. In addition, it is difficult to maintain PCS temperature <200°F, if the only method of core heat removal is natural circulation. Therefore, forced circulation is required during these operating conditions, except during intervals when the required loops or trains can be intentionally secured provided additional constraints are followed. Single failure considerations require a

3.1.9 SHUTDOWN COOLING (Continued)

BASIS (Continued)

second loop, train, or the secondary side water level of both steam generators be above the actual minus 84 percent level. Minus 84 percent is located 197.9 inches below the centerline of the main feedwater ring. A steam generator secondary water level of at least minus 84 percent covers at least one-third of the effective steam generator heat transfer area and is sufficient to support natural circulation in the PCS[1,2].

With the PCS temperature ≤200°F and the loops not filled, a single shutdown cooling train provides sufficient heat removal capability for removing decay heat. To provide adequate mixing of the PCS coolant during PCS boron concentration changes, forced circulation is required during this operating condition except during intervals when the required trains can be intentionally rendered inoperable provided additional constraints are followed. Single failure considerations, and the unavailability of the steam generators as a heat removing component, require that a second shutdown cooling train be operable.

All forced circulation may be isolated provided actions are taken to prevent dilution of the PCS and avoid situations that could produce steam in the reactor vessel. When the PCS temperature is >200°F and <300°F, maintaining ≥10°F subcooling ensures the availability of single phase natural circulation. When the PCS temperature is ≤200°F, not exceeding 200°F ensures the availability of a single phase natural circulation.

A redundant train of SDC may be intentionally rendered inoperable for testing or maintenance for any time interval provided the other SDC train is in operation. The two shutdown cooling trains are not totally independent since they share common suction and discharge piping. No time limit is specified because the time interval that is needed for each required evolution could vary. This method of operating equipment is consistent with the intent of Generic Letter 88-17, Loss of Decay Heat Removal. It is recommended that equipment be maintained and tested as appropriate to create an acceptable level of confidence that the systems will be able to perform their decay heat removal function. Therefore, appropriate testing or maintenance is considered prudent and justified, without any specific time limit related to equipment that may be inoperable to permit such evolutions. In all cases, the intent is to take reasonable actions to minimize the use of exception No. 1 of specification 3.1.9.c. If it is required to use exception No. 1 of specification 3.1.9.c, SDC will not be rendered inoperable in situations where PCS temperature is close to 200°F or the PCS heatup rate would result in the PCS temperature exceeding 200°F in a relatively short period of time.

(1) ABB/CE Letter Ops-91-0496, "Minimum S/G Level Required to Support Natural Circulation Decay Heat Removal."

(2) Consumers Power Company Engineering Analysis EA-GFP-90-03, Revision 0 "Technical Review of ABB/CE Letter OPS-91-046."

3.5 STEAM AND FEEDWATER SYSTEMS

Applicability

Applies to the operating status of the steam and feedwater systems.

Objective

To define certain conditions of the steam and feedwater system necessary to assure adequate decay heat removal.

Specifications

3.5.1 The primary coolant shall not be heated above 300°F unless the following conditions are met:

a. Both electric driven Auxiliary Feedwater Pumps and one fire protection pump shall be operable. The steam driven pump shall be operable prior to making the reactor critical.

b. The Auxiliary Feedwater System Instrumentation shall meet the minimum operability requirements addressed in Technical Specification 3.17.

c. All flow control valves associated with the Auxiliary Feedwater System shall be operable.

d. All valves, interlocks and piping associated with the above components required to function during accident conditions shall be operable.

e. A minimum of 100,000 gallons of water in the condensate storage and primary coolant system makeup tanks combined.

f. The main steam stop valves shall be operable and capable of closing in five seconds or less under no-flow conditions.

3.5.2 With the Primary Coolant System at a temperature greater than 300°F, the requirements of Specification 3.5.1 may be modified to permit the following conditions to exist. If the system is not restored to meet the requirements of Specification 3.5.1 within the time period specified below, refer to Specification 3.5.3.

a. One auxiliary feedwater pump may be inoperable for a period of 72 hours.

b. Two auxiliary feedwater pumps may be placed in manual, for testing, for a period of 4 hours.

3.5 STEAM AND FEEDWATER SYSTEMS (Cont'd)

3.5.2 (Continued)

c. The fire water makeup to the Auxiliary Feedwater Pump Suction (P-8A and P-8B) may be inoperable for a period of 7 days provided the pump service water makeup to P-8C, pump P-8C, and its corresponding flow control valves are operable.

d. The service water makeup to the Auxiliary Feedwater Pump Suction (P-8C) may be inoperable for a period of 7 days provided the fire water makeup to P-8A & P-8B, pumps P-8A and P-8B and their corresponding flow control valves are operable.

e. One flow control valve on each train may be inoperable for a period of 72 hours provided the corresponding redundant flow control valve and a pump in the other pipe train are operable.

3.5.3 With the Primary Coolant System at a temperature greater than 300°F and if the system does not satisfy the requirements of Specification 3.5.1 or the conditions of Specification 3.5.2 except as noted in Specification 3.5.4, the reactor shall be placed in hot standby within 6 hours, hot shutdown within the following 6 hours and in cold shutdown within the following 24 hours.

3.5.4 With all Auxiliary Feedwater Pumps inoperable immediately initiate corrective action to restore at least one Auxiliary Feedwater Pump to OPERABLE status as soon as possible and reduce power within 24 hours to the lowest stable power level consistent with reliable Main Feedwater System operation.

3.7 ELECTRICAL SYSTEMS

Applicability

Applies to the availability of electrical power for the operation of plant components.

Objective

To define those conditions of electrical power availability necessary to provide for safe reactor operation and the continuing availability of engineered safety features.

3.7.1 Specifications

The primary coolant system shall not be heated or maintained at temperatures above 300°F if the following electrical systems are not operable:

a. Station power transformer 1-2 (2400 V).

b. Start-up transformer 1-2 (2400 V).

c. 2400 V engineered safeguards buses 1C and 1D.

d. 480 V distribution buses 11 and 12.

e. MCC No 1, 2, 7 and 8.

f. 125 V d-c buses No 1 and 2.

g. Four preferred a-c buses.

h. Two station batteries and the d-c systems including at least one battery charger on each bus.

i. Both diesel generators, with a minimum of 2500 gallons of fuel in each day tank a minimum of 16,000 gallons of fuel in the underground storage tank.

j. Switchyard battery and the d-c system with one battery charger.

k. 240 V a-c power panels No 1 and 2, and their associated ACB breaker distribution systems.

l. 2400 V bus 1E.

3.7.2 The requirements of Specification 3.7.1 may be modified to the extent that one of the following conditions will be allowed after the reactor has been made critical. If any of the provisions of those exceptions are violated, the reactor shall be placed in a hot shutdown condition within 12 hours. If the violation is not corrected within 24 hours, the reactor shall be placed in a cold shutdown condition within 24 hours.

3.7 ELECTRICAL SYSTEMS (Continued)

3.7.3 SHUTDOWN COOLING ELECTRICAL REQUIREMENTS

With the primary coolant system at ≤300°F, and with fuel in the reactor, the shutdown cooling train(s) shall be electrically powered as follows:

a. If one train of shutdown cooling is required to meet specification 3.1.9:

   1. The appropriate engineered safeguards bus (1C or 1D) shall be operable and capable of being supplied by offsite power and an operable diesel generator.

      OR

   2. Have two trains of shutdown cooling operable, and meet all the requirements of 3.7.3.b below.

b. If two trains of shutdown cooling are required to meet specification 3.1.9, one engineered safeguards bus (1C or 1D) shall be operable and capable of being supplied by offsite power while the other engineered safeguards bus (1D or 1C) is operable and capable of being supplied by an operable diesel generator.

ACTION

With less than the required electrical sources operable:

A. Immediately initiate action to suspend core alterations,

   AND

B. Immediately initiate action to suspend movement of irradiated fuel,

   AND

C. Immediately suspend crane operations over irradiated fuel,

   AND

D. Suspend operations with a potential for draining the PCS or fuel pool,

   AND

E. Initiate action to restore the required electrical sources to operable status.

3.7.3 SHUTDOWN COOLING ELECTRICAL REQUIREMENTS (Continued)

BASIS

The operability of the minimum specified power sources and associated distribution systems during shutdown and refueling ensures that:

1. The plant can be maintained in the shutdown or refueling operation condition for extended time periods, and

2. Sufficient control capability is available for maintaining the plant status.

When a single train of shutdown cooling must be operable to meet the minimum equipment operability requirements to remove decay heat, the train must still function following the loss of one electric supply (offsite power or diesel generator).

When two trains of shutdown cooling must be operable to meet the minimum equipment operability requirements to remove decay heat, the loss of any single pump or the loss of one electrical supply (offsite power or diesel generator) must still leave a shutdown cooling train operable.

The action statements will minimize the occurrence of postulated events, however, they should not preclude the orderly completion of an activity, such as fuel movement or crane operation, in order to get into a safe and conservative position.

Table 3.17.4 (Cont'd)

No	Functional Unit	Minimum Operable Channels	Minimum Degree of Redundancy	Permissible Bypass Conditions
8.	Pressurizer Wide Range Water Level Indication	2 (m, p, q)	None	Not required in Cold or Refueling Shutdown
9.	Pressurizer Code Safety Relief Valves Position Indication (Acoustic Monitor or Temperature Indication)	1 per Valve	None	Not Required below 300°F
10.	Power Operated Relief Valves (Acoustic Monitor or Temperature Indication)	1 per Valve	None	Not required when PORV isolation valve is closed and its indication system is operable
11.	PORV Isolation Valves Position Indication	1 per Valve	None	Not required when reactor is depressurized and vented through a vent ≥1.3 sq.in.
12.	Subcooling Margin Monitor	1	None	Not required below 300°F
13.	Auxiliary Feed Flow Rate Indication	1 per flow(h) Control Valve	None	Not required below 300°F
14.	Auxiliary Feedwater Actuation System Sensor Channels	2 per steam generator(e)	1	Not required below 300°F
15.	Auxiliary Feedwater Actuation System Actuation Channels	2(f)	1	Not required below 300°F
16.	Excore Detector Deviation Alarms	1(g)	None	Not Required Below 25% of Rated Power
17.	Axial Shape Index Alarm	2(i)	1	Not Required Below 25% of Rated Power
18.	Reactor Vessel Water Level	2(j,k,l,m)	None	Not Required Below 300°F

TABLE 3.24-2

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

	INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
1.	WASTE GAS HOLDUP SYSTEM			
	a. Noble Gas Activity Monitor (RIA 1113) Providing Alarm and Automatic Termination of Release	(1)	At All Times	35
	b. Effluent System Flow Rate Measuring Device (FI 1121)	(1)	At All Times	36
2.	CONDENSER EVACUATION SYSTEM (RIA 0631)			
	a. Noble Gas Activity Monitor	(1)	Above 210°F	37
3.	STACK GAS EFFLUENT SYSTEM			
	a. Noble Gas Activity Monitor (RIA 2326 or RIA 2318)	(1)	At All Times	37
	b. Iodine/Particulate/Sampler/Monitor (RIA 2325)	(1)	At All Times	37
	c. Sampler Flow Rate Monitor	(1)	At All Times	36
	d. Hi Range Noble Gas (RIA 2327)**	(1)	Above 210°F	38
4.	STEAM GENERATOR BLOWDOWN VENT SYSTEM			
	a. Noble Gas Activity Monitor (RIA 2320)	(1)	Above 210°F	37
5.	MAIN STEAM SAFETY AND DUMP VALVE DISCHARGE LINE			
	a. Gross Gamma Activity Monitor** (RIA 2323 and 2324)	1 per Main Steam Line	Above 300°F	38
6.	ENGINEERED SAFEGUARDS ROOM VENT SYSTEM			
	a. Noble Gas Activity Monitor** (RIA 1810 and 1811)	1 per room	Above 210°F	38

** Setpoints for these instruments are exempted from Specification 3.24.5.1 limits. Setpoints for these instruments are governed by Emergency Implementing Procedures or operating procedures.

Amendment No. 85, 87,

TSPR8902

3.25 ALTERNATE SHUTDOWN SYSTEM

LIMITING CONDITION FOR OPERATION

3.25.1 The Alternate Shutdown System instrumentation and components shown in Table 3.25.1 shall be OPERABLE. Operability shall be demonstrated by performing the surveillances in accordance with Section 4.21.

APPLICABILITY:

Reactor coolant temperature > 300°F.

ACTION:

a. With less than the "Minimum Equipment" in Table 3.25.1 Operable, restore the inoperable equipment to Operable within 7 days, or provide equivalent shutdown capability and restore the inoperable equipment to Operable within 60 days; or be in Hot Shutdown within the next 12 hours and Cold Shutdown within the following 24 hours.

b. The provisions of Specification 3.0.3 and 3.0.4 do not apply.

Basis

The operability of the Alternate Shutdown System ensures that any fire will not preclude achieving safe shutdown. The Alternate Shutdown System components are independent of areas where a fire could damage systems normally used to shut down the reactor. This capability is consistent with Regulatory Guide 1.97 and Appendix R to 10CFR50.

Minimum Frequencies for Equipment Tests

12. Iodine Removal System

The Iodine Removal System shall be demonstrated operable:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.

b. At least once per 6 months by:

1. Verifying that tanks T-102 and T-103 contain the minimum required volumes.

2. Verifying the concentration of hydrazine in T-102 and sodium hydroxide in T-103.

c. At least once per refueling cycle, during shutdown, by verifying that each automatic valve in the flow path actuates to its correct position.

13. Containment Purge and Ventilation Isolation Valves

The Containment Purge and Ventilation Isolation Valves shall be determined closed:

a. At least once per 24 hours by checking the valve position indicator in the control room

b. At least once every 6 months by performing a leak rate test between the valves.

14. Steam Generator Secondary Water Level

For any steam generator required to meet the shutdown cooling requirements of specification 3.1.9, its secondary water level shall be verified at least once per 12 hours to be above minus 84%.

TABLE 4.21.1 (Continued)

ALTERNATE SHUTDOWN MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

Channel Description	Surveillance Function	Frequency	Surveillance Method
7. Start-up Range Neutron Monitor (N-001A)	a. Test	Prior to startup[4]	a. Internal test signal
8. Auxiliary Feedwater Low Suction Pressure Switch (PS-0741D)	a. Calibrate	Refueling Cycle	a. Apply known pressure to pressure sensor
9. SIRW Tank Level Indication (LI-0332B)	a. Check[1]	Quarterly	a. Compare independent level readings
	b. Calibrate	Refueling Cycle	b. Apply known differential pressure to level sensor
10. Auxiliary Feedwater Flow Rate[2] Indication (FI-0727B) (FI-0749B)	a. Calibrate	Refueling Cycle	a. Apply known differential pressure to sensor(s)
11. Auxiliary Feedwater Flow Control[3] Valves (CV-0727 & CV-0749)	a. Check	Refueling Cycle	a. Verify Control
12. Auxiliary Feedwater Pump Inlet Steam Valve (CV-0522B)	a. Check	Refueling Cycle	a. Verify Control

NOTES:

(1) Quarterly checks are not required when the PCS temperature is less than or equal to 300°F.
(2) Satisfies Table 4.1.3-15 Requirement.
(3) See Specification 4.9b.
(4) Prior to each startup, if not done previous week.

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Amendment No. 83, 122, 136,

TABLE 4.24-2 (cont)

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
5. MAIN STEAM SAFETY AND DUMP VALVE DISCHARGE LINE					
a. Gross Gamma Activity Monitor	D	M	R(3)	Q(2)	Above 300°F
6. ENGINEERED SAFEGUARDS ROOM VENT SYSTEM					
a. Noble Gas Activity Monitor	D	M	R(3)	Q(1)(2)	Above 210°F

TABLE NOTATION

(1) The CHANNEL FUNCTIONAL TEST shall also demonstrate that automatic isolation of this pathway occurs if instrument indicates measured levels above the alarm/trip set point.

(2) The CHANNEL FUNCTIONAL TEST shall also demonstrate that control room alarm annunciation occurs if either of the following conditions exists.
   a. Instrument indicates measured levels above the alarm set point (not applicable for Item 3.d, Hi Range Noble Gas).
   b. Circuit failure.

(3) a. The CHANNEL CALIBRATION shall be performed using one or more of the reference standards traceable to the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards shall permit calibrating the system over its intended range of energy and measurement range.
   b. For subsequent CHANNEL CALIBRATION, sources that have been related to the (a) calibration may be used.

(4) CHANNEL CHECK shall consist of verifying indication of flow during periods of release. CHANNEL CHECKS shall be made at least once per 24 hours on days on which continuous or batch releases are made.

TABLE FREQUENCY NOTATION

D	At least once per 24 hours	Q	At least once per 92 days
M	At least once per 31 days	R	At least once per 18 months
P	Prior to radioactive batch release	W	At least once per week

Amendment No. 85, 123,

ATTACHMENT 2

Consumers Power Company
Palisades Plant
Docket 50-255

TECHNICAL SPECIFICATIONS CHANGE REQUEST
SHUTDOWN COOLING SYSTEM

EXISTING PAGES MARKED-UP
WITH PROPOSED CHANGES

May 1, 1991

19 Pages

PALISADES PLANT TECHNICAL SPECIFICATIONS
TABLE OF CONTENTS - APPENDIX A

Amendment No. 31, 51, 57, 85, 108, 118, ~~128~~
~~September 5, 1989~~

3.1 PRIMARY COOLANT SYSTEM

Applicability

Applies to the operable status of the primary coolant system.

Objective

To specify certain conditions of the primary coolant system which must be met to assure safe reactor operation.

Specifications

3.1.1 Operable Components

a. At least one primary coolant pump or one shutdown cooling pump with a flow rate greater than or equal to 2810 gpm shall be in operation whenever a change is being made in the boron concentration of the primary coolant and the plant is operating in cold shutdown or above, except during an emergency loss of coolant flow situation. Under these circumstances, the boron concentration may be increased with no primary coolant pumps or shutdown cooling pumps running.

b. Four primary coolant pumps shall be in operation whenever the reactor is operated above hot shutdown, with the following exception:

Before removing a pump from service, thermal power shall be reduced as specified in Table 2.3.1 and appropriate corrective action implemented. With one pump ont of service, return the pump to service within 12 hours (return to four-pump operation) or be in hot shutdown (or below) with the reactor tripped (from the C-06 panel, opening the 42-01 and 42-02 circuit breakers) within the next 12 hours. Start-up (above hot shutdown) with less than four pumps is not permitted and power operation with less than three pumps is not permitted.

c. The measured four primary coolant pumps operating reactor vessel flow shall be 140.7 x 10^6 lb/hr or greater, when corrected to 532°F.

d. Both steam generators shall be capable of performing their heat transfer function whenever the average temperature of the primary coolant is above ~~325~~ 300°F.

e. Deleted

h. Forced circulation (starting the first primary coolant pump) shall not be initiated unless one of the following conditions is met:

(1) Primary coolant cold leg temperature is > 430°F.
(2) PCS cold leg temperature is ≤ 430°F and S/G secondary temperature is less than PCS cold leg temperature.
(3) Shutdown cooling is isolated from the PCS AND PCS cold leg temperature is > 210°F AND S/G secondary temperture is less than 100°F higher than PCS temperature.
(4) Shutdown cooling is isolated from the PCS AND PCS cold leg temperature is ≥ 170°F and ≤ 210°f AND S/G secondary temperature is less than 20°F higher than PCS cold leg temperature.
(5) Shutdown cooling is isolated from the PCS AND PCS cold leg temperature is ≥ 120°F and < 170°F AND S/G secondary temperature is less than 100°F higher than PCS cold leg temperature.

i. The PCS shall not be heated or maintained above ~~329~~ 300°F unless a minimum of 375 kW of pressurizer heater capacity is available from both buses 1D and 1E. Should heater capacity from either bus 1D and 1E fall below 375 kW, either restore the inoperable heaters to provide at least 375 kW of heater capacity from both buses 1D and 1E within 72 hours or be in hot shutdown within the next 12 hours.

Basis

When primary coolant boron concentration is being changed, the process must be uniform throughout the primary coolant system volume to prevent stratification of primary coolant at lower boron concentration which could result in a reactivity insertion. Sufficient mixing of the primary coolant is assured if one shutdown cooling or one primary coolant pump is in operation.(1) The shutdown cooling pump will circulate the primary system volume in less than 60 minutes when operated at rated capacity. By imposing a minimum shutdown cooling pump flow rate of 2810 gpm, sufficient time is provided for the operator to terminate the boron dilution under asymmetric flow conditions.(5) The pressurizer volume is relatively inactive, therefore will tend to have a boron concentration higher than rest of the primary coolant system during a dilution operation. Administrative procedures will provide for use of pressurizer sprays to maintain a nominal spread between the boron concentration in the pressurizer and the primary system during the addition of boron.(2)

3.1. PRIMARY COOLANT SYSTEM (PCS) (Continued)

3.1.9 SHUTDOWN COOLING - This section only applies with fuel in the reactor.

a. PCS Temperature >200°F and ≤~~325~~ 300°F

At least two of the loops or trains listed below shall be operable and at least one loop or train shall be in operation:

1. Primary Coolant System Loop 1 consisting of an operable Steam Generator and at least one operable Primary Coolant Pump (PCP).

2. Primary Coolant System Loop 2 consisting of an operable Steam Generator and at least one operable Primary Coolant Pump (PCP).

3. Shutdown Cooling Train A.

4. Shutdown Cooling Train B.

EXCEPTION:
All PCPs and Shutdown Cooling may be intentionally secured provided:

INSERT →

a. No operations are permitted that would cause reduction of the PCS boron concentration,
AND
b. Core outlet temperature stays at least 10°F below saturation temperature.

ACTION

A. If only 1 PCS loop is operable and no SDC trains are operable:

1. Immediately initiate corrective action to return a second loop or train to operable status.

B. If only 1 SDC train is operable and no PCS loops are operable:

1. Immediately initiate corrective action to return a second loop or train to operable status,
AND
2. If a second loop or train cannot be returned to operable status be less than 200°F within 24 hours.

C. If no PCS loops or Shutdown Cooling trains are in operation when required:

1. Immediately suspend all operations involving a reduction in PCS boron concentration,
AND
2. Immediately initiate corrective action to return the required loops or trains to operation.

3.1.9 SHUTDOWN COOLING (Continued)

b. PCS Temperature ≤200°F - Loops Filled

At least one of the loops or trains listed below shall be operable and in operation and one additional loop or train shall be operable or the secondary side water level of each steam generator shall be higher than minus 84 percent level:

1. Primary Coolant System Loop 1 consisting of an operable Steam Generator and at least one operable Primary Coolant Pump (PCP).

2. Primary Coolant System Loop 2 consisting of an operable Steam Generator and at least one operable Primary Coolant Pump (PCP).

3. Shutdown Cooling Train A.

4. Shutdown Cooling Train B.

EXCEPTION:
All PCPs and Shutdown Cooling may be intentionally secured provided:

INSERT →

a. No operations are permitted that would cause reduction of the PCS boron concentration,
AND
b. Core outlet temperature does not exceed 200°F.

ACTION

A. If only one PCS loop or SDC train is operable when two are required:

1. Immediately initiate corrective action to return the required loops or trains to operable status.

B. If a required Steam Generator has less than the specified water level:

1. Immediately initiate corrective action to restore the required Steam Generator water level.

C. If no PCS loops or Shutdown Cooling trains are in operation when required:

1. Immediately suspend all operations involving a reduction in PCS boron concentration,
AND
2. Immediately initiate corrective action to return the required loops or trains to operation.

3.1. PRIMARY COOLANT SYSTEM (PCS) (Continued)

3.1.9 SHUTDOWN COOLING (Continued)

c. PCS Temperature ≤200°F - Loops not filled

Two Shutdown Cooling trains (SDC) shall be operable, and at least one train shall be in operation.

EXCEPTIONS:

1. One SDC train may be intentionally rendered inoperable for testing or maintenance provided:

   a. The other SDC train is in operation.

2. All Shutdown Cooling may be intentionally secured provided:

   a. No operations are permitted that would cause reduction of the PCS boron concentration,

   AND

   b. Core outlet temperature does not exceed 200°F.

ACTION

A. If only one SDC train is operable when two are required:

   1. Immediately initiate corrective action to return two trains to operable status.

INSERT →

B. If no SDC trains are in operation when required:

   1. Immediately suspend all operations involving a reduction in PCS boron concentration,

   AND

   2. Immediately initiate corrective action to return the required trains to operation.

NEW PAGE

3.1.9 SHUTDOWN COOLING (Continued)

BASIS

A shutdown cooling train may vary in actual component configuration, method of operation and control, but it shall always accomplish the objective of transferring decay heat from the reactor to Lake Michigan as the ultimate heat sink. As a minimum, a shutdown cooling train requires: a shutdown cooling pump, one component cooling water pump, one service water pump, and appropriate piping, valves and controls for the equipment to perform its function. All of this equipment must also have adequate electrical power to be operable.

INSERT

"Loops filled" means the Primary Coolant system (PCS) loops are intact, not blocked by dams and totally filled with coolant. This permits partial draining of the PCS provided air has not entered the PCS loops.

The loops are considered "not filled" after the PCS has been drained so air has entered the loops and air sweeps have not been completed to remove the air. Once the PCS loops have been drained to any extent (install steam generator nozzle dams for example) there could be sufficient air trapped in the upper portion of the steam generator u-tubes, even after the PCS water level is raised, to prevent natural circulation in the PCS. For this reason, the steam generators cannot be considered operable when the PCS loops are not completely filled with coolant and the air sweeps completed.

With the PCS temperature >200°F and <~~325~~ 300°F a single primary coolant loop or shutdown cooling train provides sufficient heat removal capability for removing decay heat. Natural circulation is adequate for core heat removal, however it may not provide adequate mixing of the PCS coolant during PCS boron concentration changes. Therefore, forced circulation is required during these operating conditions, except during intervals when the required loops or trains can be intentionally rendered inoperable provided additional constraints are followed. Single failure considerations require a second loop or train (either PCS or shutdown cooling) be operable.

Operation of the shutdown cooling train is limited to when the PCS temperature is ≤ 300°F because 300°F is the maximum temperature used in the stress analysis of the shutdown cooling system piping.

With the PCS temperature <200°F and the loops filled, a single primary coolant loop or shutdown cooling train provides sufficient heat removal capability for removing decay heat. The steam generators remove heat by bulk heating of the secondary side water rather than creating steam. Natural circulation is adequate as a backup means for core heat removal, however it may not provide adequate mixing of the PCS coolant during PCS boron concentration changes. In additon, it is difficult to maintain PCS temperature <200°F, if the only method of core heat removal is natural circulation. Therefore, forced circulation is required during these operating conditions, except during intervals when the required loops or trains can be intentionally secured provided additional constraints are followed. Single failure considerations require a second loop, train, or the secondary side water level of both steam generators be above minus 84%. A steam generator secondary water level of at least a minus 84% is sufficient to support natural circulation in the PCS.(1,2)

Minus 84 percent is located 197.9 inches below the centerline of the main feedwater ring.

the actual percent

percent level.

Amendment No.

NEW PAGE

3.1. PRIMARY COOLANT SYSTEM (PCS) (Continued)

3.1.9 SHUTDOWN COOLING (Continued)

BASIS (Continued)

With the PCS temperature ≤200°F and the loops not filled, a single shutdown cooling train provides sufficient heat removal capability for removing decay heat. To provide adequate mixing of the PCS coolant during PCS boron concentration changes, forced circulation is required during this operating condition except during intervals when the required trains can be intentionally rendered inoperable provided additional constraints are followed. Single failure considerations, and the unavailability of the steam generators as a heat removing component, require that a second shutdown cooling train be operable.

All forced circulation may be isolated provided actions are taken to prevent dilution of the PCS and avoid situations that could produce steam in the reactor vessel. When the PCS temperature is >200°F and <~~385~~ 300°F, maintaining ≥10°F subcooling ensures the availability of single phase natural circulation. When the PCS temperature is ≤200°F, not exceeding 200°F ensures the availability of a single phase natural circulation.

A redundant train of SDC may be intentionally rendered inoperable for testing or maintenance for any time interval provided the other SDC train is in operation. No time limit is specified because the time interval that is needed for each required evolution could vary. This method of operating equipment is consistent with the intent of Generic Letter 88-17, Loss of Decay Heat Removal. It is recommended that equipment be maintained and tested as appropriate to create an acceptable level of confidence that the systems will be able to perform their decay heat removal function. Therefore, appropriate testing or maintenance is considered prudent and justified, without any specific time limit related to equipment that may be inoperable to permit such evolutions. In all cases, the intent is to take reasonable actions to minimize the use of exception No. 1 of specification 3.1.9.c. If it is required to use exception No. 1 of specification 3.1.9.c, SDC will not be rendered inoperable in situations where PCS temperature is close to 200°F or the PCS heatup rate would result in the PCS temperature exceeding 200°F in a relatively short period of time.

The two SDC trains are not totaly independent since they share common suction

(1) ABB/CE Letter OPS-91-0496 "Minimum S/G Level Required To Support Natural Circulation Decay Heat Removal".

(2) Consumers Power Company Engineering Analysis EA-GFP-90-03, Revision 0 "Technical Review of ABB/CE Letter OPS-91-046".

INSERT

3-25g h

Amendment No.

3.5 STEAM AND FEEDWATER SYSTEMS

Applicability

Applies to the operating status of the steam and feedwater systems.

Objective

To define certain conditions of the steam and feedwater system necessary to assure adequate decay heat removal.

Specifications

3.5.1 The primary coolant shall not be heated above ~~325~~ 300°F unless the following conditions are met:

a. Both electric driven Auxiliary Feedwater Pumps and one fire protection pump shall be operable. The steam driven pump shall be operable prior to making the reactor critical.

b. The Auxiliary Feedwater System Instrumentation shall meet the minimum operability requirements addressed in Technical Specification 3.17.

c. All flow control valves associated with the Auxiliary Feedwater System shall be operable.

d. All valves, interlocks and piping associated with the above components required to function during accident conditions shall be operable.

e. A minimum of 100,000 gallons of water in the condensate storage and primary coolant system makeup tanks combined.

f. The main steam stop valves shall be operable and capable of closing in five seconds or less under no-flow conditions.

3.5.2 With the Primary Coolant System at a temperature greater than ~~325~~ 300°F, the requirements of Specification 3.5.1 may be modified to permit the following conditions to exist. If the system is not restored to meet the requirements of Specification 3.5.1 within the time period specified below, refer to Specification 3.5.3.

a. ~~One~~ auxiliary feedwater pump may be inoperable for a period of ~~72~~ hours.

b. Two auxiliary feedwater pumps may be placed in manual, for testing, for a period of 4 hours.

Amendment No. ~~95~~, ~~95~~
~~January 30, 1986~~
~~Corrected 10/07/86~~

3.5 STEAM AND FEEDWATER SYSTEMS (Cont'd)

3.5.2 (Continued)

c. The fire water makeup to the Auxiliary Feedwater Pump Suction (P-8A and P-8B) may be inoperable for a period of 7 days provided the pump service water makeup to P-8C, pump P-8C, and its corresponding flow control valves are operable.

d. The service water makeup to the Auxiliary Feedwater Pump Suction (P-8C) may be inoperable for a period of 7 days provided the fire water makeup to P-8A & P-8B, pumps P-8A and P-8B and their corresponding flow control valves are operable.

e. One flow control valve on each train may be inoperable for a period of 72 hours provided the corresponding redundant flow control valve and a pump in the other pipe train are operable.

3.5.3 With the Primary Coolant System at a temperature greater than ~~325~~ 300 F and if the system does not satisfy the requirements of Specification 3.5.1 or the conditions of Specification 3.5.2 except as noted in Specification 3.5.4, the reactor shall be placed in hot standby within 6 hours, hot shutdown within the following 6 hours and in cold shutdown within the following 24 hours.

3.5.4 With all Auxiliary Feedwater Pumps inoperable immediately initiate corrective action to restore at least one Auxiliary Feedwater Pump to OPERABLE status as soon as possible and reduce power within 24 hours to the lowest stable power level consistent with reliable Main Feedwater System operation.

Amendment No. ~~96~~
~~January 30, 1986~~

3.7 ELECTRICAL SYSTEMS

Applicability

Applies to the availability of electrical power for the operation of plant components.

Objective

To define those conditions of electrical power availability necessary to provide for safe reactor operation and the continuing availability of engineered safety features.

3.7.1 Specifications

The primary coolant system shall not be heated or maintained at temperatures above ~~325~~ 300°F if the following electrical systems are not operable:

a. Station power transformer 1-2 (2400 V).

b. Start-up transformer 1-2 (2400 V).

c. 2400 V engineered safeguards buses 1C and 1D.

d. 480 V distribution buses 11 and 12.

e. MCC No 1, 2, 7 and 8.

f. 125 V d-c buses No 1 and 2.

g. Four preferred a-c buses.

h. Two station batteries and the d-c systems including at least one battery charger on each bus.

i. Both diesel generators, with a minimum of 2500 gallons of fuel in each day tank and a minimum of 16,000 gallons of fuel in the underground storage tank.

j. Switchyard battery and the d-c system with one battery charger.

k. 240 V a-c power panels No 1 and 2, and their associated ACB breaker distribution systems.

l. 2400 V bus 1E.

3.7.2 The requirements of Specification 3.7.1 may be modified to the extent that one of the following conditions will be allowed after the reactor has been made critical. If any of the provisions of those exceptions are violated, the reactor shall be placed in a hot shutdown condition within 12 hours. If the violation is not corrected within 24 hours, the reactor shall be placed in a cold shutdown condition within 24 hours.

3.7 ELECTRICAL SYSTEMS (Continued)

3.7.3 SHUTDOWN COOLING ELECTRICAL REQUIREMENTS

With the primary coolant system at $\leq$ ~~325~~ 300 °F, and with fuel in the reactor, the shutdown cooling train(s) shall be electrically powered as follows:

a. If one train of shutdown cooling is required to meet specification 3.1.9:

1. The appropriate engineered safeguards bus (1C or 1D) shall be operable and capable of being supplied by offsite power and an operable diesel generator.

OR

2. Have two trains of shutdown cooling operable, and meet all the requirements of 3.7.3.b below.

b. If two trains of shutdown cooling are required to meet specification 3.1.9, one engineered safeguards bus (1C or 1D) shall be operable and capable of being supplied by offsite power while the other engineered safeguards bus (1D or 1C) is operable and capable of being supplied by an operable diesel generator.

INSERT →

ACTION

With less than the required electrical sources operable:

A. Immediately initiate action to suspend core alterations,

AND

B. Immediately initiate action to suspend movement of irradiated fuel,

AND

C. Immediately suspend crane operations over irradiated fuel,

AND

D. Suspend operations with a potential for draining the PCS or fuel pool,

AND

E. Initiate action to restore the required electrical sources to operable status.

3.7.3 SHUTDOWN COOLING ELECTRICAL REQUIREMENTS (Continued)

Basis

The operability of the minimum specified power sources and associated distribution systems during shutdown and refueling ensures that:

1. The plant can be maintained in the shutdown or refueling mode for extended time periods, and

2. Sufficient control capability is available for maintaining the plant status.

When a single train of shutdown cooling must be operable to meet the minimum equipment operability requirements to remove decay heat, that train must still function following the loss of one electric supply (offsite or diesel generator).

INSERT → When two trains of shutdown cooling must be operable to meet the minimum equipment operability requirements to remove decay heat, the loss of any single pump or the loss of one electrical supply (offsite or diesel generator) must still leave a shutdown cooling train operable.

The action statements will minimize the occurrence of postulated events, however, they should not preclude the orderly completion of an activity, such as fuel movement or crane operation, in order to get into a safe and conservative position.

Table 3.17.4 (Cont'd)

No	Functional Unit	Minimum Operable Channels	Minimum Degree of Redundancy	Permissible Bypass Conditions	
8.	Pressurizer Wide Range Water Level Indication	2 (m, p, q)	None	Not required in Cold or Refueling Shutdown	#
9.	Pressurizer Code Safety Relief Valves Position Indication (Acoustic Monitor or Temperature Indication)	1 per Valve	None	Not Required below ~~325°F~~ 300°	/
10.	Power Operated Relief Valves (Acoustic Monitor or Temperature Indication)	1 per Valve	None	Not required when PORV isolation valve is closed and its indication system is operable	
11.	PORV Isolation Valves Position Indication	1 per Valve	None	Not required when reactor is depressurized and vented through a vent ≥1.3 sq.in.	
12.	Subcooling Margin Monitor	1	None	Not required below ~~325°F~~ 300°	/
13.	Auxiliary Feed Flow Rate Indication	1 per flow Control Valve (h)	None	Not required below ~~325°F~~ 300°	/
14.	Auxiliary Feedwater Actuation System Sensor Channels	2 per steam generator (e)	1	Not required below ~~325°F~~ 300°	/
15.	Auxiliary Feedwater Actuation System Actuation Channels	2 (f)	1	Not required below ~~325°F~~ 300	/
16.	Excore Detector Deviation Alarms	1 (g)	None	Not Required Below 25% of Rated Power	
17.	Axial Shape Index Alarm	2 (i)	1	Not Required Below 25% of Rated Power	
18.	Reactor Vessel Water Level	2 (j,k,l,m)	None	Not Required Below ~~325°F~~ 300°	# /

Amendment No. 67, 68, 96, 113, 118, ~~129~~

~~September 15, 1989~~

TABLE 3.24-2

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
1. WASTE GAS HOLDUP SYSTEM			
a. Noble Gas Activity Monitor (RIA 1113) Providing Alarm and Automatic Termination of Release	(1)	At All Times	35
b. Effluent System Flow Rate Measuring Device (FI 1121)	(1)	At All Times	36
2. CONDENSER EVACUATION SYSTEM (RIA 0631)			
a. Noble Gas Activity Monitor	(1)	Above 210°F	37
3. STACK GAS EFFLUENT SYSTEM			
a. Noble Gas Activity Monitor (RIA 2326 or RIA 2318)	(1)	At All Times	37
b. Iodine/Particulate/Sampler/Monitor (RIA 2325)	(1)	At All Times	37
c. Sampler Flow Rate Monitor	(1)	At All Times	36
d. Hi Range Noble Gas (RIA 2327) **	(1)	Above 210°F	38
4. STEAM GENERATOR BLOWDOWN VENT SYSTEM			
a. Noble Gas Activity Monitor (RIA 2320)	(1)	Above 210°F	37
5. MAIN STEAM SAFETY AND DUMP VALVE DISCHARGE LINE			
a. Gross Gamma Activity Monitor ** (RIA 2323 and 2324)	1 per Main Steam Line	Above ~~325~~ 300°F	38
6. ENGINEERED SAFEGUARDS ROOM VENT SYSTEM			
a. Noble Gas Activity Monitor ** (RIA 1810 and 1811)	1 per room	Above 210°F	38

** Setpoints for these instruments are exempted from Specification 3.24.5.1 limits. Setpoints for these instruments are governed by Emergency Implementing Procedures or operating procedures.

Amendment No ~~83~~, ~~87~~ ~~April 29, 1985~~

3.25 ALTERNATE SHUTDOWN SYSTEM

LIMITING CONDITION FOR OPERATION

3.25.1 The Alternate Shutdown System instrumentation and components shown in Table 3.25.1 shall be OPERABLE. Operability shall be demonstrated by performing the surveillances in accordance with Section ~~4.20.~~ 4.21.

APPLICABILITY:

Reactor coolant temperature ≥ ~~325°F.~~ 300°F.

ACTION:

a. With less than the "Minimum Equipment" in Table 3.25.1 Operable, restore the inoperable equipment to Operable within 7 days, or provide equivalent shutdown capability and restore the inoperable equipment to Operable within 60 days; or be in Hot Shutdown within the next 12 hours and Cold Shutdown within the following 24 hours.

b. The provisions of Specification 3.0.3 and 3.0.4 do not apply.

Basis

The operability of the Alternate Shutdown System ensures that any fire will not preclude achieving safe shutdown. The Alternate Shutdown System components are independent of areas where a fire could damage systems normally used to shut down the reactor. This capability is consistent with Regulatory Guide 1.97 and Appendix R to 10CFR50.

Table 4.2.2 (Contd)

Minimum Frequencies for Equipment Tests

12. Iodine Removal System

The Iodine Removal System shall be demonstrated operable:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.

b. At least once per 6 months by:

1. Verifying that tanks T-102 and T-103 contain the minimum required volumes.

2. Verifying the concentration of hydrazine in T-102 and sodium hydroxide in T-103.

c. At least once per refueling cycle, during shutdown, by verifying that each automatic valve in the flow path actuates to its correct position.

13. Containment Purge and Ventilation Isolation Valves

The Containment Purge and Ventilation Isolation Valves shall be determined closed:

a. At least once per 24 hours by checking the valve position indicator in the control room

b. At least once every 6 months by performing a leak rate test between the valves.

REMOVE

14. Steam Generator Secondary Water Level

For any steam generator required to meet the shutdown cooling requirements of specification 3.1.9, its secondary water level shall be verified at least once per 12 hours to be above minus 84%

INSERT

Amendment 81, 80,
August 26, 1985

TABLE 4.21.1 (Continued)

ALTERNATE SHUTDOWN MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	Channel Description	Surveillance Function	Frequency	Surveillance Method
7.	Source Range Neutron Monitor (NI-1/3C)	a. Test	Prior to startup(4)	a. Internal test signal (performed under Table 4.1.3)
8.	Auxiliary Feedwater Low Suction Pressure Switch (PS-0741D)	a. Calibrate	Refueling Cycle	a. Apply known pressure to pressure sensor
9.	SIRW Tank Level Indication (LI-0332B)	a. Check(1)	Quarterly	a. Compare independent level readings
		b. Calibrate	Refueling Cycle	b. Apply known differential pressure to level sensor
10.	Auxiliary Feedwater Flow Rate(2) Indication (FI-0727B) (FI-0749B)	a. Calibrate	Refueling Cycle	a. Apply known differential pressure to sensor(s)
11.	Auxiliary Feedwater Flow Control(3) Valves (CV-0727 & CV-0749)	a. Check	Refueling Cycle	a. Verify Control
12.	Auxiliary Feedwater Pump Inlet Steam Valve (CV-0522B)	a. Check	Refueling Cycle	a. Verify Control

NOTES:

(1) Quarterly check are not required when the ~~plant~~ RCS temperature is less than or equal to 300° F. ~~325°F.~~
(2) Satisfies Table 4.1.3-15 Requirement.
(3) See Specification 4.9b.
(4) Prior to each startup, if not done previous week.

(Next Page is 4-90)

Amendment No. 89, 122, ~~130~~
~~February 15, 1991~~

TABLE 4.24-2 (cont)

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
5. MAIN STEAM SAFETY AND DUMP VALVE DISCHARGE LINE					
a. Gross Gamma Activity Monitor	D	M	R(3)	Q(2)	Above ~~325~~ 300°F
6. ENGINEERED SAFEGUARDS ROOM VENT SYSTEM					
a. Noble Gas Activity Monitor	D	M	R(3)	Q(1)(2)	Above 210°F

TABLE NOTATION

(1) The CHANNEL FUNCTIONAL TEST shall also demonstrate that automatic isolation of this pathway occurs if instrument indicates measured levels above the alarm/trip set point.

(2) The CHANNEL FUNCTIONAL TEST shall also demonstrate that control room alarm annunciation occurs if either of the following conditions exists.
   a. Instrument indicates measured levels above the alarm set point (not applicable for Item 3.d, Hi Range Noble Gas).
   b. Circuit failure.

(3) a. The CHANNEL CALIBRATION shall be performed using one or more of the reference standards traceable to the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards shall permit calibrating the system over its intended range of energy and measurement range.
   b. For subsequent CHANNEL CALIBRATION, sources that have been related to the (a) calibration may be used.

(4) CHANNEL CHECK shall consist of verifying indication of flow during periods of release. CHANNEL CHECK shall be made at least once per 24 hours on days on which continuous or batch releases are made.

TABLE FREQUENCY NOTATION

D	At least once per 24 hours	Q	At least once per 92 days
M	At least once per 31 days	R	At least once per 18 months
P	Prior to radioactive batch release	W	At least once per week

Amendment No. 85, ~~123~~ ~~May 30, 1989~~